

**AREERA Report of Accomplishment
University of Florida/IFAS
Florida A&M University/CESTA
Research (1862) and Extension (1862/1890)
Federal Fiscal Year
2003**

This document is produced yearly through the efforts of all of Florida's 1862 and 1890 landgrant faculty and staff.

Please note that this document is designed for electronic use and best viewed in Print Layout. For clarity and efficiency many areas have links to specific information on multiple levels. The best way to use this document is to click on the links for specific areas on the Table of Contents, and returning before moving on to the next section.

April 1, 2004

This is to certify that I have seen and approved the Florida FY2003 Annual Report of Accomplishment for AREERA. This report contains the following:

- UF/FAS (1862) Research and Extension Report including Extension Multi-state and Extension and Research integrated requirements.
- FAMU/FAS (1890) Extension Report.

This is also to certify that Cheri Brodeur will be submitting this report with our knowledge and approval

Signatures:

Dr. Richard L. Jones
Dean and Director of Research



3/29/04

Dr. Charles Magee
Interim Dean and Director
Land Grant Programs



3/29/04

Dr. Larry Arrington
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3/29/04

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~ EXECUTIVE SUMMARY

Like most of the rest of the country, Florida has had to deal with the ramifications caused by 9/11 and the falling economy that occurred following that date. From 2001-2003 the Florida Legislature made cuts of approximately \$12.4 million that, when coupled with the flat budget in the previous ten years, forced a severe decrease in funding for research and educational activities. To fully implement the reduced funding, the administration, faculty and support positions as well as facilities have undergone consolidation with a downsizing of over 251 positions. Part of this downsizing was caused by the budget and part by the high percent of retirements that have occurred over the past few years resulting in the loss of human resources in some key critical areas that remain vacant. IFAS is presently reviewing all open positions and replacing those that are the most critically needed based on budget restrictions.

Along with dealing with the budget crisis and in an effort to further streamline their programs, FAMU/CESTA and UF/IFAS Extension completed long range planning processes in early 2004. UF/IFAS Research is also involved in a series of Ag Summits across the state with Ag Industry which are nearing completion at this time. These grass roots processes have provide valuable information for teaching, research and extension and will allow them to prioritize and disseminate the information gathered into needed research projects, and for the development of educational programs and activities. A formal process has been used and guidance through documents such as "[Preparing for Challenge and Change in the 21st](#)" and [9 Step Process](#) ensure standardization of the process as well as assuring that all populations including the underserved and underrepresented had the opportunity to provide valuable input.

During 2003 UF/IFAS Extension also underwent a formal external review which made recommendation for changes within the organizational structure. Following a review of the State Major Programs (SMPs) by the committee it was recommended that Extension had too many SMPs (68). As part of the long-range planning process, the recommendations of the External Review Committee were adopted and the 68 SMPs have been reduced to 6 goal areas that relate to the 5 national goals (and a 7th internal goal). These Extension goals and the three to five focus areas that fall under each goal are based on the priorities identified at the grassroots levels. Teams formed for each focus area are comprised of 1890 and 1862 Extension faculty, Research faculty and many focus teams also include industry leaders in areas of agriculture, Family and Consumer Sciences, Energy, Marine and Natural resources and youth development. A faculty accountability system called fas2 has been developed and each team provides expected outputs, outcomes, impacts and other pertinent information into the system which will be used by state and county faculty over the next year to develop their individual POWs and ROAs. UF/IFAS Research and Teaching also use this accountability system. In future years this system will be used to produce the information for the AREERA report including information from faculty on their research and extension integrated and multi-state activities.

Along with restructuring and the long-range planning process Florida Extension and Research faculty have worked hard during 2003 to provide the state with the necessary integrated research and educational programs the citizen's of the state have requested. At the beginning of each of the national goal areas you will find a summary of Research and Extension programs in Florida. Also provided in this document is a summary of multi-state and integrated activities.

~ AREERA CRITICAL NEEDS

Goal 1

An agricultural system that is highly competitive in the global economy. Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing.

Florida's Performance Goal

To Enhance and Maintain Agricultural and Food Systems

Statement of Issue:

The agriculture and natural resources industries are major contributors to Florida's economy, generating billions of dollars of revenue and tax contributions and hundreds of thousands of jobs every year. In 2000, Florida's agriculture and natural resources industry generated nearly \$62 billion in output impacts, \$31 billion in value-added (output impacts less Cost of Goods Sold), and almost \$3 billion in indirect business taxes for state and local governments. These industries supported 644,673 jobs that generated \$19 billion in labor income. In addition to these significant monetary impacts, these industries benefit the state by providing wildlife habitat, aquifer recharge areas and areas of open space. From livestock and field crops to fruit to ornamental plants to forest products, the agriculture and natural resources industries contribute significantly to Florida, the United States, and the world.

Extension education programs are essential components to the continued profitability and sustainability of Florida's agricultural and natural resource industries. These educational efforts ensure continued improvements in domestic and international competitiveness, as well as addressing important issues related to Florida's expanding urban development and sensitive natural ecosystems. These educational programs will ensure a continued supply of safe, wholesome agricultural and natural resource products for the citizens of Florida, the United States, and the world.

In the area of Food safety and quality it will encompass the total scope of Florida's agriculture industry, from production practices to food service. The goal is to provide educational programs and technical assistance for Florida's food processing and retail foods industry, regulatory officials, and related clientele in the areas of food safety, food security, nutrition, and quality as they are impacted by food processing and handling. Emphasis is on food safety, food security, and quality intervention systems, food regulations, food processing systems (e.g. ingredient technology, formulation, food processing, and food packaging), functional foods, genetically modified foods, and international aspects;

To provide and facilitate linkages between the state food regulatory, food industry and professional/trade associations; and to provide and facilitate training through participation in on-campus and distance education programs, and food industry internship programs for students in food science and related disciplines.

Also included in this goal is Plant, animal and human protection. Plant, animal and human protection is becoming increasingly important as Florida's urban areas continue to grow rapidly and the more isolated farm population shrinks. The extension community is helping to provide this protection through partnerships across the continuum from farmers to households, including researchers, extension agents, agricultural producers,

Master Gardeners, and Doctors of Plant Medicine. The mechanism for delivery is integrated pest management (IPM), the effective management of pests by using a variety of options that minimize risks to human health and the environment, e.g., pest resistant cultivars, selected growing practices, commercial natural enemies, antagonist microorganisms, and biorational pesticides. Available pest management options are diverse but virtually all of them rely on timely and accurate pest identification and diagnosis. To assure that IPM action is rapid and appropriate, the University of Florida, Institute of Food and Agricultural Sciences (IFAS) has established plant and animal pest diagnostic clinics and networks, such as Florida Plant Diagnostic Network (FPDN) and the Distance Diagnostic and Identification Information System (DDIS) that collaborate with Southern Plant Diagnostic Network (SPDN) and the Florida Department of Agriculture and Consumer Services (FDACS). When pesticides are used as a pest management option, the UF/IFAS Pesticide Safety Education Program (PSEP) provides training and information to applicators on safe, environmentally sound pesticide application practices, personal safety, and regulations. PSEP also assists applicators in meeting state and federal certification and licensing requirements to use pesticides in Florida.

Commodities applicable to the goal area

Agronomic Row Crops
Vegetables (including tropical and small fruits)
Ornamentals and Turf
Animal Sciences/Forages
Sugarcane and Rice
Citrus
Small Farms
Aquaculture
Forestry

[Related Extension Programs and Research Projects](#)

Goal 2

A safe and secure food and fiber system. To ensure an adequate food and fiber supply and food safety through improved science based detection, surveillance, prevention, and education.

Florida's Performance Goal

Processing, Distribution, Safety and Security of Food Systems

Statement of Issue:

Statewide Goal 1, Focus Area 3 (G1F3) will address food safety and quality issues across the entire food processing system, and include consumer, food service and food processing industry viewpoints and coverage. The main focus will be to address the needs of the State of Florida, although the focus area team will draw from the expertise from national and international sources from numerous institutions and industry. This multi-state (and multi-national) cooperation allows for the members to have the broadest impact within the state. This cooperation opens the door to increased funding opportunities that will lead to cooperative research that will benefit both consumers and industry. As food safety become an area of focus for government, industry, the media and consumers, the needs for accurate, easy to understand, accessibly information is becoming paramount to the mission of the focus area team.

Food safety and quality encompass the total scope of Florida's agriculture industry, from production practices to food service. The goal of focus area will be to provide educational programs and technical assistance for Florida's food processing and retail foods industry, regulatory officials, and related clientele in the areas of food safety, food security, nutrition, and quality as they are impacted by food processing and handling. Emphasis is on food safety, food security, and quality intervention systems, food regulations, food processing systems (e.g. ingredient technology, formulation, food processing, and food packaging), functional foods, genetically modified foods, and international aspects;

To provide and facilitate linkages between the state food regulatory, food industry and professional/trade associations; and to provide and facilitate training through participation in on-campus and distance education programs, and food industry internship programs for students in food science and related disciplines.

[Related Extension Programs and Research Projects](#)

Florida's Performance Goal

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality

Statement of Issue:

According to the Centers for Disease Control and Prevention, 76 million cases of foodborne illness occur each year in the U.S., with over 500,000 hospitalizations and 5000 deaths. Each year the economic impact of foodborne illnesses ranges from \$6.5 to \$35 billion. Florida ranks as one of the top 10 states in the incidence of foodborne disease. National CDC surveillance data show that more than 50% of reported foodborne illness cases are attributed to foodservice operations.

Proper nutrition and safe food is important for people at all stages of life and in all life conditions, but is especially critical during pregnancy, for young children and elders, for persons with limited resources, and for persons with conditions that compromise their immune systems. Pregnant women are at increased risk for severe effects of certain food borne pathogens that can adversely affect their babies. Pregnant teens are more likely than more mature women to have low birth weight babies, and are less likely to breast feed their babies. Food habits affect the growth and development of young children, as well as their risk for overweight and associated health conditions such as high blood pressure and diabetes. Very young children are more likely to suffer severe consequences when exposed to food borne pathogens. Florida ranks number one in the nation in the percentage of the population that is 65 years and older. Older adults, particularly those with limited resources, are at risk for malnutrition and for serious effects of food borne illness. Persons with limited resources are at increased risk for malnutrition and adverse health outcomes.

Rationale:

Lifestyle choices, such as diet, physical activity, and food handling practices affect short- and long-term health risks. Use of recommended safe food handling practices in the home and by food handlers can reduce risk of food borne illnesses. Persons with limited resources can reduce their risk of food insecurity and hunger by learning to manage their resources effectively. A key behavior that can help reduce health risks among various target audiences is using safe food handling practices;

Changes in lifestyle behaviors that lead to reduced health risks can have dramatic impacts on skyrocketing health care costs. For example, the cost of an individual case of foodborne illness resulting in death is estimated to be \$42,300. Extension programs that educate and motivate individuals to adopt healthy lifestyle behaviors can significantly impact health care costs in Florida while improving quality of life.

Related Extension Programs and Research Projects

Goal 3

A healthy, well-nourished population. Through research and education on nutrition and development of more nutritious foods, enable people to make health promoting choices.

Florida's Performance Goal:

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality

Statement of Issue:

Nutrition, Food Safety, and Health Extension education programs address critical issues that affect the health and well-being of individuals, families and communities in Florida. Floridians who adopt healthful lifestyle behaviors will improve their nutritional status and health, and help reduce Florida's \$77 billion annual health care bill.

Chronic diseases such as heart disease, cancer, stroke, and diabetes are related to lifestyle choices, and risk for these conditions can be reduced through behavior change. Heart disease and stroke are consistently the number one and three causes of death in the state, with 50,329 and 10,376 deaths, respectively, occurring in 2001. Cancer is the second leading cause of death in Florida, with 38,835 deaths occurring in 2001. Diabetes, the seventh leading cause of death in Florida, is one of the most expensive of the chronic diseases, with nationwide costs of \$92 billion for direct medical expenditures in 2002. An estimated 1 million adults in Florida have diagnosed diabetes and another 300,000 to 400,000 have undiagnosed diabetes. The incidence of overweight and obesity in Florida is rising. Among adults in the state, 38.3% are overweight and an additional 18.5% are obese. Obesity increases risk for diabetes, and risk of death from cardiovascular disease and cancer. Dramatic increases in overweight among children and youth need to be addressed to reduce risk of lifelong health problems.

In 1999-2001, an estimated 12.2% of households in Florida were food insecure, with or without hunger and 4% were food insecure with hunger. Florida has the second highest incidence of AIDS in the US, an illness that predisposes people to the most severe consequences of foodborne illness.

Rationale:

Lifestyle choices, such as diet, physical activity, and food handling practices affect short- and long-term health risks. For example, when people change their behaviors toward a healthier lifestyle, and seek and receive care at the appropriate time, they can reduce their risk for the major chronic diseases such as heart disease and stroke. Also, persons with existing diseases, such as diabetes, can reduce risk for debilitating and expensive health complications through lifestyle changes.

Extension nutrition, food safety, and health education programs give people the knowledge, motivation, and skills they need to adopt behavior changes that promote positive nutritional status and reduce health risks throughout the life cycle. Some of the

key behaviors that can help promote positive nutritional status and reduce health risks among various target audiences include:

- increasing intake of fruits, vegetables, and whole grains;
- moderating intake of total fat, sodium, and added sugars;
- decreasing intake of saturated and trans fat;
- including food sources of key nutrients for their gender and life stage
- using safe food handling practices;
- managing food resources effectively;
- increasing physical activity; and
- participating in recommended health screenings.

Healthy lifestyle practices should begin in childhood, when lifestyle habits are formed, within the context of the family and community. By educating young people themselves, and helping their parents and caregivers model healthful lifestyle practices, Extension can encourage healthy eating and physical activity patterns that promote a healthy body weight and reduce short- and long-term health risks. Middle-aged adults, particularly those faced with risk factors such as hypertension, may be responsive to educational interventions designed to reduce health risks, and older adults can be encouraged to reduce their nutrition and health risks through adoption of healthier lifestyles at any age.

Changes in lifestyle behaviors that lead to reduced health risks can have dramatic impacts on skyrocketing health care costs. For example, it has been estimated that for every person who reduces his/her need for artery-clearing procedures or surgery by adopting heart healthy lifestyle changes, an estimated \$10,930 is saved. Persons with diabetes who improve blood glucose control help to decrease medical costs of diabetes, which doubled from \$44 billion in 1997 to \$92 billion in 2002. Extension programs that educate and motivate individuals to adopt healthy lifestyle behaviors can significantly impact health care costs in Florida while improving quality of life.

[Related Extension Programs and Research Projects](#)

Goal 4

Greater harmony between agriculture and the environment. Enhance the quality of the environment through better understanding of and building on agriculture's and forestry's complex links with soil.

Florida's Performance Goal

To Maintain and Enhance Florida's Environment

Statement of Issue:

Environmental sustainability and economic vitality are keys to maintaining a high quality of life for all Floridians. Water is a critical resource for agriculture, industry, natural systems, and tourism, as well as for the health and convenience of everyone. Although Florida's water supply is currently sufficient, 700 new residents arrive in Florida each day. The demand for water is projected to increase to 9.3 billion gallons per day by 2020, which is 2 billion gallons per day more than in 1995. This rapid increase will put severe pressure on the natural resources of the state due to the loss of open land, the need to protect fragile ecosystems, and the need for high quality domestic water supplies while maintaining water availability for agriculture, tourism and industry. Water management agencies will be seriously challenged to appropriately allocate a finite water resource among all users, including natural systems, while maintaining water quality standards

associated with Total Maximum Daily Loads, the National Pollutant Discharge Elimination System, and other standards imposed by legislative bodies.

The supply and quality of Florida's water resources will degrade unless critical target audiences (agricultural and horticultural producers, natural resource managers, industry, government agencies, educators, and residents) are educated about water conservation and water quality protection. Best Management Practices (BMPs) to conserve water and protect water quality have been developed for a wide variety of agricultural commodities, but end users need to be taught about the science behind the BMPs and how to implement them before a positive effect will occur. Florida residents require education about the watersheds they live in and how their daily activities affect its health. If Floridians better understand basic water issues and how they can contribute to water conservation and improved water quality, they will be more likely to change their behavior and decrease their impact on the environment.

Natural resources (water, flora, and fauna) contribute significantly to the Florida economy and are important components of the quality of life for many residents and tourists. At least half of the respondents to a 1999 survey indicated that prevention of water pollution (72%), protecting the marine environment (64%), and conservation of wildlife habitat and endangered species (50%) were "high priority" educational program needs for their communities. And yet, many issues threaten these valuable assets. Florida ranks third among states in the number of plants and animals federally listed as being in danger of becoming extinct, and half of all Florida's non-marine vertebrates are declining in number. Problems caused by invasive, non-native species in Florida also rank as some of the most severe in the country and threaten wildlife, habitats, and ecosystems. Florida is also one of the most rapidly growing states in the country and expanding agriculture and urbanization contribute unique challenges to natural resource conservation and ecosystem function.

The objectives of UF/IFAS Extension activities and programs are intended to promote the continued existence, function, and sustainable use of Florida's natural resources for the benefit of Florida both today and in the future. These objectives are met by providing science-based information to persons that:

- 0) develop policies that affect natural resources in Florida,
- 0) implement education, management, conservation, and restoration actions that influence natural resources and ecosystems in Florida, and
- 0) consume, enjoy, or otherwise benefit from the existence of natural resources and functional ecosystems in Florida.

Many environmental challenges are exacerbated by human activity. Extension programs have the capacity to raise awareness, provide information, build skills, demonstrate alternatives, and change behaviors that will enhance the quality and quantity of Florida's natural resources. Enhancing the environmental educators' skills, resources, and programs are the mechanism for enhancing the effectiveness of these Extension programs.

Environmental education (EE) is a popular and acceptable tool for addressing environmental challenges. Across the nation, parents consistently express positive attitudes toward EE programs for their children (Roper/Gallup NEETF polls). Adults, too, benefit from EE programs that are designed to provide information about resource conservation strategies, land use management opportunities, and decision-making tools. Effective programs (media campaigns, workshops, presentations, field activities, youth materials, etc.) require use of appropriate, research-based teaching strategies and

technologies. Integrating EE into the State's Extension framework will help EE program providers across the state enhance their ability to deliver EE programs. In the first 4 years, our team's activities will enhance educator effectiveness with program strategies (e.g., service learning, issue investigation) and skill development (e.g., media delivery, critical thinking).

Successful approaches to the challenges facing Florida's estuarine, coastal and marine systems will require innovative and collaborative work. 'Conservation and sustainable use of coastal and marine natural resources and ecosystems' provides focus for work on a variety of challenges facing all Floridians, residents of other states who live in watersheds that pass through Florida, all visitors to these areas, and UF/IFAS Extension and Florida Sea Grant faculty. The challenges we face represent 'wicked problems', which means that improvements to the current situation require an iterative approach to problem definition and testing of potential solutions. Education and outreach play critical roles because all stakeholders must be continually involved in a meaningful fashion if any solution is to be accepted. This Focus Area can improve the current situation by joining with other Focus Areas and Goals to:

- 0) characterize the 'wicked' nature of the problem;
- 0) translate existing scientific findings into potential solutions for testing, with science broadly defined to include physical, chemical, biological, economic, social and political approaches;
- 0) highlight critical gaps in our knowledge and research efforts to fill them;
- 0) facilitate innovative decision-making processes; and
- 0) encourage public involvement and stewardship.

The overall objective of this Focus Area is to sustain or enhance Florida coastal and estuarine water quality, habitat quality, sustainable commercial use, and sustainable recreational use by increasing relevant knowledge and by motivating citizens, professionals and agency personnel to take actions that reduce impacts on these valuable resources. The primary impact of this work will be increased efforts to apply sustainable management to Florida's coastal and estuarine resources. This impact hinges on promoting increased awareness and understanding of ecological, economic, social and management principles and processes among citizens, professionals and agency personnel. Tangible results include an increased involvement of citizens in coastal and estuarine monitoring and management, an increased use of key ecological concepts in discussions held by state and federal management agencies, and an increased awareness and use of adaptive and participative management.

[Related Extension Programs and Research Projects](#)

Florida's Performance Goal

To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow

Statement of Issue:

The state of Florida includes 16 million residents, 40 million annual visitors, a unique ecology and climate, and a wide range of plant material grown year round. Frequently the residents, visitors and property managers have unrealistic expectations. These expectations may have negative impacts on Florida's environment. Many of these people are dependent on professional horticulture service providers to make decisions regarding the landscape management of their properties.

The professional horticulture services industry in Florida has a tremendous economic impact. According to the FNGA/IFAS Economic Impact Study this industry generates \$6.75 billion per year in estimated revenues. This industry also employs more than 157,000 people who make thousands of horticulture and pest management decisions daily. A large and growing portion of this work force is Hispanic.

With IFAS/Extension as a partner, research and science-based educational programs can provide the green industry with best management practices and necessary skills to create and manage landscapes with reduced risk to the environment.

IFAS / Extension is the only organization in Florida with the ability to deliver research-based, unbiased technical information to the professional horticulture service industries on a county-by-county basis. Teaching the green industry current knowledge and skills will:

- Encourage landscape design, installation and management practices that minimize negative environmental impacts and conserve natural resources.
- Improve business profitability and longevity by providing business and management skills.
- Improve Florida's economy through successful business growth.
- Improve quality of life in Florida by protecting the environment.
- Improve property values through installation of Florida Friendly landscapes and their correct management.
- Increase green industry professionalism through continuing education and certification programs.

Through improvement of the green industry's professionalism, the gap between unrealistic expectations and the reality of a Florida landscape can be narrowed. With adoption of best management practices, the customer can realize the aesthetic, environmental and economic benefits of a Florida friendly landscape. In addition, the professional can pass on to the property owner the knowledge and skills appropriate for Florida conditions.

Plant pests (disease, insect, exotic invasive, weeds) impact nearly all residents of Florida either directly or indirectly. Available control options are as diverse as the plants and plantings for which they have been designed, but all efficient options rely on timely and accurate problem diagnosis as a first step.

Florida is a global marketplace for agriculture and horticulture, and as such, the risk of accidental or intentional introduction of potentially devastating plant pests warrants excellence in diagnosis. One new arthropod becomes established in Florida each month and Florida is impacted on a daily basis by some sort of exotic species that has been accidentally imported.

Residents of Florida need to use available diagnostic services. Accurate pest diagnosis is essential for correct control (cultural and chemical) and proper treatment.

Incorrect diagnosis of plant pests can lead to misuse and overuse of pesticides.

Production efficiency (be it turfgrass in a home lawn or ornamental palms on a resort) would increase, and pesticide usage would become more efficient.

Water quality and the environment will be less negatively impacted when proper control measures are used.

[Related Extension Programs and Research Projects](#)

Goal 5

Enhanced economic opportunity and quality of life for Americans. Empower people and communities, through research-based information and education, to address economic and social challenges facing our youth, families, and communities.

Florida's Performance Goal

To Develop Responsible and Productive Youth Through 4-H and Other Youth Programs

Statement of Issue:

In an increasingly complex and competitive world market, the human capital of the United States is an important resource. Young people under 18 years represent 28.3% of the population in the United States and over 33% in Florida. Youth also represent 100 percent of America's future. Recent studies indicate that youth spending time in positive youth programs, such as 4-H, are less likely to become involved in high risk behaviors, have higher school attendance and grades, better conflict management practices and better work habits. Additional research studies have shown that when young people have safe, structured, supervised and healthy activities in which to participate, they are less likely to become involved in the high-risk, unhealthy behaviors than can delay or derail positive development, and they are more likely to obtain a broad range of competencies. Recent surveys of 4-H members in Florida have shown that 4-H equips and trains the youth with leadership and communication skill, offers community service, and builds a network of people that the youth can later utilize. Positive youth development occurs from an intentional process that promotes positive outcomes for young people by providing opportunities, relationships, and support. Youth development takes place in families, peer groups, schools, neighborhoods and communities. 4-H Youth Development uses experiential, research-based educational opportunities that help youth become competent, caring, confident, connected, and contributing citizens of character. Over 150 youth and adults from 38 Florida counties identified the following priorities: 1) have mentors and role models for youth, 2) involve young people in decision-making, 3) teach youth the value of diversity and how to resolve conflict, 4) encourage more positive media coverage of young people, and 5) provide ways for young people to make a difference and prepare for the workplace. Reports from 97% of Florida counties have prioritized three areas for youth programming: developing life skills and career awareness, creating constructive learning environments for youth (organizational design and development), and enhancing adult support system for youth (volunteer development). The Florida 4-H program is committed to providing inclusive and positive youth development programs that are proactive rather than reactive. Florida 4-H programs target these youth development skills as outcomes for young people: · Develop and maintain positive relationships · Process information to make effective decisions and positive choices · Lead and contribute to peers, family, community · Demonstrate marketable, productive skills for work and family life. In summary, Florida IFAS/Extension 4-H will utilize the best practices identified through research and practice to enhance the knowledge, well-being, quality of life, and civic engagement of youth by focusing on: · Life Skills Developed in Youth Through Subject Matter Experience · Organizational Strategies and Learning Environments to Support Youth Programs, and Volunteer Development and Systems to Support Youth.

Related Extension Programs and Research Projects

Florida's Performance Goals

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality

Statement of Issue:

Florida's children, youth and families are facing many risks in the 21st century. Diverse family structures such as teenage parents, single parents, dual earner families, stepfamilies, grandparents raising grandchildren, aging adults and caregiving families are increasing. Thirty percent of Florida's families are headed by a single parent (Kids Count, 2003). The number of teen parents (age 15-17) in Florida is extremely high; Florida ranks 34th in the nation (Kids Count, 2003). Nationally, 9.3% of US families are stepfamilies (Census Bureau, 2003). Among the states, Florida ranks 1st in the percentage of residents over the age of 65 (Current Population Surveys, 2002).

The majority of Florida's families are working parents. In Florida, 57% of women with a child under the age of 6 are in the labor force and approximately 66% of mothers with children 6-17 years old work outside the home (Kids Count, 2003). Working parents need assistance in caring for dependent family members, including quality, affordable childcare and after-school care, as well as elder care.

Families also face problems such as poverty, social isolation, parental substance abuse, stress, child abuse, and domestic violence. For example, 19% of Florida's children are poor (Kids Count, 2003). Florida is ranked 35th among states for the percentage of children in poverty (Children's Defense Fund, 2003).

According to the U.S. Census Bureau, 18 % of Florida's population is over the age of 65. Rising healthcare costs, changing health status and medical needs, depression, legal issues, and financial concerns impact this age group and their families. Increasingly, elders are also faced with raising their grandchildren (Kids Count, 2003).

These demographic and social trends indicate a range of social and economic challenges facing Florida's families and communities. Devoting more resources to prevention education could minimize many of these challenges (Children's Defense Fund, 2003).

UF/IFAS Extension provides program participants with the research-based information, strategies and skills needed to address the challenges faced by Florida's families. State faculty use sound models to develop programs and materials to meet the needs of Florida's families. County faculty, who are trained in human development and experienced in adult education, deliver programs statewide. Extension is able to reach families who could most benefit from these programs by bringing them directly to the participants, in settings such as community centers, schools, churches and work sites.

Research has confirmed that providing education and support services to parents significantly reduces the risk of child abuse and contributes to positive, healthy child-rearing practices. For example, the Federal Children's Bureau reported that evaluation results of Early Head Start Programs found that parents of enrollees were more supportive of learning, less detached, and more likely to use less severe discipline methods in their child rearing practices (DCF, 2001). The United States General Accounting Office has found that early intervention programs are associated with a variety of improved outcomes for program participants, including improved birth outcomes, better child health, improved child welfare, and improved development.

In addition to improved outcomes for families, intervention and prevention programs are extremely cost-effective for society. According to the Center for Florida's Children, it costs \$10,000 for one year of intensive child abuse therapy and \$40,000 to maintain a youth at a correctional facility. Childhood/family support programs can save money by reducing the need for these and other services such as the welfare system and criminal justice system. For each dollar invested in childcare and education, as much as seven

dollars can be saved later on as children are more likely to stay in school, stay away from crime, and stay in the workforce (Children's Defense Fund, 2003).

Floridians Face Economic Challenges

The population of Florida has mushroomed from a little over half a million (528,542) in 1900 to almost 16 million (15,982,378) in 2000. It is projected that by 2025 there will be 20.7 million people living in Florida. No other state in the Southern region even comes close to this rapid increase in population. The population of Florida continues to grow older as residents age and as aging individuals and couples move to Florida. It is projected that almost half of Florida's population growth in the next 25 years will be people age 65 and over, that is by 2025 the over 65 group will make up 26.33 percent of Florida's population. The Employee Benefit Research Institute projects that, if the current trend continues, by 2030 there will be a \$45 billion short fall in funds needed to cover basic expenses of retirees. Most at risk are low-income single women, who typically lack the resources needed to save for their retirement years.

Many Floridians are relying on Social Security as their retirement income even though it is designed as a supplement and not the total retirement income. Average Social Security benefits for all of Florida's beneficiaries age 65 and older in 2000 was only \$818.89 per month. This is below poverty level. According to the National Fraud Center, Florida is one of the 10 states experiencing the greatest problem with fraud. Older Floridians are especially vulnerable to fraudulent scams and con artists.

In 1998, 13.6 percent of Florida's population lived in poverty. That same year 22 percent of Florida's children under 18 lived in poverty. Florida's per capita income in 2001 was \$28,493, only 94 percent of the national average.

As we begin the 21st century the family faces many problems. The highest national debt level in history, a staggering consumer debt load, and runaway health care costs are major problems facing all Americans. Also of great concern is overextended credit, limited life skills, a soaring school dropout rate the continuous move toward a service economy, and public issues of urban and rural families, the elderly, minorities, individuals, youth, farmers, and displaced farmers. Credit has become a way of postponing financial crises. According to the Federal Reserve household debt has hit a record high 109 percent of household income; personal savings are a negative .2 percent, and personal bankruptcies are up 29 percent in the past five years. In 2003, 32,170 non-business bankruptcies were filed in Florida, up 5% from 2002.

Last year American teenagers spent over \$172 billion. That is about \$5,400 each. Findings from a recent study sponsored by Jump \$tart (www.jumpstart.org) show that teenagers receive a failing grade in money management. That is students could answer only half (50.2%) of financial management questions correctly.

Recent studies indicate a growing need for families to become more sophisticated in their financial decision making skills. The management of personal finance has become very complex with intricate tax laws, fluctuating interest rates, increase in the use of electronic technology by the financial industry, and proliferation of insurance products. At the same time, 28% of the adult population cannot make change in a financial transaction. The Consumer Federation of America conducted a nationwide survey of consumer knowledge and found that participants gave correct answers to only 54% of 249 questions. (Adults fared little better than teens.) Results showed that Americans are somewhat knowledgeable about taking prescriptions and over the counter drugs, about automobile repairs and maintenance and rental housing. On the other hand, they knew

relatively little about purchasing a house and only slightly more about life insurance, checking and savings accounts, and food purchases. Eighty-seven percent of today's consumers are value conscious, they want top quality. But one in three find shopping stressful and consider it to be an inefficient use of their time.

The cost of housing has increased from 20.2% of the family budget in the 1900's to about 35% in 2000. This includes utilities, furnishings and repairs as well as the cost of housing. Health care costs have steadily increased and there is no sign of this stabilizing or reversing. The cost of health care is beyond the reach of many families. In 2000, 20.5 percent of Floridians under 65 had no health insurance. Long-term health care is not affordable for most people. Nursing home stays average as much as \$40,000 per year, with long term health care insurance topping \$2,000 per year.

Modern medicine and technology have extended the life expectancy, but living longer does not necessarily mean living better. The issues concerning Floridians today include outliving retirement benefits, threats to Social Security, asset transfer and estate management, elder care cost, affordable health insurance and growing number of children and adults with no health insurance.

Limited resource families, individuals, and youth lack consumer education and life-long skills such as decision making, financial management, time management and management of other resources. Most consumers are interested in inequities of family legal matters. Yet studies show that two-thirds of Floridians die without a will.

Extension has the capacity to respond to the Needs of Florida's Families.

The University of Florida Extension provides program participants with the research-based information, strategies and skills needed to make behavior changes that will improve the individual's quality of life as well as improve the resources of the state.

State Extension faculty members have graduate degrees in consumer education and family economics. One member is a Certified Financial Planner. They have experience working with individuals and families to help families better manage resources and improve their quality of life. State faculty use sound models to develop programs and educational materials to meet the needs of Floridians. Programs usually consist of a series of lessons with a minimum of six hours of contact.

County faculty, who are educated in Family and Consumer Sciences, Consumer Economics and human development and are experienced in adult education, deliver programs statewide. Extension is able to reach youth, young adults, adults, and older adults who can benefit most from these programs. Financial management, family economics, and consumer education programs are offered at convenient sites such as: schools, community centers, places of worship, the work place, health departments, and prisons. Outreach is further enhanced with the assistance of trained volunteers and through media such as radio and television spots and interviews, newsletters, and articles in local newspapers.

Because of its access to research based information, educational methodologies, and state and local infrastructure, Florida Extension is a strong partner to many organizations including, American Association of Retired Persons, Florida Highway Patrol, Community Colleges, Attorney General's Office, Florida Department of Financial Services, Florida Department of Agriculture & Consumer Services, Council on Aging, Consumer Credit Counseling Service, Department of Education and high schools. Extension contributes to partnerships in a number of ways such as in-service education for agency staff, direct educational programming with clientele and providing up-to-date

education resource materials. By working together Extension and its collaborators offer a more comprehensive program with both education and service, consequently, increasing the impact for Floridians.

Shelter is one of the three essentials for mankind. Floridians spend from one-third to almost one-half of their disposable income for housing. It is an important health concern, as well as a financial consideration. One's residence also impacts the social and emotional well-being of its' occupants.

Florida faces several different housing challenges; including the availability of affordable, quality housing for low and limited income families, housing for the elderly and physically challenged, structurally sound housing to withstand hurricane force winds, and housing that provides good indoor air quality in a warm and humid climate. Also, Floridians must consider the removal and disposal of lead house paint from old structures, and the challenge of ensuring that professional builders have the knowledge needed to build houses that address energy, environmental and structural needs. Florida's rapid growth in population places additional stress on its housing situation.

Florida Extension has the information base, established programs, and delivery system needed to address the state's housing problems. Trained professionals in each of Florida's 67 counties provide programming for local residents. Several counties also fund a professional Extension Agent to work exclusively in housing.

Extension works cooperatively with other organizations and agencies to reach and teach target audiences. For example, Extension provides much of the required financial education for the SHIP and other affordable housing programs. County Extension agents working cooperatively with families, daycare centers, schools, and other organizations are able to provide information that helps Floridians to recognize and eliminate indoor air contaminants. County Extension faculty and their trained volunteers can reach and teach residents about energy conservation, lead paint risks, and how to make their homes safe. Extension is also training builders and remodelers to construct energy efficient residences.

Related Extension Programs and Research Projects

Florida's Performance Goals

To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities

Statement of Issue:

There are hundreds of municipalities in Florida, ranging from Islandia with 5 residents to the Greater Miami area with well over one million. Each Florida community has its own history and special flavor, as well as plans and hopes. The citizens of any community have the goal of working together to improve the quality of their lives and increase their opportunities. For communities to grow, they must have the active interest and involvement of citizens in the form of a rich civic life. In this way, citizens come together to discuss and debate the needs and directions for their community. Then, once the decisions are made, citizens must come together to make and execute their plans. Another requirement for growth and opportunity is a robust economy. In Florida, a significant basis for such an economy is the natural environment, in terms of natural resources and natural beauty. Together, these account for much of Florida's overall economy in the forms of tourism, industry, recreation and agriculture. Most communities in Florida are looking to one or more of these areas as sources of economic growth. As

much as citizens and leaders might desire to have vibrant, cooperative communities, the skills needed to achieve this must be learned. Communities need guidance and expertise. They need support and information. Hanging over all plans and achievements, however, is the possibility of disaster. In the last ten years or so, Florida has sustained major natural disasters, including devastating hurricanes and drought. These disasters have challenged and leveled communities. A hurricane or tornado can cause irreparable damage to a community, and a severe drought can change the economic welfare of an entire region. The past two years have made all Floridians aware of other threats to the stability of our communities. Every community must now have some response ready in case of an intentional attack. These attacks can take many forms, including bombings and the introduction of disease agents. Central to the life of our communities are the lives of their citizens, and that means working for their safety in the everyday hazards they face in their homes and workplaces. Florida's natural environment and large agricultural sector expose Florida citizens to a wide range of personal hazards or the possibility of creating hazards for others. As concerned as we are about large-scale emergencies, Floridians are much more likely to face death or injury through equipment or situations they encounter everyday. Whatever our communities are confronted with, Extension must be ready to play its role. Through its reputation for community involvement and quality information, Extension has special capabilities that can assist communities in valuable ways during good times and bad.

Related Extension Programs and Research Projects

Goal 6

Improving Extension Performance (Human Capital)

Florida's Performance Goals

To Promote Professional Development Activities Designed to Enhance Organizational Efficiency and Effectiveness

Statement of Issue:

Technical, people and programming competencies are necessary to ensure the effectiveness of Extension program development, delivery and evaluation. Customer satisfaction and future funding are both important outcomes of program excellence. Proper planning will ensure that new and veteran faculty members maintain and develop skills that will equip them to deliver programs effectively to clientele in Florida and elsewhere.

Related Extension Programs and Research Projects

Goal 7

Budget and Performance Initiative

Statement of Issue:

Related Extension Programs and Research Projects

~ RESEARCH PROJECTS AND EXTENSION PROGRAMS

Goal 1

An agricultural system that is highly competitive in the global economy. Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing.

Agricultural Profitability and the Sustainable Use of Environmental Resources

Research:

ABE-03285	ANS-03956	BRA-03609	ENH-03609	HOM-03402	LAL-03770
ABE-03492	ANS-03980	BRA-03832	ENY-03592	HOS-03402	MCS-03861
AGR-03374	APO-03523	BRA-04012	FOS-03846	HOS-03457	ONA-04006
AGR-03427	APO-03609	BRO-03651	FTL-03554	HOS-03601	PLP-03336
AGR-03854	APO-03875	ENH-03544	FTL-03602	HOS-03832	PLP-03925
ANS-03572	BGL-03827	ENH-03564	FTL-03609	JAY-03457	QUN-03609
ANS-03821	BRA-03364	ENH-03595	FTL-03620	JAY-03609	QUN-03854
ANS-03859	BRA-03524	ENH-03600	FTL-03711	JAY-03620	SWS-03834
ANS-03912	BRA-03544	ENH-03602	HAS-03875	LAL-03571	

Extension:

FL-SMP-102	FL-SMP-116	FL-SMP-133	FL-SMP-317
FL-SMP-103	FL-SMP-119	FL-SMP-212/712	FL-SMP-411
FL-SMP-105	FL-SMP-121	FL-SMP-265	
FL-SMP-112	FL-SMP-128	FL-SMP-273	

Awareness of Agriculture's Importance to an Economy That Ranges From Local to Global

Research:

ABE-03874	ANS-03912	BRA-03609	FRE-03599	FRE-04005
ANS-03572	APO-03523	BRO-03651	FRE-03701	LAL-03571
ANS-03821	APO-03609	ENY-04011	FRE-03769	MCS-03861
ANS-03859	APO-03875	FRE-03497	FRE-03863	

Extension:

FL-SMP-101	FL-SMP-119	FL-SMP-128
FL-SMP-103	FL-SMP-121	

Processing, Distribution, Safety and Security of Food Systems

Research:

ABE-03874	FOS-03456	FOS-03846	FOS-03910	FYC-03960	PLP-03588
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Extension:

FL-SMP-124	FL-SMP-135	FL-SMP-272
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Plant, Animal and Human Protection

Research:

ABE-03824	AGR-03594	ANS-03859	ANS-03912	APO-03523	APO-04012
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[BGL-04012](#) [ENY-03942](#) [FME-03966](#) [HAS-03875](#) [LAL-03896](#) [PLP-03925](#)
[BRA-03364](#) [ENY-03961](#) [FTL-03423](#) [HOM-03402](#) [LAL-03897](#) [PLP-03934](#)
[BRA-03524](#) [ENY-04011](#) [FTL-03539](#) [HOS-03402](#) [LAL-03924](#) [PLP-04031](#)
[BRA-04012](#) [ENY-04012-L](#) [FTL-03544](#) [HOS-03457](#) [MCS-03798](#)
[ENY-03419](#) [ENY-04012-W](#) [FTL-03607](#) [IMM-03924](#) [ONA-04006](#)
[ENY-03592](#) [ENY-04025](#) [FTL-03620](#) [JAY-03457](#) [PLP-03524](#)
[ENY-03934](#) [ENY-04030](#) [FTL-04066](#) [JAY-03620](#) [PLP-03623](#)

Extension:

[FL-SMP-212/712](#) [FL-SMP-128](#) [FL-SMP-133FL-](#) [FL-SMP-135](#)
[FL-SMP-124](#) [FL-SMP-416](#) [SMP-105](#) [FL-SMP-272](#)

To Maintain and Enhance Florida's Environment

Water Resources

Research:

[ENH-03544](#) [HOS-03832](#) [SWS-03834](#)

Extension:

[FL-SMP-411](#) [FL-SMP-416](#)

To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow

Green Industries' BMPs Program

Research:

[BRA-03544](#) [BRA-03832](#) [ENH-03544](#) [FTL-03711](#) [JAY-03609](#)

Extension:

[FL-SMP-116](#)

Commercial Horticulture/Urban Forestry Service

Research:

[BRA-03544](#) [ENH-03544](#) [ENH-03600](#) [ENH-03609](#) [FTL-03609](#) [QUN-03609](#)
[BRA-03609](#) [ENH-03595](#) [ENH-03602](#) [FTL-03554](#) [JAY-03609](#) [QUN-03854](#)

Extension:

[FL-SMP-112](#) [FL-SMP-116](#)

The Importance of Diagnostic Tools

Research:

[FTL-03423](#) [LAL-03571](#)

Extension:

[FL-SMP-131](#)

Goal 2

A safe and secure food and fiber system. To ensure an adequate food and fiber supply and food safety through improved science based detection, surveillance, prevention, and education.

To Enhance and Maintain Agricultural and Food Systems

Plant, Animal and Human Protection

Research:

[FME-03966](#)

Extension:

[FL-SMP-103](#)

[FL-SMP-122](#)

[FL-SMP-135](#)

[FL-SMP-121](#)

[FL-SMP-131](#)

[FL-SMP-272](#)

Processing, Distribution, Safety and Security of Food Systems

Research:

[ABE-03491](#)

[FOS-03456](#)

[FRE-03571](#)

[LAL-03571](#)

Don't fit

[FME-03477](#)

[FOS-03846](#)

[FYC-03960](#)

[PLP-03588](#)

[FRE-03597](#)

[FME-03966](#)

[FOS-03910](#)

[HOS-03559](#)

[FTL-03896](#)

Extension:

[FL-SMP-122](#)

[FL-SMP-215/715](#)

[FL-SMP-272](#)

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality

Nutrition, Food Safety, and Health

Research:

[FOS-03456](#)

[FOS-03846](#)

[FOS-03910](#)

[FYC-03960](#)

[HOS-03559](#)

[PLP-03588](#)

Extension:

[FL-SMP-122](#)

[FL-SMP-215/715](#)

Goal 3

A healthy, well-nourished population. Through research and education on nutrition and development of more nutritious foods, enable people to make health promoting choices.

To Enhance and Maintain Agricultural and Food Systems

Plant, Animal and Human Protection

Research:

[BGL-03917](#)

[FME-03966](#)

[SWS-03919](#)

Extension:

[FL-SMP-215/715](#)

[FL-SMP-273](#)

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality

Parenting, Families, and Care

Research:

[BGL-03917](#)

[FOS-03513](#)

Extension:

[FL-SMP-511](#)

[FL-SMP-271](#)

Nutrition, Food Safety, and Health

Research:

[BGL-03917](#)

[FME-03966](#)

[FOS-03515](#)

[FYC-03960](#)

[SWS-03919](#)

[FME-03477](#)

[FOS-03513](#)

[FOS-03840](#)

[FYC-03960](#)

Extension:

[FL-SMP-215/715](#) [FL-SMP-511](#) [FL-SMP-262](#) [FL-SMP-273](#) [FL-SMP-271](#)

Goal 4

Greater harmony between agriculture and the environment. Enhance the quality of the environment through better understanding of and building on agriculture's and forestry's complex links with soil, water, air, and biotic resources.

Research:

[ABE-04016](#)

Extension:

[FL-SMP-112](#) [FL-SMP-116](#) [FL-SMP-129](#) [FL-SMP-316](#) [FL-SMP-420](#)

To Maintain and Enhance Florida's Environment

Water Resources

Research:

[ABE-03593](#) [BRA-03544](#) [FOS-03548](#) [HOM-04016](#) [LAL-03832](#) [SWS-03596](#)

Extension:

[FL-SMP-105](#) [FL-SMP-121](#) [FL-SMP-273](#) [FL-SMP-416](#)
[FL-SMP-111](#) [FL-SMP-122](#) [FL-SMP-411](#)
[FL-SMP-113](#) [FL-SMP-269](#) [FL-SMP-412](#)

Conservation and Sustainable Use of Freshwater and Terrestrial Natural Resources and

Ecosystems

Research:

[ABE-03285](#) [ANS-03596](#) [ENY-03934](#) [FTL-03711](#) [LAL-03832](#) [SWS-03820](#)
[ABE-03596](#) [BGL-03827](#) [FOS-03548](#) [HOM-04016](#) [PLP-03925](#) [SWS-03897](#)
[AGR-03427](#) [BGL-03925](#) [FTL-03925](#) [HOS-03402](#) [PLP-04031](#) [SWS-03917](#)
[AGR-03594](#) [BRA-03832](#) [FTL-03539](#) [HOS-03457](#) [QUN-04012](#) [SWS-03919](#)
[AGR-03983](#) [ENH-03543](#) [FTL-03544](#) [JAY-03609](#) [SWS-03596](#)

Extension:

[FL-SMP-105](#) [FL-SMP-121](#) [FL-SMP-412](#)
[FL-SMP-112](#) [FL-SMP-411](#) [FL-SMP-416](#)

Environmental Education

Research:

[BGL-03917](#) [HOM-04016](#) [PLP-03305](#) [SWS-03596](#)

Extension:

[FL-SMP-122](#) [FL-SMP-124](#) [FL-SMP-214/714](#) [FL-SMP-411](#)

Conservation and Sustainable Use of Coastal and Marine Natural Resources and Ecosystems

Research:

[ENH-03564](#) [FRE-03863](#)

Extension:

[FL-SMP-133](#) [FL-SMP-315](#) [FL-SMP-317](#)

To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow

Residential Landscapes

Research:

[FTL-03711](#) [JAY-03609](#) [SWS-03820](#)

Extension:

[FL-SMP-122](#)

Commercial Horticulture

Research:

[BRA-03524](#) [ENH-03543](#) [JAY-03609](#) [LAL-03832](#) [PLP-03305](#) [SWS-03820](#)

Extension:

[FL-SMP-105](#) [FL-SMP-121](#) [FL-SMP-122](#) [FL-SMP-131](#)

To Enhance and Maintain Agricultural and Food Systems

Agricultural Profitability and the sustainable use of Environmental Resources

Research:

[BGL-04012](#) [BRA-03544](#) [HOS-03402](#) [LAL-03832](#) [QUN-04012](#) [SWS-03919](#)

[BGL-03496](#) [ENH-03543](#) [HOS-03457](#) [PLP-03305](#) [SWS-03596](#)

[BGL-03925](#) [FTL-03925](#) [JAY-03609](#) [PLP-03925](#) [SWS-03820](#)

[BRA-03364](#) [FTL-03711](#) [LAL-03770](#) [QUN-03934](#) [SWS-03897](#)

Extension:

[FL-SMP-102](#) [FL-SMP-105](#) [FL-SMP-411](#) [FL-SMP-273](#)

[FL-SMP-103](#) [FL-SMP-121](#)

Awareness of Agricultural importance to an Economy that ranges from local to global

Research:

[FRE-03769](#)

Extension:

[FL-SMP-121](#)

Plant, Animal and Human Protection

Research:

[APO-03924](#) [BRA-03364](#) [ENY-03934](#) [FME-03966](#) [PLP-03623](#) [QUN-03934](#)

[APO-04012](#) [BRA-03524](#) [ENY-04011](#) [FTL-03539](#) [PLP-03925](#) [QUN-04012](#)

[BGL-03917](#) [BRA-03832](#) [ENY-04012-W](#) [FTL-03544](#) [PLP-03934](#) [SWS-03897](#)

[BGL-03925](#) [BRA-04012](#) [ENY-04025](#) [HOS-03402](#) [LAL-03897](#) [SWS-03917](#)

[BGL-04012](#) [BGL-03496](#) [FTL-03925](#) [PLP-03305](#) [PLP-04031](#) [SWS-03919](#)

Extension:

[FL-SMP-105](#) [FL-SMP-122](#) [FL-SMP-124](#) [FL-SMP-416](#)

Goal 5

Enhanced economic opportunity and quality of life for Americans. Empower people and communities, through research-based information and education, to address economic and social challenges facing our youth, families, and communities.

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality

Housing and Environment

Research:

[FYC-03923](#)

Extension:

[FL-SMP-124](#)

[FL-SMP-411](#)

[FL-SMP-116](#)

[FL-SMP-510](#)

[FL-SMP-512](#)

To Develop Responsible and Productive Youth Through 4-H and Other Youth Programs

Life Skills Development

Research:

[FYC-03923](#)

Extension:

[FL-SMP-124](#)

[FL-SMP-212/712](#)

[FL-SMP-215/715](#)

[FL-SMP-217/717](#)

[FL-SMP-201/701](#)

[FL-SMP-214/714](#)

[FL-SMP-216/716](#)

Organizational Development

Research:

[FYC-03923](#)

Extension:

[FL-SMP-218/718](#)

Volunteer Development

Research:

[FYC-03923](#)

Extension:

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality

Nutrition, Food Safety and Health

Research:

[BGL-03917](#)

[FRE-03584](#)

[FRE-03660](#)

[FRE-04005](#)

Extension:

[FL-SMP-215/715](#)

Parenting, Families, and Care

Research:

[FYC-03923](#)

Extension:

[FL-SMP-215/715](#)

[FL-SMP-515](#)

Financial Management and Economic Well-Being

Research:

[FRE-03660](#) [FRE-04005](#)

Extension:

[FL-SMP-201/701](#) [FL-SMP-273](#) [FL-SMP-512](#)

Housing and Environment

Research:

[BGL-03917](#) [FTL-03423](#) [FTL-03607](#)

Extension:

[FL-SMP-124](#)

To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities

Economic Development and Community Services and Infrastructure

Research:

[ENH-03543](#) [FRE-03599](#) [FRE-03863](#)

Extension:

[FL-SMP-270](#) [FL-SMP-315](#) [FL-SMP-513](#)
[FL-SMP-273](#) [FL-SMP-317](#)

Civic Engagement, Growth, Leadership Development, and Community Decision Making

Research:

Extension:

[FL-SMP-216/716](#) [FL-SMP-315](#) [FL-SMP-513](#)
[FL-SMP-270](#) [FL-SMP-317](#)

Community Preparedness

Research:

Extension:

[FL-SMP-124](#) [FL-SMP-513](#) [FL-SMP-270](#)

To Promote Professional Development Activities Designed to Enhance Organizational Efficiency and Effectiveness

- Advancing New Technologies and Skills
- Extension Foundation Skills
- Personal and Organizational Health
- Communications and Marketing
Extension:
[FL-SMP-217/717](#)
- Administration and Leadership
Extension:
[FL-SMP-216/716](#)

Goal 6 Improving Extension Performance (Human Capital)

Keywords:

Communications and Marketing

Advancing New Technologies and Skills

Professional Development

Agricultural Communications

Enhancing Customer Service/Satisfaction

Information Technologies

Institutional Engagement

Multicultural and Diversity Issues

Extension Foundation Skills

Personal and Organizational Health

Organizational Efficiency and Effectiveness

Agricultural Communications

Enhancing Customer Service/Satisfaction

Information Technologies

Institutional Engagement

Multicultural and Diversity Issues

Administration and Leadership

• Research Impact statements

FLA-ABE-03285

Title: ANAEROBIC DECOMPOSITION OF ENERGY CROPS, WASTES, AND METALS

Critical Needs:

National Objectives: 1, 4

Key Themes: #j95 18; anaerobic digestion; digesters; equipment design; equipment development; biomass; organic waste; waste degradation; xenobiotics; methane; composts; renewable resources; energy; waste utilization; corrosion; microorganisms; metals; engineering; waste disposal; *Agricultural waste management; Hazardous material*

Summary:

Methane and other chemicals may be derived from anaerobic fermentation biomass and wastes. Toxic chemicals and metals may be transformed under certain conditions in the environment. The purpose of this project is to develop reactor designs and operating conditions for conversion of biomass and wastes to methane, compost, and other useful products. The potential for environmental degradation of toxic chemicals and biocorrosion of metals are also being investigated.

Progress: (Anaerobic Digestion of Biomass and Organic Wastes) Research continued here and at the University of Queensland on development and optimization of the patented University of Florida sequential batch anaerobic composting (SEBAC) process. This process was developed for conversion of high solids (>20%) organic feedstocks including energy crops and solid wastes. During the report period numerous experiments were run on the organic fraction of municipal solid wastes separately and blended with biosolids. Conversion was typically about 50% with a methane yield of 0.22 L/g volatile solids. Aerobic composting of blends of organic wastes and the organic fraction of MSW was investigated at the commercial Sumter Co. Florida rotating drum/windrow facility with USEPA Region 4 funding. Wastes blended with the organic fraction of MSW included biosolids, dairy, food, and layer. The MSW provided a bulking agent and the other Wastes provided a source of nutrients. The conversion and compost quality were evaluated using physical, chemical, and biological analyses. A project was initiated to look at the technical feasibility of using the SEBAC process for processing organic wastes generated during long-term space missions. An example of such a mission would be a trip to Mars with a crew of six and a six year duration. (Biodegradability of Energy Crops and Wastes) Our laboratory employs the biochemical methane potential assay for evaluating the extent and rates of conversion of biomass and waste samples. During this project period this method was employed to evaluate the BMP of several waste components expected to be of interest in long term space missions. The samples included paper and several inedible crop residues (wheat, tomato, potato, peanut, sweet potato, and rice). These data will be employed to predict extent and rates of conversion in actual digester runs discussed above. The influence of temperature on degradation of cellulose added to landfill leachate samples was investigated. The site of leachate collection was known to reach temperatures as high as 60°C which is thought to be the upper limit for many microorganisms. We observed that methanogenic activity was higher at 55°C than at 60°C suggesting that operating procedures should aim at preventing the higher temperature. (Anaerobic Biodegradability of Xenobiotic

Compounds) Bleaching of paper results in release of chloroform into groundwater. We investigated the degradation of chloroform in soil microcosms set up from soil samples collected from paper mill grounds. The results showed that chloroform is degraded in 2-7 weeks depending upon soil organic matter content and anaerobic conditions. Research was completed on the fate of mercury in landfills. It was concluded that mercury is volatilized after discharge into landfills in the form of batteries, fluorescent bulbs, and other mercury-containing wastes. Under anaerobic conditions mercury is converted to elemental and methylated mercury forms which are volatile and undoubtedly emitted as atmospheric pollutants. These data suggest that mercury measurements in landfill samples underestimate the importance of that pollutant.

Impacts: Anaerobic processes are expected to have a major impact on environmental quality. Anaerobic digestion is a sustainable of regeneration of nutrients and recovery of energy and compost from wastes generated on earth and during space missions. Anaerobic processes also play a major role in degradation of toxic compounds released into the environment and corrosion of metals. An understanding of these activities will reduce potential health problems and costs related to metals corrosion.

Source of Federal Funds: Hatch

FLA-ABE-03491

Title: *PARAMETER SENSING AND CONTROL SYSTEMS FOR DRYING AGRICULTURAL COMMODITIES*

Critical Needs:

National Objectives: 2

Key Themes: instrumentation; agricultural engineering; sensors; control systems; drying systems; measuring equipment; curing; systems analysis; agricultural commodities; data analysis; effectiveness; parameters; criteria; operational analysis; integrated production; environmental control; processing; handbooks; *Food Quality; Food Handling*

Summary: Efficient curing/drying of important Southern Region Agricultural commodities requires effective sensors and techniques for continuous measurement of critical parameters. This project implements control systems and collects and evaluates data documenting effectiveness and efficiency of sensors/control systems in curing/drying the various commodities involved.

Progress: Lack of funding and research interest shift to cooling horticultural crops resulted in minimum effort during the past year. As part of Regional Project S-266, the loss of most of the regional membership due to reassignment or retirement prevent cooperative efforts.

Impacts: Primary impact related to improved drying controls for peanut drying through use of computer controls.

Source of Federal Funds: Hatch

Title: MICROIRRIGATION OF HORTICULTURAL CROPS IN HUMID REGIONS

Critical Needs:

National Objectives: 1

Key Themes: micro irrigation; irrigation management; drip irrigation; irrigation systems; irrigation efficiency; systems design; chemigation; costs; evapotranspiration; water quality; water conservation; expert systems; engineering; horticultural crops; citrus; solanaceae; ornamental plants; potatoes; *precision agriculture; Ornamental/Green agriculture; organic agriculture*

Summary: Microirrigation systems can help conserve water, increase crop production and economic return, and maintain high water quality, but systems must be properly designed, managed and maintained to achieve these benefits. The purpose of this project is to develop management systems using microirrigation techniques to apply water and nutrients to horticultural crops while minimizing adverse impacts on water quality, to document economic benefits and to determine effects on water resources.

Progress: A study of irrigation for container grown ornamental plants was continued. Plants were grown in multi-pot boxes that collected excess rain and irrigation for later use. Several papers related to this study were submitted and published. First season (spring 2001) of microirrigation/fertigation project at an organic farm was completed and the experiments are continued during this fall. Effluent from an anaerobic digester was used as an organic fertilizer in this system. Various chemical treatments were evaluated as line clogging prevention methods. A proceeding paper was published and presented at an annual symposium. A study on evapotranspiration models for Florida has been completed and four refereed papers were submitted during this year. One is in print and one is accepted. A drip irrigation research project consisting of four irrigation treatments and three nitrogen treatments was conducted on various vegetable crops. The experiment on watermelon was completed in the spring of 2001. Chapter 8 of Vegetable Production Guide was rewritten and significantly changed from the previous years based on new information.

Impacts: Microirrigated multi-pot boxes provided significant water savings in all seasons. In some seasons plants were grown only using water harvested from the rain. A model of water use for plants grown in the new production system is being developed. Several publications were published and submitted. The chemical treatments against clogging of a drip tape with effluent injection on organic vegetables were successful for two out of three drip tapes evaluated in spring of 2001. Injection of chlorine, acid and/or ozone resulted in similar tape performance. We observed decrease of total flow rate due to some plugging but the uniformity was high for two drip tapes out of three tested in the experiment. There was a significant difference in overall

clogging among three types of tapes used in the experiment. Results from the first year of drip irrigation and N application have shown that watermelon yields responded quadratically to irrigation rates. The interaction irrigation rate x N rate was not significant for early and total marketable. The effect of N rate was significant for early yield but not for total yield.

Source of Federal Funds: Hatch

FLA-ABE-03593

Title: *DEVELOPMENT AND APPLICATION OF COMPREHENSIVE AGRICULTURAL ECOSYSTEMS MODELS*

Critical Needs:

National Objectives: 4

Key Themes: environmental models; ecosystems; ecosystem management; agricultural land; land use; expert systems; hydrologic models; water quality; nutrient transport; non point pollution; geographic information systems; watershed management; pasture management; agricultural practices; economic analysis; crop growth; climate change; *wetlands restoration and protection*

Summary: Agricultural management practices can be used to reduce the impacts of agricultural production on water resources, but it is difficult to quantify these effects. This project develops and tests hydrologic and ecosystems models for use in assessing the impacts of agricultural practices on water resources.

Progress: A new field study was initiated at a 5000 acre commercial vegetable farm in the Suwannee River Basin. Biweekly sampling of soil water content and soil water nitrogen was conducted by taking soil cores over the top 90cm at 10 locations throughout one 140 acre vegetable field. Periodic plant biomass sampling was conducted to obtain moisture content, dry matter content, total nitrogen content and weight of all plant components. Biweekly sampling of the 13 wells installed in and around the field was conducted. An on-site weather station that measures rainfall, temperature, and solar radiation was downloaded weekly. Field sampling will continue at this site over the next 2-3 years. Field data collected to date shows that groundwater nitrate declined over the cover crop-peanuts-cover crop rotation which occurred from April 1999 through April 2000. However groundwater nitrate increased significantly over the corn-cotton-potatoes rotation which occurred from June 2000 through June 2001. Of approximately 300 kg/ha N applied to the spring 2001 potato crop on the order of 100 kg/ha N was taken up by crop and on the order of 200kg/ha N leached below root zone. Soil water nitrate concentrations ranged from 100-450 mg/l in the top 1 m of soil, and declined to approximately 25-50 mg/l at the 5m depth, which is consistent with well water nitrate concentrations. These data are currently being used to develop recommendations for alternative vegetable water and nutrient management practices intended to reduce the leaching of nitrate to

groundwater. The data will also be used in crop growth and subsurface flow and transport models to make long term predictions crop yield, water and nitrogen leaching for alternative vegetable water and nutrient management practices. An object-oriented, nitrogen and phosphorus process module (ACRU-NP) was designed in the Unified Modeling Language (UML) and implemented in the Java programming language as an extension to the ACRU2000 modeling system. The nitrogen and phosphorus component, process and data objects used in ACRU-NP were patterned after transformation and transport concepts used in the GLEAMS model.

Impacts: The nitrate load to the Suwannee River in the middle Suwannee Basin is contributed almost exclusively through groundwater discharge to the river. Knowledge gained from this project will help develop BMPs for vegetable farms in the Suwannee River Basin that will reduce nitrate leaching to groundwater. Development of BMPS will be essential to meet the nitrate TMDL that will ultimately be established for the Suwannee River.

Source of Federal Funds: Hatch

FLA-ABE-03596

Title: *ANIMAL MANURE AND WASTE UTILIZATION, TREATMENT AND NUISANCE AVOIDANCE FOR A SUSTAINABLE AGRICULTURE*

Critical Needs:

National Objectives: 4

Key Themes: waste; animal waste; waste treatment; sustainable agriculture; livestock production; wetlands; riparian sites; waste water; engineering; manure management; dairy farms; solid waste; composting; anaerobic digestion; odor control; chemical treatment; lagoons; phosphorus; nutrient removal; design criteria

Summary Manure from production of meat, milk and eggs can contribute to nitrogen and phosphorus in both groundwater and surface water if they are not properly managed and utilized. This is particularly important in the sandy soils and vulnerable water resources in Florida. This project evaluates new and more effectively engineered systems for processing animal manures into useful products, such as compost and nursery potting media, and for removing nutrients from stormwater runoff from animal production facilities

Progress: 1996/10 TO 2001/09

A constructed wetlands and overland flow system was placed in operation on a 200 cow commercial dairy farm in Central Florida. The system consisted of two wetland cells (0.13 ha each) planted with arrowhead and pickerel weed. The effluent from the second wetland cell was pumped to an overland flow system (0.34 ha) planted with Floralta limpogress. Influent to the system was from the third cell in a lagoon system that handled wastewater from the milking parlor and from a drainage ditch that captured lot runoff and effluent from the overland flow system. Results showed only a 25% removal of total phosphorus

and a 61% removal of total nitrogen in the system. Most of the phosphorus removal was in the overland flow system, and most of the nitrogen removal was in the constructed wetlands system. Laboratory and pilot scale tests were performed using aluminum and iron compounds to remove nutrients from dairy farm wastewater. A commercial chemical and biological treatment system was tested on wastewater from the University of Florida Dairy Research Unit. The system utilized reactors filled with dolomitic limestone and lava rock. Although previous testing on wastewaters with a lower nutrient content had shown promising results for the system, it did not perform better than control treatments on dairy wastewater that contained high levels of nitrogen and phosphorus in the modes of operation that were tested. The treatments included aeration to promote nitrification and denitrification and the use of different numbers of reactors. A project on composting of scraped dairy manure was completed. Testing was conducted in bench scale reactors and in a demonstration bin composting system on a commercial dairy farm. Scraped dairy manure in Florida is very wet, and a bulking agent must be added to help reduce the moisture content and to provide porosity to the composting material. The mixtures which performed the best were the sawdust and manure at 67% and 71% moisture, pine mulch and manure at 64% and 65% moisture, yard waste and manure at 65% and 74% moisture, and peanut hulls and manure at 63% moisture. These mixtures performed better than mixtures with lower moisture content. The addition of coastal Bermuda grass hay did not provide enough porosity to the manure/hay matrix to allow for an efficient composting process. A research/demonstration waste management system was installed on a 1600 cow commercial dairy farm near Zephyrhills, Florida. The system included a sedimentation basin, holding tank, mechanical screen, tangential flow separator, plate clarifier and a large horizontal drum composter. The drum composter had a volume of 90 cubic meters. The objective was to recover as many solids as possible from the wastewater and produce a potting media (peat substitute) that could be sold to the plant nursery businesses in the area. Screened solids at 70 to 75% moisture content were successfully composted in the drum composter in three days. Nematode free certification was obtained from the State. Evaluations of the material as a replacement for peat in potting media in laboratory and greenhouse tests were very successful.

Impacts: 1996/10 TO 2001/09

Constructed wetlands and overland flow systems were shown to be effective in removing nutrients from dairy farm runoff. Composting systems for dairy manure were successfully demonstrated on commercial farms. A saleable peat replacement product was created from screened dairy farm wastewater. These results give economic incentives to removal of nutrients from dairy farms and to reducing nutrient losses to the environment.

Source of Federal Funds: Hatch

FLA-ABE-03824

Title: *SYSTEMS FOR CONTROLLING AIR POLLUTANT EMISSIONS AND INDOOR ENVIRONMENTS OF POULTRY, SWINE AND DAIRY FACILITIES*

Critical Needs:

National Objectives: 1

Key Themes: chickens; environmental stress; swine; dairy cattle; livestock production; poultry production; animal housing; heat stress; air pollution; emissions; environmental stress; agricultural engineering; pollution control; systems development; quantitative analysis; performance evaluation; environmental effects; air quality; sustainable agriculture; ventilation; cooling systems

Summary: Livestock heat stress limits production in warm climates such as Florida's. Air pollution in livestock housing can cause health problems for workers and livestock. This project studies systems for ventilation and air pollution control methods for livestock housing

Progress: Tunnel ventilation and mechanical cooling systems were evaluated for effectiveness in cooling dairy cows in Florida's hot, humid climate. Pressure distributions under hoofs of dairy cows were measured.

Impacts: Information from cow ventilation and cooling studies will result in improved milk production and improved cow health. Better information about the pressures on cow hoofs will result in improved flooring surfaces and improved cow health.

Source of Federal Funds: Hatch

FLA-ABE-03874

Title: *IMPROVEMENT OF THERMAL AND ALTERNATIVE PROCESSES FOR FOODS*

Critical Needs:

National Objectives: 1

Key Themes: food production; sterilization; pasteurization; thermal processing; bacterial spores; food microbiology; kinetics; population dynamics; thermophilic bacteria; aseptic processing; ultra high temperature; food processing; on line systems; simulation models; computer programs; control systems; food quality; food safety; *saccharomyces cerevisiae*; *escherichia coli*; process development; *agricultural profitability*; *Information technology*

Summary: FDA regulations to assure safety of sterilized canned foods require that product be destroyed when unexpected temperature deviations occur during processing at considerable economic loss. This project will develop mathematical models for use with

computer control systems that will correct such deviations on-line without compromising product safety.

Progress: Objectives for this project are: 1. To measure and model process-dependent kinetic parameters which affect food quality and safety attributes. 2. To identify and describe transport phenomena and/or mechanisms occurring in food processes. 3. To develop mathematical models for analysis, design and improvement of food processes. Progress to-date includes the following accomplishments: 1. Kinetic parameters describing thermal inactivation of E.coli in heat pasteurization of orange juice have been estimated by two different types of methods. Results show that D-values at a given temperature can differ by as much as 25% depending upon method used. Accuracy of each method was determined by comparing model predicted survivors (using parameters estimated by both methods) with laboratory plate counts resulting from a known but challenging dynamic time-temperature heat treatment outside the range of temperatures used for parameter estimation. In all cases, kinetic parameters estimated by the dynamic PEIE method yielded model predictions that agreed most closely with experimental results. 2. Development of mathematical models for simulating thermal processes of foods by coupling numerical solutions to differential equations describing heat transfer with analytical solutions of differential equations describing thermal inactivation kinetics of reactions (microbial lethality and/or quality retention). 3. Three book chapters on various aspects of thermal processing were prepared and submitted for publication during this reporting period. 4. Work on the influence of high isostatic pressure on heat capacity and density of liquid foods undergoing high pressure processing has been published. 5. Work on extraction rates for removal of L-dopa from Mucuna bean using water as solvent has been published. 6. Review of the literature on microbial physiology commenced in 2001 with the objective of learning the current state of modeling the reaction and, in particular, transport processes involved. It appears that significant knowledge and capability exist for modeling catabolic and anabolic reactions but not for the transport processes. Significant qualitative but not quantitative knowledge exists for modeling causal bases and dynamics of transport. This effort will continue in 2004.

Impacts: Control systems developed with results from this project continue to impact the food canning industry by helping the industry achieve increased safety assurance of sterilized canned foods to the consuming public with optimum quality at lower cost, and with improved manufacturing efficiency.

Source of Federal Funds: Hatch

FLA-AGR-03374

Title: GENETIC IMPROVEMENT OF FORAGE GRASS SPECIES

Critical Needs:

National Objectives: 1

Key Themes: forage grasses; forage quality; forage yields; pennisetum; hybrids; selection; plant breeding; poly crossbreeding; plant disease resistance; persistence; summer; festuca arundinacea; lolium; plant genetics; plant improvement; warm season grasses; cool season grasses; annual grasses; *Plant genomics*; *plant germplasm*

Summary: Many forage grass species are not genetically adapted to Florida conditions. To genetically modify grass species to improve their utility in grazing systems.

Progress: A long-term phenotypic selection program was continued in a tall fescue population for adaptation and productivity under Florida conditions. A nursery of approximately 1250 individual plants was established in the field during early fall. Selection of approximately 125 individuals was made the following spring prior to anthesis. The selected individuals were allowed to interpollinate and seeds were harvested on an individual plant basis in summer. These seeds were then used to continue this program with equal numbers of progeny seedlings being established from each parent for a new nursery. A tall fescue performance trial was established at two locations in Florida, Gainesville and Jay. These were identical tests with all entries were commercial cultivars except for two experimental populations developed at Gainesville. At Gainesville, one of the Florida experimental breeding population produced significantly higher yields for the season than the commercially available entries. This trial will continue to be harvested during the upcoming growing season. At the other location, an extremely dry year allowed only one harvest of the material. No statistical differences were detected in this test. Seven experimental annual ryegrass populations were released as named cultivars. Ten other ryegrass populations were selected for cold tolerance, crown rust and gray leaf spot resistance and high forage and seed yields. Persistence studies continued with several turf and forage tall fescue populations.

Impacts: The development of experimental populations of forage grasses will assist animal producers in economically managing their operation. This research is focused on either developing new cultivars of cool season grasses for use during the winter or by developing new cultivars of tropical grasses which have a longer growing season, in essence prolonging their productivity during the early part of the winter.

Source of Federal Funds: Hatch

FLA-AGR-03427

Title: *RECYCLABLE ORGANIC SOLIDS IN CONSERVATION TILLAGE MULTIPLE CROPPING SYSTEMS*

Critical Needs:

National Objectives: 1, 4

Key Themes: soil chemistry; economic analysis; tillage; cropping systems; soil organic matter; soil fertility; mulches; grass clippings; soil amendments; nitrogen fertilizers; fertilizer requirements; corn; subtropical agriculture; double cropping; vegetables; legumes; nematode population; manures; *innovative farming techniques; agricultural waste management; land use*

Summary: Alternative uses of urban yard waste can alleviate up to one-third of landfill disposal sites. This research examines tillage, cropping systems, soil quality, crop nutrition and crop yield in conservation tillage multiple cropping systems and from

recycling urban yard waste on agricultural land. Additional research is also devoted to subtropical corn breeding.

Progress:

Impacts: Yard waste compost(YWC)had acceptable levels of heavy metals and soluble salts for recycling on farmland. YWC improved soil quality (water holding capacity, bulk density, and levels of essential plant nutrients) and was correlated with increased sweet corn yield and quality. Therefore application of this waste as compost to agricultural land is a viable alternative to landfill disposal.

Source of Federal Funds: Hatch

FLA-AGR-03594

Title: FORMATION, SPROUTING AND LONGEVITY OF HYDRILLA TUBERS

Critical Needs:

National Objectives: 1, 4

Key Themes: weeds; aquatic weeds; plant reproduction; hydrilla; tubers; hydrosol; sprouting; environmental factors; weed control; lakes; ponds; ecosystem management; vegetative propagation; natural areas; longevity; *invasive species*; *Endangered species*;

Summary: The submersed aquatic weed hydrilla invades waterways of the southeast U.S., displacing native vegetation, and adversely impacting irrigation, flood control, recreation and public health. Long-term control strategies must include depletion of populations of hydrilla tubers. This project examines factors that influence the production, longevity and germination of hydrilla tubers, with the objective of improving long-term control of hydrilla populations.

Progress: A greater understanding of the dynamics of subterranean turions (tubers) of hydrilla is critical to developing improved management programs for this invasive, exotic aquatic plant. The vertical distribution of hydrilla tubers in lake hydrosols and tuber location in the sediment did not affect subsequent sprouting potential. Mesocosm studies (900 L tanks) indicated that removing the vegetative canopy of hydrilla does not affect the rate of tuber sprouting, however, control methods that kill the root system increased sprouting rates by 20 to 48 percent (independent of tuber age). Tuber sprouting was much greater in sand than in organic or loam sediments following mechanical or herbicide treatments. Changes that occur in the microenvironment where roots and tubers are closely associated, likely stimulated sprouting in mesocosm studies. Tuber populations were monitored over a 30 month period in research ponds in North Florida and showed no difference in sprouting between untreated control ponds and treated (vegetation removed) ponds. Monthly sprouting rates generally remained below 3 percent, with peaks (5-7%) noted in the Fall. Limited tuber production in untreated systems is attributed to reduced rootcrown density (loci for tuber production) due to intraspecific

competition. When management was stopped at 27 months, tubers were replenished to near pretreatment densities within 3 months. Laboratory studies show that once a tuber is disturbed following its removal from the sediment, the likelihood of sprouting increases linearly with time through 48 hours. Use of disturbed tubers in laboratory studies may confound results depending on the length of time the tuber has been removed from the sediment. Laboratory evaluations suggested that exogenous application of abscisic acid at concentrations as low as 0.05 to 1.0 micro-molar strongly inhibited tuber sprouting under both aerobic and anoxic conditions; however, this effect was partially overcome by addition of GA3(15-150 micro-molar). Inhibitors of ethylene action and synthesis, as well as ethanol did not impact tuber sprouting at physiological concentrations. Carbon dioxide at concentrations of 1 to 14 atm also inhibited tuber sprouting. Results suggest that drawdowns remain the only management tool currently available that will significantly stimulate sprouting of hydrilla tubers, particularly those in coarse (sand) substrates. Tuber formation appears to be independent of sediment redox potential, but it is hypothesized that tuber sprouting may be at least partially regulated by the redox potential in the micro-zone immediately adjacent to quiescent tubers.

Impacts: Since its introduction into waters of the United States in 1960, hydrilla is now considered the most serious aquatic weed in this country. Annual expenditures of public funds for management and in some states, eradication, costs in excess of \$30 million/year. Hydrilla produces vegetative tubers, seed-like propagules which form in the hydrosol and assure the continued survival and re-infestation of waterways following human or natural control or reduction of plant populations. A greater understanding of tuber production and sprouting will lead to more efficient management programs and significantly reduce these increasing annual expenditures.

Source of Federal Funds: Hatch

FLA-AGR-03854

Title: *SELECTION AND ADAPTATION OF GRASS AND LEGUME SPECIES FOR FORAGE PRODUCTION IN THE SOUTHERN COASTAL PLAIN AND PENINSULAR FLORIDA*

Critical Needs:

National Objectives: 1

Key Themes: photoperiod; forage; setaria; paspalum; paspalum notatum; forage grasses; plant adaptation; forage production; coastal plains; plant genetics; germplasm; plant evaluation; plant breeding; plant improvement; forage yields; plant pest resistance; transgenic plants; plant response; plant accessions;

plant growth; seasonal growth; clover; lolium; *plant production efficiency; grazing; plant geonomics, plant germplasm*

Summary: Winter forage production in Florida is limited by short days and cold winter temperatures which impact production of tropical forage grasses. The purpose of this project is to breed and select for tropical forage grasses which are less impacted by short days and cold winter temperatures.

Progress: Research was completed to evaluate the effects of three levels each of colchicine, trifluralin, and oryzalin as mitotic spindle poisons in tissue culture to double the chromosome numbers of Pensacola derived bahiagrass (*Paspalum notatum*). Over 2000 clones produced by these treatments were planted on 90 cm centers in the field. Initial morphological evaluation of these clones showed variability for growth habit, plant diameter, and number of flowering heads. Early ploidy assessment was conducted using mitotic root tip chromosome counts. Mitotic root tip chromosome counts in bahiagrass are difficult and laborious. Therefore, alternative methods for ploidy assessment were pursued. Evaluation of leaf stomatal size was found to be a good preliminary screen for predicting putative 4x clones. Acquisition of a flow cytometry instrument in summer 2003 enabled rapid ploidy verification of putative 4x clones. This instrument greatly reduced the amount of time necessary for ploidy verification. Over the course of this research, mitotic chromosomes counts were obtained on less than 5 clones per day, while 50 or more clones per day were analyzed using flow cytometry. Final ploidy verification was conducted using either mitotic root tip counts (167clones) or flow cytometry (256 clones). Although all treatments yielded tetraploid clones, mean percentage tetraploid individuals recovered varied among treatments(colchicine 23%, trifluralin 14%, and oryzalin 10%). At present, approximately 310 clones have been verified as tetraploid by various methods. Approximately 100 verified tetraploid clones were evaluated for response to frequent (bi-weekly) close mowing. Four replicates of each clone were planted in May in 90 cm rows with in-row spacing of 45 cm. Variability for response to mowing was observed with some clones dying by the end of summer. Final selections for clones that persist under mowing will be made in spring 2004. A second experiment evaluated response to the same mowing treatment of approximately 800 2x individuals from a segregating population. Persistence among these individuals was variable, but overall was superior to the 4x population. Research to evaluate leaf tissue tolerance to frost and freezing in bahiagrass has identified significant variability for this trait. Experiments under controlled growth chamber conditions have confirmed these differences. Preliminary research suggests that lines with higher levels of freeze damage resistance (remain green at temperatures that kill leaves of other lines) show differences in anatomical structure. Crosses are being made between freeze resistance and susceptible lines to evaluate the inheritance of this characteristic.

Impacts: Development of improved bahiagrass cultivars with cold tolerance and superior growth in late fall and early spring should enhance the profitability and sustainability of the beef cow calf industry in the SE USA.

Source of Federal Funds: Hatch

FLA-AGR-03983

Title: *CONSERVATION TILLAGE MULTIPLE CROPPING MANAGEMENT STRATEGIES FOR GREATER SUSTAINABILITY*

Critical Needs:

National Objectives: 1, 4

Key Themes: non tillage; conservation tillage; multiple cropping; double cropping; triple cropping; nitrogen fertilizers; plant nutrition; soil fertility; sustainable agriculture; nematodes; corn; cotton; peanuts; hemp; winter annuals; small grains; vegetables; organic farming; urban areas; chickens; poultry manure; crop management; management systems; cropping systems; performance testing; nutrient utilization; crop yields; soil properties; *plant production efficiency, innovative farming techniques; soil erosion; soil quality*

Summary: Conventional tillage and monocropping contribute to erosion, loss of farmland productivity, the potential for pollution of air and streams and buildup of pests. This project examines conservation tillage multiple cropping strategies for increased utilization of farmland on a year-round basis for greater sustainability.

Progress: Proper tillage management and variety selection for peanut (*Arachis hypogaea* L.) is important to the survival of peanut farmers. Strip-till was compared to conventional tillage management to test 12 peanut varieties following a winter crop of rye (*Secale cereale* L.), at Citra, FL in 2003. Tillage was the main treatment and variety was the sub treatment in a split plot experimental design with six replications. Peanuts were all planted in 0.76 m wide rows, 4 rows wide and 10.7 m long at in-row spacing of 6 cm. Irrigation, gypsum, and other fertilizer were applied as recommended. Weeds, insects and diseases were controlled with chemicals. Disease ratings and pod yield were collected. Pod yield was not affected by tillage. Best varieties were DP-1, Andru II, and AP-3 with pod yields of 5850, 5620, and 5540 kg ha⁻¹. These yields were almost twice the Florida state average. These high yielding varieties also had the lowest incidence of Tomato Spotted Wilt virus and Late Leaf Spot diseases. Disease ratings were lowest in strip-till treatment. These high yields also attest to the importance of our breeders who continually develop high yielding low disease incidence varieties of peanut. Variety testing of five long-juvenile soybean lines developed by the late Dr. K. Hinson was completed in 2003. Yields of the full season planting in 2003 were essentially the same as for when planted in late August. All data illustrate the potential for significant forage production by these lines. Nitrogen content and other lab

analysis will be conducted in the coming months. Depending on the line, we now have from 100 to 300 pounds of each in cold storage for future research and or potential variety release. We now have three years of data on 20 combinations of triple-cropping systems for forage. The long-juvenile soybean variety Hinson has been in the test for one of the fall planted crops. The systems have been initiated for a fourth year at present.

Impacts: Crop management studies continue to provide information to farmers on best combinations of crops and varieties to use in double and triple cropping successions and rotations. We continue to find that conservation tillage crop yields are equal or better than conventional tillage. Because of this research, present and future farmers can make better-informed choices for their economic survival and environmental benefits to society.

Source of Federal Funds: Hatch

FLA-ANS-03572

Title: *BYPRODUCT FEEDSTUFFS: RUMEN DEGRADABILITY OF CARBOHYDRATE AND FAT FRACTIONS AND EFFECTS ON FEED EFFI*

Critical Needs:

National Objectives: 1

Key Themes: feed; animal nutrition; ruminant nutrition; byproducts; citrus pulp; dietary carbohydrates; dietary fats; feed composition; rumen fermentation; fermentation products; digestibility; hominy; feed supplements; rumen metabolism; lactation; feed efficiency; production efficiency; feed formulation; dairy cattle; feed nutritive value; *animal health; animal production efficiency*

Summary: 1. Analyze soluble fiber and neutral sugar contents of dried citrus pulp collected across the harvest season from a variety of sources. 2. Measure differences in fermentation rates and products between citrus pulp and hominy feed. In vitro fermentations of original samples, ethanol-insoluble residues, and neutral detergent production measurement system. Type and amounts of volatile fatty acids produced will be compared between and within feed type, and substrate. Rates of carbohydrate (soluble fiber and neutral detergent fiber) fermentation will be determined from the gas production curves and compared among and within feeds and carbohydrate type. 3. In vitro fermentations with 6 fat sources (fish oil, tallow, poultry fat, calcium soaps of poultry fat, whole cottonseed, and corn oil) will be used to determine the pattern of biohydrogenation of fats and their effect on neutral detergent fiber digestibility at 0, 12 and 24 hours of fermentation. Fats will be incorporated into hominy, corn silage, or alfalfa hay before being mixed together and subjected to in vitro fermentation. Following fermentation, samples will be subjected to fatty acid analysis. 4. A nitrogen balance trial with lactating dairy cows will be conducted to assess the affect of the substitution of soluble fiber for starch. On

isonitrogenous corn silage- and alfalfa-based rations, citrus pulp will be substituted for hominy feed.

Progress: Byproduct feeds tend to contain a variety of non-neutral detergent fiber (non-NDF) carbohydrates (NFC) other than starch. However, starch is the predominant NFC fed in much of the country. Data on the fermentation product yield from the non-starch NFC, such as sugars and soluble fiber, is lacking. The yield of microbial crude protein (CP) from sucrose, corn starch, and citrus pectin was examined using trichloroacetic acid (TCA) precipitation of batch cultures. The substrates were NFC+bermudagrass NDF (40:60). Microbial CP (TCACP) was estimated as TCA-precipitated CP corrected for the TCA-precipitated CP content of substrates at 0 h, and the mean of fermentation blanks from each hour. Medium pH did not decline below 6.49 in any fermentation tube. Comparisons of maximal yields based on the hour in which the measured mean yield was greatest for each substrate in each fermentation indicated that Sta > Suc = Pec > iNDF ($P < 0.05$). All substrates showed increases in TCACP to their maxima, followed by declines in TCACP. This likely reflects the relative dominance of production or degradation of microbes about the point of substrate limitation. Unlike other substrates, Suc had no detectable lag, and presented a more persistent TCACP yield curve than the other non-NDF carbohydrates (NFC). Regression analysis of TCACP yield over time for iNDF vs. other substrates, Pec + Sta vs. Suc, and Pec vs. Sta indicated that the compared curves were not parallel ($P < 0.05$). The patterns of TCACP yield over time were cubic for iNDF and Suc, and quartic for Pec and Sta. The maximal yields of TCACP predicted from the regressions were Sta: 34.0 mg at 15.6 h, Pec: 29.9 mg at 13.5 h, Suc: 25.5 mg at 12.6 h, and iNDF: 13.6 mg at 19.3 h. The NFC carbohydrates examined differed in both maximal yields and temporal patterns of yield of TCACP. The proportion by weight of microbially "usable" carbon and weight of monomers released upon hydrolysis of the starch and pectin appears to be related to their differences in microbial CP yield. In a subsequent collaborative study with Dr. Paul Weimer of USDA testing 3 different levels of sucrose fermented in vitro with bermudagrass NDF, dextran content, TCACP yield, and organic acid yields increased linearly with increasing sucrose substrate. Efficiency of microbial CP yield and microbial CP+organic acid+dextran yields per milligram of sucrose substrate decreased with increasing sucrose substrate. The linear increase in products with increasing sucrose suggest that nutrient yield can be predicted from substrate available. However, the sucrose is not converted to fermentation products with the same efficiency at all levels of substrate.

Impacts: Describing the temporal differences among fermentable carbohydrates in their yields of products, including organic acids and microbial protein is an essential starting point to predicting the yield of metabolizable nutrients to the cow. Differences noted in microbial CP yield for sucrose, starch, and pectin are in

agreement with and help to explain the results of animal feeding trials. Currently, microbial yield from these three non-NDF carbohydrates are treated as being equivalent. This information will be used to modify animal feeding recommendations and they open the door for investigations into appropriate carbohydrate and protein supplementation strategies to meet animal nutrient requirements. This information can be used to help reduce nutrient excretion by animals through more accurate ration formulation and better feed efficiency.

Source of Federal Funds: Hatch

FLA-ANS-03596

Title: ANIMAL MANURE AND WASTE UTILIZATION, TREATMENT AND NUISANCE AVOIDANCE FOR A SUSTAINABLE AGRICULTURE

Critical Needs:

National Objectives: 4

Key Themes: waste; waste treatment; animal waste; livestock production; manure management; odor control; sustainable agriculture; engineering; pollution control; gaseous pollutants; air borne particulates; feeding systems; dairy farms; anaerobic digestion; flocculation; precipitation; nutrient removal; phosphorus; ruminant nutrition; diets; *nutrient management; Agricultural waste management*

Summary: The effect of adding flocculants to dairy flushwaters to precipitate manure fertilizer nutrients, especially P, will be evaluated along with management systems to assist farmers to concentrate manure nutrients for export off-farm. Several anaerobic digestion systems will be tested for reducing odor. Reducing N excretion by improving rumen utilization of dietary carbohydrate and protein will also be investigated.

Progress: Previous research has contributed to improved estimates of manure nutrient excretions and provided information to guide producers to reduce dietary nutrient inputs and, consequently, excretions as the first step in whole-farm nutrient management. Research under primary leadership of K. R. Woodard and L. E. Sollenberger, Agronomy Dept. U.F. Florida shows that year-round forage systems can prevent loss of N to groundwater from waste effluent sprayfields. The purpose was to measure forage N removal and nitrate-N leaching out of the rooting zone for two, year-round forage systems during four, 12-month cycles. Soil at the site is an excessively drained, Kershaw fine sand. The average annual loading rates of effluent N were 450, 610, and 810 lb/acre per cycle. During the first three cycles, average N removed by the bermudagrass-rye cropping system (BR) was 415, 472, and 522 lb/acre per cycle for the low, medium, and high loading rates, respectively. For the corn-forage sorghum-rye system (CSR), N removals were 286, 292, and 338 lb/acre per cycle, respectively. The higher N removals of the BR system

were attributed to higher N concentration in bermudagrass (range: 1.9 to 2.2 %) compared to that in corn and forage sorghum (range: 1.1 to 1.3 %) of the CSR system. Nitrogen removal by the rye components of both systems did not differ. Over the four-cycle period, N removal for rye ranged from 48 to 78 lb/acre per cycle. Dry matter yield declined in the fourth cycle for bermudagrass but N removal continued to be higher in BR than CSR. The BR system was much more effective at preventing nitrate-N leaching. For CSR, nitrate-N concentration in soil water (five feet below surface) increased steeply during the period between the harvest of one forage and canopy closure of the next, peaking within a few days of canopy closure and subsequently declining. We conclude that the BR system was better than CSR at preventing nitrate-N loss to groundwater in dairy effluent sprayfields.

Impacts: Many Florida dairies will utilize no-till, sod-based forage programs with Tifton 85 bermudagrass as the primary forage in a two or three-crop system to scavenge and utilize high levels of manure N efficiently. This system will be utilized especially in deep sand soils to protect against leaching of nitrate N to groundwater.

Source of Federal Funds: Hatch

FLA-ANS-03821

Title: *SYNCHRONIZATION OF ESTRUS IN CATTLE OF BOS INDICUS BREEDING*

Critical Needs:

National Objectives: 1

Key Themes: prostaglandins; progesterone; artificial insemination; beef cattle; estrus; synchronization; animal breeding; anestrus; animal physiology; reproductive performance; livestock production; performance evaluation; lactation; post partum; heifers; production systems; systems development; regional research; tropical agriculture; beef cows; gonadotropin releasing hormone; growth factors; comparative analysis; field trials; estradiol; timing; pregnancy rate; *animal production efficiency, agricultural profitability*

Summary: Cattle that have some Bos indicus breeding are less responsive to estrus synchronization products than cattle of Bos taurus breeding and therefore have a decreased reproductive efficiency to estrus synchronization programs. This project will evaluate different combinations of estrus synchronization products in cattle of Bos indicus breeding to enhance the success rate of AI and eventual development of a timed-AI protocol.

Progress: The objective of all our estrus synchronization research is to develop an effective estrus synchronization experiment in cattle of Bos indicus x Bos taurus breeding that consistently yields an acceptable AI pregnancy rate (greater than 50%) while using the drugs that are currently available to beef cattle producers and approved for use by the Food and Drug Administration (FDA). We conducted a 2x2 factorial estrus synchronization experiment in postpartum lactating Bos indicus x Bos Taurus

cows and Bos taurus cows. Tested the main effect of GnRH vs. no-GnRH at the insertion of a 7 day controlled intravaginal releasing device (CIDR) to improve pregnancy rates to a AI breeding 7 days later. At CIDR removal all cows received prostaglandin on day 7. There were two AI protocols 1) cows AI for 3 days after a detected heat with all cows not showing heat by 72 hours were timed-AI with GnRH (AI+GnRH) 2) cows received estradiol cypionate (ECP) 24 hours after CIDR removal and cows were AI after an observed estrus and all cows not showing estrus by 72 hours after CIDR removal were timed-AI at such time (ECP). The pregnancy rates for Bos indicus X Bos taurus cows for the four treatments were 1) GnRH+CIDR with AI +GnRH - 59.7% 2) No GnRH+CIDR with AI +GnRH - 40.3% 3) GnRH+CIDR with ECP - 53.1% 4) No GnRH+CIDR with ECP - 44.4%. The pregnancy rates for the Bos taurus cows for the four treatments were 1) GnRH+CIDR with AI +GnRH - 66.7%; 2) No GnRH+CIDR with AI +GnRH - 53.3% 3) GnRH+CIDR with ECP - 44.9% 4) No GnRH+CIDR with ECP - 66.4%. Providing GnRH at CIDR insertion increased ($P < 0.05$) overall pregnancy rates by 14% in the Bos indicus x Bos taurus cows compared to the CIDR alone but had no added benefit in the Bos taurus cows. Combining three days of estrus detection with a timed-AI was the most consistent synchronization protocol in either breed of cows. It resulted in a 60% AI pregnancy rate in the Bos indicus x Bos taurus cows and 66.7% in the Bos taurus cows.

Impacts: This research has very important implications for beef producers in Florida as well as other beef producer synchronizing estrus in Bos indicus x Bos taurus cattle. First, producers must use GnRH at the initiation of a CIDR treatment to attain acceptable results. If they do not use GnRH at the insertion of a CIDR, AI pregnancy rates could be decreased by 10 to 15%. Second, this is also important because it provides producers with an effective estrous synchronization system that utilizes drugs that have been approved by the FDA for use in food producing animals with no withdrawal time.

Source of Federal Funds: Hatch

FLA-ANS-03859

Title: *USE OF BST, SHORTENING THE DRY PERIOD, AND PREPARTUM FEEDING OF ANIONIC SALTS TO IMPROVE MILK PRODUCTION AND HEALTH OF DAIRY COWS.*

Critical Needs:

National Objectives: 1

Key Themes: dairy cows; lactation; feed intake; somatotropic hormones; animal health; animal hormones; metabolites; dry cows; estrogens; milk composition; pre partum; body weight; diet; body condition; anions; cations; dairy cattle; nutrient utilization; animal physiology; livestock management; animal nutrition;

dosage; biological activity; growth factors; blood levels; plasma levels; field trials; reproductive performance; post partum; estradiol; animal metabolism; *animal health, animal production efficiency; agricultural profitability*

Summary: Management practices, diets fed and shortened dry periods are being evaluated in dairy cows. The purpose of this study is to examine the effectiveness of available technology, feeding management, and short dry periods to improve the feed intake of dairy cows around calving. The purpose is to improve their intake of feed, reduce their health problems and allow high milk production after calving. The project also examines whether we can speed-up the dry-off of mammary tissue by using estrogen at the time of dry-off and thereby reduce the standard 60-day dry period in half.

Progress: The final bST experiment was initiated and completed. Major objectives were to evaluate effects of biweekly injections of low doses of bST (0.4 mL of POSILAC, 10.2 mg/d) on plasma concentrations of somatotropin (ST), insulin (INS) and calcium (Ca), and calving variables and milk yield (MY). This experiment was a larger field-trial using multiparous Holstein cows (n=103) assigned randomly to a 2x2 factorial arrangement of treatments (TRT; I=no bST, n=26; II= bST postpartum, n=25; III=bST prepartum, n=27; IV=bST prepartum and postpartum, n=25). Prepartum injections began 3 wk before expected calving through calving and postpartum injections were from calving through 28 DIM. Cows injected prepartum or postpartum or during both periods had greater mean daily MY than controls (33.50, 34.50, 37.55 vs. 29.68 kg; $P<0.01$). No TRT effects were detected on mean body weight (BW, $P=0.62$) or body condition score (BCS, $P=0.42$) prepartum or at calving. No TRT effects were detected on mean calf birth weight ($P=0.61$). Prepartum injections of bST increased ST concentrations during the prepartum period (~6%), and in cows injected postpartum ST concentrations were higher only after 3 wk postpartum (~35%). No TRT effects were detected on INS or Ca concentrations throughout the experimental period. Injecting bST during the transition period positively impacted ST concentrations and increased MY, with no apparent adverse effects at calving or on cow or calf health. Collection of milk yield data, and liver and blood plasma analyses are continuing. The fourth experiment previously described was completed. Multiparous Holstein cows were used to evaluate glucogenic supplements added to daily TMR. Treatments were 1)control, none, n=29; 2) NutroCal (Kemin Americas), 0.114 kg/d, n=33; 3) Metaxerol (Pestell America), 0.454 kg/d, n=31; and 4) propylene glycol, 0.300 kg/d, n=31. Closeup dry TMR was fed through day of calving then fresh cow TMR was fed through 100 DIM, but supplements were discontinued after d 28. Prepartum feed intake (kg/d) at wk -3 (28.85), wk -2 (31.91) and wk -1 (28.89) did not differ due to TRT. Feed intake decreased 17.8-30.9% the week before calving, greatest decrease was during the 2 d before calving.

Postpartum feed intake increased in all TRT groups during each of the 4 wk and no differences in intake were detected due to TRT except during wk 4 (1>2; 39.18 vs 36.50, P= 0.0608) and (3>2; 39.05 vs. 36.50, P=0.0698). MY for TRT groups did not differ during the first 4 wk when supplements were fed except that cows in TRT 4 produced less milk (~2.5 kg/d; P=0.0356). Overall, 3.4 kg/d less milk was produced during hot season. MY did not differ due to TRT for 28-70 (P=0.7127) or 4-100 DIM (P=0.9072) and no TRT comparisons were significant. BCS and BW prepartum and postpartum did not differ due to TRT. Overall, cows in all groups had similar MY, maintained BW and BCS equally well, and had similar patterns of feed intake during prepartum and postpartum periods. Analyses of blood plasma samples and liver samples, and their association to milk production are in progress.

Impacts: The occurrence of several different metabolic diseases is greater during the transition period than at any other time during the lactation cycle of the dairy cow. Higher incidences of these diseases seems to be associated with reduced feed intake and greater energy deficit during the late prepartum and early postpartum periods. The sudden start of milk production after calving places a great strain on the metabolism of the cow as she tries to support the function of the the mammary gland. This strain is exacerbated if feed intake is reduced before calving and/or is too slow to increase after calving. This often leads to a shortage of available glucose and other metabolites that are needed to support milk synthesis which then results in too great a mobilization of lipids and their storage in the liver. Our goals have been to define the extent of this problem and then to evaluate ways to limit the extent of feed reduction and liver lipid accumulation and to increase the availabiltiy of glucose if there is reduced feed intake. We have done this by using low doses of bST to improve feed intake and body metabolism and to supply additional glucogenic precursors to offest this limitation. These strategies have been used jointly and singly to evaluate the best practices to implement as a way to improve transiton period feed intake and metabolism. We have limited our research to those strategies that could be implmented on commercial dairy farms.

Source of Federal Funds: Hatch

FLA-ANS-03912

Title: *ENHANCING PRODUCTION AND REPRODUCTIVE PERFORMANCE OF HEAT-STRESSED DAIRY CATTLE*

Critical Needs:

National Objectives: 1

Key Themes: heat stress; dairy cattle; reproduction; reproductive performance; animal nutrition; embryo survival; livestock production; livestock management; nutrient utilization; animal physiology; environmental stress; biochemistry; cell biology; animal development; environmental effects; nutrient intake; animal metabolism; endocrine system; lactation; milk production; heat tolerance; profitability; humidity; climate; body weight; body condition; body temperature; milk yields; milk composition; post partum; feed supplements; vitamin e; antioxidants; selenium; comparative analysis; pregnancy rate; embryo transfer; performance evaluation; heat shock; *Animal Health; Agricultural profitability, agricultural competitiveness; animal production efficiency*

Summary: Heat stress is a major limiting factor in dairy production systems that acts to reduce milk yield and reproductive performance. This project will provide insight into the biological changes induced by heat stress which decrease performance of lactating dairy cows. This information will be used to develop management practices to reduce the negative effects of heat stress. Particular emphasis will be placed on using embryo transfer or other technologies to enhance pregnancy rates during heat stress.

Progress: Exposure of cultured preimplantation embryos to temperatures similar to those experienced by heat-stressed cows inhibits subsequent development. In this study, the effects of heat shock on the ultrastructure of two-cell bovine embryos were examined to determine mechanisms for inhibition of development. Two-cell embryos produced in vitro were harvested at 28 h post-insemination and cultured for 6 h at one of three temperatures: 38.5C (cow body temperature), 41.0C (characteristic temperature for heat-stressed cows), or 43.0C (severe heat shock). Ultrastructural examinations revealed that both heat shocks resulted in the movement of organelles towards the center of the blastomere. In addition, heat shock increased the percent of mitochondria exhibiting a swollen morphology. Distance between the membranes comprising the nuclear envelope was increased, but only when embryos were treated at 43.0C. To determine if ultrastructural responses to heat shock in culture were similar between embryos produced in vitro and in vivo, two-cell embryos were collected from superovulated Angus cows 48 h post-insemination and treated ex-vivo for six h at 38.5 or 41.0C. Again, heat shock caused an increase in number of swollen mitochondria and movement of organelles away from the periphery of the blastomere. In conclusion, exposure of two-cell bovine embryos to physiologically-relevant elevated temperatures causes disruption in ultrastructural morphology that is inimical to development. The observation that overall morphology and response to heat was similar between embryos produced in vitro and in vivo implies that the former can be a good model for understanding embryonic responses to heat shock.

Impacts: The observation that overall morphology and response to heat was similar between embryos produced in vitro and in vivo implies that the former can be a good model for understanding embryonic responses to heat shock.

Source of Federal Funds: Hatch

FLA-ANS-03956

Title: ***LUTEINIZING HORMONE (LH) SYNTHESIS AND SECRETION REGULATION IN HORSES***

Critical Needs:

National Objectives: 1

Key Themes: gonadotropin releasing hormone; receptors; gonadotrophic hormones; pituitary gland; horses; ovaries; hamsters; binding; luteinizing hormone; biosynthesis; secretion; regulation; animal physiology; biochemical mechanisms; mares; estrus; animal models; signal transduction; animal breeding; livestock management; sheep; animal genetics; cell lines; comparative analysis; transfection; mutation; amino acid sequence; binding sites; structural analysis

Summary: Horses are tolerant to continuous GnRH stimulation, which raises the question of how the GnRH receptor can tolerate continuous ligand stimulation without undergoing cell response attenuation. The purpose of the project is to understand how the equine GnRH receptor can tolerate continuous ligand stimulation without undergoing response attenuation.

Progress: The main objective of this proposed research is to understand the mechanisms by which LH synthesis and secretion from the pituitary is regulated in mares. The prolonged secretion of LH during estrus, and the apparent tolerance to continuous or high-dose Gonadotropin releasing hormone (GnRH) administration suggest that regulatory mechanisms in horses differ from our current understanding of regulation of LH synthesis and secretion in other species. Studies of the kinetics of GnRH receptor binding and intracellular trafficking have elucidated two important concepts. The first concept is that in the presence of excess ligand, equine pituitary cell surface binding of radiolabeled GnRH increases by approximately 100% within two to three hours. The second concept is that the endocytotic rate (rate of receptor internalization) is considerably slower than that of other species in which excess ligand has been shown to result in internalization of cell surface receptors and loss of binding. These observations lead to the conclusion that the equine GnRH receptor is highly resistant to down regulation by GnRH. This agrees well with the physiological concept of more or less continuous GnRH secretion in mares, as opposed to pulsatile GnRH secretion in other species. Studies of negative and positive feedback influence of estrogen on pituitary LH secretion have also indicated that: 1) there is little evidence for a negative feedback of estrogen on LH in mares, and 2) although there is a positive feedback of estrogen on LH, progesterone withdrawal

studies suggest that the positive feedback of estrogen is not necessary for preovulatory LH concentrations. Rather, we hypothesize that the key signal for the preovulatory rise in LH is merely the withdrawal of the negative feedback of progesterone.

Impacts: The impact of these studies is presentation of an animal model in which the hypothalamic-pituitary signalling system is unusual compared with other common animal models. Our results to date have led to the working hypothesis that the equine hypothalamus is relatively unregulated by negative feedback, except for the well-accepted negative feedback of progesterone, and the negative effects of short day length. Thus, the equine hypothalamic-pituitary system may remain in a "constant surge" state unless acted upon by the negative feedback effects of progesterone or season.

Source of Federal Funds: Hatch

FLA-ANS-03980

Title: *IMPROVING EFFICIENCIES OF IN VITRO EMBRYO PRODUCTION TECHNOLOGIES IN CATTLE.*

Critical Needs:

National Objectives: 1

Key Themes: embryo culture; beef cattle; in vitro; dairy cattle; reproductive performance; livestock production; cell biology; molecular biology; embryo development; production efficiency; production systems; speed; viability; insulin like growth factors; embryo survival; performance evaluation; genetic markers; biochemistry; prediction; environmental factors; gene expression; animal genetics

Summary: Advanced in vitro embryo technologies are still quite inefficient due to associated problems with early embryonic loss, large offspring syndrome, and postnatal mortality. The purpose of this project is twofold: 1) to devise rapid methods for assessing viability in preimplantation bovine embryos for increased survival; and 2) determine how in vitro culture conditions effect the expression of Insulin-like Growth Factor (IGF) family members.

Progress: Maintenance of recipient cows is the most expensive component of embryo transfer, especially if the fetus is lost late in gestation. Improving our ability to select embryos that are genetically normal will increase chances of survival to term and decrease costs associated with maintaining open recipients. This will make the newer reproductive technologies, such as embryo transfer, in vitro embryo production, cloning, and genetic selection more economically feasible for cattle producers. One of the goals of this project was to develop genetic tests for pre-screening cattle embryos prior to transfer, allowing us to quickly eliminate genetically abnormal embryos and even select for embryos with beneficial traits. We have made substantial progress towards completing the first objective, which was to optimize embryo biopsy and fusion techniques for producing metaphase spreads for genetic analysis. To do this we now use a

piezo injection procedure that bypasses the fusion process, making this a much more efficient process. Additionally, we are working on chemical means for inducing chromosome condensation for improving efficiencies for these tests. The second objective to develop karyotyping and FISH procedures is still in progress. To further enhance progress on this project, a University of Florida Opportunity Grant was also obtained which will expand our interests to include use of genetic screening in equine embryos. Two graduate students are now working on these and related projects to further the progress of this research. Another aspect of this project has been comparing gene expression of the insulin like growth factor (IGF) family members in cloned embryos versus in vivo and in vitro produced embryos as a means to determine possible causes of large offspring syndrome (LOS). We have determined that gene expression of these growth factors is aberrant as early as day 25 of gestation in cloned embryos and this information has been published in abstract form and a manuscript has been submitted for publication in a peer reviewed journal. Since the start of this project however, it has now been shown that expression of many genes are altered in clones and we are now pursuing possible mechanisms for this global effect. An NRI proposal has been submitted to help fund this research.

Impacts: Methods that improve embryo survival and enhance our ability to assess the embryo's ability to survive will greatly increase efficiencies of the artificial reproductive technologies, namely cloning and in vitro embryo production. Improved efficiencies will reduce costs, making these technologies more feasible for use by cattle producers and allow for increased production of genetically superior animals.

Source of Federal Funds: Hatch

FLA-APO-03523

Title: *MANAGEMENT OF DISEASES OF TROPICAL FOLIAGE PLANTS*

Critical Needs:

National Objectives: 1

Key Themes: plant diseases; tropical plants; foliage plants; plant disease control; pathogen identification; bacterial diseases (plants); ornamental plants; fungus diseases (plants); microbial ecology; plant pathogens; chemical control (diseases); plant disease resistance; biological control (diseases); resistant varieties; *plant health; plant production efficiency; emerging infectious diseases; ornamental/green agricultural*

Summary: Significant yield losses caused by plant pathogens are common in the ornamental foliage and bedding plant industries. The purpose of this project is first to identify and describe the diseases limiting production. Secondly, to develop chemical, nonchemical and integrated methods for control of foliage and bedding plant

diseases. Subsequently, to disseminate this information on diseases and their management to extension personal and to growers.

Progress: Since the inception of this project, research has been conducted for the ornamental plant industry on biological control, plant resistance, pesticide efficacy tests, international regulatory issues regarding pathogen movement, and taxonomy of fungal and bacterial pathogens. The following are specific accomplishments under this project: 1) Discovered and described a new *Xanthomonas* disease on ornamental Asparagus ferns using classical, molecular, and biochemical techniques. 2) Compared 588 strains of three closely related species of *Xanthomonas* and *Stenotrophomonas* (*Xanthomonas*) *maltophilia* using cellular fatty acid analyses. 3) Discovered and described a distinct subpopulation of *Ralstonia* (*Pseudomonas*) *solanacearum* (Race 1, Biovar 1); which is entering Florida from Costa Rica in infected ornamental propagative stock. 4) Using internal growth rates in plants, metabolic fingerprinting, pulse-field RFLP, and fatty acid composition described the *Xanthomonas* *pathovar* *hederae*, which infects English ivy and closely related species. 5) Conducted research on a morphological and genomic comparison of isolates of *Cylindrocladium* from spathiphyllum and leatherleaf fern. 6) Studied the ecology of *Colletotrichum* *acutatum*, the causal agent of anthracnose on leatherleaf fern. 7) Conducted research on the use of biological control of *Rhizoctonia* root rot of flowering and bedding plants using species of *Bacillus*. 8) Examined twenty of the most popular cultivars of *Dieffenbachia* for resistance to *Xanthomonas* *campestris* pv. *dieffenbachiae*, *Erwinia* *chrysanthemi*, *Fusarium* *solani*, and *Myrothecium* *roridum*. 9) Looked for resistance in potted anthurium cultivars to anthurium blight caused by *Xanthomonas* *campestris* pv. *dieffenbachiae*. 9) Examined cultivars of *Spathiphyllum* plants for resistance to *Cylindrocladium* root rot. 10) Worked with growers to determine if recycled water was promoting *Erwinia* soft-rot outbreaks in nurseries.

Impacts: The ornamental industry in Florida has a wholesale value of over \$1.7 billion. Research conducted in this project on pathogen epidemiology and movements, taxonomic differences within pathogens, and host resistance; make it possible to give sound recommendations on disease control. Thus, this research directly affects productivity of the State's horticultural industry.

Source of Federal Funds: Hatch

FLA-APO-03609

Title: *INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS*

Critical Needs:

National Objectives: 1

Key Themes: ornamental plants; floriculture; plant evaluation; plant introductions; foliage plants; woody ornamentals; plant collection; nursery stock; information collection; plant breeding; new varieties; experimental design; data bases; plant adaptation; screening systems; plant genetics; genetic stocks; *ornamental/green agriculture; agricultural competitiveness; diversified/alternative agriculture*

Summary: The ornamental industry is continually in need of new plant materials to expand their markets. This project examines growth and performance of new plants that may have commercial ornamental potential.

Progress: Accessions of Epipremnum and Monstera are being evaluated for desirable horticultural characteristics and for breeding potential. We are also evaluating Barleria and Ruellia species and cultivars for breeding potential. Our long range goal is to develop new interspecific hybrid cultivars that are sterile.

Impacts: New germplasm evaluation is important to the continued improvement of any crop. It is essential for finding new genetic sources of insect or disease resistance that can then be incorporated into new cultivars.

Source of Federal Funds: Hatch

FLA-APO-03875

Title: DEVELOPMENT OF NEW POTATO CLONES FOR ENVIRONMENTAL AND ECONOMICAL SUSTAINABILITY IN THE NORTHEAST

Critical Needs:

National Objectives: 1

Key Themes: potatoes; climate; late blight (potatoes); bacterial wilt (potatoes); brown rot; nutrient management; plant biology; plant genetics; clones; new varieties; environmental factors; sustainable agriculture; heritability; traits; plant improvement; tetraploids; plant pest resistance; plant evaluation; early maturity; cold storage; cultural practices; *plant germplasm; agricultural profitability; plant production efficiency; adding value to new and old agriculture products*

Summary: Cultivars and new seedlings will be evaluated in replicated trials for horticultural performance and disease resistance

Progress: Terminated 09/30/2002

Impacts: Over 630 potato lines and varieties were evaluated for characteristics to improve quality and yield under Florida growing conditions. Two lines have been identified for release which should provide market advantages for processing and fresh market sales.

Source of Federal Funds: Hatch

FLA-APO-03924

Title: DEVELOPMENT, EVALUATION, AND SAFETY OF ENTOMOPATHOGENS FOR CONTROL OF ARTHROPOD PESTS

Critical Needs:

National Objectives: 4

Key Themes: insect control; biological control (insects); integrated pest management; ornamental plants; bemisia; mites; thrips; aphididae; pseudococcidae; entomopathogens; performance evaluation; product development; safety; product evaluation; mass production; fungus diseases (insects); survival; virulence; spraying; product improvement; natural enemies; greenhouse production

Summary: NON-TECHNICAL SUMMARY: Overuse of chemical pesticides has resulted in environmental pollution, increase in health problems, and decrease in effectiveness due to pest resistance. The purpose of this project is to develop a sustainable IPM programs for ornamental crops using all available tools including entomopathogens.

Progress: Isolated strains of *Verticillium lecanii*, *Verticillium psalioetae*, *Beauveria bassiana* and *Paecilomyces fumosoroseus* which are active against scales, mealybugs, and broad mites. Evaluated various pathogens in an IPM program for greenhouse grown vegetables. The results indicate the both *Paecilomyces fumosoroseus* and *Beauveria bassiana* can be used as a tool to reduce high populations of whiteflies without negatively impacting the control exerted by *Encarsia transvena*. *P. fumosoroseus* established and continued to add to the whitefly mortality throughout the experiment whereas there was no evidence that *B. bassiana* established. We are currently looking at various insect pathogenic fungi as potential control agents for the Cycad scale.

Impacts: This information will further our knowledge of insect pathogens in forests. The other publications will help in the development of IPM programs for 2 introduced pests. Overuse of chemical pesticides has resulted in environmental pollution, increase in health problems, and decrease in effectiveness due to pest resistance. The purpose of this project is to develop a sustainable IPM programs for ornamental crops using all available tools including entomopathogens. Three of the new exotic pests attacking ornamentals in Florida can spend a portion of their life in the soil feeding on roots. Control of these individuals is very difficult with pesticides. Fungi could play a significant role in the management of these soil inhabitants.

Source of Federal Funds: Hatch

FLA-APO-04012

Title: *BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES*

Critical Needs:

National Objectives: 1,4

Key Themes: *integrated pest management*; vegetables; biological control (insects); insecticides; insecticide resistance; insect control; brassica; *plutella xylostella*; aphididae; bemisia; *trichoplusia ni*; leaf miners; insect biology; management systems; systems

development; crop production; economic injury threshold; non target organisms; natural enemies; fertilizers; production systems; cultural practices; host range; insect population; population census; sampling; distribution; decision making; crop yields; predictive models; *biological control*

Summary: Insecticide resistance, losses of registrations, effects on the environment, and safety issues have presented a need for alternatives to insecticides in the management of insect pests of vegetables. The purpose of this project is to address problems in the management of insect pests in vegetable crops, principally cold crops such as head cabbage and collards. Emphasis is placed on the use of insecticides and alternatives to insecticides in the management of diamondback moth, cabbage looper, aphids, whiteflies, and dipterous leafminers.

Progress: Laboratory and field experiments to determine the effects of a two-species host system on species-specific parasitism by *Trichogramma* were completed. Farmer interviews were completed in Puerto Rico to collect information to be used to characterize the local farming systems and vegetable-growing practices with a focus on cabbage production and the integration of biological control with egg parasitoids.

Impacts: The results of this work will contribute to the acceptance of biological control as a management tool for caterpillar pests of cabbage on small-scale farms, which, in turn, will contribute to a reduction in the use of insecticides and an increase in the sustainability of cabbage production.

Source of Federal Funds: Hatch

FLA-BGL-03496

Title: *POLYPHASIC ANALYSIS OF XANTHOMONADS ASSOCIATED WITH HORTICULTURAL CROP PLANTS IN FLORIDA*

Critical Needs:

National Objectives: 4

Key Themes: bacterial diseases (plants); plant disease control; xanthomonas; bacterial genetics; strains (genetics); plant pathology; pathogenicity; phenotypes; genotypes; epidemiology; polymerase chain reaction; host range; plant pathogen relations; peppers; tomatoes; taro; vegetables; population genetics; *sustainable agriculture; Plant health*

Summary: The ecology and economic impact of Xanthomonads species on tomato, pepper and lettuce will be examined. Reduce losses for producers from this group of pathogens.

Progress: Faculty member has prepared a new project FLA-BGL-03937. No further progress to report on this project.

Impacts: Bacterial leafspot of lettuce caused by *Xanthomonas campestris* pv. *vesicatoria* continues to be a major problem in the Everglades Agricultural Area of southern Florida. Field observations that Romaine-type lettuce is more susceptible to this disease were confirmed by greenhouse experiments. It was shown that wide variation in susceptibility exists, with some butterhead cultivars

showing less than 1/2 the amount of leafspot, with potential yield loss mitigation of over 50 %.

Source of Federal Funds: Hatch

FLA-BGL-03827

Title: BEST MANAGEMENT PRACTICES FOR TURF SYSTEMS IN THE EAST

Critical Needs:

National Objectives: 1

Key Themes: salt tolerance; drought tolerance; lance nematodes; nematodes; best management practices; turf; regional research; plant genetics; plant evaluation; *germplasm*; variety tests; environmental effects; environmental impact; pesticides; nutrient management; plant breeding; plant nematode resistance; warm season grasses; plant improvement; *Home lawn and gardening*; *Adding value to new and old agricultural products*

Summary: With accelerated development along the coastlines of the United States, water shortages and salt water intrusions require that turf species be capable of tolerating these abiotic stresses. Secondly, the loss of methylbromide as a soil sterilant requires that new turf cultivars have improved resistance to nematodes. This project focuses on the development of warm season turf cultivars with tolerance to abiotic stress.

Progress: Investigator transferred to Indian River Research Center - work is continuing under project number FTP03827

Impacts: See project number [FTP-03827](#)

Source of Federal Funds: Hatch

FLA-BGL-03917

Title: REDUCING THE POTENTIAL FOR ENVIRONMENTAL CONTAMINATION BY PESTICIDES AND OTHER ORGANIC CHEMICALS

Critical Needs:

National Objectives: 3,4,5

Key Themes: fenamiphos; pesticide exposure; organic phosphates; inhalation; environmental impact; environmental pollution hazard; pollution control; watershed management; human health; watersheds; toxicology; quantitative analysis; microbiology; chemistry; *sustainable agriculture*; stakeholders; turf grasses; simulation; volatilization; measurement; risk assessment; dosage; surveys; soil amendments; soil leaching; golf courses; lysimeters; *Human health*; *Hazardous materials*; *Pesticide application*; *Workforce safety*; *soil quality*

Summary: There is a general perception that golfers and the environment are at risk from pesticides applied to golf course turfgrass. The purpose of the project is to assess the risk to golfers from pesticides applied to golf turf, and to investigate soil amendments as a means of reducing leaching of pesticides from golf greens

Progress: Herbicides containing monosodium methanearsonate (MSMA) often are used for weed control in bermudagrass (*Cynodon* sp.) golf

greens and fairways. However, no direct measurements of volatilized As, or of As as dislodgeable residues, or in percolate, grass clippings, or soil following label-rate applications of MSMA to golf greens are available. Our study is designed to obtain these data for MSMA, and to assess risks to golfers from MSMA use on golf courses. A commercial grade MSMA was spray-applied on August 29, September 5, and September 12, 2002, at the maximum recommended rate of 0.224 g m⁻² to established 'Tifdwarf' bermudagrass plots in a USGA green at the Ft. Lauderdale Research and Education Center. No As had been applied to these plots previously. The plots contained lysimeters for recovering percolate. There were four replications of four root zone media in the study, all having USGA-specification sand texture: 1) quartz sand, 2) quartz sand with 10% (volume) sphagnum peat, 3) naturally-coated (goethite, gibbsite, kaolinite, hydroxy-interlayer vermiculite) sand with 10% peat, and 4) artificially clay-coated (Ca-montmorillonite) sand with 10% peat. At weekly intervals, percolate water was recovered and clippings were collected. On two occasions, an adjacent area on the green was sprayed with MSMA for measuring dislodgeable residues at several time intervals following MSMA application by rubbing a 25 cm square area three times in each of two right-angle opposed directions with moistened cheese cloth attached to a 10 cm square metal device weighing 2.93 kg. The cloth was separated from the metal surface with a layer of plastic film. The percolate water was analyzed for various As species, and the plant tissue and soil (0 - 10 cm depth) have been analyzed for total As. The cheese cloth will be analyzed for total As, and various species of As will be determined in fresh plant tissue, but these data are not available at this time. Studies of As volatilization following application to the green are planned. Following three applications of MSMA, As concentration in the root zone mixes increased. The greatest concentration of As was found in the artificially-coated sand root zone mix, which retained approximately 45% of the applied As in the 0 - 10 cm depth. After three applications of MSMA, As leaching ranged from 4 to 12% of that applied. The greatest amount of As leaching was observed in the sand (without peat) root zone mix. Arsenic concentration in clippings taken after MSMA application averaged 12 to 23 ug kg⁻¹, but decreased substantially after MSMA useage ceased. Nevertheless, during the study period less than 1% of the applied As was recovered in clippings regardless of the root zone mix. During the first month following the initial MSMA (MSM) application, most As leaching was either in the dimethylarsinic acid (DMA) or As(V) form, and the latter increasingly predominated over time. These results indicate that both methylation and decomposition occur after applying MSMA. Observed As concentrations in all forms except As(III) rose to amounts considerably above the legal drinking water standard of 10 ug L⁻¹.

Impacts: Arsenic contained in the widely-used herbicide MSMA has been found at elevated levels in golf course soil and groundwater in south Florida. However, data on direct measurements of As in soil, percolate, grass clippings, and dislodgeable residues of As following known applications of MSMA are not widely available. The current study will provide these data, which will be used in making decisions on the use of MSMA on golf courses.

Source of Federal Funds: Hatch

FLA-BGL-03925

Title: *BIOLOGICAL CONTROL OF SOILBORNE PLANT PATHOGENS FOR SUSTAINABLE AGRICULTURE*

Critical Needs:

National Objectives: 4

Key Themes: tomatoes; microbial competition; soil borne diseases; plant disease control; *biological control* (diseases); antibiosis; optimization; performance evaluation; soil fumigation; application methods; selection; roots; host colonization; soil amendments; fusarium oxysporum; greenhouse production; field studies; genotypes; plant microbiology; plant growth; plant development; *plant health*;

Summary: One of the most serious soilborne diseases limiting tomato production in southern Florida is Fusarium crown and root rot (FCRR). FCRR has reduced commercial yields up to 15 percent. Several disease control strategies including methyl bromide have met with limited success in managing FCRR in the field. The purpose of this project is to evaluate commercial bacterial and fungal microorganisms for promoting plant growth and suppressing FCRR under fumigated and non-fumigated field conditions

Progress: This investigators responsibilities changed and the new focus is on soilborne diseases that affect turfgrasses. Consequently, the effects of fungicides, a systemic required resistant activator and a biological on brown patch (*Rhizoctonia solani*) development in St. Augustinegrass (*Stenotaphrum secundatum*) were evaluated at the Everglades Research and Education Center. Eighteen treatments and one control were arranged in a randomized complete block design with four replications. Treated experimental units were approximately one square meter. Treatments consisted of the following: Chipco Triton, Heritage, Medallion, Banner MAXX, Messenger, Bacillus subtilis, potassium silicate, and Daconil. Treatments were applied using a CO₂, 2.07 x 10⁵ Pa (30 psi), backpack sprayer equipped with two single flat fan nozzles on a hand-held boom. Treatments were delivered in a volume of 11.4 L (3 gal.) water/ 90 m² (1000 ft²). Both Messenger treatments were applied three days (9 Dec. 2001) before the other treatments. Chipco Triton 0.3 was broadcast incorporated then irrigated with 2.5 mm (0.1 in.) of water. Inoculum of *R. solani* was grown on autoclaved rice seed

in magenta boxes for about 10 to 14 days, and 50 g of inoculum was incorporated into each experimental unit approximately four hours after applying all treatments on 12 Dec. 2001. Afterwards, inverted white painted plastic boxes, 28 x 41 cm (11 x 16 in), were placed directly within each experimental unit to increase the relative humidity and to enhance the potential for infection. This experiment was evaluated for brown patch development on 17, 18, 19 and 20 Dec. 2001. Percent disease severity of brown patch was based on the total infected area of the lower canopy beneath the inverted boxes. These data also were used to generate AUDPC's. Environmental conditions were very conducive for good brown patch development. Brown patch was relatively uniform in the lower canopy of the turf and severe throughout the experiment, reaching a mean final disease severity in the controls of 76 percent. Disease development was so rapid that only one application per treatment could be made, except for the Messenger at 7 days and this treatment received two applications. For final percent brown patch severity, all treatments significantly ($P=0.05$) reduced disease development in comparison to the control, except *B. subtilis* at 300 and 1500 g and Messenger at the 14 day interval (Messenger was only applied once for this treatment). However, for final AUDPC's, the following treatments were not significantly different from the control: Chipco Trition 0.3 at both rates, *B. subtilis* at all rates and Messenger at both rates.

Impacts: The potential of biological control agents or a plant systemic acquired resistant activators might reduce the need for fungicide use in the environment.

Source of Federal Funds: Hatch

FLA-BGL-04012

Title: *BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES*

Critical Needs:

National Objectives: 1,4

Key Themes: vegetables; insect control; integrated pest management; plant insect resistance; insecticides; spodoptera frugiperda; euxesta stigmatias; elasmopalpus lignosellus; liriomyza trifolii; diabrotica balteata; leaf miners; aphididae; insect biology; elateridae; sweetcorn; beans; brassica; natural enemies; monitoring; insect population; crop damage; environmental impact; crop production; thrips; insect reproduction; insect growth; insect development; insect behavior; insect traps; cultural practices; *plant health; plant germplasm; agricultural profitability; pesticide application; soil quality; sustainable agriculture; plant genomics*

Summary: Vegetable crops are major Florida agricultural commodities (e.g., \$1.3 billion estimated value, 1999-2000) which are attacked by a large complex of arthropod pests. Research on many of these arthropods is required to foster our understanding of their complex biologies and behaviors and to facilitate the

development of environmentally and economically acceptable control strategies.

Progress: Continued plant breeding and selection program for resistance to insect feeding in romaine lettuce. Crosses made between susceptible and resistant cultivars followed by insect feeding tests indicated that the resistance mechanism is under genetic control and may have a non-nuclear genetic component provided by the seed parent. This work is ongoing with 2003 goal to generate isogenic lines for use in biochemical assays to determine chemical component of resistance. Process for producing 'corn silk fly' (*Euxesta stigmatias*) completely in the laboratory, including artificial diet, submitted for publication. Laboratory bioassays of insecticidal activity against *E. stigmatias* completed and manuscript submitted for publication. Results indicate a wide range of insecticide efficacy and residual effectiveness of field-applied products and a potential mechanism for detoxifying pyrethroids. A sweet corn cultivar with at least partial resistance to *E. stigmatias* feeding was recently released. A proposed scale for rating feeding damage caused by *E. stigmatias* feeding was accepted for publication. Insecticides were evaluated in field trials for control of various insect pests of leafy vegetables and sweet corn. Two-year study of insects associated with faba beans was completed that suggests that two insect groups would reduce yields of this potential winter vegetable or forage crop: aphids and virus they vector and pod feeding stink bugs and seed bugs (Pentatomidae and Lygaeidae).

Impacts: Search for insect resistance mechanisms in lettuce will lead to rapid tests to screen for resistance without the lengthy insect feeding bioassay methods that will speed up efforts to release insect resistant germplasm. Information from insecticide field trials and bioassays will help growers to select the most effective insecticides for long term crop protection. The germplasm resistant to the two major insect pests of sweet corn (*E. stigmatias* and *Spodoptera frugiperda*) in Florida that we have released will in time lead to commercial cultivars that will increase sustainability and reduce insecticidal contamination of soil and water.

Source of Federal Funds: Hatch

FLA-BRA-03364

Title: *BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES*

Critical Needs:

National Objectives: 1,4

Key Themes: insects; insect control; vegetables; *integrated pest management*; insect ecology; *bemisia*; thrips; *plutella xylostella*; biological control (insects); cultural control (insects); insect biology; plant insect resistance; host plants; insect predators; insect parasites; predator prey relations; insect predators; *plant health*; *invasive species*; *agricultural profitability*; *Biological control*

Summary: Vegetables in Florida are attacked by numerous insect pests inflicting direct damage through feeding on leaves, stems, flowers and fruit and inflicting indirect damage through transmission of plant diseases. The purpose of the project is to develop management systems that are economical, practical and effective. To accomplish this the biology and population dynamics of pests are studied, methods for estimating and monitoring pest and beneficial insects are developed, appropriate management tactics are developed, and management systems are evaluated.

Progress: The following areas were emphasized: 1) The relationship between the density of silverleaf whitefly nymphs and symptoms of irregular ripening of tomato were positive and linear. 2) Life table studies of the silverleaf whitefly on tomato showed that mortality due to natural enemies ranged from 7-46 percent. 3) Silverleaf whitefly nymphs were found most numerous on the 7-8th leaf from the top of tomato stems. Using this sampling site, a density of 0.5 nymphs/10 terminal leaflets was found to be an action threshold for applying insect growth regulators to control the whitefly and avoid irregular ripening. 4) Accessions of *Lycopersicon hirsutum* and *L. pennellii* demonstrated antibiosis and antixenosis toward the silverleaf whitefly. Compounds found in trichome exudates were repellent and induced mortality by residual and fumigant exposure. 5) UV-reflective plastic soil mulches reduced the number of silverleaf whitefly adults alighting on tomato plants and delayed the incidence of plants with whitefly-vectored virus. 6) Liquid and tag formulations of sex attractant pheromone provided mating disruption of the tomato pinworm for 7-8 weeks. 7) The application of selected plant growth promoting rhizobacteria to growth media of tomato transplants resulted in delayed incidence of whitefly-vectored virus, when the plants were grown in the field. 8) Captures of silverleaf whitefly adults on yellow sticky traps placed horizontally in staked tomatoes at or two feet above canopy level were significantly related to the increase in numbers of adults sampled on foliage over 24 hrs; however, coefficients of variation were low, ranging from 0.2 to 0.4. 9) A resistance-inducing protein applied weekly to commercially grown tomatoes in two field trials resulted in increases in yield of about 17 percent over non-treated plants. 10) The incidence of tomato plants with symptoms of silverleaf whitefly-vectored virus in the field was reduced by 25-35 percent when the plants were encircled with squash relative to when the plants were not encircled with squash. 11) A laboratory method using cut cotton petioles in varying concentrations of imidacloprid solutions was developed for estimating the susceptibility of silverleaf whitefly adults to the systemic insecticide. In two years of monitoring, the resistance ratios of populations of whitefly adults from 4 of 11 sites relative to a susceptible laboratory colony ranged from about 8 to 15. 12) A laboratory bioassay was developed and used to screen about 40 products or combinations of products for repellency to silverleaf whitefly adults. Paraffinic oil resulted in fewer plants infected

with whitefly-vectored virus in greenhouse cage studies. 13) No resistance of pepper weevil adults to oxamyl was detected among 8 field populations using a laboratory method. 14) Sound trapping for adult mole crickets and a trachinid parasitoid, yellow pan trapping for aphids and whiteflies, and yellow sticky card trapping were conducted during the duration of the project. 15) Insecticides and insecticide combinations were evaluated in field trails for control of the silverleaf whitefly, armyworms, the pepper weevil and the pickleworm.

Impacts Using mating disruption for managing the tomato pinworm and UV-reflective soil mulches for whiteflies and the viruses they transmit will reduce the need for conventional pesticides. Using an action threshold will maximize the effectiveness of insect growth regulators for whitefly control. Monitoring insecticide resistance in insects will help ensure the availability of key insecticides for insect management on vegetables.:

Source of Federal Funds: Hatch

FLA-BRA-03524

Title: IDENTIFICATION, MANAGEMENT AND CONTROL OF VIRUSES INFECTING ORNAMENTAL AND RELATED CROPS

Critical Needs:

National Objectives: 1,4

Key Themes: plant diseases; virus diseases (plants); ornamental plants; plant disease control; planting stock; plant pathogens; pathogen identification; virus identification; virus characterization; virus detection; cost effectiveness; aroids; gladiolus; liliium; foliage plants; *Plant genomics; plant germplasm; plant healthemerging infectious diseases; sustainable agriculture; adding value to new and old agricultural products; ornamentals/green agriculture*

Summary Diseases caused by viruses can be a problem in ornamental and foliage crops. The purpose of this project is to identify viruses causing problems in ornamental and foliage crops and to develop management strategies for their control:

Progress: Research was conducted to identify the causal agent of grassy tuber disease of caladium. We modified previous protocols to extract viroid RNA from caladiums. We used these techniques and found at least one viroid that is associated with grassy tuber disease. The viroid appears to be unique and distantly related to chrysanthemum chlorotic mottle viroid. Molecular and biological characteristics support its possible identity as a new viroid belonging to the Avsunviroidae family, genus Avsunviroid. Further molecular characterization is in progress to confirm these data.

Impacts: Impact: The results of this research should enable us to selectively detect the causal agent of grassy tuber disease, accurately diagnosis grassy tuber disease, make effective management recommendations for the control of grassy tuber, and work with the tissue culture industry to produce caladiums free of grassy tuber disease.

Source of Federal Funds: Hatch

FLA-BRA-03544

Title: *IMPROVED NUTRITION AND IRRIGATION OF ORNAMENTAL PLANTS*

Critical Needs:

National Objectives: 1,4

Key Themes: cultural practices; ornamental plants; plant nutrition; irrigation systems; fertilizer practices; floricultural crops; drip irrigation; fertilizer rates; potting media; leaching; nutrient availability; water conservation; crop quality; fertigation; rooting; pollution control; bedding plants; *ornamental/Green Agriculture; Plant production efficiency; soil quality; precision agriculture; small farm viability; agricultural profitability*

Summary: The approximate value of ornamental products in Florida is over \$1.3 billion. Management of fertilizer and water resources are critical for a profitable return on production investments and protection of the environment. This project examines the effectiveness of the latest fertilizer technologies and irrigation practices affecting production of ornamental crops. These studies also determine the effects of new production strategies on water conservation, environmental compatibility, pest management, and plant quality.

Progress: Irrigation and drainage practices for the majority of caladium (*Caladium x hortulanum* Birdsey) growers in central Florida have developed over the years as rather undefined water management strategies. We completed a two year study to develop best management practices for irrigating field caladiums. Water table depths of 30, 45, or 60 cm were established in field lysimeters to establish a baseline for optimal sub-irrigation programs. The cultivar White Christmas was used in the first year of the study and represents a vigorous fancy leaf caladium variety. There was a 33 (45 cm water table) or 70 (30 cm water table) percent increase in weight of tubers compared to weight of tubers grown with a 60 cm water table. Yields in the second year with Florida Cardinal also increased by 28 or 70 percent for 45 cm or 70 cm treatments compared to the control (60 cm). The production index, an estimate of the value of harvested tubers, increased 24 (yr 1) or 26 (yr 2) percent with a water table depth of 45 cm, and 42 (yr 1) or 34 (yr 2) percent with a 30 cm water compared to the control. Daily evapotranspiration rates were also determined during the entire 8 month growing season so that actual daily water requirements could be estimated. This information will be necessary for the development of new irrigation/drainage designs that optimize water conservation. In addition, permits for new wells require water use rates to define pumping needs. In general, the greatest daily water use was around 0.25 cm with a water table of 30 cm. Two to four times less water was used with a 60 cm water table. 2.) In order to assess the efficiency of mole drains, shallow wells were placed every 9 m diagonally across a caladium field to monitor water movement in and out of the

field. Results indicate that reliance upon this traditional method of drainage/irrigation will not be acceptable for optimal water management. 3.) Understanding how fertilization influences the outbreak of thrips populations would provide growers with information to integrate crop production practices into control strategies for thrips management. The main objectives of this research project are to correlate the relationship between foliar nutrient content of nitrogen and phosphorus in Impatiens with thrips populations and incidence/severity of feeding damage, and to define fertilization regimes which result in plants that are nonpreferential for thrips feeding while still resulting in timely crop production with optimum flowering and plant quality. Although there were trends for the number of thrips relative to fertilization practices, differences in plant size and flowering compromised the commercial importance of these findings. That is, some differences in thrips populations may have been due to plant size rather than nutritional status. Cooperative tests at Kansas State University also indicated that nutritional status of the plant had a minimal effect on thrips populations and severity of feeding and plants for all treatments were within acceptable commercial standards for quality.

Impacts: 1) Specific information on irrigation requirements for caladium tuber production can lead to the development of best management practices which optimize yield for this high value crop.
2) Understanding how fertilization influences the outbreak of thrips populations would provide growers with information to integrate crop production practices into control strategies for thrips

Source of Federal Funds: Hatch

FLA-BRA-03553

Title: *VEGETABLE VARIETY EVALUATION IN FLORIDA*

Critical Needs:

National Objectives: 1

Key Themes: vegetables; plant breeding; plant evaluation; cultivars; new varieties; breeding lines; variety tests; crop yields; crop quality; plant disease resistance; field trials; experimental design; data collection; seed color; sugar content; fruit color; *Niche market; Diversified/alternative agriculture; agricultural competitiveness; sustainable agriculture; agricultural profitability; Diversified/Alternative agriculture; small farm viability; tropical agriculture*

Summary: Tropical pumpkin is an important traditional crop throughout the tropics and subtropics of the western hemisphere. Currently, local selections are grown and maintained by farmers. However, with an increasing urban population and a decreasing agricultural community, there is a need for a dependable seed source of new more productive varieties. There is economic opportunity for expanded production of tropical pumpkins to meet local demand and develop export markets.

Progress: Cabbage. 20 entries, fall-winter 2001-2002. Yields ranged from 740 50-lb crates for Red Dynasty to 1361 50-lb crates/acre for Atlantis. Yields of nine other entries were not different from those of Atlantis. The proportion of heads harvested varied from 79% for Red Dynasty to 99% for Atlantis, Pruktor, and Green Cup. Yields in this trial were 1.2 to 2.2 times greater than the state average. Average head weight ranged from 2.7 pounds for Red Dynasty to 4.0 pounds for Atlantis. Tomato. 31 entries, fall 2001. Yields from 4 harvests ranged from 1658 cartons/acre for HA 3061 to 3268 cartons/acre for NC 99405. Ten other entries had yields similar to those of NC 99405. Yields of extra-large fruit varied from 960 cartons/acre for HT-250 to 2516 cartons/acre for Sanibel. Cull fruit varied from 11% by weight for EX 1405037 to 33% for HA 3061. Prominent blossom-end nipples, rough shoulders, and small fruit were the principal defects. Average fruit weight was from 5.3 oz for HT-310 to 6.9 oz for Fla. 7943. Tomato. 27 entries, spring 2002. Yields from 3 harvests ranged from 1634 cartons/acre for HMX 0800 to 2967 cartons/acre for Fla. 7973. Yields of extra-large fruit varied from 1256 cartons/acre for ACX 12A to 2543 cartons/acre for Fla. 7926. Cull fruit varied from 12% by weight for RFT 0252 and Florida 91 to 30% for ACX 12A. Blossom-end rot, rough shoulders, and small fruit were the principal defects. Average fruit weight was from 5.5 oz for Lucky 13 to 7.6 oz for RFT 0417. TYLC- infected plants ranged from 0 for several entries to 60% for HMX 0800. Over 80% of the entries had at least one infected plant. Diploid Watermelon. 22 entries. spring 2002. Yields varied from 535 cwt/acre for Gold Strike to 925 cwt/acre for Rojo Grande. Average fruit weight ranged from 18.2 lbs for Gold Strike to 24.8 lbs for Dulce. Fruit per plant varied from 1.9 for Gold Strike and XWD 98210 to 2.8 for Rojo Grande. Soluble solids concentrations ranged from 11.5% for Festival to 13.6% for SWD 403. The incidence of hollowheart varied from none in ten entries to 50% in Dulce and Pinata. The highest yields ranged from 439 cwt/acre in 1996 to 1026 cwt/acre in 1993. The highest yield was 925 cwt/acre which was more than the 11-year average yield of 777 cwt/acre. Triploid Watermelon. 41 entries. spring 2002. Yields ranged from 375 cwt/acre for Amarillo to 1253 cwt/acre for HA 6033. Only one other entry produced yields significantly similar to those of HA 6033. Average fruit weight varied from 14.8 lbs for ZG 8825 to 22.9 lbs SW 493. Fruit per plant ranged from 1.5 for Amarillo to 3.6 for HA 6033. Soluble solids concentrations varied from 11.9% for HSR 2402 to 13.9% for HA 6033. All entries far exceeded the 10% specified for optional use. The incidence of hollowheart ranged from 0% in 11005031, Omega, Trillion and XWT 8706 to 75% in HSR 2402. The highest yields ranged from 507 cwt/acre in 1996 to 1253 cwt/A in 2002 which greatly exceeded the 871 cwt/acre average high during the 15-year period.

Impacts: Variety selection is one of the most important decisions made by commercial vegetable growers. Growers need information on

yield, disease resistance, adaptability, horticultural quality, and market acceptability to assist with this decision. Results of variety evaluations also assist commercial seed companies in determination of the adaptability of proprietary varieties.

Source of Federal Funds: Hatch

FLA-BRA-03554

Title: *FLOWER INITIATION AND DEVELOPMENT OF FLORICULTURE CROPS*

Critical Needs:

National Objectives: 1

Key Themes: plant physiology; floriculture; flower initiation; flower development; cultural practices; fertilizer rates; growth regulators; irrigation frequency; bedding plants; environmental factors; temperature; photoperiod; irradiation; flowering; herbaceous plants; ornamental plants; *ornamental/green agriculture; agricultural profitability; adding value to new and old agricultural products; home lawn and gardening; urban gardening*

Summary: The value of ornamental crops in Florida is over \$1.3 billion. Since most ornamentals are currently being sold in flower, it is critical to know all the factors that cause plants to flower. This project examines the effects of environmental (such as light, temperature, and photoperiod) and biotic (such as growth hormones) factors that can be manipulated to induce plants to flower so that producers will be able to market high quality plants, in flower, in a reasonable and profitable length of time.

Progress: 1.) *Eustoma grandiflorum* (lisianthus) has become a significant new bedding, pot, and cut flower since its introduction into the floriculture trade in 1980. One limitation to its acceptance has been the small window of time for flowering with the current commercial cultivars. Lisianthus rosette when seedlings are grown at average temperatures of 25 to 28 C, temperatures that are common in many production areas during much of the growing season. In addition, many cultivars are obligate long day plants, again limiting the season for flowering. We have a breeding program to select for heat tolerant and day neutral lisianthus. Cultivars released from this program can be flowered year-round. During the 5 years of this project, 8 pot cultivars were released in the Maurine series and 3 semi-dwarf bedding plant cultivars in the Florida series. Current efforts are being directed at development of cut flowers and double flowering cultivars. 2.) Bacterial blight of Geranium, caused by *Xanthomonas campestris* pv. *Pelargonii*, is a devastating disease for growers of seedling and cutting Geraniums. Soft rot caused by *Erwinia* is a common problem in propagation (mist) greenhouses. These bacterial diseases are difficult to control with chemical bactericides. In addition, chemical pesticides are not considered environmentally friendly and bacteria have typically developed resistance to new pesticides quickly. A novel approach which uses h-(host-range) mutant bacteriophages as an

alternative control strategy for these bacterial diseases was proposed. A mixture of 5-h-mutant phages was developed to treat bacterial blight on geranium seedlings. Disease incidence and severity were less for plants treated daily with phages than for those treated with copper sulfate pentahydrate. Phages specific for *Erwinia* have been isolated and are being processed to select for h-mutants. 3.) Black-eyed Susan, *Rudbeckia hirta* L., is a wild flower native to much of the U.S., including Florida. It was hypothesized that ecotypes of black-eyed Susan have developed that perform better in specific locations. We compared the performance of 3 ecotypes of black-eyed Susan under three AHS Heat Zones in Florida. Plants from seed of a Texas ecotype were the largest and showiest (the greatest number of flowers and largest flowers) but the shortest-lived compared to the north Florida and central Florida ecotypes. Under more intensely managed garden conditions, the central Florida ecotype may be a highly desirable wildflower due to its vigor and durability under subtropical or tropical summers. 4) In order to correlate the relationship between foliar nutrient content of nitrogen and phosphorus in impatiens with thrips populations and severity of feeding damage, fertilization regimes were tested to produce plants that are nonpreferential for thrips feeding while still resulting in crops with optimum flowering and plant quality. Florida and Kansas results indicate thrips preference was not correlated to tissue levels of N or P, but rather to plant and flower size.

Impacts: Impact Statement Developing information on the requirements for flowering of new species of plants can lead to development of new crops that are profitable to produce. With specific information on flowering, breeding efforts can then be used to expand the potential use of these new crops.

Source of Federal Funds: Hatch

FLA-BRA-03609

Title: *INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS*

Critical Needs:

National Objectives:1

Key Themes: ornamental plants; floriculture; plant breeding; plant genetics; plant introductions; plant evaluation; genetic stocks; plant collection; screening systems; new varieties; information; information dissemination; data collection; annual plants; perennial plants; grasses; foliage plants; *ornamental/green agriculture; plant genomics; diversified/alternative agriculture; home lawn and garden; sustainability of agriculture; small farm viability*

Summary: A. New plant materials need to be evaluated for their floricultural use. B. Genetic diversity needs to be incorporated into existing floricultural crops. A. This project will collect and evaluate new

plants and make preliminary crosses to increase the availability of new floricultural crops. B. Plant production management systems will be initiated for each new plant cultivar.

Progress: Florida producers of cut flowers and flowering pot plants require a continuous flow of new cultivars in order to maintain current markets and to expand production/sales. New cultivars may be advanced breeding selections of crops currently under production or newly introduced novel crops, that are adaptable to Florida growing conditions, climate, and that are resistant to crop pests. 1) A caladium breeding program emphasizing bright colorful leaves, multiple leaf development, and large, good quality tubers was established in 1976. Hybridizations among commercial caladium cultivars and their subsequent culture and selection on muck and sandy soils have resulted in the release of 11 new cultivars with the first release in 1988. The cultivar Florida Moonlight (a large-white fancy leaved caladium) was released to the industry in 2002. This cultivar prefers partial to full shade conditions in the landscape, and makes an excellent potted plant when tubers are de-eyed for production in 10 to 15 cm pots. Seven advanced breeding lines were increased for potential release within the next three years. F1 seedlings were produced from parents with known fusarium resistance. After preliminary screening, over 50 lines of the 1500 seedlings are being subjected to macro-propagation for further screening due to little or no tuber rot observed in inoculated tubers. 2) A lisianthus selection and breeding program was begun in 1985 with the goal of developing heat-tolerant, basal branching, bedding (dwarf) and pot plant (semi-dwarf) cultivars. Maurine Blue and Florida Blue lisianthus cultivars were released in 1995, and by 2002 there have been nine pot types in the Maurine series and four dwarf bedding types in the Florida series. They have been developed as the first heat-tolerant cultivars whose seedlings can be grown at 28 to 31C without rosetting making them highly desirable for production in Florida. Two dwarf bedding plant selections are being evaluated for release in the Florida series. They have bicolored flowers, white with a dark purple or pink rim. They should be released in 2003 as the first bi-color, heat-tolerant, bedding plant lisianthus. They are day neutral, allowing production year-round in Florida. Current research is for double flowering pot and bedding plant types, and a new cut flower program was initiated for fall flowering, heat-tolerant tall cultivars of lisianthus. 3) A comprehensive program for evaluating seed propagated bedding plants was initiated in 1984 and expanded in 2000 to include fully replicated cultivar evaluations with and without pest management. Over three hundred cultivars were evaluated that included Impatiens, Tagetes, Pansy, Viola, Petunia, Pelargonium, Ageratum, Begonia, Celosia, Pentas, Dianthus, Eustoma, Nicotiana, Gazania, Antirrhinum, Helianthus and other miscellaneous annual seeded bedding plants. 4) Eleven Trachelium cultivars

were evaluated for cut flower production in Florida. New genetics provided significant improvements over older cultivars.

Impacts: Determining the performance of floricultural crops under Central Florida conditions provides valuable information for crop selection and production of these crops by growers, as well as aiding decisions for use of selected varieties by landscapers and homeowners. Breeding efforts are also enhanced with the potential to develop new varieties with improved performance.

Source of Federal Funds: Hatch

FLA-BRA-03832

Title: *MICROIRRIGATION TECHNOLOGIES FOR PROTECTION OF NATURAL RESOURCES AND OPTIMUM PRODUCTION*

Critical Needs:

National Objectives: 1,4

Key Themes: drip irrigation; water conservation; nutrient management; micro irrigation; irrigation systems; optimization; crop production; water use efficiency; production systems; performance evaluation; systems development; decision making; information dissemination; educational materials; nitrogen; *water quality*; subsurface; water samples; nitrates; concentration; tomatoes; strawberries; container production; row crops; vegetables; runoff; soil characteristics; *precision agriculture*; *natural resources management*; *soil quality*; *soil erosion*; *nutrient management*;

Summary: Irrigated agriculture is facing increased public pressure and institutional regulation for water quality concerns and conservation of natural resources. This project examines the management improvements (such as nutrient management and water conservation) that are a result of using microirrigation practices

Progress: Objective 1. To evaluate and refine microirrigation management strategies to promote natural resource protection and optimal crop production. 1) A sod irrigation management study was initiated to evaluate different types of subirrigation systems (seepage, subsurface tile and fully-enclosed subirrigation) and provide information to improve irrigation scheduling. A 127-acre commercial sod production site with subsurface tile was chosen and 62 water table monitoring wells were installed. GIS techniques were used to visually evaluate grower Results from the first data collection period revealed grower management using water table monitoring achieved high efficiency irrigation since the cumulative Penman ET for the sampling period was 244 mm, and total rainfall was 205 mm and applied water was 52.4 mm (257.4 mm rainfall and irrigation combined). 2) a study to determine tomato and green pepper transplant water requirements using microirrigation, fully enclosed and seepage subirrigation was initiated. The spring 2003 (initiated in March 2003) study was designed to accomplish the task of differing the establishment period by varying the transplanting date resulting

in establishment periods of 0, 5, 10, and 15 days. In all cases, the target water table level for establishment was set at 22 inches which was controlled using float switches controlling solenoid valves which turned irrigation on and off as needed. First season results indicated that for tomato, plant height was not affected by either establishment period or irrigation system. Plant width showed some separation among establishment treatments (not irrigation system), but primarily the 15-day treatment exhibited more branching which contributed to more plant width. Minimal differences were detected with respect to number of nodes for either main treatment. Significant differences for fresh and dry weights again showed separation of the 15-day establishment treatment, but no differences among irrigation systems. 3) A study to create a simulation model to describe solute flow in a mulched bed based on hydraulic and thermal properties of the soil included measuring soil bed temperatures in microirrigated and subirrigated growing situations, with and without tomato plants. Each of 12 subplots had 32 thermocouple arranged in a grid fashion and connected to multiplexers and data loggers measuring temperature at 15-minute intervals, 24-hr per day for the entire growing season. Data is in analysis process.

Impacts: Improved irrigation management through adoption of management practices which result in water conservation

Source of Federal Funds: Hatch

FLA-BRA-04012

Title: *BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES*

Critical Needs:

National Objectives: 1,4

Key Themes: integrated pest management; insect control; vegetables; *biological control* (insects); plant insect resistance; cultural control (insects); chemical control (insects); *anthonomus eugenii*; *bemisia argentifolii*; *bemisia tabaci*; thrips; *plutella xylostella*; leaf miners; *elateridae*; *aphididae*; tomatoes; peppers; estimation; crop damage; insect population; crop production; insect ecology; quantitative analysis; oviposition; insect development; predation; economic injury threshold; mites; *diptera*; *keiferia lycopersicella*; *agricultural profitability*; *plant health*; *pesticide application*;

Summary: Vegetables are major agricultural commodities produced in Florida that are attacked by many arthropod pests including whiteflies, weevils, lepidopterous larvae, flies, wireworms, aphids and mites with losses ranging from about 25 to 100 percent. The purpose of this project is to develop appropriate management tactics that are practical, economical, environmentally sound, and commercially acceptable.

Progress: The following research areas were emphasized: 1) A laboratory bioassay using cut cotton leaf petioles in varying concentrations of imidacloprid solutions was used to estimate the susceptibility of silverleaf whitefly adults reared from nymphs on field-

collected tomato foliage to the systemic insecticide. The resistance ratios of LC50 values of the field populations to that of a susceptible laboratory colony from 10 sites ranged from about 4 to 21 and averaged about 15. Field collected efficacy data indicated that whiteflies were not out of control at 3 sites. Resistance ratios declined to lower levels after the whiteflies were reared in the laboratory for three generations without exposure to imidacloprid; however, higher ratios were detected in one field population after being reared for only one generation on tomato plants treated with the LC50 of the susceptible colony. When this population was bioassayed for susceptibility to thiamethoxam using the same technique, the LC50 value was comparable to that of the laboratory colony. However, when the population was reared for one generation on tomato plants treated with the LC50 value of the laboratory colony for thiamethoxam, the thiamethoxam resistance ratio was nearly 11, thus indicating the potential for development of field populations with reduced susceptibility to both imidacloprid and thiamethoxam. 2) A laboratory, no-choice bioassay was used to screen 23 products or chemicals for repellency to silverleaf whitefly adults. None of the products or chemicals were more repellent than the paraffinic oil used as a standard. 3) A greenhouse choice bioassay was used to evaluate various encapsulated oils and volatile chemicals alone or combined with vegetable oils for repellency to silverleaf adults. None were consistently more repellent than the paraffinic oil used as a standard. 4) Soil applications of two nicotinoid insecticides, imidacloprid and thiamethoxam, were compared for whitefly control on tomato at two commercial farms and at the University of Florida Gulf Coast Research and Education Center. Both nicotinoids reduced the numbers of whitefly nymphs relative to non-treated plants for at least eight weeks after treatment. 5) Sound trapping for adult mole crickets and a tachinid parasite were continued. 6) Insecticides, miticides, insecticide combinations and insecticide rotations were evaluated in field trials for control of the silverleaf whitefly, armyworm larvae, spider mites, the broad mite and the pepper weevil. 7) Different formulations of pheromones/attractants were evaluated as lures in double-sided sticky traps for trapping pepper weevil adults. None were found to result in higher trap catches than the standard, commercially available lure.

Impacts: The use of adult repellents, especially for protecting tomato seedlings in transplant production houses, could improve management of whitefly-vectored viruses with reduced, adverse environmental impact. Monitoring of field populations of the silverleaf whitefly for susceptibility to imidacloprid and thiamethoxam is an essential part of a resistance management program and will help ensure the continued availability of these indispensable insecticides for whitefly control. The identification of pesticides and pesticidal rotations will help ensure the continued

management of key arthropod pests of vegetable crops grown in Florida and elsewhere.

Source of Federal Funds: Hatch

FLA-BRO-03651

Title: *BREEDING TO OPTIMIZE MATERNAL PERFORMANCE AND REPRODUCTION OF BEEF COWS IN THE SOUTHERN REGION*

Critical Needs:

National Objectives: 1

Key Themes: animal breeding; reproduction; beef cows; maternal performance; reproductive performance; top crossing; animal genetics; crossbreeding; fertility; sires; brahman cattle; senepol cattle; tuli cattle; charolais cattle

Summary: Brahman, Senepol and Tuli-sired F1 cows from Angus dams will be evaluated for fertility and maternal traits over four calf crops. Their calves will be sired by Charolais bulls and data from this and seven other locations will be polled to evaluate sire breed of dam and its interaction with location.

Progress: In the hot-humid subtropics of the United States, the beef cattle industry is primarily cow-calf. Generally, calves produced in this region are transported to the mid-west for growing and finishing. This necessitates that the cows are adapted to the region. Brahman (Zebu) crossbred cows are dominant in this region because they combine the adaptation of the Brahman with the more desirable carcass qualities, earlier maturity, and reproductive efficiency of breeds adapted to temperate climates. Recently, emphasis has been placed on the adaptability and productivity of tropically adapted non-Zebu breeds. The Senepol is an adapted non-Zebu breed from U.S. Virgin Islands and the Tuli is an adapted Sanga breed from Zimbabwe. To determine the maternal and reproductive performance of adapted F1 cows in the subtropics, 42 Brahman x Angus, 34 Senepol x Angus, and 50 Tuli x Angus cows were bred to Angus bulls to calve first and subsequently to Charolais bulls to calve as three- to eight-yr-olds. Age at first calving did not differ among crossbred cows. Angus-sired calf birth weights were heavier ($P < 0.01$) from Senepol x Angus than either Brahman x Angus or Tuli x Angus cows. Weaning weights of Angus-sired calves were heavier ($P < 0.01$) from Brahman x Angus (213.5 kg) than either Senepol x Angus (194.9 kg) or Tuli x Angus (191.5 kg) cows. As three- to eight-yr-old cows, calf birth weights were heavier ($P < 0.05$) from Senepol x Angus compared to Brahman x Angus but not Tuli x Angus cows. Weaning weights of Charolais-sired calves were heaviest ($P < 0.05$) from Brahman x Angus cows (268.9 kg), lightest from Tuli x Angus cows (233.4 kg), and intermediate from Senepol x Angus cows (245.0 kg). Calf crop born and calf crop weaned were lowest ($P < 0.05$) for Senepol x Angus cows (76.9 and 70.2%) and did not differ between

Brahman x Angus (89.0 and 86.1%) and Tuli x Angus (94.7 and 86.5%) cows. Tuli x Angus cows tended ($P < 0.10$) to have a lower percentage of normal births and lower ($P < 0.10$) calf survival to weaning than Brahman x Angus cows but not Senepol x Angus cows. As three- to eight-yr-olds, weaning weight per cow exposed was heaviest ($P < 0.05$) for Brahman x Angus (234.2 kg), lightest ($P < 0.05$) for Senepol x Angus (173.0 kg), and intermediate ($P < 0.05$) for Tuli x Angus (209.1 kg) cows. Efficiency, weaning weight per 100 kg cow exposed, was similar for Brahman x Angus (45.0) and Tuli x Angus (44.2) cows and both were greater ($P < 0.01$) than for Senepol x Angus (37.6) cows. These data indicate that in the subtropics, maternal and reproductive performance of Tuli x Angus cows, but not Senepol x Angus cows, was comparable to Brahman x Angus cows except for lower calf survivability primarily due to calving difficulty and weaning weight.

Impacts: Brahman crossbred cows excel in the subtropics and are the standard to which other breed types should be compared in this environment. Reproductive and maternal performance of Senepol x Angus cows was generally inferior to that observed for Brahman x Angus cows. Performance of Tuli x Angus cows, however, was comparable to Brahman x Angus cows for all traits except calf survivability (primarily due to calving difficulty) and weaning weight. The smaller size of Tuli vs. Brahman crosses may be a benefit in the subtropics as related to overall efficiency of production if there is a way to deal with calving difficulty.

Source of Federal Funds: Hatch

FLA-ENH-03543

Title: *ESTABLISHING TREES IN URBAN LANDSCAPES*

Critical Needs:

National Objectives: 4,5

Key Themes: forestry; trees; urban forestry; urban areas; tree planting; irrigation levels; landscapes; transplanting; container stock; container types; tree growth; drought stress; plant establishment; *sustainability of agriculture and forestry; urban gardening; plant production efficiency; ornamental/green agriculture/home lawn and gardening/ plant health; agricultural profitability; biological control; forest resource management; forest crops;*

Summary: Trees will be grown in containers and in the ground to simulate conditions in a nursery. They will be transplanted to a simulated landscape site, typically a sandy, well drained soil. Growth measurements after transplanting will include root, trunk and shoot growth as well as xylem potential in selected cases.

Progress: Live oak (*Quercus virginiana*) trees were grown to about a 2.5 in (6 cm) caliper in various container and field production systems,

then transplanted to a landscape with and without mycorrhizae-forming spores under two irrigation regimes. Trees grew at nearly the same rate in the nurseries, regardless of production method. However, root distribution was altered. Low profile, air root-pruning containers had less roots on the outside surface of the root ball than traditional plastic containers. Application of mycorrhizae-forming fungi to the backfill soil at planting in a landscape had no impact on live oak the first 30 months after planting. However, nursery production method and irrigation frequency following planting had a huge influence on tree survival. Irrigating 2.5 in (5 cm) caliper live oak for only 6 weeks after planting in spring in a slightly drier than normal year resulted in 43% tree death rate. Irrigating twice each week through the first summer after planting in spring kept all trees alive. Under limited irrigation conditions, trees from containers died sooner and more trees died than field-grown B&B trees. Root-pruned field-grown B&B trees survived better than all others following transplanting. Trees planted from all nursery production methods survived and grew similarly provided they were irrigated regularly through the first growing season. Under limited irrigation, landscape managers would obtain the most live trees by planting root-pruned, field-grown B&B nursery stock. Southern magnolia (*Magnolia grandiflora*) planted as 3.7 l (1 gal) liners into sandy soil did not respond to nitrogen applications above 19.5 g N/m² (4 lbs N/1000 ft²)/year the first two years after planting. Seedling magnolia and 10-13 cm (4-5 in) caliper field-grown live oak (*Quercus virginiana*) trees receiving nitrogen responded the first year of application by growing faster than those that received no nitrogen. Nitrogen source had little impact on growth or tissue nitrogen concentration (1.4%) of 10-13 cm (4-5 in) caliper live oak in the first three years after field transplanting. Any fertilizer containing nitrogen promoted growth. Field-grown trees that were not root pruned during production had poorer survival following digging in the summer and winter than those receiving either of two root-pruned treatments. In contrast, summer and winter survival was similar for root-pruned trees indicating that live oak can be dug in summer as well as the more traditional winter period as long as trees are root pruned during production. Trees pruned with fabric under the liner at planting in combination with spade pruning survived better than traditional spade root pruned trees.

Impacts: The savings from existing urban trees in Florida may be equivalent to more than 3 100-MW power plants. With this much at stake, efficient practices that retain and add to urban tree canopy are vital to the economy in Florida. We found that trees grow at nearly the same rate in nurseries regardless of production method. This is useful because it allows urban tree managers to make better-informed decisions on tree selection. We have also determined that application of soil amendments such as mycorrhizae-forming fungi and other organic materials to the

backfill soil at transplanting had no impact on post-transplant stress, growth, or survival after planting trees in urban landscapes. However, nursery production method did impact survivability and growth under real-world conditions. Under limited irrigation conditions root-pruned field-grown trees that were dug and held in the nursery for ten weeks prior to transplanting to a landscape had the greatest survival of all production methods following transplanting; trees from containers died in greater numbers (55%) and sooner than field-grown B&B trees (14%). Following transplanting to the landscape growth rate of surviving trees was not affected by nursery production method. Under limited irrigation conditions common to most landscapes, planting field-grown B&B trees that were root pruned regularly in the nursery and dug ten weeks prior to transplanting to the landscape provided for the most live trees per dollar.

Source of Federal Funds: Hatch

FLA-ENH-03544

Title: IMPROVED NUTRITION AND IRRIGATION OF ORNAMENTAL PLANTS

Critical Needs:

National Objectives: 1

Key Themes: ornamental plants; cultural practices; irrigation systems; woody ornamentals; plant nutrition; fertilizer rates; nutrient availability; fertilizer practices; runoff; nitrates; fertigation; potting media; nitrogen; water conservation; pollution control; container production; leaching; nutrient utilization; phosphorus; *ornamental/green agriculture; agricultural profitability; home lawn and gardening; plant production efficiency; Forest crops*

Summary Nutritional regulation relative to growth, environmental effects, and cultural practices are increasingly important economically to Florida's ornamentals industries. Establish optimal nutrient and water delivery practices for Florida's ornamental industry:

Progress: Seedling live oaks (*Quercus virginiana* Mill.) were transplanted in October 2001 to #25 plastic containers with a 40% pine bark, 60% New Peat, and 10% sand substrate amended with 3 kg per cubic meter limestone and 0.6 kg per cubic meter Sure-Gro 0-0-7K. Fertilizer treatments were initiated by applying Nutricote Total 17N-3P-7K Type 270/70 fertilizer slightly below substrate surface at a rate of 27, 95 or 162 grams nitrogen per container. Irrigation water was applied once (continuous) or twice (cyclic) per day to trees that received each nitrogen application rate. Continuous and cyclic irrigation events provide the same total amount of water per day to each tree. For continuous irrigation, the total amount of water applied daily was applied in the late afternoon. For cyclic irrigation, the total amount of water-applied daily was divided into a late morning and late afternoon application. Trees were arranged within 8 blocks or groups that represented the 6 treatments. Suction lysimeters were located in containers of all treatments in 4 blocks. Liquid extract from

within the container was removed by vacuum weekly for 3 weeks, then every third week immediately after irrigation. Extract nitrate nitrogen was measured. Eight trees (4 cyclic and 4 continuous irrigation) were not fertilized. Tree heights were measured initially and after one year. Increases in tree heights after one year were similar for all nitrogen application rates regardless of irrigation schedule. Extract nitrate nitrogen was similar for continuous and cyclic irrigation and concentrations for the 95 and 162 grams nitrogen rate were generally excessive (greater than 100 mg per liter) after 4 and 2 months, respectively. Fertilizer was reapplied in October 2002 based on monitoring substrate nutrition. Research conducted throughout the duration of this project has resulted in development of water and nutrient-conserving plant production systems for container-grown plants. Plant production systems that were evaluated included multiple pot boxes, funnel containers, mats, flats, wicks and subirrigation. The amount of water applied for several systems can be reduced at least 50% when compared to traditional overhead sprinkler applications. Plant response may vary due to fertilizer, water, and substrate interactions; however, the ability to produce marketable plants with a reduced irrigation application volume is a positive impact considering the limitations that regulations have imposed on water use. Additionally, research was conducted to study nutrient leaching and/or runoff with various container production systems. Results obtained with production surface underlay materials, substrate amendments, water and fertilizer application rates, and water and fertilizer delivery methods provided the framework for managing production systems that have minimal nutrient runoff and/or leaching.

Impacts: Irrigation and nutrition research from this project has resulted in management strategies or BMPs such as monitoring substrate nutrition to make environmentally conscious decisions regarding fertilization. The amount of fertilizer applied and timing of reapplications should be based on achieving desirable substrate nutritional levels in order to prevent excessive application or leaching of fertilizer.

Source of Federal Funds: Hatch

FLA-ENH-03564

Title: *MICROPROPAGATION PROTOCOL DEVELOPMENT FOR PRODUCTION OF NATIVE WETLAND, AQUARIUM AND WATER GARDEN PL*

Critical Needs:

National Objectives: 1,4

Key Themes: plant breeding; cultural practices; aquatic plants; micropropagation; plant propagation; native plants; wetlands; genetic variance; plant genetics; rapid plant growth; plant establishment; tissue culture; meristem culture; plant regeneration; shoot tip culture; rooting; acclimatization;

ornamental/green agriculture; plant genomics; plant germplasm; tropical gardening; urban gardening; home lawn and gardening; aquaculture; wetland restoration and protection;

Summary: The market for aquatic and wetland plants used as ornamentals and for habitat restoration is one of the fastest growing segments of environmental horticulture. Ecologically sound and efficient production methods are required. This project determines the feasibility of developing commercially viable and ecologically sound micropropagation protocols for genotypic characterization, selection and production of native wetland, aquarium and water garden plants.

Progress: Micropropagation protocols have been completed for the aquatic/wetland plants: *Pontederia cordata*, *Eleocharis montana*, *Spartina bakeri* and *Sagittaria kurziana* and the dune species *Uniola paniculata*. RAPID analysis of genetic diversity and population structure of four Florida *Uniola paniculata* L. (sea-oats) populations have been submitted for publication. Results indicated genetic differentiation between Atlantic and Gulf coast sea oats populations with limited differentiation between Atlantic coast populations. Similar results were observed in seedling populations. In vitro propagated sea oats genotypes exhibited significant differences in capacity for shoot multiplication, rooting and ex vitro acclimatization. The physiological/anatomical basis for these differences is now being investigated. To assess the field performance of micropropagated sea oats genotypes, 16 genotypes were outplanted at Anastasia Stake Park (Anastasia, FL) and St. George Island, Florida during September 2001. In vitro propagated ecotypes of *Sagittaria latifolia*, collected from Rhode Island, North and South Carolina and three Florida populations) were grown in 5-gal containers in Gainesville, Florida to compare vegetative growth, flowering and corm formation under north Florida conditions. The second growing season repeated experiment of this study was completed in fall 2001.

Impacts: Development of micropropagation protocols for aquatic/wetland and dune species and site specific genotypes will eliminate the need for field collection of plant materials and subsequent damage to donor sites. These protocols have been made available to commercial micropropagation labs. Three commercial micropropagation laboratories are using the protocols developed from this research. These data are also important for ecological research on establishment and maintenance of biodiversity and ecological function in restored or rehabilitated habitats. The benefits and limitations of this approach need to be further determined. The sensitivity and reliability of the modified AFLP procedure will enable rapid genetic characterization of diverse plant populations and individuals.

Source of Federal Funds: Hatch

Title: ASEXUAL PROPAGATION OF ENVIRONMENTAL PLANTS

Critical Needs:

National Objectives: 1

Key Themes: plant reproduction; plant physiology; asexual propagation; plant propagation; growth regulators; growth stage; adventitious roots; root development; root initiation; juvenility (plants); plant anatomy; indolebutyric acid; gibberellic acid; benzyl adenine; vegetative propagation; plant cuttings; mechanical pruning; *ornamental/green agriculture; plant production efficiency; home lawn and gardening;*

Summary: To determine the methods and procedures for vegetative propagation of woody plants produced in the nursery industry. The results of this project should facilitate production of difficult to propagate woody plants

Progress: 1. Rooting of *Eriobotrya japonica* (Loquat) cuttings treated with IBA and BA. Preliminary literature search on vegetative propagation of *Eriobotrya japonica* indicated no previous research or publications. In a 3 x 3 factorial experiment four replication of 12 cuttings of loquat were treated with 0, 8000, and 16000 PPM IBA followed by 0, 500, and 1000 PPM BA dip. These were arranged randomly under an intermittent mist system of 10min/5 sec frequency. Although rooting percentage ranged from 32 to 88% within all treatments, a significantly higher number of cuttings (88%) developed prolific healthy roots when treated with 8000 PPM IBA, irrespective of BA treatment. Although number of rooted cuttings treated with 16000 PPM was nearly equal to those of 8000 PPM, their root quality was not within the acceptable range. Cuttings treated with BA alone rooted poorly. Thus, neither BA treatment nor IBA concentrations of greater than 8000 PPM are recommended. 2. Effect of Varying Hormone Treatments and Sexual Dimorphism on Rooting of *Ilex* sp. Cuttings. This experiment was designed to determine if in dioecious plants such as *Ilex* cuttings of one sex root faster and more profusely than the other of the same species. Four replications of 10 tip cuttings each from male and female plants of a recently discovered Florida native *Ilex* species were treated separately in a 3 x 3 factorial arrangement of 0, 250, and 500 PPM BA and 0, 5000, and 10000 PPM IBA, with DMSO used as carrier. Rooting response was measured qualitatively by a rating system from 0 (dead) to 6 (superior) and quantitatively by rooting percentage and number of roots. Cuttings treated with a combination of BA and IBA exhibited better rooting response than either chemical alone. Cuttings of female plants had significantly higher rooting percentage and root quality than those of the males. 3. A two-year study of the effects of latitudinal source on early growth and development of in vitro propagated ecotypes of the wetland species *Sagittaria latifolia* was completed. *S. latifolia* genotypes displayed significant differences in rhizome and leaf production, flowering and corm formation under Florida conditions. These differences were attributed to adaptation to latitudinal differences in

environmental factors prevailing where the plants were originally collected. Long-term field evaluation studies are required assess the ecological importance of these ecotypic differences with respect to habitat restoration. Significant differences in in vitro shoot multiplication and leaf length of two genotypes of the dune grass *Uniola paniculata* were observed in response to benzyladenine and indole-3-acetic acid treatments. Micropropagation procedures for *Viburnum odoratissimum* production were developed for use in physiological studies of shoot flush growth.

Impacts: The treatment methods and procedures described in this report will facilitate vegetative propagation of the plants studied. To the best of our knowledge, vegetative propagation of loquat has not been reported and preferential rooting of cuttings in relation to plant sex has only rarely been noted in the literature. Impact: Development of micropropagation protocols for production of diverse aquatic/wetland and dune species and site-specific ecotypes for habit restoration will decrease the need field collection of plant materials. Several commercial micropropagation labs are using these procedures to produce native plants for habitat restoration. Information is important for further ecological research on establishment and maintenance of biodiversity and ecological function in restored or rehabilitated habitats.

Source of Federal Funds: Hatch

FLA-ENH-03600

Title: *MORPHOLOGICAL AND PHYSIOLOGICAL RESPONSES OF CHIMERAL PLANTS TO ENVIRONMENTAL FACTORS*

Critical Needs:

National Objectives: 1

Key Themes: plant physiology; plant morphology; environmental factors; plant response; cultural practices; leaf development; variegation; photosynthetic efficiency; chimeras; ontogeny; light intensity; light quality; irradiation; chlorophylls; flavonoids; chloroplasts; cell ultrastructure; carotenoids; microscopy; *ornamental/green agriculture*

Summary: The shape and function of plant leaves produced in different environments often differ dramatically. Environmental effects on the way leaves develop can be determined easier using plants with variegated leaves. This project examines how leaves develop in response to different environmental factors.

Progress: Publications in preparation show that morphological and physiological responses of chimeral foliage plants when plants are transferred from production light levels (500-1,000 micromols) to very low light levels typical of most building interiors (4,8,16 micromols) is consistent within genera but changes in per cent leaf variegation is cultivar dependent. Past research has shown that per cent leaf variegation of new leaves may increase or decrease when production light levels decrease. This response is

species dependent and is developmentally integrated over time. Consequently plants transferred from high light environments to low light environments in sequence to their rate of leaf production will exhibit a morphological and anatomical response that is intermedial between the two extremes.

Impacts: Knowledge of specific cultivar responses will permit commercial growers and interior decorators to grow/use the best plants in specific locations.

Source of Federal Funds: Hatch

FLA-ENH-03602

Title: *TAXONOMY AND BIOSYSTEMATICS OF CULTIVATED PLANTS*

Critical Needs:

National Objectives: 1

Key Themes: plant taxonomy; biosystematics; cultivated plants; plant identification; wild plants; classification systems; euphorbiaceae; plant propagation; plant introductions; conservation; endangered plants; plant anatomy; plant morphology; electrophoresis; chromosome number; microscopy; *tropical agriculture; medicinal plants; ornamental/green agriculture; adding value to new and old agricultural products; new uses for agricultural products; plant genomics*

Summary: Resolution of relationships, classification, and nomenclature of cultivated plants. The intent of this project is to facilitate understanding of the cultivated plant groups in horticulture and to assure accuracy of their identification in the trade.

Progress: A Taxonomic Monograph of the Neotropical Species of *Jatropha* (Euphorbiaceae). Genus *Jatropha* consists of about 175-200 species of which more than one-half are native to the New World's seasonally dry subtropical regions and the remainder are African and Indian. A revision of the infrageneric taxa of the genus was published in 1979 (Dehgan, B. and G. L. Webster. 1979. Morphology and Infrageneric Relationships of the Genus *Jatropha* (Euphorbiaceae). Univ. Calif. Press, Botany. Vol. 74). The genus as whole is a variable group of taxa with a number of hybrid complexes. Determination of relationships among these complexes is being evaluated with DNA and other methods. Significant progress has been made in the study and annotation of nearly 10,000 herbarium sheets from various herbaria. Most natural habitats where species of the genus are to be found have been visited and living and dried specimens have been collected. All taxa under study are currently being illustrated and the many living specimens are being photographed for publication. Publication of the monograph in 2004 is anticipated.

Impacts: As perhaps the most primitive member of the Euphorbiaceae, a thorough study of *Jatropha* and its phylogeny is considerable significance, both within the family and with respect to related families. Moreover, several species of *Jatropha*, particularly

those in the section Curcas are currently under extensive cultivation for production of hydrocarbons and several species are being studied for their medicinal value.

Source of Federal Funds: Hatch

FLA-ENH-03609

Title: INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS

Critical Needs:

National Objectives: 1

Key Themes: floriculture; ornamental plants; information collection; plant evaluation; plant introductions; nursery stock; plant breeding; annual plants; perennial plants; grasses; foliage plants; turf grasses; information dissemination; genetic stocks; new varieties; screening systems; plant collection; *tropical agriculture; ornamental/green agriculture; agricultural profitability; invasive plants*

Summary: Florida's climate is ideal for the growth of semi tropical and tropical plant species. Plant collections throughout the world are needed to evaluate new plant materials for use in Florida's multi-billion dollar ornamental plant industry. To provide statewide reporting of activities involved in collection and evaluation of plant taxa which may be used as source materials for release to industry or other projects. Also to provide listings of plant taxa that are unsuitable because of poor adaptive traits, poor quality factors, or dangers of becoming weed pests.

Progress: Cool-season turfgrass blends, mixtures, and pure stands totalling 30 entries were overseeded on a 'Tifdwarf' bermudagrass putting green and on a 'TifSport' bermudagrass fairway at Gainesville, FL. National Turfgrass Evaluation Program trials involving 34 seeded and vegetative bermudagrasses, 12 St. Augustinegrasses, and 24 Zoysiagrasses were terminated after four years of growth at Gainesville, FL. Seven bermudagrasses selected in Hawaii were no better than a 'TifSport' bermudagrass control cultivar after four years of growth at three golf course locations in North, Central, and South Florida.

Impacts:

Source of Federal Funds: Hatch

FLA-ENY-03419

Title: TOXICOLOGY OF AGRICULTURALLY IMPORTANT INSECT PESTS OF FLORIDA

Critical Needs:

National Objectives: 1

Key Themes: *spodoptera frugiperda*; insects; insect control; ecdysone; breakdown; insect biochemistry; plant biochemistry;

allelochemicals; cytochromes; mono oxygenases; plant chemistry; insect hormones; enzyme induction; insect physiology; entomology; plant insect relations; *pesticide application; biological control*

Summary: Insecticide resistance caused by overusage of insecticides is very serious in insects. This project intends to develop new control measures which reduce pesticide usage and delay the evolution of resistance.

Progress: Glutathione S-transferase (GST) from midgut microsomes of fall armyworm larvae metabolized a variety of model substrates such as CDNB, DCNB, para-nitrophenyl acetate, and para-nitrobenzyl chloride but had no activity toward 1,2-epoxy-3-(para-nitrophenoxy) propane, 4-nitropyridine-N-oxide, bromosulphophthalein, and alpha,beta-unsaturated carbonyl compounds (e.g., trans-4-phenyl-3-buten-2-one, trans-2-octenal, trans,trans-2,4-decadienal). Microsomal GST activity (toward CDNB) was generally less sensitive to inhibition by different inhibitors than the cytosolic GSTs. Unlike cytosolic GSTs, microsomal GST was not induced by xanthotoxin and indole 3-acetonitrile. The enzyme was not activated by the treatment of microsomes with N-ethylmaleimide. A single GST isozyme was affinity-purified 22-fold from midgut microsomes, which had a subunit molecular weight of 27,000 Da. The transferase has an apparent K_m value of 0.91 mM and a V_{max} of 6.67 micromoles/min/mg protein (toward CDNB). In comparison with microsomal GST, midgut cytosolic GSTs showed a broader substrate specificity and were active toward various alpha,beta-unsaturated carbonyl compounds. Two affinity-purified GST isozymes, GST-1 and GST-2, from the midgut cytosol exhibited the same substrate specificity as the cytosol except that DCNB did not serve as substrate for the enzymes. The purifications were 5- to 133-fold depending on the substrates used. Both isozymes were heterodimers with subunit molecular weights of 26,700 and 28,000 Da. GST-1 had an apparent K_m value of 0.91 mM and a V_{max} of 2.35 micromoles/min/mg protein (toward CDNB). GST-2 showed an apparent K_m of 2.26 M and a V_{max} of 3.00 micromoles/min/mg protein (toward CDNB). GST-2 was not immunologically related to microsomal GST. Both microsomal and cytosolic GST isozymes possessed cumene hydroperoxide peroxidase activity, indicating the antioxidant nature of the enzymes.

Impacts: The knowledge gained from this research will help us fully understand the molecular mechanisms of detoxification and insecticide resistance. As a result, we will be able to develop more effective methods of pest management.

Source of Federal Funds: Hatch

FLA-ENY-03592

Title: *INTEGRATED MANAGEMENT OF ARTHROPOD PESTS OF LIVESTOCK AND POULTRY*

Critical Needs:

National Objectives: 1

Key Themes: *integrated pest management*; livestock; poultry; insect control; insects; host parasite relations; biting flies; population distribution; insect dispersal; diapause; ixodidae; haematobia irritans; stomoxys calcitrans; insect traps; insect surveys; muscidae; carbon dioxide; odor; host selection; *animal health*; *agricultural profitability*;

Summary: Examine arthropod distribution, processes and impact of arthropod dispersal to determine whether mechanisms regulating these procedures can be modified in realistic integrated pest management strategies. Research control strategies to reduce pests by surveillance and traps. Research host attraction, host finding and parasite movement for muscoid flies. Assess host-parasite-environment interactions that govern arthropod abundance and injury levels. Design environmentally safe arthropod pest management systems that improve production efficiency and implement technology transfer to producers.

Progress: Regional project objectives reported: (1) The status and nature of horn fly insecticide resistance and develop resistance management strategies. Untreated seasonal herd populations of horn flies were followed. Horn fly, house fly and stable fly counts on an untreated herd has been maintained for the last 10 years. Horn flies, house flies, and stable flies were counted weekly on ten known animals and the means plotted to determine the normal populations of flies. Horn fly populations were high from weeks 19-38 during the year. Very high numbers occurred during years 1991, 1993, and 1998, reaching 2,300. Winter populations never dropped to 0 flies per animal. House fly populations varied greatly with highs reaching means of 42 during the years 1992, 1993, 1995, and 2000. High numbers were seen from weeks 6 through 20 of the year. Low stable fly numbers were present early in the year from weeks 7 to 21. Peak populations were observed in February to May each year. (2)The cattle-arthropod pest interactions, host finding and maintenance of flies. Semiochemical research continued in 2001 evaluating attractants for flies. Major differences were seen between house flies and blood feeding horn and stable flies. Blood feeding insects showed high attractancy to CO₂, house flies were neither attracted or repelled by it. Heart beat trap test designs are underway adding attractants to the system. Research to evaluate exotic parasite effect on horn flies is continuing in cooperation with the USDA CMAVE at Gainesville, FL.

Impacts: Reduce the damage caused by flies to livestock and poultry.

Source of Federal Funds: Hatch

FLA-ENY-03934

Title: *BIOLOGICAL CONTROL OF ARTHROPOD PESTS AND WEEDS*

Critical Needs:

National Objectives: 4

Key Themes: insect control; weed control; *biological control* (insects); *biological control* (weeds); vegetables; citrus; turf grasses; aquatic weeds; natural enemies; performance evaluation; scale (insects); bemisia; aphididae; lepidoptera; gryllotalpidae; quarantines; native species; exotic species; non target organisms; environmental impact; quantitative analysis; habitat manipulation; *invasive species*; *integrated pest management*

Summary: Exotic pests continue to pose threats to American agriculture and well being, making continued efforts in importation biological control relevant and necessary. It is anticipated that natural enemies will be discovered and introduced for control of melaleuca, Brazilian peppertree, old world climbing fern, kudzu, tropical soda apple, water hyacinth (including pathogens), Chinese tallow, Chinese privet, tarnished plant bug, brown citrus aphid, cotton fleahopper, bromeliad weevil, red imported fire ant, muscoid flies, mole crickets, and weevils.

Progress: The phytophagous tarsonemid mite *Steneotarsonemus* (=Parasteneotarsonemus) *panici* (Mohanasundaram) (Acari: Tarsonemidae), native to Tamilnadu, India, may be a good biocontrol candidate against torpedo grass, *Panicum repens* L. It attacks only torpedo grass, and is found beneath the leaf sheaths of the plant, where it would be afforded some protection from ant predation. *Steneotarsonemus panici* and other candidate arthropods (if they indeed exist) would require extensive host range testing to ensure that only torpedo grass will be attacked. From March to November 2003, monthly surveys of midge pupal exuviae were conducted in selected springs on the Wacissa River in Jefferson Co., Florida. The objective was to monitor the establishment, seasonality, and distribution of *Cricotopus lebetis* Sublette on hydrilla infestations. In total, 8,145 pupae and pupal exuviae of six species of *Cricotopus* were collected from March through September from four sites along the Wacissa River. However, only exuviae of a single *C. lebetis* were collected, which accounted for < 0.01% of the total sample. The almost complete absence of *C. lebetis* could explain the high infestation of hydrilla in this river system. Parasitoids were collected in Guangdong, China on cycad *Aulacaspis* scale, *Aulacaspis yasumatsui*. Living specimens were shipped to quarantine in Gainesville. Parasitoids identified were *Coccobius fulvus* (Compere & Annecke), *Aphytis lepidosaphes* Compere (or near *chrysomphali* group), and *Pteroptrix chinensis* (Howard). Cultures were not successfully established. Additional attempts will be made. The literature was reviewed to derive a list of all of the animal species imported into Florida, beginning in 1899, and established as classical biological control agents. All published and unpublished sources that were detected were then checked for evidence of nontarget effects by these species. It is hoped to publish the results during 2004. Evaluated the establishment of *Lipolexis oregmae*, a parasitoid of the brown citrus aphid; this parasitoid has established throughout Florida's citrus groves, attacking brown citrus aphids, as well as melon, spirea and

cowpea aphids. The use of alternative pest aphids may enhance the establishment of *Lipolexis*. *Tamarixia radiata*, a parasitoid of the Asian citrus psylla, was monitored throughout the growing season in an unsprayed citrus grove near Ft. Pierce to evaluate its impact on psyllid populations. *Semiolachar petiolatus*, a parasitoid of the citrus leafminer, was introduced into quarantine for evaluation. We will determine whether it acts as a facultative hyperparasitoid and could disrupt the effectiveness of *Ageniaspis citricola*, which is already established and an important natural enemy of the citrus leafminer.

Impacts: From 1980 to 1993, approximately \$39 million were spent managing hydrilla in Florida's public waters. Since 1995, hydrilla control costs using non-biological methods have increased steadily to over \$12 million per year. The recent discovery of the midge *C. lebetis* in Crystal River, Florida, suggests that this hydrilla natural enemy is capable of establishing persistent populations on this aquatic weed, and has potential as a biological control agent of hydrilla infesting other north Florida springs. A classical biological control program may be appropriate against torpedo grass because that weed is difficult to control in Florida using conventional methods. Although biological control is not risk free, the introduction of host specific arthropod natural enemies that are capable of damaging or killing torpedo grass can provide an environmentally sound and long-term solution to the torpedo grass problem in Florida and other states where this grass weed has become invasive. However, a formal economic and ecological risk-benefit analysis would have to be completed before proceeding with a biological control project.

Source of Federal Funds: Hatch

FLA-ENY-03942

Title: *TOXICOLOGY OF AGRICULTURALLY IMPORTANT INSECT PESTS OF FLORIDA*

Critical Needs:

National Objectives: 1

Key Themes: insect pests; insect control; detoxification; insecticide resistance; synergists; insecticides; defense mechanisms; enzyme inhibitors; *spodoptera frugiperda*; microsomes; glutathione transferases; allelochemicals; regional research; corn; insecticide resistant insects; enzyme characterization; protein purification; performance testing; insect larvae; biological activity; bioassays; *biological control*

Summary: A. Insecticides are becoming less effective because of the development of resistance in insects. B. Resistance management is very important for prolonging the usage of insecticides. A. This study is to learn more about the in vivo inhibitors of glutathione transferases in insects. B. This study is to learn more about the mechanisms of insecticide detoxification and resistance in insects

Progress: A strain of the fall armyworm, *Spodoptera frugiperda* (J.E. Smith), collected from corn in Citra, Florida, showed high resistance to carbaryl (562-fold) and methyl parathion (354-fold). Biochemical studies revealed that various detoxification enzyme activities were higher in the field strain than in the susceptible strain. In larval midguts, activities of microsomal oxidases (epoxidases, hydroxylase, sulfoxidase, N-demethylase, and O-demethylase) and hydrolases (general esterase, carboxylesterase, beta-glucosidase) were 1.2 to 1.9-fold higher in the field strain than in the susceptible strain. In larval fat bodies, various activities of microsomal oxidases (epoxidases, hydroxylase, N-demethylase, O-demethylase, and S-demethylase), glutathione S-transferases (CDNB, DCNB, and para-nitrophenyl acetate conjugation), hydrolases (general esterase, carboxylesterase, beta-glucosidase, and carboxylamidase) and reductases (juglone reductase and cytochrome c reductase) were 1.3- to 7.7-fold higher in the field strain than in the susceptible strain. Cytochrome P450 level was 2.5-fold higher in the field strain than in the susceptible strain. In adult abdomens, their detoxification enzyme activities were generally lower than those in larval midguts or fat bodies; this is especially true when microsomal oxidases are considered. However, activities of microsomal oxidases (S-demethylase), hydrolases (general esterase and permethrin esterase) and reductases (juglone reductase and cytochrome c reductase) were 1.5- to 3.0-fold higher in the field strain than in the susceptible strain. Levels of cytochrome P450 and cytochrome b5 were 2.1 and 2.9-fold higher, respectively, in the field strain than in the susceptible strain. In addition, acetylcholinesterase from the field strain was 2- to 85-fold less sensitive than that from the susceptible strain to inhibition by carbamates (carbaryl, propoxur, carbofuran, bendiocarb, thiocarb) and organophosphates (methyl paraoxon, paraoxon, dichlorvos), insensitivity being highest toward carbaryl. Kinetic studies showed that the apparent Km value for acetylcholinesterase from the field strain was 56% of that from the susceptible strain. The results indicated that the insecticide resistance observed in the field strain was due to multiple resistance mechanisms, including increased detoxification of these insecticides by microsomal oxidases, glutathione S-transferases, hydrolases and reductases, and target site insensitivity such as insensitive acetylcholinesterase. Resistance appeared to be correlated better with detoxification enzyme activities in larval fat bodies than in larval midguts, suggesting that the larval fat body is an ideal tissue source for comparing detoxification capability between insecticide susceptible and -resistant insects.

Impacts: Understanding the molecular mechanisms of insecticide resistance will help us develop more effective methods of resistance management.

Source of Federal Funds: Hatch

Title: SELECTION OF HONEY BEES FOR SUPPRESSED REPRODUCTION OF THE PARASITIC VARROA MITE AND MAPPING OF THE QUANTITATIVE TRAIT LOCI (QTL) INVOLVED

Critical Needs:

National Objectives: 1

Key Themes: apis mellifera; varroa destructor; aflp; mites; insect breeding; reproduction; genetic markers; genetic mapping; quantitative genetics; traits; gene loci; selection; insect genetics; molecular genetics; bees; performance evaluation; genotypes; homozygosity; heterozygosity; infestation; recombination; computer software; gene analysis; linkage (genetics); statistical analysis; *apiculture*;

Summary: The parasitic mite Varroa destructor has devastated honey bee populations world-wide. Chemicals used to control the mite have contaminated wax and honey and have selected resistant mites. Suppression of mite reproduction (SMR) is one of the most promising of the honey bee's natural defenses against the Varroa mite. The goals of this project are to select for SMR and to find associated DNA markers, thereby locating the genes responsible along genetic maps (QTL).

Progress: The goal of this project is to find DNA markers (AFLPs) in honey bees that are associated with SMR (suppression of Varroa mite reproduction), thereby locating the responsible genes (quantitative trait loci - QTL) along genetic maps. For this project, drone progeny are produced from queens that are hybrids between SMR and susceptible (SUS) bees. In these drones, markers are identified that have segregated along with SMR genes expressed by the drones' worker offspring. Dr. John Harbo, (USDA-ARS, Baton Rouge) has provided SMR and SUS queens. During the year 2002 and into 2003, SMR stock was maintained by crossing progeny of different SMR queens, whereas SUS stock was inbred for several generations. The inbreeding was intended to eliminate any SMR tendency, to enhance differential expression among bees with SMR and SUS alleles. Crosses were made between SMR and SUS bees, from which hybrid daughter queens were raised. For the tests, drone progeny from one hybrid queen were used to singly inseminate super sister (same father) queens, about 50 of which were introduced into separate small hives containing about the same numbers of bees and mites. The proportion of non-reproductive mites in the second brood cycle was determined (SMR expression is delayed). Two tests were conducted this year. In the first test, the drones were crossed to SUS queens, but these queens failed to lay eggs, perhaps a consequence of being highly inbred. In the second test, the drones were crossed to SMR queens. Being late in the season, only a fraction of the test

colonies survived from which levels of SMR were determined. However, these colonies provided useful information. Levels of SMR expression were as expected. The results suggest that, at most, a few loci are involved. The use of inbred SUS lines appears not to be necessary to obtain differential expression. The procedure for AFLP analyses was modified slightly to obtain clearly defined markers. To date, about 50 distinguishing markers have been found among the drones used for the tests. A total of about 500 markers are expected to be found. The tests will be repeated in 2004, to obtain the amount of data necessary to identify the QTLs.

Impacts: The parasitic mite *Varroa destructor* has devastated populations of the western honey bee, *Apis mellifera*, world-wide. Chemical acaricides used to control the mite have contaminated beeswax and honey, and mites have developed resistance to the chemicals. Satisfactory control must ultimately draw from the bees' natural defenses, such as an ability to suppress mite reproduction (SMR). SMR is latent in bee populations and can be greatly enhanced through selective breeding. Selection of different lines honey bees for SMR may reduce or eliminate the need for chemical control. Through QTL mapping, the genomic regions responsible for SMR should be revealed. Thereafter, marker-assisted selection, with flanking DNA polymorphisms, may facilitate the introduction of SMR into stocks already selected for other desirable traits, e.g. productivity and temperament.

Source of Federal Funds: Hatch

FLA-ENY-04011

Title: *A COMPARATIVE ANALYSIS OF PLANT AND INSECT PARASITIC NEMATODES: A NOVEL APPROACH TO CONTROLLING INSECT PESTS AND PLANT PATHOGENS*

Critical Needs:

National Objectives: 1,4

Key Themes: parasitic nematodes; evolution; coevolution; parasitism; phylogenetics; entomopathogens; systematics; nematode genetics; comparative analysis; insect pests; insect control; *biological control* (insects); dna sequences; gene analysis; *caenorhabditis elegans*; gene expression; temporal distribution; localization; gene mapping; host parasite relations; polymerase chain reaction; gene cloning; *steinernema*; *heterorhabditis*;

Summary: Some parasitic nematodes are plant pathogens, others provide beneficial services by controlling pest insects. Understanding the genes involved in parasitism and which nematodes have them is a crucial first step to utilizing genetic information to suppress or enhance parasitism. The purpose of this project is to identify common genes involved in parasitism and understand their evolutionary relationships. This knowledge can be used to

control plant parasitic nematodes and enhance the effectiveness of insect parasitic nematodes.

Progress: In the last year progress was made in the following areas: 1. Numerous species of plant parasitic Tylenchid nematodes were collected, identified, sequenced, and added to the growing multiple sequence alignment for phylogenetic analysis. Preliminary alignments were optimized and phylogenetic trees explored. Meloidogyninae (root-knot nematodes) and Heteroderidae (cyst nematodes), two of the most damaging groups of plant parasites previously thought to be closely related are shown to not be sister taxa. Instead, the Meloidogyninae are most closely related to the Hemicyclophoridae. This finding will significantly impact genome projects that aim to extend and identify genetic controls of parasitism in root-knot and cyst nematodes because they are much more distantly related than heretofore imagined. 2. Species boundaries for populations of *Xiphinema* (lance nematode) and *Belonolaimus* (sting nematode) have been explored in detail. New taxa have been identified that are correlated with expansions of host range and other bionomic factors. Species previously thought to be benign have been indicted in host range expansion. We show that these populations actually represent new, undescribed species that have probably invaded from non-agricultural hosts. 3. Several new taxa of insect parasitic nematodes have been identified and are currently being described as new species and assayed for their ability to control pest insects, particularly mole crickets and the citrus root weevil. 4. The genetic structure of numerous (over 70) strains of endosymbiotic bacteria of insect pathogenic nematodes have been identified and characterized and are currently being used to inform genome exploration and microarray projects. 5. The origin and maintenance of nematode parasitism, and surveys of geographic distribution and host ranges of mollusks has been studied as a prelude to using nematodes as control agents of pest gastropods.

Impacts: 1. Our work on the phylogenetics of plant parasitic nematodes shows that the assumption of evolutionary similarity among major plant parasitic nematodes is bogus and could lead to a significant amount of ineffective research effort. (= saving billions of dollars worldwide and alleviating much human suffering due to malnutrition) 2. Now that we know that newly discovered damage to citrus and strawberry is due to highly structured and genetically divergent evolutionary lineages (different species, not just variation among populations), growers now have the information they need to make more informed choices about the measures needed to take for improved crop protection. (= saving millions of dollars statewide in citrus and strawberries) 3. Use of indigenous nematodes to control pest insects are more effective, and offer longer lasting protection, than the non-native entomopathogenic nematodes. (= millions of dollars saved due to decreased cost of pest control; decreased impact on native habitats). 4. Because we have shown that some bacteria

associated with entomopathogenic nematodes do not always show high levels of host fidelity, workers in biological control will need to contend with the fact that nematodes can pick up non-native endosymbionts and move them to unintentional (or intentional) targets. (= significant tool for further genetic dissections, improved pest management)

Source of Federal Funds: Hatch

FLA-ENY-04012-L

Title: *BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES*

Critical Needs:

National Objectives: 1

Key Themes: insect pheromones; insecticides; insect traps; tomatoes; peppers; bemisia; aphididae; insect biology; crop production; environmental impact; natural enemies; pesticide evaluation; monitoring; crop damage; mating disruption; field studies; comparative analysis; performance evaluation; insect control; anthonomus eugenii; keiferia lycopersicella; spodoptera exigua

Summary: Tomato and peppers are major vegetable crops produced in Florida, which are impacted by a diverse assemblage of pests. The majority of pesticides used for managing vegetable pests are toxic and eliminate natural enemies that regulate key pest populations. This project aims to develop new management techniques for key insect pests of vegetables. Our goal is to reduce or eliminate the number of sprays used for managing key vegetable pests

Progress: During the 2003 field season, samples were collected from zucchini located at the Plant Science Research and Education Unit in Citra, Florida. Zucchini were planted on seven 2-foot beds spaced 4 feet apart. Treatments included two synthetic mulches (white and reflective), two living mulches (buckwheat and white clover), and a bare ground (control). Zucchini and living mulches were planted on September 29th, and sampling took place between October 13th and November 17th. Living mulch treatments that included buckwheat and white clover were planted inter-row. Treatments were replicated four times in a randomized block design with each block spaced 52 m apart. Aphid and whiteflies were sampled weekly for 6 weeks beginning October 15th. White mulch had significantly more aphids in treated plots compared with other treatments including the control. Also, more symptoms of squash silverleaf disorder were recorded on white mulch compared with other treatments including the control. Data from counts of immature whiteflies also showed that white mulch had significantly higher numbers of immatures compared with other treatments (with the exception of buckwheat). Alternately, the reflective mulch had significantly fewer aphids and whiteflies compared with other mulch treatments. With the exception of the reflective mulch, buckwheat had significantly fewer adult whiteflies than other treatments. Zucchini planted within the clover mulch and bare

ground (control) had significantly higher levels of viral infection compared with other mulch treatments. Data taken at the end of the season revealed that two viral strains, PRSV-W and WMV-2 were present in the field. Our yield data revealed that significantly more marketable zucchini were harvested from plots with reflective and white mulch compared with all other treatments including the control. Overall, buckwheat plots produced significantly higher yields than plots treated with clover as well as the control plots. However, zucchini planted in plots treated with reflective mulch had significantly larger fruit than all other treatments including the control.

Impacts: The use of living mulches will allow the natural decomposition of organic matter (from mulches) in the field. This will ultimately reduce the labor cost involved in the removal of synthetic mulch from the field. In addition, the use of reflective or living mulch will reduce reliance on the use of toxic pesticide for managing key pests in cucurbits.

Source of Federal Funds: Hatch

FLA-ENY-04012-W

Title: *BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES*

Critical Needs:

National Objectives: 1,4

Key Themes: vegetables; insect control; potatoes; beneficial insects; economic injury threshold; sampling; disease vectors; plant viruses; brassica; cucurbitaceae; aphididae; bemisia; vespidae; parasitoids; predators; insect biology; insect ecology; disease transmission; communities (ecology); community structure; natural enemies; cultural practices; insect population; estimation; squash; crop yields; field trials; *pesticide application*;

Summary: Florida vegetables are attacked by a great variety of pests and many traditional chemical control options are being lost. This project seeks to enhance our understanding of the biology and ecology of crop systems with regard to insects and to develop reduced-risk alternatives to manage pests and conserve beneficial insects.

Progress: Colorado potato beetle (CPB) has a long history of becoming resistant to insecticides in other parts of the country. New materials, preferably not harmful to beneficial insects, need to be evaluated. Older standard materials, such as aldicarb, may be not as effective as in the past, and this also needs to be confirmed so that growers can make profitable choices when considering control strategies. We tested several new insecticides for control of CPB and aphids in the spring of 2003. Some of these newer chemicals (dinotefuran, for example) were very effective for both aphid and CPB control. On the first sampling date, there were almost 90 small CPB larvae per plant on untreated plants and none on those treated with dinotefuran. On the other hand, aldicarb was not very effective (43 small larvae per plant) and

needs further evaluation. A heavy rain soon after planting may have reduced its efficacy. By the last sampling date, there were almost 50 adult CPB per plant in the untreated check and an average of only 0.05 adults on the dinotefuran-treated plants. A *Bacillus thuringiensis* product (Novodor) was very effective (0.05 adults per plant on the last sampling date) and when combined with an insecticide specific for aphids, provided excellent control without harming beneficial insects. Unfortunately, Novodor is unlikely to be registered in Florida because of the limited market. The new challenge for growers will be using the neonicotinoids (like imidacloprid, thiamethoxam and dinotefuran) in a way that minimizes the development of resistance. Resistance to this class of chemicals has already developed in other parts of the country. Cultural and biological controls should be explored.

Impacts: Information from this trial will be used in a presentation to growers and will help them make good choices in insect management. The apparent resistance to aldicarb will help make them realize the need to use pesticides wisely. We may be able to prevent the development of resistance to neonicotinoids by providing alternatives and identifying gaps in our management strategies.

Source of Federal Funds: Hatch

FLA-ENY-04025

Title: *CHEMICAL ECOLOGY AND MANAGEMENT OF INSECT PESTS OF BLUEBERRY, VACCINIUM SPP., IN FLORIDA*

Critical Needs:

National Objectives: 1,4

Key Themes: insect pheromones; phenology; sampling; insect control; insect ecology; plant insect resistance; volatile substances; biological control (insects); plant biochemistry; blueberries; thrips; midges; *rhagoletis mendax*; insect pests; *vaccinium*; plant genetics; crop production; risk assessment; insect biology; insect behavior; cultivars; breeding lines; plant evaluation; surveys; life history; sex pheromones; plant accessions; predators; parasitoids; insect identification; *Small farm viability*; *integrated pest management*; *pesticide application*

Summary: Insect pests are increasing in abundance and are now limiting blueberry production in Florida. The purpose of this project is to determine nonchemical ways to manage blueberry insect pests.

Progress: Techniques to detect life stages of blueberry gall midge (cranberry tipworm) and thrips were evaluated in rabbiteye and southern highbush blueberry. Three monitoring techniques for gall midge were evaluated: 1) unbaited yellow sticky boards, 2) collection of bud samples for emergence, 3) collection of bud samples for dissection. Floral and vegetative buds were collected separately. In our rabbiteye planting, the emergence technique detected significantly more adults in floral buds compared with either yellow boards or dissection techniques. In leaf buds, yellow sticky boards were more effective in detecting adults than

emergence or dissection techniques. Similar numbers of larvae were detected using emergence and dissection techniques in floral and leaf buds. Eggs were only detected with the dissection technique. In the southern highbush planting, the emergence technique was significantly better in detecting adults in floral and leaf buds compared with yellow sticky boards or dissection techniques. No eggs were found in southern highbush floral buds. Various colors of unbaited sticky board traps were used to monitor flower thrips: 1) standard pantone yellow, 2) safety white, 3) walnut husk green and 4) thrips blue. White, blue, and yellow sticky traps captured significantly more thrips than green in rabbiteye and southern highbush plantings. Three other techniques were evaluated for their ability to detect flower thrips population in blueberry plantings: dipping flower clusters into alcohol, tapping floral clusters onto a white surface and collecting floral clusters for dissection. In rabbiteye plantings, white sticky boards were significantly more effective in detecting flower thrips than the other techniques evaluated. Alcohol dip and floral dissection techniques were equivalent in their abilities to detect thrips. *Frankliniella bispinosa* was the most abundant species of flower thrips encountered, comprising more than 95% of the total thrips in our samples. Other species recorded were *F. tritici* and *F. occidentalis*. We recorded *Rhagoletis mendax* adults in 3 of the 4 counties that were monitored in Georgia. We found no blueberry maggot in our surveillance studies in Florida. Seven insecticides treatments were evaluated for control of gall midge and flower thrips: diazinon, malathion, thiamethoxam, spinosad, azadirachtin, Surround and an untreated control. Diazinon-treated blueberry bushes had significantly fewer gall midge larvae compared with buds treated with other compounds. In Florida, Surround was the only insecticide that significantly reduced flower thrips populations whereas in Georgia, malathion and Ecozin were the most promising compounds. Preliminary observations of gall midge mating behavior indicate that a volatile pheromone perceived from some distance is probably involved in mate location. In a greenhouse, male gall midge were observed orienting in flight to a stationary female on a blueberry leaf. Males appeared to follow an odor plume and then hovered close to the female. Males landed on the leaves, oriented and walked to the female. After brief wing fanning, copulation took place and lasted approximately 3 minutes.

Impacts: Developing an effective monitoring technique will allow growers to detect the presence of gall midge and thrips early in the season. This will allow growers to make management decisions that may minimize the use of pesticides. The use of reduced-risk pesticides will enable growers to use less toxic compounds for managing key pests; thereby minimizing the negative effects on the environment.

Source of Federal Funds: Hatch

FLA-ENY-04030

Title: SOURCES, DISPERSAL AND MANAGEMENT OF STABLE FLIES ON GRAZING BEEF AND DAIRY CATTLE

Critical Needs:

National Objectives: 1

Key Themes: insect dispersal; dairy cattle; insect control; stomoxys calcitrans; beef cattle; grazing; sources; animal welfare; habitat characteristics; insect development; overwintering; insect population; quantitative analysis; comparative analysis; substrates; mathematical models; statistical models; insect genetics; insect traps; prevention; insecticides; *biological control* (insects); pteromalidae; wolbachia; performance evaluation

Summary: Stable flies parasitize livestock causing economic damage and disease transmission. Very little or no control measures are available. Define the ecological habitate of stable flies and devise control measures.

Progress: Fly trapping systems using heart beat sound activated traps (Sonic Web) were evaluated in late 2001 to determine if the addition of CO₂ and selected attractants would improve the catch rates. CO₂ at 1000 ml/min and the addition of Musk 781 showed the greatest increase in catch of the materials tested. The trap its self was shown to be an effective stable fly attractant system. New stable fly repellent trials were conducted to evaluate natural oils for repelling flies from animals and in an Olfactometer. Geraniol and geraniol-nerol treatments on artificial skin in the Olfactometer were the most significantly effective at 86% control for up to 8 hours. This control was equal to earlier formulations supplied for on cattle testing in both Nebraska and Louisiana. Others will report the results of those tests.

Impacts: Develop and improve fly trap systems for the the stable fly Stomoxys calcitrans.

Source of Federal Funds: Hatch

FLA-FME-03477

Title: DEVELOP METHODS FOR PREDICTING HUMAN EPIDEMICS OF MOSQUITO-BORNE ENCEPHALITIS VIRUS IN FLORIDA

Critical Needs:

National Objectives: 2,3

Key Themes: human health; epidemiology; virus diseases (animals); mosquito borne diseases; encephalitis; insect vectors; arbo viruses; disease reservoirs; epidemics; insect ecology; insect behavior; virus reservoirs; disease surveillance; wild birds; vector host relations; weather; virus transmission; *animal health; human health;*

SummaryThe seasonal transmission of mosquito-borne viruses (St. Louis encephalitis; eastern and Venezuelan equine encephalitis) to humans and domestic animals is currently unpredictable. This project will identify biotic (mosquito vectors, arbovirus biology, and avian amplification host biology) and abiotic (rainfall and

temperature) factors that can be tracked to help predict human infections.:

Progress: Field and laboratory studies designed to help predict human epidemics of mosquito-borne encephalitis virus in Florida continued at the Florida Medical Entomology Laboratory (FMEL) during the federal fiscal year 10-1-00 through 9-30-01. West Nile (WN) virus appeared in north Florida during the spring and early summer of 2001. It has continued to spread south and has now become established throughout Florida. Eleven human cases and more than 270 horse cases were reported in Florida during 2001. The introduction of WN virus into Florida has proven to be extremely expensive (\$4.2 million was spent on vector control efforts in north Florida) and disruptive. At the FMEL, we dedicated much of the 00/01 fiscal year to evaluating the true risk of a widespread WN epidemic in Florida during the summer of 2001. We conducted field experiments in north Florida to establish actual WN transmission rates, something that was not done by any other Florida or Federal agency. We constructed, updated, and posted arboviral transmission risk maps as part of our Encephalitis Information System that can be found at The WN virus is related to St. Louis encephalitis (SLE) virus which we have studied at the FMEL since 1983. The arboviral surveillance techniques we developed for SLE were used to detect and track WN virus as it moved through Florida during 2001. Our surveillance program centers on the collection of data that accurately indicate real-time viral transmission. The components of this surveillance program include measures of viral abundance; vector abundance, age, and infection status; and wild vertebrate amplification host abundance, age and infection status. Our program includes an active long-term surveillance of vector populations, the use of sentinel chickens (SC) to measure viral abundance and temporal transmission, and a wild bird surveillance program to monitor the abundance and immunological status of avian species that are responsible for the rapid amplification of these viruses. Our state-wide arboviral surveillance program begins each year on the first of January. The movement of hurricane Allison across the Florida Panhandle in June of 2001 touched off a WN transmission event that continued throughout the state until the end of the year. It is unclear at this time how pervasive WN transmission will be in Florida during the coming years. However, it is clear that an active surveillance program is necessary to monitor continued arboviral transmission and the risk of infection for Florida residents and visitors. To that end, we will continue our ongoing arboviral surveillance program at the FMEL.

Impacts: Infection of humans and domestic animals by mosquito transmitted viruses poses an important public health threat in Florida. Our development of long-term surveillance protocols allows real-time prediction of epidemic transmission allowing sufficient time for appropriate public health responses including vector

control, media contact, and issuance of Medical Advisories and Medical Alerts prior to the onset of epidemic transmission.

Source of Federal Funds: Hatch

FLA-FME-03966

Title: PREDICTING MOSQUITO-BORNE DISEASE TRANSMISSION IN FLORIDA

Critical Needs:

National Objectives: 1,2,3,4

Key Themes: disease transmission; west nile virus; encephalitis; equine encephalitis; culicidae; disease outbreaks; risk assessment; mapping; epidemiology; disease vectors; virus diseases (animals); human diseases; zoonoses; hydrology; quantitative analysis; real time (computers); monitoring; mathematical models; predictive models; arbo viruses; animal diseases; wildlife; *animal health; human health; Agricultural communications; Information technologies; Invasive species program;*

Summary: Mosquito-borne pathogens present a significant health risk to Florida residents, domestic animals and wildlife. This project will help identify periods when the risk of disease transmission is unusually high in Florida.

Progress Field studies to predict mosquito-borne encephalitis epidemics in Florida continued at the Florida Medical Entomology Laboratory (FMEL) during the federal fiscal year 10-1-02 through 9-30-03. West Nile (WN) virus continued to spread through Florida during the 2002/2003 transmission season. The main focus of WN transmission during 2003 was in the western panhandle and in southwest Florida. Eighty-nine human cases of WN were reported and were largely sporadic in their geographical and temporal distributions. The cumulative WN epicurve for Florida can be viewed at <http://eis.ifas.ufl.edu>. The first Florida human WN case of 2003 was reported in Okaloosa County in June and the final case was from Madison County in November. Even in counties with substantial numbers of human cases (Bay County with 13 cases and Escambia with 12), transmission was not focused in time, but was sporadic over the entire transmission season. The first 3 years of WN virus transmission to humans in Florida has been sporadic. A major WN epidemic (4,156 cases and 284 deaths) was reported in 2002 along the Mississippi and Ohio River basins. Likewise, a major (8,912 cases and 211 deaths) WN epidemic was reported during 2003 in and around Colorado. To date, Florida has escaped a major WN epidemic. If Florida experiences an epidemic similar to the one observed in Colorado during 2003, there will be 10,000 human cases and 300 deaths in the state. We dedicated much of the 02/03 fiscal year at the FMEL to evaluating the true risk of a widespread WN epidemic in Florida. We used the FMEL Arbovirus Rapid Deployment System (ARDS) to evaluate epidemic risk in Indian River and St. Lucie Counties during the summer of 2003. The ARDS protocol was used to quickly establish actual WN

transmission rates in selected areas of each County. We then constructed, updated, and posted arboviral transmission risk maps as part of our Encephalitis Information System that can be viewed at the web site listed above. Maps at this site are updated frequently to reflect the true risk of arboviral transmission in Florida. The arboviral surveillance techniques developed at the FMEL are used to detect and track the mosquito-borne viruses that pose an important threat to the health and well-being of humans and animals in Florida. Our surveillance program centers on collection of data that accurately indicates real-time viral transmission. The components of this surveillance program include measures of viral abundance; vector abundance, age, and infection status; and wild vertebrate amplification host abundance, age and infection status. Our program includes the long-term surveillance of vector populations, the use of sentinel chickens to measure viral presence and transmission patterns, and wild bird surveillance to monitor the abundance and immunological status of avian species that are responsible for rapid arboviral amplification. Clearly, WN virus will remain endemic throughout Florida and now poses a major threat to the economic health of the state. An active, accurate surveillance program is necessary to monitor continued arboviral transmission and the risk of infection for Florida residents and visitors.:

Impacts: Infection of humans and domestic animals by mosquito transmitted viruses poses a significant public health threat in Florida. The development of long-term surveillance protocols at the FMEL allows the real-time prediction (and reporting at <http://eis.ifas.ufl.edu>) of epidemic transmission allowing sufficient time for appropriate public health responses including vector control, media contact, and issuance of Medical Advisories and Medical Alerts prior to the onset of epidemic transmission.

Source of Federal Funds: Hatch

FLA-FOS-03456

Title: *IMPROVEMENT OF THERMAL PROCESSES FOR FOODS*

Critical Needs:

National Objectives: 1

Key Themes: food products; food processing; thermal processing; heat transfer; mass transfer; rheology; engineering; kinetics; food; high pressure; supercritical fluid extraction; heating; thawing; frozen foods; food quality; automation; food safety; food engineering; seafood

Summary: Apply engineering principals of heat and mass transfer in developing models to simulate the ohmic heating and thawing of frozen foods in Florida Seafood Processing Industry. Combine transport phenomena with rheological data and reaction kinetics data to model high pressure and supercritical processes for application

to extraction, microbial, and enzyme treatment purposes in processed foods, and automated food quality detection systems.

Progress: This project dealt with 3 issues: 1) Development of mathematical models of thermal processing of different geometrical shapes. Finite difference mathematical models were developed for conical, cylindrical, and elliptical shapes. This enabled prediction of temperature at any location, at any time for these shapes during processing under agitation or not, and therefore optimization of nutrient retention was made possible. In addition, an optimization method was developed to determine the best retort temperatures during processing. Applications to shrimp cooking were developed. Quality and yield of shrimp could be predicted, as well as its safety. Software developed for the above allowed rapid and easy application of these methods to real problems. 2) Measurement of kinetics during thermal processing. Thermal death rate constants for *Bacillus stearothermophilus* in peas, bromelain in pineapple juice, and flavor in cupuacu were experimentally determined. 3) Development of ohmic thawing. Conventional thawing of food blocks (e.g. shrimp) is done by water immersion. This generates large quantities of waste water, is very energy inefficient (water needs to be heated), and has safety and quality concerns. An alternative is to pass electricity through the food to heat it. A batch mode ohmic thawing device was designed, built and tested for thawing frozen shrimp blocks. The process was automated. Quality of ohmically and conventionally thawed shrimp were compared. This method was demonstrated to be energy efficient, safer, and environmentally more friendly than water immersion thawing. Many graduate and undergraduate students were involved with these projects. The results were published in several book chapters, and many refereed journal articles.

Impacts: Optimization of shrimp processing alone will have a significant economic impact on processors. Typically, when shrimp is cooked, it loses up to 22% of its weight. Cooked shrimp is sold by weight, with an average price of \$5/lb. We demonstrated that we could reduce the yield loss to below 10%, and still have a safe and good quality shrimp. This means a savings of \$0.6/lb that translates to millions of dollars nationwide. Shrimp cooking charts were developed based on our findings to minimize yield loss, and maximize quality. The mathematical models developed were coded into computer programs, and made available to the processors. This allowed access to methods and optimization of thermal processing for food processors. The ohmic thawing method is currently being pursued to apply it to commercial food processing. This requires a continuous operation. We are pursuing funding to develop a continuous ohmic thawing device.

Source of Federal Funds: Hatch

FLA-FOS-03513

Title: *CONTROLLED DIETARY FOLATE EFFECT ON FOLATE STATUS IN ELDERLY WOMEN*

Critical Needs:

National Objectives: 3

Key Themes: folates; dietary levels; folic acid; dietary goals; recommendations; human nutrition; nutrient requirements; elderly; women; homocysteine; human metabolism; nutrient levels; nutritional status; *Human health; human nutrition*

Summary: Folate requirements for elderly women have not been studied adequately. Poor folate status can increase the risk for chronic diseases such as heart disease, the leading cause of death in postmenopausal women. The purpose of this project is to learn more about the folate requirements of elderly women.

Progress: This project was the first to report the response to controlled folate intake using a depletion-repletion protocol in women between the ages of 60-85 years. It is also the first to report the impact of the 677 C-T MTHFR polymorphism on folate status and to describe the effect of folate depletion on DNA methylation in response to controlled folate intake. This research provides age-specific evidence in support of the decision to increase the recommended level of folate intake in elderly women. Previous decisions were based on data from younger populations. It also suggests that in response to low folate intake/status, women homozygous for the 677C-T MTHFR polymorphism are at even greater risk for elevation in plasma homocysteine concentration, a risk factor for vascular disease. DNA methylation may also be impaired in response to low folate intake. Hypomethylation of DNA has been associated with increased cancer risk. Finally, we have shown that folate catabolite excretion (total pABG) reflects total body folate pool size and is a long-term indicator that parallels functional measures of folate status. A total of 4 peer-reviewed papers and 4 abstracts have resulted from this work.

Impacts: It is anticipated that the data from this research project will be used to support decisions about the amount of folate to recommend for elderly women in future revisions of the the Dietary Reference Intakes. It also is anticipated that our findings will be used in considering the impact of genetic polymorphisms on folate requirements and potential for disease risk.

Source of Federal Funds: Hatch

FLA-FOS-03515

Title: *FOLATE REQUIREMENTS OF PREGNANT HUMAN SUBJECTS*

Critical Needs:

National Objectives: 3

Key Themes: *human nutrition*; pregnancy; women; nutrient requirements; folates; metabolites; catalysis; dietary levels; urinalysis; blood analysis; human metabolism; *human health; infant mortality*

Summary: Folate requirements of pregnant women are unknown. Adequate folate intake is essential for normal fetal development and

maternal health. The purpose of this study is to estimate folate requirements of pregnant women. This project examines gestational effects on folate utilization.

Progress: This project has terminated and all publications reported previously.

Impacts: The data from this investigation provided data that were instrumental in revising the Recommended Dietary Allowance for folate for pregnant women.:

Source of Federal Funds: Hatch

FLA-FOS-03548

Title: *SOLID-PHASE EXTRACTION TECHNIQUES FOR PESTICIDES IN WATER SAMPLES*

Critical Needs:

National Objectives: 4

Key Themes: pesticides; chemistry; analytical chemistry; water; water samples; solid phase extraction; laboratory techniques; analytical methods; storage stability; water analysis; gas chromatography; hplc (chromatography); chlorpyrifos; bromacil; atrazine; metolachlor; *water quality; Natural resources management*

Summary: Conventional analytical techniques for pesticides in water are expensive and cumbersome requiring frequent repetitions for sample analysis. This project develops analytical techniques for the extraction of pesticides from all water types which are rapid, inexpensive, sensitive and reliable.

Progress: Faculty member has retired and there are no further results to report

Impacts: This year's work has demonstrated that a much-improved technique for extracting and shipping pesticide residues in water is now available for use by those laboratories engaged in determining the impact pesticide runoff or leaching might have on surface water quality.

Source of Federal Funds: Hatch

FLA-FOS-03840

Title: *BIOTIN METABOLISM IN A RAT MODEL OF SEPSIS*

Critical Needs:

National Objectives: 3

Key Themes: biotin; inflammation; immune response; human metabolism; carboxylases; animal models; rats; lipopolysaccharides; biochemistry; nutrient function; human nutrition; immunology; plasma levels; liver; concentration; protein binding; catabolism; vitamins; nutrient deficiency; physiological stress; human physiology; infection; metabolites; endotoxins; urine; hplc (chromatography); localization; *Human health; human nutrition*

Summary: Systemic infections, including those initiated by gram negative bacteria, result in large changes in the metabolism of nutrients. This altered metabolism is correlated with increased morbidity and mortality. This project aims to analyze the effect of an inflammatory response such as sepsis on the metabolism and function of the water soluble vitamin biotin, which is involved in

the metabolism of carbohydrate, fat, and protein. It further proposed to determine if individuals who are marginally biotin deficient can respond appropriately to a systemic infection.

Progress: The current CRIS project on the interaction between biotin nutrition and immune function depends upon appropriate animal models. Studies were undertaken to analyze the relationship between dietary biotin intake and biotin metabolism in rats. Biotin status of rats was manipulated through dietary intervention to model moderate biotin deficiency, adequacy, supplementation, and pharmacological biotin supplementation (0, 0.06, 0.6, and 100 mg/kg, respectively). Urinary biotin excretion was directly related to biotin intake, but no difference between biotin adequate and supplemented rats was detected. In contrast, plasma biotin was directly and significantly regulated by biotin intake at every intake level. A hepatic free biotin pool was directly demonstrated in these studies, and like plasma, its size was directly related to dietary biotin intake. The relationship between dietary biotin intake and protein bound biotin was also analyzed. Moderate biotin deficiency markedly decreased the abundance of each biotinylated polypeptide in rat liver. Biotin supplementation did not significantly elevate the abundance of biotinylated pyruvate, propionyl CoA, methylcrotonyl CoA, or acetyl CoA carboxylase 1. The abundance of biotinylated acetyl CoA carboxylase 2, however, was significantly higher in biotin supplemented rats. Pharmacological biotin intake significantly reduced the abundance of biotinylated propionyl CoA and methylcrotonyl CoA carboxylase. These results indicate that (i) moderate biotin deficiency reduces free and protein bound biotin, (ii) biotin intakes in rats that mimic the currently recommended daily value (DV) do not result in full protein biotinylation, and (iii) pharmacological supplementation may reduce the abundance of functional carboxylases. Overall, these studies suggest that the lack of outward appearances may not be a reliable method by which to assess biotin status in the general population. Glucocorticoid administration is a common method to treat chronic disease states, including inflammatory conditions. The effect of dexamethasone on biotin metabolism was analyzed in rats consuming a purified diet containing a more physiological level of dietary biotin intake (0.06 mg/kg). Acute (5 h) dexamethasone administration (0.5 mg/kg) elicited elevated urinary glucose output as well as elevated urinary biotin excretion and serum biotin. Renal and hepatic free biotin was also significantly elevated by acute dexamethasone administration. Chow fed rats treated with an acute administration of dexamethasone demonstrated significantly elevated urinary glucose excretion, urinary biotin excretion, and serum biotin, but no change in tissue associated biotin was detected. Chronic administration of dexamethasone (0.5 mg/kg i.p.) over four days significantly elevated urinary glucose excretion 42%, but had no effect on urinary biotin excretion, serum biotin, or hepatic or renal associated free biotin. These

results demonstrate the existence of novel regulatory pathways for biotin metabolism and the possibility that experimental models with high initial biotin status may mask potentially important regulatory mechanisms.

Impacts: Initial studies into the relationship between biotin nutrition and immunity have demonstrated a significant role for this vitamin in the inflammatory response. Both the metabolism and function of biotin during inflammation appear to be altered, but the mechanisms behind these alterations are as yet unclear. These results are expected to aid in the administration of essential nutrients to the critically ill to reduce morbidity and enhance recovery.

Source of Federal Funds: Hatch

FLA-FOS-03846

Title: *POSTHARVEST QUALITY AND SAFETY IN FRESH-CUT VEGETABLES AND FRUITS*

Critical Needs:

National Objectives: 1,2

Key Themes: post harvest; fresh produce; food quality; food safety; fruit; vegetables; phytochemicals; quality evaluation; product evaluation; food nutritive value; antioxidants; polyphenolic compounds; carotenoids; plant enzymes; food processing; biological activity; oxidation; plant biochemistry; *food handling*; food storage; *Food recovery/gleaning*; *food quality*; *agricultural profitability*

Summary: Consumer demand for fresh-cut vegetables and fruits has led to a proliferation of these products in US markets. Losses of important plant-based compounds are associated with fresh-cut operations, which reduce quality characteristics and daily intake of antioxidants. This project will explore methods to promote or reduce losses of plant-based antioxidant compounds, which has important implications for improved quality and human health. Novel approaches to solving these problems will be investigated, by examining mechanisms of oxidative loss in fresh-cut vegetables and fruits.

Progress: Fresh-cut corn is a viable product with great consumer interest and potential for economic growth. However, under certain storage conditions and subsequent cooking, kernels experience mild to severe browning that appreciably impacts product quality. Physical and chemical mechanisms leading to the formation of these brown pigments during heating of fresh cut corn were evaluated. Preliminary data indicates a stress-induced response that is independent of caramelization, Maillard, enzymatic, or polyphenolic autoxidation.

Impacts: A chemical or physical mechanism leading to the formation of brown pigments in fresh cut corn were evaluated. Remediation of these problems will benefit consumers with a higher quality food product free of obvious visual defects.

Source of Federal Funds: Hatch

Title: *PHYTOCHEMICAL AND QUALITY ASSESSMENT OF FRESH AND PROCESSED FRUITS AND VEGETABLES*

Critical Needs:

National Objectives: 1, 2

Key Themes: fruit; vegetables; coatings; food processing; food nutritive value; food chemistry; food quality; antioxidants; fresh produce; thermal processing; phenolics; quality maintenance; post harvest; mangoes; carrots; food composition; regional research; biological activity; human health; performance evaluation; product stability; food storage; enzyme inhibitors; reductases; oxygen; controlled atmosphere storage

Summary: Fruits and vegetables contain a diversity of phytonutrient compounds that contribute to food quality and overall human health.

Improving overall quality phytonutrient content in fruits and vegetables may increase marketable characteristics to U.S. consumers. This project will explore phytochemical compounds in commodities important to the economy of Florida and explore chemical isolates from these crops for antioxidant properties.

Progress: Polyphenolics were characterized in eight muscadine (*Vitis rotundifolia*) cultivars and evaluated for AOX as influenced by ripening and location in the fruit (skin, pulp and juice). Polyphenolics increased as fruit ripened and the highest concentrations were located in the skins. Free ellagic, ellagic acid glycosides, and total ellagic acid ranged from 8-162, 7-115, and 587-1900 mg/kg respectively in the skin of ripe grapes. Little information exists on synergistic or antagonistic biochemical interactions in fruits and vegetables. Studies to investigate interactions between quercetin and ellagic acid showed these compounds acted synergistically (at 10 mmol/L each) in the reduction of proliferation and viability, in the induction of apoptosis and the alteration of cell cycle kinetics. Anthocyanins and polyphenolics present in the pulp of acai (*Euterpe oleracea* Mart.) were determined and their contribution to antioxidant capacity and anthocyanin functional properties established. Color stability against hydrogen peroxide over a range of temperatures was determined and compared to those from various other sources. Polyphenolic content, antioxidant capacity, and relative pigment stability of acai fruit were established for the first time under a diversity of storage conditions. Stability of red grape anthocyanins (*Vitis vinifera*) in a model juice system during normal and accelerated storage was evaluated in the presence of ascorbic acid. Rosemary polyphenolic cofactors were evaluated as stabilizing agents. Compounds followed first order degradation kinetics during storage. Copigmented treatments underwent a lower conversion of L-ascorbic acid into dehydroascorbic acid during storage

when compared to the control favorably impacting the vitamin content of these models. The effect of PPO activity on phytochemical stability of an ascorbic acid fortified muscadine grape juice following high pressure processing and storage was investigated. Rosemary and thyme polyphenolic cofactors were evaluated as anthocyanin-stabilizing agents. PPO activity increased following HHP and the addition of cofactors not only increased color and antioxidant activity but also reduced phytonutrient losses created by the highly oxidative conditions that resulted from HHP. Greenhouse-grown bell peppers (*Capsicum annuum*, cv. Robusta) were harvested from early and late season plants and subsequently stored at 20C in a continuous-flow chamber consisting of either 100 mL/L ethylene (balance air) or air-only (control) at 90% relative humidity (RH). Exposure to ethylene hastened ripening time compared to the air control but was independent of fruit maturity at harvest. Differences in phytochemical concentrations between harvest times were attributed to environmental factors such as average temperature day length and light intensity. Yaupon holly (*Ilex Vomitoria*) were investigated by HPLC for concentrations of alkaloids and antioxidant cinnamic acid derivatives. Fertilized samples produced higher concentrations with females responding more to fertilization than males.

Impacts: Information on phytochemical content, stability, antioxidant capacity, and quality of various plant-based systems was evaluated. By monitoring these factors in food and biological systems, a better understanding of food quality and potential health promoting properties were assessed.

Source of Federal Funds: Hatch

FLA-FRE-03497

Title: *AGRICULTURAL CHANGE IN THE GULF OF MEXICO: THE CASE OF CITRUS AND SUGARCANE IN FLORIDA AND VERACRUZ*

Critical Needs:

National Objectives: 1

Key Themes: economics; agricultural economics; mexico; citrus; sugarcane; agricultural production; marketing; institutional arrangements; international trade; international competition; social economics; marketing channels; trade policies; econometric models; technology; policy analysis; economic structure; trade agreements; *agricultural profitability; agricultural competitiveness;*

Summary: The methodology spans from the macro socio-economic level to the micro enterprise relationships for citrus and sugar products. Political economy, international trade trends and practices and marketing channels. Conceptual models in the form of commodity chains and channel diagrams will be developed and validated as general analytical tools. Available secondary

information on production and international trade will be collected and analyzed. Emphasis for Mexico is on gathering industry level information through interviews with growers, processors, packers, shippers and retailers. Policy assessments will rely on the study of institutional and technological factors that influence competitive position primarily between Florida and Veracruz. This information will be used to provide a basis for assessing structural adjustments to NAFTA and related trade or domestic policies.

Progress: Research was conducted on both the citrus and sugar industries of Mexico with special reference to the competitive relationship between Mexico and Florida. The work on sugar dealt with the reforms undertaken by the Government of Mexico with respect to its sugar industry, notably privatization of sugar mills and decontrol of the price of sugar. Demand equations for domestic consumption of sugar in Mexico distinguishing between direct consumption and indirect consumption by industrial users. An evaluation of the factors which have supported expanded production of Mexican sugar was also conducted. A discussion of the controversy regarding U.S. exports of HFCS was also presented. With respect to citrus, analysis of the Mexican orange industry was conducted in which an evaluation of its potential as an exporter of orange juice to the United States was considered. Since the implementation of NAFTA, Mexico has failed to take advantage of the reduced tariffs imposed by the United States on imports of both FCOJ and not-from-concentrate (NFC). An analysis of the constraints faced by the Mexican citrus industry was presented. **Impacts:** The results of this research provide to both decision-makers and other academics a better insight to the sugar and citrus sectors of Mexico. Mexico has proven to be a strong competitor in sugar, but not in citrus. As tariffs on orange juice continue to be reduced, U.S. processed orange producers have a better understanding of the competition offered from Mexico

Source of Federal Funds: Hatch

FLA-FRE-03571

Title: *DYNAMIC ECONOMIC ANALYSIS OF THE FLORIDA CITRUS INDUSTRY*

Critical Needs:

National Objectives: 2

Key Themes: economics; citrus; agricultural economics; economic analysis; fruit; world trade; marketing systems; production systems; international competition; investments; marketing strategies; policy analysis; simulation models; cash flow; spatial equilibrium; foreign markets; supply and demand; econometrics; *Food accessibility and Affordability; agricultural profitability; Food resource management*

Summary: 1. Supplement existing work with secondary data and primary data collection. 2. Develop simulation models of cash flow using standard techniques. 3. Develop spatial equilibrium models of

world markets for citrus products; estimate supply and demand equations for citrus products using econometric techniques. 4. The models developed under objectives 2 and 3 will be used to analyze policy issues via both deterministic and stochastic simulation techniques.

Progress: Research encompassed four areas related to the Florida citrus industry: the likely impact of passage of FTAA and elimination of the U.S. orange juice tariff, possible economic implications of citrus canker, potential of the Cuban citrus industry, and NAFTA and its impact of the citrus industries of Mexico and Florida. Elimination of the U.S. orange juice tariff would have a significant impact on Florida orange growers. Delivered-in prices are projected to decline by \$.20 per pound solid which translates to decreased grower prices of \$1.20 to \$1.40 per 90 pound box. Preliminary work suggest the citrus canker would both decrease per acre yields and increase grower costs, hence lowering grower returns. Cuba continues to struggle in competing in world markets for fresh grapefruit. It continues to send most of its fruit to the processing sector. Mexico has not yet been able to advantage of increased access to the U.S. market under NAFTA. Its citrus industry remains highly fragmented.

Impacts: Citrus continues to be the largest agricultural industry in Florida and Florida is the second largest citrus producing region in the world. Understanding of the impact of proposed trade agreements and the competitive position of Florida's competitors will assist Florida growers in decisions regarding expansion or contraction of production.

Source of Federal Funds: Hatch

FLA-FRE-03584

Title: PRIVATE STRATEGIES, PUBLIC POLICIES, AND FOOD SYSTEM PERFORMANCE

Critical Needs:

National Objectives: 5

Key Themes: economics; food economics; economic analysis; public policies; *food safety*; food nutritive value; *human nutrition*; **food quality**; consumer surveys; perceptions; public attitudes; risk assessment; *risk management*; consumer behavior; food contamination; microbial pathogens; statistical analysis; meat; *Food safety*;

Summary: Provide economic analysis of food safety issues. Measure consumer perceptions of foodborne illness and personal risk management strategies to avoid foodborne illness.

Progress: Public concern about pesticide residues in food has placed pressure on agricultural producers and processors to reduce pesticide residues. This pressure impacts firms through the risks and costs of failing to meet government regulatory standards. It presents new opportunities for product differentiation on the basis of safer food. Firms may react to uncertainty about input quality by seeking to increase the mean level and reduce the variance of that quality. In the case of pesticide residues, this implies efforts

to reduce the mean level and variance of pesticide residues in inputs. This article analyzes data on pesticide residues and the occurrence of vertical integration from a sample of Florida strawberry and tomato growers. The hypothesis tested is that products sampled from vertically integrated firms will have lower mean levels and variances of pesticide residues. Vertical integration was associated with significantly less varied fungicide and insecticide residues from Florida strawberry growers. This means that the strawberries coming from vertically integrated strawberry growers are a more uniform quality than those from non-vertically integrated growers. Furthermore, the strawberries from vertically integrated strawberry growers are of higher quality because fungicide residue levels are, on average, lower than those from non-vertically integrated growers. In contrast, vertical integration appears to be significantly associated with more varied fungicide residues in tomatoes; however, insecticide residue levels are less varied and more uniform in tomatoes. This study represents the first known attempt to quantify the relationship between food safety and vertical coordination in agricultural markets. The results confirm the positive relationship hypothesized in the growing number of qualitative studies in this area, at least for the case of fungicide and insecticide residues in Florida strawberries and the insecticide residues in Florida tomatoes. Some of the limitations of this study suggest important topics for further research. In particular, a similar study using data collected randomly would allow implications to be drawn for a broader population. In addition, information about the weightings assigned by firms to their various product quality objectives would allow the effects of conflicting objectives to be identified. Finally, further evidence of a negative relationship between vertical coordination and pesticide residues in food may suggest important market-based targets for government policies aimed at improving food safety. These may include measures to improve information transfer at all levels of the market through unified grading and labelling standards, improved information technology and more accurate and less expensive testing mechanisms, and government standards in product tracking from producer to processor to retailer.

Impacts Further evidence of a negative relationship between vertical coordination and pesticide residues in food may suggest important market-based targets for government policies aimed at improving food safety. These may include measures to improve information transfer at all levels of the market through unified grading and labelling standards, improved information technology and more accurate and less expensive testing mechanisms, and government standards in product tracking from producer to processor to retailer.:

Source of Federal Funds: Hatch

FLA-FRE-03597

**Title: FACTORS AFFECTING THE COST OF CAPITAL IN RURAL COMMUNITIES:
CHANGING COMPETITION AND REGULATIONS**

Critical Needs:

National Objectives: 2, 5

Key Themes: economics; rural communities; credit; government regulations; technological change; policy analysis; structural analysis; consumer demand; agricultural production; market competition; cost functions; capital; econometrics; banks; rural institutions; *Impact of change on rural communities; agricultural financial management*

Summary: To accomplish these objectives, this study will use econometric techniques to estimate multiproduct cost functions for rural banks and the demand for credit by production agriculture.

Progress: This study examined the possibility for imperfect competition in the agricultural capital market using an econometric approach to test for monopolistic pricing. In general, the study was hindered by data and concavity problems in the banking data. Much of the research focused on the estimation of system of equations with missing data.

Impacts: This research project has spawned additional research into nonparametric methodologies that can be used in the estimation of market clearing conditions under missing data. Specifically, following the work of a graduate student, several ongoing efforts exists in imputation procedures for missing data, estimation using entropy approaches, and nonparametric and semiparametric approaches in cost functions.

Source of Federal Funds: Hatch

FLA-FRE-03599

Title: THE EFFECT OF FARMLAND BOOM/BUST CYCLES ON THE RURAL ECONOMY

Critical Needs:

National Objectives:1,5

Key Themes: economics; land; farm land; rural communities; land values; market structure; value changes; price fluctuations; interest rates; government policies; returns; economic security; assets; community economy; wealth; multipliers; *community development; agricultural financial management; small farms and their contributions to local economics*

Summary: Farmland values in United States have experienced frequent boom/bust cycles. These cycles have significant implications for rural communities and institutions. This research develops an empirical model of farmland boom/bust cycles and links these cycles to economic cycles in rural communities.

Progress: Most of the work this year centered around the interaction between land values, urban sprawl and productivity. This work was presented in an organized symposium at the AAEEA meetings in July and at a meeting of the UNECE, OECD and FAO in Geneva in October. In addition, we received funding for a conference on

farmland values that will be held in Washington, DC on May 6, 2002. We are currently in the process contacting the speakers and finalizing the program.

Impacts:

Source of Federal Funds: Hatch

FLA-FRE-03660

Title: FOOD DEMAND, NUTRITION AND CONSUMER BEHAVIOR

Critical Needs:

National Objectives: 5

Key Themes: *human nutrition*; economics; consumer behavior; consumer demand; consumer awareness; consumer attitudes; *human health*; diets; food nutritive value; food programs; economic analysis; social economics; food consumption surveys; low income consumers; household consumers; *consumer management*

Summary: A levels version of the Rotterdam demand system will be used to incorporate nutrients as price deflators using the 1987-88 National Food Consumption Survey (NFCS) data. The study will focus on low income household food consumption. A household production model will be used to analyze the implicit values of nutrients in U.S. household food consumption. The 1987-88 NFCS data will be used to estimate the implicit values and the impacts of household composition on the demand for nutrients.

Progress: Our primary involvement in the demand estimation this year involved extending the Florida Model of demand from a cross-sectional model to a time-series model. Next, we intend to estimate this model using informational fitting.

Impacts:

Source of Federal Funds: Hatch

FLA-FRE-03701

Title: AGRICULTURAL AND FOOD PRODUCT LOGISTICS: IMPLICATIONS FOR FLORIDA AND THE U.S. IN A WORLD MARKET

Critical Needs:

National Objectives: 1,

Key Themes: produce; logistics; eastern Europe; regional research; trade agreements; food marketing; market analysis; economic analysis; agricultural economics; international trade; transportation; united states; Canada; Latin America; legal aspects; refrigeration; food storage; perishable foods; marketing systems; economic potential; economic impact; costs; rail transportation; truck transportation; trucking; demography; workers; data collection; *risk management*; *sustainable agriculture*; *Sustainability of agriculture and forestry*; *agricultural competitiveness*;

Summary: It is crucial for Florida and U.S. agricultural and food industries to have up-to-date knowledge about developments in logistics. In the project will be examined the implications of technological and institutional changes on the ability of Florida and other U.S.

producers of perishables to compete in domestic and foreign markets, with particular attention on current and potential competition from Latin America and potential markets for Florida products in Eastern Europe and the Former Soviet Union.

Progress: In the project's second year the investigation was completed of the impacts of NAFTA on produce shipments in the United States. The results indicate that NAFTA's effects have been negligible. While the large southern tier U.S. produce producing states (i.e., FL, TX, AZ, and CA) have lost market share, only a quarter of these losses have been to the benefit of Mexico. In addition, over 90 percent of the variation in Mexico's shipments into the U.S. can be explained by exchange rates, while there are no apparent effects from NAFTA. Using a large survey of drivers of long distance refrigerated trucks, the extent to which schedules encourage violations of hours-of-service regulations and/or speed limits was investigated. The results indicate that schedules have compensated for increases in speed limits since the early 1990s. Drivers today are as, if not more, likely to have violation-inducing schedules as they were a decade before. Work was also completed on a study of the structure of the trucking industry serving Florida's ornamental industry. The results suggest that changes in concentration levels in this never-regulated industry have been similar to segments of trucking which experienced deregulation. This indicates that concentration changes in the latter may not have been due or due primarily to deregulation. Work in progress is investigating driver supply. Despite widespread beliefs to the contrary, preliminary results indicate general satisfaction with work conditions and pay rates. This suggests that fears about a looming driver shortage may be overstated.

Impacts: The project will help determine the extent and impacts of changes within the transport sector serving Florida agriculture. Many areas of this work, such as the work on NAFTA, safety, driver supply, and industry structure, have implications for the nation as a whole.

Source of Federal Funds: Hatch

FLA-FRE-03769

Title: *FINANCING AGRICULTURE AND RURAL AMERICA: ISSUES FO POLICY STRUCTURE AND TECHNICAL CHANGE*

Critical Needs:

National Objectives: 1,4, 5

Key Themes: farm financial management; farm and agribusiness risk; asset prices; *Risk management; Agricultural Financial Management; Impact of change on rural communities*

Summary: 1. Examine the impact in the southeast of various policy initiatives on investment decisions and asset values. 2. Investigate alternative sources of lender and equity for the many large adn mega-farms in the southeast. 3. Standard econometric techniques will be used to explore the impact of technology on finance issues.

Progress: Project is terminated

Impacts: It is expected that the competitive position of citrus producers will be enhanced by this work.

Source of Federal Funds: Hatch

FLA-FRE-03863

Title: *THE EFFICIENCY OF ALTERNATIVE NATURAL RESOURCE AND ENVIRONMENTAL POLICIES AND PRACTICES*

Critical Needs:

National Objectives: 1,4,5

Key Themes: econometric models; economic impact; environmental impact; economic analysis; fisheries; regional research; marine fish; optimization; resource management; renewable resources; rent; public policies; management alternatives; environmental quality; data collection; resource utilization; social impact; comparative analysis; information collection; feasibility; short term; policy analysis; cost benefit analysis; incentives; decision making; value determination; willingness to pay; prices; linear programming; non linear programming; *Natural resources management; agricultural financial management*

Summary: Florida's natural resources and environmental quality are subject to potential overuse and degradation. Proposed resource management and environmental policies often neglect indirect benefits from potentially harmful and irreversible practices. This project examines the economic efficiency of resource and environmental policies. The purpose of this study is to develop methodologies, data, and quantitative economic information on policies for managing natural resources or environmental quality.

Progress: Several natural resource and environmental issues were considered in 2003 in order to address all three project objectives. The research pertained to the Southeast U.S. commercial shark fishery (effort assessment and valuation), Southeast U.S. precision cotton farming (determination of factors affecting observed environmental improvements), modeling of optimal fee structures using bioeconomic models (estimation of price and cost functions in a small squid fishery), and ecolabeling in fisheries (i.e., characteristics of certified fisheries). In addition, several manuscripts from previous work on this project were published during this year. One new research project (grant-funded) was initiated during this period. It involves assessing the fair market value of commercial shark permit holders in the Gulf of Mexico and South Atlantic regions. This project is timely since several effort buyback programs for commercial fisheries are being proposed. The key issue underlying the establishment of these programs is the total cost, which depends on the value of the permit and/or vessel. Given that the shark fishery in question involves vessels that routinely harvest several other species, the valuation question is complicated. Since, at this time, there is no standardized methodology for determining what is the fair market value in the context of a fisheries effort buyback

program, this project has wide potential application. Progress on this project has involved bringing in a speaker for the J. Wayne Reitz seminar series and attempting to obtain records of fishing behavior for permitted individuals in all fisheries. In addition, an Invited Paper session was proposed and accepted by the Southern Agricultural Economics Association. The grant-funded project initiated last year involving the development of a bioeconomic model to evaluate optimal licensing fee systems was formally approved in 2003. Work to date has involved evaluating the available biological information and estimating vessel-level cost functions and hedonic price functions. Two continuing grant-funded projects were also advanced during this period. Under the first, the probability of observing environmental benefits from the use of precision farming was estimated as a function of various farm and farmer characteristics and production behaviors. Under the second, the characteristics of fisheries that have obtained the Marine Stewardship Councils environmental certification for seafood were summarized and used to identify commonalities among fisheries.

Impacts: For the marine ornamental industry, results can help harvesters develop marketing plans and decide whether to become ecolabeled. For the squid fishery, results from the cost and price functions can aid the government in assessing the feasibility of fees by vessel size and aid harvesters in size targeting strategies. For cham scallops, results predict optimal harvesting by region, production method, and week that government and harvesters can benefit from. Since aquaculture is increasing, and cham scallops are valuable, these results have broad applicability. Portfolio theory was used to examine optimal product diversification at the harvest and processing levels. Aside from direct benefits to harvesters and processors, results also suggest profitable changes to resource management plans. Theoretical work on the economic benefits of considering intrinsic fish quality is applicable to finfish fisheries characterized by variable quality at the time of harvest. The blue crab workshops revealed preferences for future management, which can aid managers in establishing regulations that have industry support. Building consensus prior to the establishment of regulations can expedite regulations to protect overfished and or overcapitalized fisheries. Examination of factors affecting whether environmental improvements from precision farming have been observed has the potential to increase future improvements through educational efforts.

Source of Federal Funds: Hatch

FLA-FRE-04005

Title: CONSUMER ATTITUDES AND PREFERENCES REGARDING FLORIDA AGRICULTURAL PRODUCTS.

Critical Needs:

National Objectives: 1, 5

Key Themes: consumer demand; perceptions; methodology; consumer attitudes; consumer preferences; agricultural commodities; econometrics; information collection; food marketing; food consumption; food safety; extension; information dissemination; focus groups; consumer surveys; data collection; decision making; biotechnology; agribusiness; willingness to pay; incentives; value determination; econometric models; data analysis

Summary: Understanding more about the factors that influence consumers' subjective perceptions about food consumption will allow agribusinesses, agricultural producers, and policy makers to respond more effectively to consumer concerns. This project is designed to improve our understanding of the effects of consumer tastes and preferences, including food safety, on Florida agriculture.

Progress: A number of studies are underway examining consumer tastes and preferences for agricultural products in both Florida and the United States. One survey was administered gathering information on consumer preferences for seafood products and another was administered focusing on identifying the determinants of consumer acceptance of genetically modified foods. The work on genetically modified foods is part of a team project with two other U.S. institutions and a group in Europe based out of the University of Reading. Data from these surveys is currently being compiled and preliminary results have been presented at a number of professional meetings. Several papers are in review (or accepted) in peer-reviewed journals and have been presented at professional meetings.

Impacts: The research examining consumer perceptions of genetically modified foods has had a significant impact in a number of arenas. Consumer perceptions of varying types of genetically modified foods have important implications for public policy and marketing of agricultural commodities. Our research is beginning to address some of the important questions posed by policy makers and the biotechnology industry, potentially making future policy and marketing campaigns more effective. The research on consumer opinions of seafood is important because it can provide information to the growing seafood industry on how to target specific market segments.

Source of Federal Funds: Hatch

FLA-FTL-03423

Title: *FORAGING BEHAVIOR AND CONTROL OF SUBTERRANEAN TERMITES*

Critical Needs:

National Objectives: 1,5

Key Themes: housing; insect control; rhinotermitidae; insect behavior; insect ecology; infestation; prevention; foraging behavior; territoriality; structures; wood; protection; bait traps; environmental factors; correlation; insect colonies; historic sites; buildings; *home safety*; *invasive species*; *information technologies*, *GIS/GPS*

Summary: Monitoring stations containing pre-weighted wooden blocks will be placed within foraging territories of subterranean termites to measure foraging activity. Effects of environmental factors such as temperature, rainfall, food availability, and soil type on foraging activity will be examined using correlation analysis. Foraging populations and territory sizes of subterranean termite colonies will be elucidated using the triple-mark-recapture procedure and the weighted mean model. Duration of structural protection afforded by a baiting program from subterranean termite populations will be measured using the monitoring stations and stake survey methods. Effects of baiting technology for protection of historic structures and landscapes from subterranean termites will be evaluated using above- and in-ground monitoring and baiting stations.

Progress: Sensors comprised of wooden stakes painted with conductive circuits of silver particle emulsion were inserted in Sentricon stations in soil near structures. Sensors were wired to a datalogger that was programmed to test for circuit breakage every 2 h and store the data in its memory. A host computer was programmed to access the datalogger through telephone communication lines for data download every 4 d. The computerized monitoring system was tested in 3 remote sites, and site visits were conducted monthly for 6 mo to examine system accuracy in detecting termite activity. The mean monthly accuracy for the system to correctly report the presence (true positive) or absence of termites (true negative) in the stations was 85%, but the accuracy at 6 mo after system installation ranged from 41 to 79%. Mean sensor longevity, defined as the time for a sensor circuit to break in the absence of termites, was ca. 4.4 mo. Literature on the studies of foraging behavior of subterranean termites was reviewed. To study the foraging galleries of subterranean termites in soil, early researchers painstakingly excavated underground tunneling system of these cryptic insects. These studies enabled the visualization of the underground gallery system of subterranean termites, but the destructive sampling methods also rendered the field colonies useless for further studies. Indirect sampling techniques such as monitoring and trapping systems developed in the early 1970s provided unprecedented access to underground populations of subterranean termites. Monitoring stations derived from these techniques were adopted for termite population studies, and were used as access port or entry portal for applying control agents such as microbes or bait toxicants. They were also used to study populations of subterranean termites in different environments, and were essential in the development of baits for population control of subterranean termites. Fractal geometry was used to analyze the morphology

of the tunneling system of two subterranean termite species, *Reticulitermes flavipes* and *Coptotermes formosanus* (Isoptera: Rhinotermitidae), and to evaluate the effect of termite species, and the presence of wood on the degree of intricacy of the tunnels represented by the fractal dimension (D), and on the abundance of tunnels (log K). The differences in D and log K, before and after termites reaching a testing chamber were also examined. Results indicated that termite tunneling systems have a fractal structure because D lies between -1 and -2. The tunnel fractal dimension (D) was not significantly different between *C. formosanus* and *R. flavipes*, before or after reaching a testing chamber, suggesting that *C. formosanus* and *R. flavipes* created tunnels with the same degree of intricacy at all time periods. The abundance of tunnels, log K, was higher before reaching a testing chamber, while termites were searching for food, than after regardless of the presence of wood or the species of termite introduced in the arenas.

Impacts: Over 150,000 homes are currently protected from subterranean termite termites using the Sentricon system which is a monitoring-baiting program that relies on a routine monitoring for early detection of termite activity. Manual monitoring, however, is labor consuming and costly because a technician has to be on site to open each station for visual inspection. For some termite species, a frequent inspection may disrupt termite feeding in the stations. Moreover, some homeowners often question if the monthly or quarterly on-site inspection is frequent enough to prevent termite damage before detection and subsequent baiting. The automated monitoring system described in the study can be used for a frequently monitoring of termite activity near a house, which will remedy these problems. Understanding of previous studies on the ecology and behavior of subterranean termites provide us with future direction of research for these cryptic insects which may ultimately lead us to a better control strategy. The fractal dimension model may provide new ways for understanding the functional implications of the branching patterns of termite tunnels in relation to optimum soil exploration by termites.

Source of Federal Funds: Hatch

FLA-FTL-03539

Title: *THE INFLUENCE OF EDAPHIC FACTORS ON GROWTH OF TORPEDOGRASS, MAIDENCANE, AND HYGROPHILA AND THEIR RES*

Critical Needs:

National Objectives: 1,4

Key Themes: weeds; plant ecology; aquatic plants; hydrilla; plant communities; edaphic factors; weed control; population dynamics; panicum; *biological control* (weeds); plant competition; native plants; exotic plants; irrigation canals;

aquatic weeds; sediments; nutrient levels; grasses; herbicides; *aquaculture; Wetland restoration and protection; invasive species; endangered species*

Summary: Torpedograss and hygrophila are two exotic plant causing major problems in aquatic systems in Florida. Maidencane, a native plant closely resembling Torpedograss, is being displaced by torpedograss and the emerged growth form of hygrophila. This project will examine edaphic factors related to growth and development of torpedograss, hygrophila, and maidencane.

Progress: Torpedograss is a major weed problem in shoreline and wetland areas. Control of torpedograss is essential for establishment and growth of native emerged aquatic plants in mitigation and restoration projects. Torpedograss can take advantage of a variety of nutrient conditions in the sediments, and grow at the expense of native plants. Torpedograss is not considered an obligate wetland species, but will establish and grow under conditions similar to that for Maidencane, a native wetland grass. Hygrophila grows best at high sediment nutrient levels, and control of emerged plants along the shoreline is essential in helping to prevent establishment of submerged plants.

Impacts: This project showed that control of Torpedograss and Hygrophila is essential to allow for growth of Florida's native aquatic plants. Both of these exotic plants will grow as monocultures crowding and eliminating growth of native species. Most native species require low sediment nutrients for optimum growth. Because Torpedograss will grow under high and low nutrients in the sediments, this grass removes nutrient resources required for growth of native species. Hygrophila on the other hand prefers to grow in soils with high amounts of nutrients. Surveys for nutrients in the sediments may help in determining locations where Hygrophila problems may occur.

Source of Federal Funds: Hatch

FLA-FTL-03544

Title: IMPROVED NUTRITION AND IRRIGATION OF ORNAMENTAL PLANTS

Critical Needs:

National Objectives: 4

Key Themes: cultural practices; ornamental plants; tropical plants; plant nutrition; irrigation systems; fertilizer rates; nutrient availability; fertigation; growth media; leaching; floricultural crops; woody ornamentals; nutrient levels; irrigation frequency; container production; soil moisture; *ornamental/green agriculture; tropical agriculture;*

Summary: Plant nutrition is a major limiting factor in the production and use of ornamental plants in Florida. The purpose of this project is to study tropical ornamental plant nutritional disorders, as well as their causes, prevention, and treatment.

Progress: A study with *Nora Grant ixoras* showed that a common reddish leaf blotch disorder on older leaves of this species was caused by a combination of K and P deficiencies. In another study evaluating

two different irrigation systems, areca palms, philodendrons, and impatiens were found to grow better with overhead irrigation, whereas petunias and salvias grew better with subirrigation. Use of subirrigation also eliminated nitrate runoff from the pots. A study evaluating the effects of P fertilization on root and shoot growth of 10 species of herbaceous ornamental and vegetable plants showed that shoot dry weight increased for all species as P fertilization rate was increased from 0 to 8 mg P/pot/week. At higher rates, neither root nor shoot growth increased. Root to shoot ratio decreased sharply as P fertilization rate was increased from 0 to 8 mg/pot/week, but remained relatively constant in response to further increases in P fertilization rate. Another study showed that clinoptilolitic zeolite, when used as a soil amendment at 10 or 20% by volume, improved areca palm color and size in a Margate Fine Sand soil, but did not improve palm quality in a pine bark-based potting substrate where K is not normally limiting. Downy jasmine size and quality were improved in both the potting substrate and the sand soil due to improved ammonium retention by the zeolite. In two experiments, optimum fertilization rates were determined for several species of tropical ornamental plants grown under different light intensities. In palms and pleomele, optimum fertilization rates did not differ greatly among light intensities, but in artillery fern, the optimum fertilization rate was much higher for higher light intensities. In an experiment evaluating the effects of fertilizer NPK ratio (3:1:2 vs 1:1:1) and rates on plant color rating, root and shoot dry weights, and number of flowers or fruits in five species of bedding plants, we found that plant quality variables responded only to N levels in the fertilizer, not P or K levels. An experiment evaluating the relative effectiveness of various Fe sources in alleviating Fe chlorosis in dwarf ixora grown in a limestone rock soil or a poorly aerated sand/muck soil showed that FeEDDHA, followed by FeDTPA and FeEDTA were the most effective sources on both soils. Ferrous sulfate was no better than untreated controls on either soil type. When applied as foliar sprays, only FeDTPA effectively eliminated Fe chlorosis. In another series of experiments we found that FeEDTA and FeDTPA are highly toxic to marigolds and geraniums, whereas FeEDDHA was only slightly toxic to these plants, and ferrous sulfate was relatively non-toxic. Soil pH had no effect on Fe fertilizer toxicity.

Impacts: The reddish leaf blotch disorder of ixoras can be controlled with appropriate P and K fertilization, nursery nitrate runoff can be reduced or eliminated without sacrificing plant quality by using ebb and flood subirrigation, most plants can be grown just as well with much less phosphorus fertilization, fertilization rates can be tailored to the production light intensity, the efficiency of water-soluble fertilizers can be improved in highly leached soils by incorporating clinoptilolitic zeolite, Fe chlorosis can be successfully treated in ixora using chelates such as FeEDDHA on alkaline soils or foliar sprays with FeDTPA, and the Fe

toxicity problem in marigolds and geraniums can be eliminated by using FeEDDHA instead of the highly toxic FeEDTA or FeDTPA.

Source of Federal Funds: Hatch

FLA-FTL-03554

Title: *FLOWER INITIATION AND DEVELOPMENT OF FLORICULTURE CROPS*

Critical Needs:

National Objectives: 1, 4

Key Themes: floriculture; plant physiology; flower initiation; flower development; anthesis; bedding plants; herbaceous plants; ornamental plants; cultural practices; fertilizer rates; environmental factors; growth regulators; irrigation frequency; temperature; photoperiod; irradiation; *ornamental/green agriculture; agricultural profitability; yard waste and composting; nutrient management; plant production efficiency*

Summary: Plant production practices can influence floriculture crop flower initiation and development. The purpose of this study is to learn more about how varying production practices and greenhouse conditions will influence floriculture crop flowering and development.

Progress: The objective of this project is to investigate the influence of production practices and the environment on flower initiation and development of floriculture crops. Several studies were conducted to meet this objective. Growth of selected bedding plant species and herbaceous perennial plant species in substrates containing compost made from biosolids and yard trimmings, compost made from seaweed and yard trimmings, dairy manure, or swine manure were similar to control plants. In many cases, fertilization rates could be reduced when nutrient rich amendments were incorporated into the growing substrate. An additional study was conducted investigating the impact of compost maturity on the end use. Another study investigated the growth and flowering of bedding plants as well as nutrient leaching from three different commercial substrates fertilized with either a controlled-release fertilizer or a water-soluble fertilizer. New Guinea impatiens plant growth and flowering was investigated under full-sun, fifty-five percent shade, or seventy-three percent shade and at ten fertilization rates. Best quality full sun plants were grown at higher fertilization rates than best quality shade plants. A final study compared the growth and flowering of commercially important aquatic plant species under traditional aquatic production regimes versus traditional greenhouse production regimes. Saleable quality aquatic plants were produced in both regimes.

Impacts: Optimization of fertilization rates based on the growing environment and production practices to produce marketable flowering plants will reduce fertilizer waste and nutrient run-off from greenhouses

Source of Federal Funds: Hatch

Title: TAXONOMY AND BIOSYSTEMATICS OF CULTIVATED PLANTS

Critical Needs:

National Objectives: 1

Key Themes: plant taxonomy; biosystematics; cultivated plants; plant identification; wild plants; classification systems; euphorbiaceae; plant propagation; plant introductions; conservation; *endangered plants*; plant anatomy; plant morphology; electrophoresis; chromosome number; microscopy; *ornamental/green agriculture*; *Plant production efficiency*

Summary: The Florida nursery industry relies on the biodiversity of compatible floras worldwide. Understanding the biological relationships of important cultivated plant groups is thus extremely important and has immediate applications to future crop improvement through selection and breeding. The purpose of this project is to elucidate the taxonomic and other biological relationships of useful ornamental plants. Particular focus is on the monocot families Amaryllidaceae and Alstroemeriaceae, both important sources of cutflower and garden herbaceous perennials.

Progress: Three plastid DNA sequences were analyzed for a broad sampling of Amaryllidaceae to resolve the American genera of the Amaryllidaceae as a clade that is sister to the Eurasian genera of the family, but base substitution rates for these genes are too low to resolve much of the intergeneric relationships within the American clade. We obtained ITS rDNA sequences for 76 species of American Amaryllidaceae and analyzed the aligned matrix cladistically, both with and without gaps included, using two species of *Pancratium* as outgroup taxa. ITS resolves two moderately to strongly supported groups, an Andean tetraploid clade, and a primarily extra-Andean hippeastroid clade. Within the hippeastroid clade, the tribe Griffineae is resolved as sister to the rest of Hippeastreae. The genera *Rhodophiala* and *Zephyranthes* are resolved as polyphyletic, but the possibility of reticulation within this clade argues against any re-arrangement of these genera without further investigation. Within the Andean subclade, Eustephieae resolves as sister to all other tribes; a distinct petiolate-leafed group is resolved, combining the tribe Eucharideae and the petiolate Stenomesseae; and a distinct Hymenocallideae is supported. These Andean clades are all at least partially supported by plastid sequence data as well. We infer from our data that a great deal of the diversity of the family in the Americas is recent, and that the American Amaryllidaceae may have been reduced to peripheral isolates some time after its initial entry and spread through the Americas. While the sister relationship of the American and Eurasian clades might argue for a Boreotropical origin for the family in America, the cladistic relationships within the American clade based on ITS do not provide any further support for this or any other hypothesis of the entry of this family into America. The new tribe Clinantheae

is described (four genera: Clinanthus, Pamianthe, Paramongaia and Pucara), and the lorate-leafed species of Stenomesson are transferred to Clinanthus.

Impacts: Better understanding of the phylogenetic relationships of the flowers represented by the lily plant families.

Source of Federal Funds: Hatch

FLA-FTL-03607

Title: *BIONOMICS AND MANAGEMENT OF HEMIPTEROUS PESTS OF WOODY ORNAMENTAL PLANTS AND TURFGRASSES IN FLORIDA*

Critical Needs:

National Objectives: 1,5

Key Themes: insects; insect control; woody ornamentals; plant insect relations; turf grasses; bionomics; hemiptera; homoptera; cycads; toumeyella; myndus crudus; palmae; insect biology; field studies; cycads; *invasive species; ornamental/green agriculture*

Summary: Insect species in the order Hemiptera that are important pests of woody ornamental plants and turfgrass in southern Florida will be studied in the field to obtain biological data of importance in developing pest management strategies for them.

Progress: More than 150 species of woody plants were identified as hosts of the lobate lac scale insect, *Paratachardina lobata* (Hemiptera: Coccoidea: Kerriidae), an exotic pest found in southern Florida in 1999. Development time from settled first instar to adult was 4 months (April-July) [RWPI]. First instars survived for 2 weeks without a host. There are two larval instars; the third development stage is the mature female. Males of *P. lobata* apparently do not occur in Florida. In studies of temperature relationships, first instars did not survive at minus 1 degree Celsius for 2 hours. Some adults survived at minus 2 degrees Celsius for 2 hours. Two species of Encyrtidae (Hymenoptera), viz., *Metaphycus* sp. and *Ammonoencyrtus* sp., were reared from field-collected lobate lac scales; less than 1 percent of lobate lac scale insects were parasitized. Imidacloprid in a root drench at 3 rates (AI), 0.56, 0.28, and 0.14 g per cm of dbh, nearly eliminated infestations of the scale on large (ca 75 cm dbh) *Ficus microcarpa* trees within three months after treatments. Rearing techniques were developed for colonies of lobate lac scale for biological control research. The bionomics of *Aulacaspis yasumatsui* (Hemiptera: Coccoidea: Diaspididae) were elucidated. This scale insect lives exclusively on Cycadales, and shows a marked preference of species of *Cycas*. It has the unusual characteristic of infesting roots in addition to aboveground parts of its hosts. This scale insect was effectively controlled with foliar sprays of a fish oil product mixed with any of several insecticides, including malathion, carbaryl or bendiocarb, or with malathion or carbaryl mixed with water and an emulsifier. Immersion of the root ball of containerized cycads

in an emulsion of paraffin-based horticultural oil and water for a few minutes, or in water for three days, resulted in almost 100 percent control of *A. yasumatsui* on the roots, with no adverse effects on the plant. A single root drench of royal palms, *Roystonea regia* (Palmae), with imidacloprid prevented damage by the royal palm bug, *Xylastodoris luteolus* (Hemiptera: Heteroptera: Thaumastocoridae) for two spring seasons. *Myndus crudus* (Hemiptera: Auchenorrhyncha: Cixiidae), is a vector of lethal yellowing of palms whose larvae develop on roots of grasses. It was shown that dicotyledonous ground-covers did not support the development of this insect. Plants shown to be non-hosts included *Pueraria phaseoloides* and *Arachis pintoi* (Leguminosae); these are widely used as ground-cover in palm plantations. Adults of various species of Derbidae (Hemiptera: Auchenorrhyncha) are widely distributed on palms in warm regions. It was shown that the larvae of a palmivorous derbid, *Cedusa inflata*, develop in decaying palm debris, and population levels of this insect on palms were related to the distance of the palm from heaps of decaying vegetation.

Impacts The knowledge of bionomics of *Myndus crudus* and *Cedusa inflata* (Auchenorrhyncha), *Aulacaspis yasumatsui* and *Paratrichardnia lobata* (Coccoidea) generated in this project is useful as a basis for developing and improving pest management practices for these and related insect pests. The chemical treatments developed in this project for several hemipterous pests of ornamental plants will provide effective control of these pests in nurseries and landscaped areas.:

Source of Federal Funds: Hatch

FLA-FTL-03609

Title: INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS

Critical Needs:

National Objectives: 1

Key Themes: ornamental plants; floriculture; plant introductions; plant evaluation; new varieties; nursery stock; woody ornamentals; landscape plants; potted plants; foliage plants; cut flowers; cultural practices; information collection; drought tolerance; plant resistance; information dissemination; cold hardiness; fertilizer requirements; *adding value to new and old agricultural products; agricultural competitiveness; agricultural profitability; diversified/Alternative agriculture; tropical agriculture.*

Summary: The nursery industry is constantly looking for new plant materials to add to their product mix. The purpose of this project is to import, evaluate, and work out production methods for new ornamental horticultural crops.

Progress: No work was done on this project in 2002

Impacts: Malayan Dwarf and Maypan coconuts have been widely planted throughout south Florida and the Caribbean region because of their supposed resistance to lethal yellowing, but this study

shows that they are not resistant to this disease. The Fiji Dwarf, however, may be.

Source of Federal Funds: Hatch

FLA-FTL-03620

Title: WEED BIOLOGY AND CONTROL FOR TURFGRASS AND THE LANDSCAPE

Critical Needs:

National Objectives: 1, 4

Key Themes: weeds; grasses; turf grasses; weed control; landscape management; plant competition; plant communities; plant ecology; herbicides; *biological control* (weeds); growth regulators; *integrated pest management*; golf courses; lawns; cynodon; stenotaphrum; paspalum; eremochloa; plant taxonomy; plant genetics; *ornamental/green agriculture, home lawn and garden*

Summary: Controlling weeds in Florida turf costs \$90 million each year. Yet weeds damage public easements, lawns, and recreation areas, and cost urban people in health, safety, and removal. Weeds cause human allergy, traffic accidents, and loss of use and reduction of property values. This study seeks environmentally sound ways to manage urban weeds, especially weeds of golf courses, sod, and home lawns.

Progress: Phenoxy herbicides were evaluated as alternatives to atrazine for postemergence broadleaf weed control in St. Augustinegrass (*Stenotaphrum secundatum*) lawns and sod. Phytotoxicity varied greatly among formulations, for example, 2.2 kg/ha acid equivalent 2,4-D as dimethylamine formulation caused only 19% injury to St. Augustinegrass, whereas 0.7 kg/ha 2,4-D as 2-ethylhexyl ester caused 60% injury. MCPA and mecoprop were very harmful to St. Augustinegrass individually and in mixtures. Carfentrazone-ethyl + phenoxy herbicide mixtures controlled dollarweed (*Hydrocotyle umbellata*) more effectively and more quickly than atrazine, clopyralid, or metsulfuron in turf field plots. The potential injury to subtropical landscape plants caused by volatile turf herbicides was evaluated in polyethylene enclosures. The most sensitive species were African marigold (*Tagetes erecta*), Joseph's coat (*Alternanthera ficoidea*), and tomato (*Lycopersicon esculentum*). Severe injury (epinasty of stems and petioles, marginal leaf curling, stem swelling, root proliferation, discoloration of leaf or stem and flower drop) was caused by exposure to herbicides containing 2,4-D isooctyl ester and MCPA isooctyl ester. Exposure to individual active ingredients 2,4-D dimethylamine, dicamba acid, atrazine, and metsulfuron resulted in no injury to the species tested. Postemergence control of tropical signalgrass (*Urochloa subquadriflora*) was evaluated using asulam, diclofop-methyl, ethofumesate, metribuzin, MSMA, quinclorac, and trifloxysulfuron, and preemergence control with atrazine, dithiopyr, metolachlor, oryzalin, oxadiazon, pendimethalin, and prodiamine. Only MSMA at 2.5 kg/ha in two to four applications

was effective in postemergence control, and could only be used in bermudagrass (*Cynodon* spp.) turf. Among preemergence herbicides, tropical signalgrass seedlings were controlled best by oxadiazon at 2.3 kg/ha and pendimethalin at 3.4 kg/ha, but the most effective herbicide, oxadiazon, resulted in 27 seedlings/sq m, compared with 100 seedlings/sq m for untreated. Field experiments were conducted on the reduction of torpedograss canopy by multiple split applications of quinclorac applied postemergence to bermudagrass golf course roughs in Florida. The most effective treatment, 0.42 kg/ha quinclorac applied four times each year for two years, reduced torpedograss canopy from 10%, compared with 86% torpedograss canopy in untreated plots, and reduced torpedograss dry wt to 1,570 kg/ha, compared with 8,010 kg/ha in untreated plots. Following two years of reapplication with the commercially labeled treatment, quinclorac at 0.84 kg/ha applied twice per year, torpedograss canopy was reduced to 45% and dry wt to 4,640 kg/ha. Visual evaluation of canopy was too optimistic in representing the herbicidal control of torpedograss by quinclorac, as torpedograss regrew from rhizomes, and canopy was a relatively small part of the plant. In plots not chemically treated, pachymorph rhizomes were 63%, leptomorph rhizomes were 24%, and leaves were only 13% of the total dry wt of torpedograss.

Impacts: Biology can help make herbicide applications more effective. Reduced rates of quinclorac applied multiple times control torpedograss better than the current label with higher application rates applied fewer times. Torpedograss has an extremely dense biomass reserve in the form of "pachymorph" rhizomes, from which it regrows. The development of carfentrazone phenoxy mixtures led to mixtures too phytotoxic for use on St. Augustinegrass. It was shown from the active ingredients that the problem could be explained by the inclusion of the ethylhexyl (isooctyl) ester of 2,4-D, which was very harmful to Augustinegrass. Tropical signalgrass was identified as a difficult weed in both bermudagrass and St. Augustinegrass turf. Interestingly, oxadiazon and pendimethalin, normally preemergence herbicides, were discovered to have sufficient postemergence effect on tropical signalgrass seedlings that they more effectively controlled the seedlings when applied 8 d after plug planting on a sod farm, versus 1 d after. The most serious weeds of bermudagrass turf in South Florida were (in order of seriousness): goosegrass, torpedograss, crabgrasses, tropical signalgrass, and off-type bermudagrass. Based on four surveys of golf and sports turf managers in south Florida, the five top weeds represented 74% of the weighted seriousness values of bermudagrass turf weeds. Other weeds ranked in the "Top Ten" in seriousness were crowfootgrass, green kyllinga, dollarweed, spurge, and *Poa annua*. Weed research will be continued in project FLA-FTL-04066, "Environmental management of weeds in Turfgrass."

Source of Federal Funds: Hatch

Title: *TURFGRASS FERTILITY MANAGEMENT AND ENVIRONMENTAL IMPACT*

Critical Needs:

National Objectives: 1,4

Key Themes: turf grasses; fertilization; lawns; runoff; leaching; nitrogen; phosphorus; golf courses; fields; sports; program evaluation; performance evaluation; application rate; systems development; lysimeters; water samples; application methods; application intervals; cultural practices; surface properties; pollution control; *home lawn and gardening; nutrient management; water quality; urban gardening*

Summary: N and P are essential for healthy turfgrasses. However, the fertilization must minimize N and P losses in runoff waters. The project is designed to identify techniques that minimize nutrient losses in runoff waters from golf and home lawns, and to identify practices that promote playable sports turf. This project examines the effectiveness of fertilizer application techniques, sources, rates, and irrigation to reduce N and P in runoff waters.

Progress: Turfgrass management has been implicated as a potential source of N pollution in hydrologically linked watersheds. Two projects were conducted to determine N leaching from turfgrass systems. In one project, 2 N rates (15 and 30 g N/m²), 6 N sources (no fertilizer, urea, and 4 combinations of urea with IBDU or SCU), and two irrigation rates (fixed or adjusted) were examined to determine their effect on N leaching from St. Augustinegrass. The fixed irrigation is considered the high rate of irrigation, equaling 125% ET adjusted on a monthly basis. The adjusted irrigation is to irrigate upon visual plant stress. This test was performed on grass grown on soil with either 4 or 8% organic matter. There was an increased amount on N leaching from the sod grown in on the soil with higher OM. N leaching increased with N rate. N leaching was greater from turf receiving the fixed irrigation only during the rainy season. In the second experiment, N leaching from two mature contrasting landscapes were compared (St. Augustinegrass vs. a mixed-species ornamentals landscape). The mixed-species ornamentals landscape was maintained with no fertilization, while the St. Augustinegrass was fertilized at the current IFAS recommended rate. Both landscapes were only watered upon visual plant stress. N leaching from both the landscapes decreased from the previous year, however there was more N leaching from the mixed-species ornamental landscape. While irrigation had to be applied to each landscape at times of water stress, the mixed-species ornamental landscape required more irrigation to recover from water stress.

Impacts: The experiments are being conducted to quantify the environmental impact from turfgrass management, especially nitrogen. The results will provide a basis for BMPs to minimize potential N leaching from management of turfgrass systems

Source of Federal Funds: Hatch

FLA-FTL-03896

Title: *BIORATIONAL METHODS FOR INSECT PEST MANAGEMENT (IPM):
BIOORGANIC AND MOLECULAR APPROACHES*

Critical Needs:

National Objectives: 2, 4

Key Themes: coleoptera; anobiidae; gas chromatography; sex pheromones; extraction; detection; insect control; *integrated pest management*; semiochemicals; insect biochemistry; cooperative research; electroantennograms; insect behavior;

Summary: Co-project leader Vernard R. Lewis (UC-Berkeley Cooperative Extension) collects large quantities of deathwatch-beetle-infested boards from various sites in the San Francisco Bay Area. The wood is placed in large rearing cages and the emerging beetles are sent to the University of Minnesota to the laboratory of co-project leader, Steven Seybold, where the pheromone-containing tissues of the abdomen of each female beetle are dissected and extracted in a solvent (methylene chloride). Dr. Brian Cabrera (University of Florida) prepared extracts in Seybold's lab by the solvent extraction technique and also collected chemicals from the air above the females using a technique called solid phase microextraction (SPME). The pheromone extract or the SPME fiber can be chemically analyzed by gas chromatography or the liquid extract can be used for behavioral assays of the male beetles. Another type of assay with the extract is performed in the USDA Agricultural Research Service laboratory of the cooperator Dr. Allard Cosse in Peoria Illinois. Dr. Cosse is an expert at an electrophysiological technique called gas chromatography-electro-antennal-detection (GC-EAD). In this technique, the antenna of a male deathwatch beetle is linked to an electrical detection system and chemicals from the extract made in Seybold's lab are passed through a gas chromatograph and presented to the still-living antennal tissue. Those chemicals that are likely to be pheromones of the deathwatch beetle will stimulate the antennae and cause an electrical impulse to pass to an amplifier and recording device. Positive responses of male deathwatch beetle antennae to the extract and to volatile collections from live females were recorded by the GC-EAD technique.

Progress: Cultures of *Lyctus africanus* (Lesne)(Coleoptera:Lyctidae) were started using a yeast and wheat flour-based rearing medium. Male and female *L. africanus* emerging from infested wood picture frame mouldings were placed in glass quart mason jars containing pieces of baked medium. The jars were stored in an environmental chamber at 25 degrees celsius and a 16:8 light:dark cycle. First generation beetles emerged six to eight months later and were transferred to new jars containing fresh media. Expired adult beetles were collected and mounted in preparation for scanning and transmission electron microscopy

of the antennae. An unsuccessful attempt was made to culture Mexican book beetles, *Tricorynus herbarius* (Gorham)(Coleoptera: Anobiidae) collected in Kendall, FL from a home with infested bookshelves. *Heterobostrychus aequalis* (Waterhouse)(Coleoptera: Bostrichidae), an exotic species native to the Old World tropics, was collected from infested wooden packing crates in Ocala, FL. A culture of this species was initiated by placing adults in quart mason jars with fresh medium. A statewide survey of wood-infesting beetles was also initiated. Requests for participation in the survey were mailed to over 1500 pest control operators and to all 67 county extension offices in the state. The purpose of the survey is to obtain data on wood-infesting beetles in Florida such as number and relative abundance of species, prevalence, distribution, and presence and establishment of non-endemic species. We also hope to obtain live specimens of various species in the hopes of starting new cultures - all with the expectation of isolating and identifying putative sex pheromones from different species.

Impacts: Wood-destroying beetles (WDB) can cause extensive damage to structural wood and other wooden items associated with dwellings. Infestations by WDBs often go undetected until major damage has already occurred. Treatment and repair costs are sometimes very expensive. Identification of WDB pheromones is important in the development of monitoring traps or control as part of an integrated management program for these pests.

Source of Federal Funds: Hatch

FLA-FTL-03925

Title: *BIOLOGICAL CONTROL OF SOILBORNE PLANT PATHOGENS FOR SUSTAINABLE AGRICULTURE*

Critical Needs:

National Objectives: 4

Key Themes: *biological control* (diseases); plant disease control; sustainable agriculture; soil borne diseases; fungus diseases (plants); seed treatment; soil treatment; plant pathology; upland cotton; wheat; snap beans; bedding plants; optimization; microbial competition; performance evaluation; application methods; bacillus; streptomyces; rhizoctonia solani; damping off; heat tolerance; inhibition; phytotoxicity; comparative analysis; soil microbiology; plant microbiology; bioassays; impatiens; *soil quality; sustainable agriculture; biological Control*

Summary: Soilborne plant pathogens cause an estimated \$4 billion loss to crop production in the USA. This project will develop sustainable agricultural systems for the Southern Region based on environmentally-sound management strategies that control soilborne pathogens through the introduction and enhancement of biological control by regional testing and cultural practices.

Progress: *Rhizoctonia solani* continues to be a problem of ornamental bedding plants in southern Florida, either in the nursery production system or after planting in the landscape. The use of biological

control agents is desirable in the highly populated areas of Southern Florida, either to reduce pollution or exposure to pesticides. The information reported below is a continuation of a project to screen Bacillaceae bacteria for inhibition of *R. solani*. Beginning with a collection of 912 Bacillaceae isolates, in vitro screening resulted in a subset of fourteen isolates to screen for in vivo control of post-emergence damping-off caused by *R. solani*. Marigold and vinca are the plant species used for evaluation, with marigolds evaluated in the winter months and vinca evaluated during the summer months. Seeds are germinated in Jiffy Mix under mist. At the appropriate size, plants are transplanted into 400-ml pots containing Pro-Mix infested with 1% *R. solani* inoculum grown on cornmeal and sand mix. Control plant growth medium contains sterile cornmeal and sand mix. Pots are filled with the infested or non-infested growth medium three days prior to transplanting. Bacterial isolates are grown in potato-dextrose broth for three days at 25 C. For one experiment, bacteria with broth were applied to seeds at planting and to plant growth medium three days prior to transplanting - i.e., at the same time the *R. solani* inoculum was incorporated into the plant growth medium. For remaining experiments, bacteria and/or broth alone were applied three days prior to transplanting only. Minimal, if any, inhibition of post-emergence damping-off of marigolds was observed when the bacteria were introduced at seeding. Four isolates did decrease disease when the bacteria were applied just prior to transplanting. In a subsequent marigold test, it appeared that one of these isolates (98-4041) reduced disease based on a product produced in the broth. Disease levels in the vinca experiments were not as great as in the marigold experiments. Two of the isolates inhibiting disease in marigolds also appeared to inhibit disease development in vinca. The vinca cultivar used ('Peppermint Cooler') exhibited iron chlorosis, even when the plants were not inoculated with *R. solani*. On a scale of 1 to 5, with 5 representing a uniformly green plant, non-inoculated plants rated a 4.0 whereas inoculated plants rated a 3.0. It was observed that two bacterial isolates increased the color rating to that of non-inoculated plants. This increased uniformity in color was not necessarily related to disease suppression.

Impacts: A reduction in the use of chemical fungicides may be achieved.

Source of Federal Funds: Hatch

FLA-FTL-04066

Title: *ENVIRONMENTAL MANAGEMENT OF WEEDS IN TURFGRASS*

Critical Needs:

National Objectives: 1

Key Themes: weeds; *stenotaphrum secundatum*; *cynodon dactylon*; *paspalum notatum*; golf courses; lawns; plant competition; plant ecology; turf grasses; turf; farms; plant population; plant biology; wetlands; weed control; cultural practices; herbicides;

alternatives; atrazine; msma; mowing; watering; fertilization; plant canopy; biomass; seed production; seedlings

Summary: Weeds in turfgrass cost Florida citizens millions of dollars each and involve large amounts of chemical weed killers. Weed management in turfgrass can be made more effective and more efficient by understanding cultural practices such as irrigation, mowing, and fertilization. Alternatives are needed for some herbicides that may harm water quality in Florida. This project describes the relationship of cultural practices and weeds, particularly for home lawns, and of weed populations in golf courses and sod farms, so that chemical weed killers can be used effectively in lower dosages.

Progress: Mature goosegrass (*Eleusine indica*) was controlled (> 85% dead) in 'Tifway' bermudagrass (*Cynodon* sp.) golf and sports turf with 2 applications of foramsulfuron at 0.029 or 0.044 kg ai/ha + metribuzin at 0.105 to 0.210 kg ai/ha, sprayed on a 7-d interval. Goosegrass control was as good or better from foramsulfuron + metribuzin, compared with MSMA + metribuzin. Bermudagrass phytotoxicity was temporary. In one location there was noticeable phytotoxicity 4 wk after initial treatment. Foramsulfuron at 0.029 kg ai/ha + metribuzin at 0.79 kg ai/ha in two applications, beginning 39 days after seed planting of Princess-77 bermudagrass, removed dense goosegrass with no injury to the bermudagrass turf. Weeds in turf can be controlled to some degree culturally, without herbicides. A review of over 750 scientific papers on turfgrass weed control showed that only 25 papers emphasize cultural management. Close mowing contributes to higher weed populations in cool-season turfgrasses. Higher rates of N fertilization, 100 to 300 kg N/ha/yr, contribute to lower weed populations. Weeds can be reduced in turfgrasses by reduction of environmental stresses, including drought injury, unnecessary aeration and vertical mowing, and biotic stresses such as nematodes, insects, and diseases. Adapted cultivars and species of turfgrasses that are genetically resistant to some of the biotic and environmental stresses, have fewer weed problems, and can be managed in the absence of herbicides. There are possible tradeoffs among choices of herbicide use and cultural techniques for weed management. A high N fertilization rate, while reducing weed populations, costs more in fossil fuel use, increases mowing energy requirement, and may have negative environmental consequences. Optimum management of the goosegrass population system is being evaluated. Dollarweed (*Hydrocotyle umbellata*) is the most serious weed of St. Augustinegrass (*Stenotaphrum secundatum*) lawns in Florida. Irrigation management was used to reduce dollarweed populations in the field. High (daily to replace evapotranspiration) irrigation supported 30% dollarweed infestation, but moderate (weekly to saturate the root zone when wilted) and low (only rarely under extreme wilt) irrigation caused the reduction of dollarweed populations to less than 10%. Three field studies were assessed

herbicides and rates of application to remove perennial ryegrass. Removal of 80% perennial ryegrass should be achieved in not less than 14 d, nor more than 21 d, after herbicide treatment, and 50% removal must be achieved within 10 d after treatment. Diclofop caused acceptable speed of perennial ryegrass removal in three years, at 910 to 1140 g/ha. Foramsulfuron caused acceptable though rapid perennial ryegrass removal at 7 to 29 g/ha. Metsulfuron caused acceptable speed of perennial ryegrass removal at 5 to 20 g/ha. Pronamide caused acceptable speed of perennial ryegrass removal at 1140 g/ha, in two of three years. Rimsulfuron caused too rapid perennial ryegrass removal within the range of rates used, but might be effective at 7 g/ha or less.

Impacts: Discovery that foramsulfuron is an herbicide replacement for MSMA is helpful. MSMA is widely used for goosegrass control in golf and sports turf in sand soil and is associated with excessive concentrations of arsenic in the surficial aquifer of South Florida. Research on cultural management of weeds turf is an important public interest, representing about 3% of the total published research, while herbicide research represents about 97% of all published research on weeds of turfgrass.

Source of Federal Funds: Hatch

FLA-FTP-03827

Title: *BEST MANAGEMENT PRACTICES FOR TURF SYSTEMS IN THE EAST*

Critical Needs:

National Objectives: Not in spreadsheet

Key Themes: salt tolerance; drought tolerance; lance nematodes; nematodes; best management practices turf; regional research; plant genetics; plant evaluation; germplasm; variety tests; environmental effects environmental impact; pesticides; nutrient management; plant breeding; plant nematode resistance warm season grasses; plant improvement

Summary: With accelerated development along the coastlines of the United States, water shortages and salt water intrusions require that turf species be capable of tolerating these abiotic stresses. Secondly, the loss of methylbromide as a soil sterilant requires that new turf cultivars have improved resistance to nematodes. This project focuses on the development of warm season turf cultivars with tolerance to abiotic stress.

Progress: 2002/10 TO 2003/10
Two zoysia breeding lines have been selected for submission to the cultivar release committee

Impacts: 2002/10 TO 2003/10
Resistance to abiotic and biotic stress will reduce pesticide contamination in the environment.

Source of Federal Funds: Hatch

FLA-FYC-03923

Title: EVALUATION RESEARCH IN THE AREA OF YOUTH DEVELOPMENT AND YOUTH CRIME AND VIOLENCE IN PUBLIC SCHOOLS

Critical Needs:

National Objectives: 5

Key Themes: intervention; program effectiveness; program evaluation; human resources; human development; crime; violence; conflicts; prevention; legal aspects; schools; safety; human behavior; sociology; family members; trends; school districts; aggression; risk assessment; data analysis; quantitative analysis; community problems; temporal distribution; comparative analysis; decision making

Summary: Certain risk factors lead to increased youth crime and violence in Florida schools. The purpose of this study is to determine which interventions are effective in creating positive behavior change toward reducing youth crime and violence.

Progress: Objective 1 Findings: (1) Findings from an analysis conducted to compare actual rates of school crime and violence incidents reported in Florida schools versus perceived levels of safety held by 2,073 Florida elementary, middle, and high school students, parents, and teachers found that elementary school level participants perceived that the following are problems at their school: fights, stealing, and threats; data analysis on incidents confirms that fights, stealing and threats were indeed occurring the most frequently. (2) Over half of the middle school participants believed that fighting, threats, theft, and property damage were the four leading problems on their campuses; while fighting, disorderly conduct, violent acts against persons and harassment (including threats) were the four leading problems reported. (3) High school participants identified fighting, threats, stealing, and property damage as the most problematic during school; the five most frequently reported incident types were: Disorderly Conduct, ATOD, Fighting, Property and Harassment, indicating that high school students had a realistic perception of problems at their schools. Objective 2 Findings.(1)Another research project examined the effects of Aggressors, Victims and Bystanders, a Harvard program designed to prevent violence, in three Palm Beach County middle schools against two control schools. Control and intervention group responses to pre-, post- and post-post surveys of teachers, students, and school police officers found that the program significantly impacted youth in many of the cognitive areas related to the roles of being an aggressor, victim or bystander and also had moderate impact in some others;(2)A change of positive outcomes of programmatic impact was found specifically related to student beliefs that (a)people's violent behavior can be prevented; (b)they can make a difference in helping to prevent violence;(c)people can be taught to help prevent violence;and(d)doing or saying certain kinds of things can work to help prevent violence. Objective 3 Findings (1)A longitudinal study completed on the 12,191 juvenile first offender cases handled in the first seven years of the Palm Beach County Youth Court determined that the most

frequently occurring juvenile first offenders in the program were 16-year old white males; the most frequently occurring first offenses are retail theft, possession of marijuana, battery, possession of paraphernalia, and petit theft;(2)The study documented changing trends in crimes committed by year, age, race/ethnicity and location;(3)It also found gender differences in first crimes committed by males and females; females most frequently committed retail theft at higher rates than males, and to a lesser degree committed battery, possession of marijuana, disruption of school activity, and possession of paraphernalia violations. Objective 4 Findings:(1)The success of PBCYC cases processed (72.4% over the 7-year period) and recidivism rates were also determined, which found that approximately 85% of the youthful first offenders were positively affected such that they did not commit a second crime.

Impacts: Discovering the types of violent or problematic incidences taking place on campuses and in local communities by youthful offenders is another ingredient in the formula for safer schools. This examination of changing trends and programmatic impacts will allow youth workers and police officers to specifically target key areas and behaviors with the appropriate programs and interventions.

Source of Federal Funds: Hatch

FLA-FYC-03960

Title: ENHANCING FOOD SAFETY AND QUALITY THROUGH TECHNOLOGIES AND CONSUMER RESEARCH

Critical Needs:

National Objectives: 1,2,3

Key Themes: carotenoids; vitamin e; lutein; tocopherols; ascorbic acid; *food safety*; tocotrienols; high pressure; folates; tomatoes; potatoes; sensory evaluation; consumer preferences; vegetables; post harvest; fruit; food quality; food processing; product improvement; food chemistry; food storage; *food handling*; food nutritive value; quantitative analysis; consumer behavior; new technology; consumer surveys; irradiation; thermal processing; comparative analysis; *food quality*

Summary: Traditional heat processing resulted in significant loss of desirable sensory quality and/or health-promoting components in fruits and vegetables. Non-thermal processing such as high hydrostatic pressure may have significant potential to preserve quality and the health-promoting components. This project will examines alternative technologies to enhance quality and safety of fruits and vegetables and selected foods.

Progress: Objectives of this research plan are to 1) Evaluate selected chemical, nutritional, physical, microbiological and sensory changes in selected foods as affected by technology, handling, or storage, and 2.) Gain qualitative and quantitative consumer information related to food safety and quality and to better understand

consumer behaviors with respect to food safety and quality. Two major studies were completed. First the evaluation of consumer preferences among six varieties of Eastern (E), Western (W) and Galia (G) - types grown in Florida environment. The taste tests were conducted in June 2001 and 2002 following the guidelines and recommendations from the American Society of Testing Materials. The results show that the industry standard Athena was top rated in flavor and overall preference in 2001, but was only ranked fourth overall. The overall top three rated varieties were Mission (W), Odyssey (E), and Inbar (G). The eating quality of Passport (G) was consistently below median values. The interaction between year and sensory attributes was significant, suggesting that conditions other than soil type and variety, and possibly including weather conditions, affected consumer preference. These panels preferred the sensory characteristics of the eastern-type and orange-fleshed varieties over those of the western-type and yellow-fleshed ones, respectively. American's exposure to ethnic foods has expanded while little information is available about the safety of these foods. The second study examined CDC foodborne illness data (1990 to 2000) for ethnic foods to determine food safety trends in this food. Total outbreaks for ethnic foods rose from 3% to 11% while the total number of cases showed no specific trend. Since most outbreaks reported were for Mexican, Italian, or oriental foods; this paper will focus on these three categories. Highest outbreaks occurred in restaurants (43 %), private homes (21 %), schools (7 %), and others (29 %), and the top five states were Florida (n=136), California (n=74), New York (n=42), Maryland (n=40), and Michigan (n=37). The etiologies of ethnic food outbreaks were primarily unknown (61 %) then Salmonella spp (18 %), Clostridium spp (6 %), Bacillus spp (4 %), Staphylococcus spp (4 %), and all others (7 %). Based on known etiology, each ethnic category had its own profile of microorganisms and characteristic foods. Current food manager certification may not adequately cover specific details desired for ethnic food preparation. The findings should bring awareness to food safety professionals of unique issues and risks related to ethnic foods.

Impacts: The results of these two studies will be beneficial to educators, consumers, Florida growers, producers and others. In addition, the results from these studies will be used to obtain additional funding to support future research and educational programs for Floridians.

Source of Federal Funds: Hatch

FLA-HAS-03875

Title: *DEVELOPMENT OF NEW POTATO CLONES FOR ENVIRONMENTAL AND ECONOMICAL SUSTAINABILITY IN THE NORTHEAST*

Critical Needs:

National Objectives: 1

Key Themes: potatoes; cultural practices; late blight (potatoes); bacterial wilt (potatoes); brown rot; nutrient management; pseudomonas solanacearum; pseudomonas; tobacco rattle virus; phytophthora infestans; heritability; traits; plant biology; plant genetics; plant pathology; tetraploids; early maturity; plant disease resistance; cultivars; plant evaluation; climate; *Adding value to New and Old agricultural products; agricultural competitiveness*

Summary: Cultivars and new seedlings will be evaluated in replicated trials for horticultural performance and disease resistance.

Progress: This project is a multi-state potato variety evaluation program in which production and quality characteristics of new clones are compared to current commercially accepted varieties. Cooperative potato variety trials provide information on the production, adaptation, and performance stability of new potato clones under a wide range of geographic, climatic, soil, and cultural conditions. Twenty-six fresh market white-skinned, red-skinned, russet-skinned, and chip potato selections were evaluated. The standard fresh market white-skinned variety, LaChipper, and red-skinned variety, Red LaSoda, for the region were not included in the trial. NY115 produced the highest total and marketable yields at was 48.4 and 43.0 MT/ha, respectively. NY115 is a round, white-skinned clone under consideration for fresh market production. Marketable yield for Atlantic, the standard chipping potato for the region, was 40.5 MT/ha. Specific gravity of Atlantic tubers was 1.076. Of the clones evaluated, B1425-9 will be evaluated further for chip production. Marketable yield and specific gravity of B1425-9 were 41.4 and 1.081, respectively. Russet Legend and Russet Norkotah were highest producing russet-skinned selections with a marketable yield of 30.6 and 31.7 MT/ha, respectively.

Impacts: The coordination of trials on the East Coast insures that superior potato clones can be successfully grown in southern, as well as, northern seed producing states. In addition, the advanced clones tested in this project are, in most cases, close to release. Evaluation of these clones provides Florida growers with the background information needed to make insightful seed choices.

Source of Federal Funds: Hatch

FLA-HOM-03402

Title: *INTEGRATED PEST MANAGEMENT AS AN ALTERNATIVE FOR CONTROL OF SOILBORNE PESTS OF VEGETABLE CROPS*

Critical Needs:

National Objectives: 1, 4

Key Themes: #ipm; *integrated pest management*; vegetables; crop production; soil borne diseases; non chemical control; alternatives; methyl bromide; crop sequences; squash; tomatoes; organic compounds; soil amendments; population dynamics; soil pathogens; alternative pesticides; plant pathology; plant disease control; *soil quality; yard waste/composting*

Summary: Many effective measures for controlling soilborne diseases and pests of vegetables, most notably fumigants that contain methyl bromide, will become unavailable in the near future. This project evaluates non-toxic and sustainable measures, such as solarization and the use of cover crops, for ameliorating the effects of soilborne diseases and pests in Florida vegetable production.

Progress: No differences were found between tomatoes grown in soils fumigated with methyl bromide-chloropicrin (MC-33) and those grown in compost-treated soils for marketable or large fruit yields, plant height, root knot nematodes, and dry root weights. Experiments were conducted to determine temporal changes in: 1) soil microbial biomass due to additions of various cover crop residues to gravelly calcareous soil during the tomato growing season, and 2) percent of soil microbial biomass in soil organic carbon and nitrogen. The cover crops sunn hemp 'Tropic Sun', cow pea 'Iron and Clay', and Japanese millet were planted on raised beds in mid 10/99 and were flail mowed in mid 12/99. Soil microbial biomass C in sunnhemp and cowpea (two legumes, with low C/N ratio) treatments decreases progressively because of the decomposition of soil organic C and its uptake upon mineralization by tomato plants. SMBN decreased in all treatments until tomato flowering in January (except with sunn hemp) and then increased up to harvest. Soil organic carbon (SOC) increased in all treatments except in millet. Percent SMBC in SOC decreased during the season. Soil organic nitrogen and percent SMBN in SON in all treatments were greater at harvest than they had been at mowing. A solarization study determined the effects of solarization of recycled potting media and addition of organic amendments on petunia, impatiens, and periwinkle plant growth in comparison to non-solarized recycled media and new media. Used potting media were solarized in clear plastic bags for 0, 2 and 4 weeks after 9/1/00. Media solarized for 4 weeks, to which humic acid was added, produced plants with the greatest heights and widths. Heights and widths of plants grown in solarized media were greater than in new media sterile media. Both the A1 and A2 mating types of *Phytophthora capsici* were present in commercial squash fields, and both mating types were recovered from the same plant five times. Insensitivity to mefenoxam was common among isolates, with EC50s ranging from 5 mg mefenoxam ml⁻¹ to more than 60 mg ml⁻¹. Of 15 weed species that were examined as possible alternative hosts of the pathogen, only common purslane, *Portulaca oleracea*, was infected by *P. capsici*. In laboratory studies, maximum oospore production (major survival structure) occurred at 18°C, and production also occurred at 14, 20, 24 and 26°C, but not at 6, 12, 30 and 32°C. Three races of *Fusarium oxysporum* f. sp. *lycopersici*, causal agent of fusarium wilt of tomato, exist. Resistance to races 1 and 2 is widely present in commercial lines that are grown in the state, but resistance to race 3 is not. Last year, race 3 was observed in experimental fields at TREC. This was the first time

that this race had been found outside the Ruskin, panhandle and Ft. Pierce production areas.

Impacts: As MeBr is lost for use on high value vegetable crops (e.g. tomato, eggplant, etc.) alternatives for its replacement will be needed. In the absence of MeBr, these studies demonstrated the potential for cover crops, organic composts, solarization, and resistant cultivars in these cropping systems. In combination, these practices/measures could be used when MeBr is no longer available. Specific work on phytophthora blight of pepper and squash suggests that this disease will be particularly difficult to control in the future. Although results from this work enable a greater understanding of the challenge that we face, it also indicates that integrated management of the disease will require more effective components than are currently available (especially, better host resistance and more effective pesticides).

Source of Federal Funds: Hatch

FLA-HOM-04016

Title: DEVELOPMENT AND EVALUATION OF TMDL PLANNING AND ASSESSMENT TOOLS AND PROCESSES

Critical Needs:

National Objectives: 4

Key Themes: hydrology; water quality; pollution; water flow; best management practices; buffers; water pollution; pollution control; vegetation; hydrologic models; sediments; simulation models; mathematical models; watersheds; watershed management; botanical composition; species composition; riparian sites; grazing; harvesting; slopes; uncertainty; runoff

Summary: Changing human activity to protect water quality is expensive. This can be done by setting Total Maximum Daily Load (TMDL) limits, defined as the calculated maximum amount of pollutant that a water body can receive and still meet state water quality standards. Projected total costs of the TMDL program are \$15-66 billion in 15 yr. A design procedure and computer program for buffer strips such as the one proposed will represent an objective tool to meet TMDL sediment runoff.

Progress: Our contribution to this multi-state project has been done in close collaboration with Dr. John Parsons at North Carolina State University (Raleigh). A new procedure to design vegetative filter strips (VFS) as a best management practice (BMP) to reduce sediment runoff off from disturbed lands has been developed and submitted for publication. This procedure uses the computer simulation model VFSSMOD-W created by our group. The objective of the design procedure is to obtain the optimal filter length to filter a given percentage of the maximum runoff sediment event (defined by the TMDL) generated for a certain design storm (defined in terms of return period). The procedure considers several design parameters specific to the application location: i) design storms (usually 1, 2, 5 and 10 year return periods) for the area; ii) soil types present in the area; iii)

disturbed land conditions including crops and practices; iv) vegetative filter types recommended for the area; v) field and filter slopes. Revised model documentation and code has been made available through the web.

Impacts: At the end of the project an advanced tool for design of a BMP in the application and development of TMDL for sediment and sediment-bound chemicals will be delivered.

Source of Federal Funds: Hatch

FLA-HOS-03402

Title: *INTEGRATED PEST MANAGEMENT AS AN ALTERNATIVE FOR CONTROL OF SOILBORNE PESTS OF VEGETABLE CROPS*

Critical Needs:

National Objectives: 1, 4

Key Themes: #ipm; *integrated pest management*; soil pathogens; soil borne diseases; weed control; soil borne organisms; plant disease control; pesticide usage; methyl bromide; vegetables; tomatoes; crop production; systems approach; chemical control (pests); non chemical control; efficacy; solanaceae; melons; *Innovative farming techniques*

Summary: With the scheduled phase-out of methyl bromide as a fumigant for polyethylene mulched crops, an alternative for control of nutsedge and other weeds is critical for economical crop production. Alternative fumigants and herbicides will be applied to polyethylene mulched crops in an effort to control nutsedge and other weeds and to produce acceptable crop yields.

Progress: Tomato was grown during the Spring of 1999 and 2000 to evaluate the effect of method of application of 1,3- dichloropropene(1,3-D) + 17% and 35% chloropicrin (pic) on fruit production and pest control. Application of 1,3-D + pic and metam-Na broadcast and then pressed into a bed provided pest control that was comparable to in-row 1,3-D or with MBr(methyl bromide)-pic. Nematode root gall ratings were somewhat poorer with metam-Na than with 1,3-D but were significantly better than with the untreated tomato. In past work, application of metam-Na at 295 L/ha in-row was not effective. However, in the present study with 295 L/ha metam-Na applied broadcast and pressed into a bed, pest control was more comparable to that with MBr-Pic. With the treatment of 1.8 m area and bedded into 0.9 m beds, the fumigant was concentrated and activity was enhanced. These studies indicate that broadcast application of 1,3-D + pic was as effective as in-row applications. Broadcast applications of metam-Na broadcast were apparently more effective than in-row applications in past studies, probably due to a concentration of the fumigant in the bed under the mulch. Application of pebulate in-row as in spring 2000 was more effective than broadcast application as in spring 1999 in control of nutsedge.

Impacts: This work indicates that 1,3-D can be applied broadcast effectively to control pests. Broadcast application with bedding 7-10 days later

minimizes the worker protection issues since hand labor is not involved in contrast to in-row applications. This work also shows that broadcast application of pebulate before bed preparation is less than in-row applications in nutsedge control.

Source of Federal Funds: Hatch

FLA-HOS-03457

Title: *PHENOLOGY, POPULATION DYNAMICS AND INTERFERENCE: A BASIS FOR UNDERSTANDING WEED BIOLOGY AND ECOLOGY*

Critical Needs:

National Objectives: 1,4

Key Themes: plant reproduction; weeds; weed control; population control; cyperus esculentus; plant competition; interference; plant ecology; systems approach; weed control systems; environmental factors; cultural control (weeds); *biological control* (weeds); mechanical control (weeds); physical control; crop yields; melons; tomatoes; *agricultural profitability*

Summary: Weed interference contributes to large losses of yield and quality in vegetable crops. The purpose of this study is to determine to population of weeds that will reduce yield and quality as well as the time in the crops life cycle that the weed is the most competitive.

Progress: Additive studies were carried out at two locations to evaluate the competitive effects of smooth amaranth and livid amaranth on cucumber growth and yield. Smooth amaranth is an upright growing plant, while livid amaranth is recumbant. Both weeds are a problem in cucumber production in Florida. It was found that there was no difference in competitive effects on cucumber yield between the two weed species. A 10% cucumber yield loss was seen at 2 weeds/square m of row. A biological threshold of 40% yield loss was seen at 8 plants/square meter. Publication of this work will be in a student's thesis and will be submitted to a journal.

Impacts: Growers will be made aware of cucumber yield loss due to number of amaranth plants per meter of row. Control decisions can be made with control measure costs verses loss percentages as to number of weeds per row.

Source of Federal Funds: Hatch

FLA-HOS-03559

Title: *SENESCENCE PHYSIOLOGY AND DETERIORATION IN HARVESTED TOMATO AND OTHER FRUITS*

Critical Needs:

National Objectives: 2

Key Themes: plant physiology; fruit; tomatoes; senescence; post harvest losses; fruit quality; ripening; storage stability; polysaccharides; environmental stress; enzyme activity; low temperature; ph; cell

wall; electrolytes; watermelons; tropical fruit; fruit processing; membrane permeability; fruit softening; *food handling*; *food quality*;

Summary: The shelf-life of fresh fruits and fresh-cut fruit products is limited by senescence and other factors contributing to deterioration. The purpose of this study is to learn more about the cellular physiology contributing to the deterioration and senescence of fruits and fruit products.

Progress: Ethylene-induced placental-tissue water soaking in harvested watermelon fruit is accompanied by cell separation and collapse, depolymerization of water- and chelator-soluble pectic fractions, a loss in total uronic acids, and increased polygalacturonase activity. In this study, we investigated whether hemicellulosic polysaccharides were altered in response to ethylene treatment. Watermelon fruit harvested at the full-ripe stage were treated with 50 microL per L ethylene or air for 5 days at 20 C. Visual inspection confirmed the development of water soaking in ethylene-treated fruit. Alkali-soluble (4 N) hemicelluloses were prepared, and mol mass distributions examined using Sepharose 6B-200 chromatography. Polymers from 0 day and 5 day air-treated fruit were similar in mol mass distribution, with the majority of polymers eluting within the void volume of Sepharose 6B (MWCO for polysaccharides = 1×10^6). In contrast, polymers from ethylene-treated fruit showed significant mol mass downshifts involving xyloglucan (XG) polymers. Total hemicelluloses were enriched in XG, with xylose and glucose comprising nearly 70 % of total 4 N alkali-soluble neutral sugars. Treatment of watermelon fruit with ethylene was not accompanied by changes in hemicellulose composition, indicating that depolymerization did not result in increased solubility and loss of XG. Cell-free protein extracts from watermelon placental tissue degraded tamarind seed xyloglucan, resulting in significant mol mass downshifts. Similarly, watermelon hemicelluloses were degraded by the protein extract, resulting in mol mass distributions similar to those noted for ethylene-treated fruit. Xyloglucanase activity assessed using tamarind xyloglucan was similar between ethylene- and air-treated fruit, indicating that enzyme levels per se are not the primary factor increasing xyloglucan depolymerization in ethylene-treated watermelon fruit. Water soaking in watermelon was accompanied by increases in the activities of phospholipase C (13.8%), phospholipase D (21.5%), and lipoxygenase (10.0%), and a significant increase (26.3%) in phosphatidic acid (PA). Declines in phosphatidylcholine (17.8%) and phosphatidylinositol (22.5%) were noted. Water-soaking symptoms were not observed in fruit that had received treatment with 5 microliters per liter 1-methylcyclopropene (1-MCP) for 18 h prior to ethylene exposure; however, ethylene-induced increases in PLC, PLD and LOX were blocked 50-75 % in 1-MCP-treated fruit. The high perishability of breadfruit has been well documented and is in large part responsible for the limited

distribution of this fruit. Although the breadfruit does not possess the ripening dynamics of typical climacteric fruits such as avocado and papaya, its high respiration rate and ethylene production make it a likely candidate for positive responses to wax and 1-MCP treatments. For reasons not yet understood, mild bruising of mature-green and turning stage tomato fruit has an adverse influence on tomato aroma and flavor volatiles

Impacts:

Source of Federal Funds: Hatch

FLA-HOS-03601

Title: IDENTIFICATION OF GENETIC AND PHYSIOLOGICAL MECHANISMS OF THERMOTOLERANCE IN LETTUCE SEED

Critical Needs:

National Objectives: 1

Key Themes: seeds; vegetables; plant physiology; plant genetics; heat tolerance; lettuce; seed germination; seed dormancy; seed vigor; metabolic regulation; breeding lines; physiological criteria; germplasm; high temperature; *plant germplasm; plant geonomics; plant health*

Summary: Genetic, physiological and environmental mechanisms associated with seed affect germination, vigor, and yield in field crops. This project evaluates various conditions affecting germination, vigor, and yield in field crops, including seed preparation and temperature. Genetic aspects will also be investigated to determine thermotolerance.

Progress: Lettuce genotypes have different germination characteristics under different temperatures from 20 to 36C. The upper temperature limit for germination of lettuce seed could be modified by manipulating the temperature during seed development. Thus, the potential thermotolerance of seed thereby increased, where in thermosensitive genotypes became thermotolerant and thermotolerant genotypes germinated fully at 36C. Thermosensitive and thermotolerant genotypes were determined to have different puncture force of the seed and endosperm during imbibition and priming the seeds reduces the puncture force especially in thermotolerant lines. Differences in germination of the different genotypes were further attributed to the production of ethylene based on experiments using the precursor ACC and the inhibitor silver thiosulfate. Enzyme-mediated degradation of endosperm cell walls is a crucial factor for lettuce germination at high temperature. By increasing the concentration of ethylene in thermosensitive lettuce seeds by providing ACC either during priming or during germination, endo-beta-mannanase (EBM) activity was increased and the inhibitory effect of high temperature on germination was overcome via weakening of the endosperm. Endo-beta-mannanase was found prior to germination and activity prior to germination was higher in thermotolerant lines than thermosensitive lines. Furthermore, priming increased the

activity of EBM and more so in thermotolerant lines than thermosensitive ones. Maturation of lettuce seed at 30/20C (day/night) compared to 20/10C leads to more ethylene production when seeds were subsequently germinated which can account for their improved germination at supraoptimal temperature. Transgenic lettuce seed were developed to have reduced ethylene perception than wild-types. Imbibition in dark at both optimal and supraoptimal temperatures led to reduced ethylene production compared to the production in light. The unaffected germination of both thermosensitive (DGB) and thermotolerant (EVE) seeds with reduced ethylene perception at optimal temperature and reduced germination at supraoptimal temperatures supported the hypothesis that the requirements for ethylene increases as imbibition temperatures increase. DGB-transgenic seeds had reduced germination at much lower temperatures than did EVE-transgenic seeds which also produced significantly less ethylene than the EVE-transgenic seeds. Reduced ethylene perception led to reduced ability of both thermosensitive and thermotolerant lettuce seeds to germinate at supraoptimal temperature indicating an important role for ethylene in lettuce germination at high temperature.

Impacts: Outcomes of this research will benefit both the fundamental seed biology core and the seed industry. This research will provide a better understanding of the hormonal regulation of seed development, dormancy, regulating seed germination and of the importance of enzyme regulation (causing the weakening of the endosperm) in overcoming dormancy. This research can potentially provide the seed industry with lettuce seed with having higher ability to germinate at supraoptimal temperatures. This can result in no need of high-cost commercial priming of lettuce seed, thus improve vigor, stand establishment, and ultimately reduce the cost of lettuce seed.

Source of Federal Funds: Hatch

FLA-HOS-03832

Title: MICROIRRIGATION TECHNOLOGIES FOR PROTECTION OF NATURAL RESOURCES AND OPTIMUM PRODUCTION

Critical Needs:

National Objectives: 1

Key Themes: tomato; pepper; water use; blossom-end rot; drip irrigation; polyethylene mulch; calcium nutrition; *precision agriculture*; *innovative farming techniques*

Summary: Water and fertilizer management are essential for good crop production of drip irrigated, polyethylene mulched crops. Studies to be conducted include work with tomatoes, watermelon, peppers and other vegetables. Tomatoes often develop a disorder on the fruit known as "blossom-end rot". This disorder is due to a calcium deficiency. Studies will be conducted with drip irrigated, polyethylene mulched vegetables using different kinds of calcium fertilizer and different amounts of water. These studies

should help determine the best management of calcium sources and water for best vegetable production.

Progress: Two different approaches were used to increase nutrient use efficiency with vegetable crops grown with plasticulture. First, dye tests and controlled irrigation conditions were used to describe wetting pattern response to irrigation volume. On a 15-ft deep Lakeland fine sandy soil, increasing irrigation volume from 24 to 192 gal/100ft significantly increased depth, width and emitter-to-emitter coverage of the water front. The wetting front passed the bottom of the root depth (12 inch) after an irrigation volume of approximately 72 gal/100ft (3 hours). Therefore, the highest volume of irrigation water that can be applied in this soil type when no leaching is expected is 72 gal/100ft. Another possible strategy to increase nutrient efficiency is to increase soil water holding capacity (SWHC) by using inorganic amendments such as Phyllipsite-type zeolyte. Because of their high specific surface, zeolites are able to absorb up to 30% of their dry weight in gases such as nitrogen and ammonia, and over 70% of water. The increase in SWHC increase was practical at 50:50 mixing rates. At low rates (up to 8 tons/acre), reducing irrigation rates reduced tomato growth and yield. Hence, this amendment did not appear suitable for commercial purposes.

Impacts: Increasing fertilizer efficiency through increased irrigation management will (1) decrease production costs, (2) reduce the environmental impact of intensively grow vegetable crops, (3) reduce water use, and (4) better prepare vegetable growers to implement Best Management Practices.

Source of Federal Funds: Hatch

FLA-IMM-03924

Title: DEVELOPMENT, EVALUATION AND SAFETY OF ENTOMOPATHOGENS FOR CONTROL OF ARTHROPOD PESTS

Critical Needs:

National Objectives: 1, 4

Key Themes: diaprepes; arthropod; *biological control; agricultural profitability*

Summary: Non-Technical summary. The impact of Diaprepes infestation on native, disturbed and cultivated plant communities will be evaluated and related ; to the activity and diversity of naturally occurring entomophagous nematodes. Diaprepes populations will be reduced by managing vegetation to increase populations of alternate hosts of entomophagous nematodes. This project examines the effectiveness of native and introduced nematodes in different soil types to reduce losses in peaches due to feeding of Diaprepes larvae.

Progress: Work in Collier County Florida was initiated during fall 2000 in response to a peach grower's request for assistance controlling an infestation of Diaprepes abbreviatus that had caused loss of approximately 80 % of his trees. Affected trees were 3 to 4 years old and in decline due to severe root damage from larval feeding

ascertained upon excavation. A survey of the 12-acre and surrounding pine/palmetto flatwoods in the fall of 2000 revealed large numbers of weevils feeding and ovipositing on the peach trees and also aggregating on Brazilian pepper (*Schinus terebinthifolius*) and winged sumac (*Rhus copallina*). The grower was advised to spray peaches with carbaryl to control adult weevils and to inject entomopathogenic nematodes to control larvae. Pyramidal Tedders traps and cone emergence traps were set up in the orchard and woods were checked weekly to monitor weevil emergence and foliage sampled by beating from Sep 01 to Dec 02. Mark recapture was used to track movement and estimate populations. Weevils were present year round with populations peaking late fall both in the woods and in the orchard. The ratio captures from cone traps and Tedder's traps was 1:30 compared to 1:10 in citrus, indicating that fewer weevils were emerging on site. Of 636 weevils marked and released in the woods less than 200 yards from the orchard perimeter, only 5 of 866 captured in the grove were marked. Recaptures in the woods went from 0 to 50% as the season progressed from fall to winter. The pattern of abundance contrasted with that seen in irrigated citrus, which typically peaked in late spring. Weevil emergence in the woods could be delayed compared to the irrigated grove due to the dry condition of the soil in spring, suggesting the woods is now the likely source of most weevils seen in peaches. This conclusion was supported by the lack of evidence for emergence within the peach orchard. At the same time, the low rate of recapture pointed to considerable size and mobility of the weevil population during the warmer months. Numbers in the peach orchard have dropped steadily over the last 2 years and condition of the trees has improved markedly. Plans are to sample the soil for indigenous and augmented nematodes in search of an explanation for evident low weevil production within the grove.

Impacts: Management practices including use of entomophagous nematodes resulted in alleviation of damage to a peach grove by the root weevil, *Diaprepes abbreviatus*.

Source of Federal Funds: Hatch

FLA-JAY-03457

Title: *PHENOLOGY, POPULATION DYNAMICS, AND INTERFERENCE: A BASIS FOR UNDERSTANDING WEED BIOLOGY AND ECOLOGY*

Critical Needs:

National Objectives: 1

Key Themes: weeds; cotton; population dynamics; crop rotation; cassia obtusifolia; cyperus esculentus; plant reproduction; seed beds; tillage systems; plant competition; interference; tubers; plant development; plant biology; plant ecology; plant physiology; field plots; weed control systems; innovative farming techniques

Summary: A five-year study will be conducted to evaluate the impact of four levels of weed management and two tillage systems (conventional and no-tillage) on weed management in cotton. Weed population monitoring will include field weed counts and, by allowing weeds to germinate and emerge from soil samples collected in the field and placed in the greenhouse, estimates of soil seed bank levels. Similar data will be collected from plots managed as perennial forage for five years and then brought into row-crop production with a peanut-cotton rotation using two tillage systems and two levels of weed management. The impact of six management schemes on sicklepod in the soil seed bank will be studied. Sicklepod seed will be sieved from soil taken from each of the management systems. Seed number, viability and germination will be determined. In addition, experiments will be conducted to gain a better understanding of processes which control nutsedge tuber formation. The impact of photoperiod on nutsedge tuber production and the effect of tillage and cultural practices and herbicides on tuber production will be determined.

Progress: Long-term studies were conducted over a 5-year period to evaluate the impact of tillage and herbicide input on weed population dynamics in cotton was completed. By the end of the study, a heavy weed infestation had developed that required a high level of herbicide input to provide adequate weed control in both conventional and no-tillage production systems. A limited herbicide input plus cultivation in conventional tillage did not provide the desired level of weed control. Glyphosate applied over the top of the glyphosate-tolerant cotton was one of the few treatments that provided acceptable weed control in both the conventional and no-till systems. Late-season sicklepod (*Senna obtusifolia*) and common cocklebur (*Xanthium strumarium*) densities were higher in the no-till system compared with the conventional tillage throughout the course of the study. In another long-term study the impact of various levels of weed management on sicklepod seed dynamics was determined. Soil seed bank numbers remained low throughout the four years of the study in treatments where sicklepod seed rain was reduced or eliminated. Seed numbers dramatically increased in plots where deer damage destroyed the soybean crop and removed crop competition. A single season of seed production after two years of no seed rain elevated soil seed bank numbers to the level of the untreated check.

Impacts: These long-term studies document the effect of various levels of weed management intensity on weed infestation severity over time. In order to maintain a level of weed infestation that is easily managed, a relatively high level of weed control input is required, regardless of tillage system employed.

Source of Federal Funds: Hatch

Title: INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS

Critical Needs:

National Objectives: 1,4

Key Themes: ornamental plants; floriculture; plant introductions; plant evaluation; information collection; nursery stock; field trials; plant adaptation; exotic plants; native plants; cercis; tropical plants; herbaceous plants; perennial plants; irrigation; plant propagation; cultural practices; landscape plants; propagation; *ornamental/green; agricultural profitability; agricultural competitiveness*

Summary: Collection of Florida endemic or exotic taxa from geographical regions of similar climate, propagation by seed, or propagules, and production utilizing standard horticultural techniques common to the Florida horticulture industry. Comprehensive performance records will be maintained by assigning an accession number to each taxon under consideration. Following determination of propagation and nursery or greenhouse production protocols, field trials of new introductions will be conducted to determine the optimal landscape location (seaside planting, shade or sunny outdoor locations, and drought or heat tolerance) and method of landscape establishment and management (optimal irrigation and nutrition levels) will be conducted for suitable taxa. In all herbaceous perennial crops, standards of production will follow those outlined by the Perennial Plant Association in their national guidelines. Trial plantings of herbaceous material will be implemented in a manner which parallels those used in both Monticello and Bradenton research stations so that future comparison at these different locations will generate information of use to growers throughout the state of Florida.

Progress: Research on woody landscape plants continued to evaluate the landscape performance of Florida native herbaceous, woody and grass plants in low input landscapes. Data collection continues for field experiments evaluating woody plant tolerance to root knot nematode species, field production of new *Magnolia grandiflora* germplasm and *Hypericum reductum* germplasm. Manuscripts were prepared, presented or published describing the outcome of a field experiment to evaluate potential seed production of *Buddleia* cultivars that was terminated in Dec. 2002.

Impacts: Ongoing research focuses on the development of production and landscape establishment protocols for desirable landscape crops that are improved or distinct or crops that are not currently introduced into the horticulture trade. Results of greenhouse and field experiments continue to provide information on the landscape performance of both native and introduced species in response to environmental impacts such as low fertility and irrigation inputs or natural pests such as root knot nematodes. Local, regional, and statewide programming including web pages, presentations, and publications transfers the new information directly to state specialists, land managers, students and the

horticulture industry. This information will ultimately influence plant breeding, selection, production and use in the landscape industry, thereby ultimately reducing the inputs necessary for plant production, establishment and management

Source of Federal Funds: Hatch

FLA-JAY-03620

Title: WEED BIOLOGY AND CONTROL FOR TURFGRASS AND THE LANDSCAPE

Critical Needs:

National Objectives: 1

Key Themes: weeds; grasses; landscape management; grass management; turf grasses; weed control; plant ecology; plant competition; herbicides; biological control (weeds); growth regulators; integrated pest management; plant reproduction; irrigation management; fertilizer practices; mowing; traffic; herbicide evaluation; *ornamental/green agriculture; agricultural profitability*

Summary: The reproduction and competitiveness of selected turfgrass weeds will be measured as a response to integrated weed management variables such as irrigation, fertilization, mowing and traffic. Herbicides will be evaluated in replicated trials for selective control of important weeds.

Progress: During the life of this project turfgrass weed management systems were developed. Three sequential applications of the herbicide quinclorac (0.56 kg/ha) at 21 day intervals or a mixture of quinclorac at 0.8 kg/ha plus diclofop at 0.75 kg/ha applied twice provided 85 to 90% torpedograss (*Panicum repens*) control. Mowing just prior to quinclorac application did not reduce torpedograss control compared to a one week interval between mowing an application. In addition, level of nitrogen fertility had no impact on quinclorac activity. Trifloxysulfuron was evaluated for torpedograss, kyllinga and purple nutsedge (*Cyperus rotundus*) management in hybrid bermudagrass turf. Two sequential applications (0.022 kg/ha) of a sprayable formulation at 4 to 6 week intervals provided 80 to 90% control of all three species without causing injury to the turfgrass. Tropical signalgrass (*Urachloa subquadriflora*), one of the most serious weed pests in Florida turfgrass, germinates best at pH 5 to 6, temperatures of 25 to 30 C and at water potentials >-0.04 Mpa. Tropical signalgrass shoots emerged from as deep as 6 cm with maximum emergence from seed placed on the soil surface. Tropical signalgrass emerged during mid-March in the field in central Florida when soil and ambient temperatures were 20 C. Postemergence herbicide treatments that are registered for use in St. Augustinegrass were ineffective for control of tropical signalgrass. Several Preemergence treatments, however, provided excellent control. These included prodiamine, dithiopyr, oryzalin, benefin + oryzalin or benefin + trifluralin. Tolerance of seashore paspalum (*Paspalum vaginatum*), a turfgrass species that tolerates high salt content in irrigation

water, to standard turfgrass herbicides was determined. Seashore paspalum was not injured by preemergence applications of several dinitroaniline herbicides including prodiamine, pendimethalin and trifluralin. Postemergence treatments of quinclorac, metsulfuron, clopyralid, bentazon, halosulfuron, imazaquin, bromoxynil and metribuzin were also tolerated by seashore paspalum. Ethofumesate, asulam, sethoxydim, MSMA, imazapic and clethodim caused damage to the seashore paspalum. Experiments were conducted under greenhouse condition to evaluate the salt tolerance of eight weed species: torpedograss, dollarweed, Virginia buttonweed, large crabgrass, common bermudagrass, purple nutsedge, goosegrass, and Florida pusley to determine the potential for using saltwater for weed management in seashore paspalum. The weeds were subjected to five seawater concentrations: 34,000 ppm salt (1x), 25,500 ppm (3/4x), 17,000 ppm (1/2x), 8,500 ppm (1/4x), and untreated (0x). Crabgrass, common bermudagrass, and purple nutsedge were controlled 70% or greater by 1/2x or greater saltwater while dollarweed, Virginia buttonweed, goosegrass, and Florida pusley showed 70% injury at concentrations of 1/4x or greater. Torpedograss was not affected by any of the saltwater treatments.

Impacts: Quinclorac offers effective control of torpedograss when used in a series of sequential applications. Mowing and fertility level appear to have little impact on quinclorac activity. Trifloxysulfuron controls both torpedograss and purple nutsedge, two serious perennial weed problems in turfgrass. Information developed on tropical signalgrass germination and emergence can be used by sod producers to select proper timing of preemergence herbicide applications. Depth of emergence information suggests that deep turning of the soil will bury tropical signalgrass deeper than the 6 cm maximum depth of emergence, thus providing a potential management tool for this weed. For areas where seashore paspalum is grown, the use of saltwater for irrigation will also provide significant weed control and could reduce herbicide use on this turfgrass species by 25 to 50%.

Source of Federal Funds: Hatch

FLA-LAL-03571

Title: *DYNAMIC ECONOMIC ANALYSIS OF THE FLORIDA CITRUS INDUSTRY*

Critical Needs:

National Objectives: 1,2

Key Themes: economics; fruit; citrus; economic analysis; computer analysis; international competition; world trade; supply and demand; investments; marketing strategies; simulation models; econometrics; policy analysis; expert systems; *agricultural competitiveness; agricultural profitability; Food accessibility and Affordability; food resource management*

Summary: Will survey citrus industry for data and develop computer decision aids for citrus growers.

Progress: Compiled and published annual citrus comparative budgets for the three major citrus producing regions in Florida-Central Florida, Southwest Florida and Indian River(East Coast). Annual citrus caretaker custom rates were compiled and published for the Central Florida and the Indian River/South Florida production regions. Published updated comparative costs between Florida's and Sao Paulo's (Brazil) citrus industries. Developed and Excel computer decision aid for citrus growers to evaluate resetting/tree replacement strategies; computer program made available on Lake Alfred CREC Extension web page.

Impacts: Florida is the second largest citrus producing region in the world and the largest supplier of orange juice products to the U.S. market. Federal trade policy has focused on a 'Free Trade of the Americas Agreement' which has included discussions on reducing or eliminating the FCOJ import tariff. The loss of the FCOJ tariff would enable foreign citrus production (e.g., Sao Paulo-Brazil) to become more cost competitive and potentially reducing Florida citrus growers returns by \$1.20 to \$1.40 per box. Resetting/tree replacement costs average 13% of the total grove care costs for a citrus operation. The reset analysis computer program will enhance citrus growers tree replacement strategy decisions, and improve production efficiency and returns.

Source of Federal Funds: Hatch

FLA-LAL-03770

Title: *ENVIRONMENTAL EFFECTS ON VEGETATIVE AND REPRODUCTIVE GROWTH OF CITRUS*

Critical Needs:

National Objectives: 1,4

Key Themes: citrus; environmental stress; plant physiology; radiation; temperature; soil plant water relations; fertilizers; soil plant nutrient relations; photosynthesis; crop yields; fruit quality; phytotoxicity; insect pests; plant diseases; environmental effects; humidity; plant biology; climate; data collection; decision making; production efficiency; stress tolerance; plant growth; mineral nutrition; gas exchange; environmental factors; rainfall; flowering; quantitative analysis; plant response; *agricultural profitability; Natural resources management*

Summary: The Florida citrus industry annually produces more than 1 billion dollars worth of fruit. Substantial production and quality losses result from biotic and or abiotic environmental stresses. For example, freeze damage, flooding, drought, salinity, diseases, and insects reduce productivity and quality of Florida citrus. The purpose of this project is to gain information that will be of use in minimizing tree stress and fruit loss thereby maximizing fruit quality while protecting the environment.

Progress: In N deficient citrus leaves, small chloroplasts had no starch granules, disintegrated grana and stroma lamellae that coincided with the accretion of numerous large plastoglobuli in the stroma. High N leaves had large chloroplasts with well developed grana, stroma lamellae and numerous large starch granules that apparently disrupted chloroplasts such that photosynthesis was no greater than in high n leaves than in moderate N leaves. Fifty percent shade cloth and kaolin particle film reduced midday leaf temperature and leaf-to-air vapor pressure difference such that stomatal conductance and photosynthesis were increased above that of sunlit leaves. Photoinhibition of photo system II was greater in sunlit than in shaded leaves so non-stomatal factors were more important than stomatal limitations on photosynthesis during radiation and high temperature stress. Diaprepes root weevil populations were correlated to flooding stress and soil pH in the field. Citrus seedlings that were previously stressed by flooding were more susceptible to Diaprepes root weevil feeding than non flooded seedlings. In Spring navel orange trees, the presence of a normal fruit load resulted in lower foliar carbohydrate concentrations and higher rates of photosynthesis than in leaves of de-fruited trees. A new Citrus Flowering Monitor Expert System was tested for the second year and performed well to predict flowering intensity and dates of bloom for all citrus districts in Florida. In most years in Florida, multiple bloom waves occur within the normal bloom period from February to April. Three times more flowers occur per summer compared to a spring shoot.

Impacts: Work under this project allows Florida growers to better adjust their production practices to the various biotic and abiotic factors that impact citrus trees and their fruit development. A better understanding of the physiological behavior of citrus under Florida conditions also furthers our basic understanding so that progress can be made in overcoming adverse environmental conditions.

Source of Federal Funds: Hatch

FLA-LAL-03832

Title: *MICROIRRIGATION TECHNOLOGIES FOR PROTECTION OF NATURAL RESOURCES AND OPTIMUM PRODUCTION*

Critical Needs:

National Objectives: 4

Key Themes: plant physiology; water use efficiency; micro irrigation; evapotranspiration; irrigation management; *water quality*; citrus; crop production; production systems; optimization; management systems; performance evaluation; environmental impact; sprinkler irrigation; recycling; water reuse; water status; water contamination; groundwater

Summary: Improper irrigation management with microsprinklers can lead to overirrigation and/or loss of water and nutrients. This project will help improve irrigation management and help reduce

potential groundwater contamination with nutrients caused by overirrigation.

Progress: Tests were set up to determine microsprinkler irrigation land area coverage needed for optimum production. Four irrigation treatments of approx 25, 50, 75, and 100% of total land area coverage were established. Optimum coverage was found to be 50 to 75%. There was no advantage to 100% coverage. 25% coverage was inadequate and trees here showed greater water stress. Water deficits in the spring caused major yield loss in the 50% treatment. Springtime water stress should be avoided. On this Candler sand, 250 mm of irrigation was insufficient for good yield. Effective rainfall (ER) is that portion of total rainfall that directly satisfies crop water needs. Effective rainfall was determined by measuring changes in soil water content. This was compared to the TR-21 model. Values determined by water balance differed from TR-21 by 10-15%. A major contributor to the difference is the uneven distribution of rainfall. TR-21 has sufficient level of accuracy needed to determine water allocation for microsprinkler irrigated citrus on the ridge. Moderately priced soil water sensors are being evaluated and calibrated. Advantages and disadvantages of different sensors have been noted. Tests on Hamlin and Valencia oranges show that water stress imposed in fall & winter can increase fruit brix, acid, and lb solids/box. Water stress caused ratio to decline which aids in earlier harvesting. Yield was not adversely affected. Growers can save water by withholding irrigation in fall and winter and not lose overall yield.

Impacts: This work will tell growers what percentage of ground cover is needed to obtain optimum production. Information of soil water sensors will help growers schedule irrigation better and reduce deep soil water loss from percolation. Growers can save some irrigation costs by reducing irrigation in fall and winter and enhance solids production. Up to 5 cm and over 10 cm of water have been saved with Hamlin and Valencia oranges, respectively.

Source of Federal Funds: Hatch

FLA-LAL-03896

Title: NATURAL PRODUCTS CHEMISTRY AS A RESOURCE FOR BIORATIONAL METHODS OF INSECT CONTROL

Critical Needs:

National Objectives: 1

Key Themes: tephritidae; bactrocera dorsalis; ceratitis capitata; anastrepha ludens; insect attractants; lures; eradication; insect control; semiochemicals; detection; perception; insect biology; insect biochemistry; chemical analysis; gas chromatography; liquid chromatography; mass spectrometry; hplc (chromatography); bioassays; laboratory tests; field testing; insect traps; *invasive species*

Summary: Fruit flies lead to quarantine of agricultural products. This project addresses improved detection and eradication systems. The purpose of this project is to discover semiochemicals which can be used in improved lures and attractants for fruit flies.

Progress: We have completed the development of a technique for determining the consumption of an individual fruit fly. This has enabled us to determine that sucrose is a preferred sugar by Caribbean fruit fly, *Anastrepha suspensa*. This technique has enabled us to show that *A. suspensa* prefers 0.2 m sucrose (6.8% sucrose). Commercial lures for this fly contain 1% or less sucrose or 14% sucrose dependent on the lure. We have determined that a preferred amino acid is lysine.

Impacts: We have developed, for the first time, an insect consumption technique that can compare various baits and lures and can be used to examine resistance to ingested pesticides. Data in progress will lead to improved baits, stronger fly management programs and environmental benefits through reduction in pesticide use.

Source of Federal Funds: Hatch

FLA-LAL-03897

Title: *SOIL MICROBIAL TAXONOMIC AND FUNCTIONAL DIVERSITY AS AFFECTED BY LAND USE AND MANAGEMENT*

Critical Needs:

National Objectives: 1, 4

Key Themes: phosphorus; soil microorganisms; land use; mycorrhizae; arbuscular (fungi); diversity; fertility; taxonomy; land management; citrus; production management; management systems; soil fungi; symbiosis; hyphae; microbial ecology; proliferation; roots; cropping systems; fertilizer application; soil fertility; soil plant nutrient relations; plant growth; growth response; soil structure

Summary: Arbuscular mycorrhizal fungi (AMF) are a major determinant of plant growth response in a crop soil. The function of mycorrhizas in crop growth under high P fertility is not established. The purpose is to establish the impact of mycorrhizas on crop growth under high P fertility.

Progress: Loss of productive capacity of sugarcane in the first year after successive planting is a widespread problem in sugarcane worldwide. Fallow management of sugarcane soils by repeated tillage to break up the root crown and to reduce weed cover before replanting produces up to a 30% increase in biomass at the first cutting, but only a slight response in the second cutting and no response in the third cutting. Soil treatment with methyl bromide duplicates the fallowing effect. No soil microorganisms deleterious to sugarcane roots have been identified in most instances. Several AMF were trapped from successively planted

fields in South Florida, and three *Glomus* isolates were selected to reconstitute a steamed local Tory muck soil in glasshouse experiments. Roots emerged from sugarcane seed pieces and only those in non-steamed soil were rapidly colonized in advance of shoot development. Colonization rate varied with *Glomus* isolate in reconstituted soils. Shoot growth rate was inversely related to colonization rate among soil and *Glomus* isolate treatments. Depression of biomass gain compared to the steamed soil treatment was best predicted by root colonization at 2 weeks and to a lesser extent by later colonization. Results suggest that early colonization of sugarcane roots before shoots emerge produces a carbon cost that isn't recoverable by the first cutting. This hypothesis will be tested in fallow field plots reconstituted with native AMF.

Impacts: Roots of crop plants become colonized by AM fungi to different extents depending on climate, soils, cropping practices and fertilizer history. The impact of mycorrhizas on crop growth under high P fertility is not established. Therefore, the primary objective is to evaluate the rate and extent to which AM fungi isolated from crop soils colonize roots. The secondary objective is to determine how this colonization affects plant growth, carbon status and nutrition at soil P availability levels that have accumulated after fertilization of crop fields.

Source of Federal Funds: Hatch

FLA-LAL-03924

Title: Development, Evaluation, and Safety of Entomopathogens for Control of Arthropod Pests

Critical Needs:

National Objectives: 1

Key Themes: fungi; entomopathogens; nematodes; insect pests; insect control; biological control (insects); performance evaluation; product development; safety; insect diseases; homoptera; soil nematodes; soil microbiology; *beauveria bassiana*; fungus diseases (insects); pathogen identification; soil insects; insect larvae; *curculionidae*; species diversity; strains (genetics); roots; *invasive species*

Summary: Fruit flies lead to quarantine of agricultural products. This project addresses improved detection and eradication systems. The purpose of this project is to discover semiochemicals which can be used in improved lures and attractants for fruit flies.

Progress: We have completed the development of a technique for determining the consumption of an individual fruit fly. This has enabled us to determine that sucrose is a preferred sugar by Caribbean fruit fly, *Anastrepha suspensa*. This technique has enabled us to show that *A. suspensa* prefers 0.2 m sucrose (6.8% sucrose). Commercial lures for this fly contain

Impacts: 1% or less sucrose or 14% sucrose dependent on the lure. We have determined that a preferred amino acid is lysine. We have developed, for the first time, an insect consumption technique that can compare various baits and lures and can be used to examine resistance to ingested pesticides. Data in progress will lead to improved baits, stronger fly management programs and environmental benefits through reduction in pesticide use.

Source of Federal Funds: Hatch

FLA-MCS-03798

Title: BIOLOGICALLY BASED IPM SYSTEMS FOR MANAGEMENT OF PLANT-PARASITIC NEMATODS

Critical Needs:

National Objectives: 1,4

Key Themes: *biological control* (nematodes); *integrated pest management*; nematode control; parasitic nematodes; pasteuria; performance evaluation; comparative analysis; soil amendments; crop rotation; plant nematode resistance; host pathogen relations; adhesion; phylogenetics; host selection; strains (genetics)

Summary: biological control of plant -paraitic nematodes is needed to replace methylbromide and other nematicides for economical production of most crops. The goal of this project is to develop the *Pasteuria* spp as effective and benign alternatives for the control of plant-parasitic nematods.

Progress: The immunoassay for the detection of spores of *Pasteuria* spp. has been applied to soil samples collected various golf courses. The immunodetection assay has been used to screen soil samples at different locations selected on the basis of the presence of sting nematodes. The immunoassay found varying levels of epitope that indicated varying levels of *Pasteuria* endospores. The relationship between epitope levels and the extent to which these soils are suppressive to infestation by sting nematode (*Belanolaimus longicaudatus*) is being determined. The *Pasteuria* infecting these nematodes are being evaluated by genetic and immunological methods to further define the nature of adhesins responsible for the recognition of *B. longicaudatus* by *Pasteuria* spp. Sequence information has been obtained for the sigE gene from *Pasteuria ramosa* and compared with that from *P. penetrans* P20. There are much greater differences in the nucleotide sequences in the sigE genes from these two *Pasteuria* spp. than there in the nucleotide sequences of the genes encoding 16S ribosomal RNA. This indicates that specific primers designed for for the sigE gene will be useful in selectively amplifying genes for a particular species, and should be useful for the environmental quantitation of different

Impacts: Pasteuria spp. and biotypes that are specific for different species of nematode. Protocols for the immunodetection of endospores in soil have been further developed to determine the extent to which it is suppressive for infestation of species of sting nematode, *Belanolaimus longicaudatus*. These will be field tested with the expectation that a convenient and accurate protocol that can be used to allow growers to estimate the need for application of chemical nematicides for applications to golf courses as well as potato fields. The determination of the DNA sequences encoding sigE genes of different Pasteuria spp and biotypes has provided probes that will be useful for the detection of vegetative cells in planta. This will allow a grower to estimate the extent to which a field is suppressive, and will continue to be suppressive for the following year, and thereby allow the judicious application of chemical nematicides.

Source of Federal Funds: Hatch

FLA-MCS-03861

Title: GENETIC ENGINEERING OF ZYMOMONAS MOBILIS FOR FUEL ETHANOL PRODUCTION

Critical Needs:

National Objectives: 1

Key Themes: bacterial genetics; genetic engineering; ethanol; fuel; molecular biology; restriction enzymes; endonucleases; enzyme modification; methyl transferases; methylation; nucleosides; electroporation; transformation; production efficiency; gene cloning; gene expression; escherichia coli; strains (genetics); process development; optimization; gene transfer

Summary: Genetic manipulations to improve ethanol production in *Z. mobilis* are complicated by enzymes that prevent introduction of foreign DNA into the bacteria. The purpose of this project is to determine the factors that limit the efficiency of transfer of foreign genes into *Z. mobilis* and to produce new strains which will be more amenable to genetic engineering which may be used to enhance their fuel ethanol production.

Progress: The previously cloned CcrM-like methylase gene was examined to determine if it exhibited a cell cycle regulation activity in *Z. mobilis* as has been reported in other bacteria. To express the CcrM methylase at a higher than normal level in *Z. mobilis*, the CcrM gene was cloned behind the pBR322 rop gene promoter in the previously described plasmid (pBR-oriV) with a RSF1010 origin of replication. The construct was electroporated into *Z. mobilis* CP4 containing pLOI1844, a helper plasmid with the RSF1010 replication

genes. The additional copies of the CcrM gene caused little if any change in growth rate, but did cause morphological changes in a subpopulation of the cells. The morphologically abnormal cells varied in diameter and were highly elongated, up to 30-fold longer than control cells. The elongated cells contained multiple DAPI-staining, nucleoid regions that were not separated by septa. New constructs with the CcrM gene behind *Z. mobilis* promoters are being prepared to attempt to vary the CcrM gene expression and determine its effect on cell growth rates and cell morphology. To purify and study the properties of the CcrM methylase in vitro, a variety of vectors and hosts were examined to determine the optimal combination for the expression of CcrM in *E. coli*. Of the combinations tested, the best expression of the CcrM methylase was achieved in *E. coli* strain HMS174 with the CcrM gene in the pET24b vector. Fractionation protocols to purify the HIS-tagged CcrM methylase are being examined to determine conditions required to purify the protein in order to study its properties in vitro. The pBR-oriV plasmid with a RSF1010 origin of replication is useful in the transfer of genes into *Zymomonas* if a helper plasmid containing the RSF1010 replication genes is present. A transposon was constructed to integrate the RSF1010 replication genes into the genome of *Zymomonas* and other bacterial species to eliminate the need for a helper plasmid and to improve the general usefulness of pBR-oriV. The promoterless chloramphenicol gene with a synthetic consensus promoter (pSYN) from pLOI204 and the RSF1010 replication genes from pLOI1844 were cloned into an EX::TN pMOD vector (Epicentre). The insert with the transposon mosaic end sequences was PCR amplified, combined with the transposase and transferred into *Z. mobilis* CP4 by electroporation and chloramphenicol-resistant recombinants selected. This transposon, containing the RSF1010 replication genes, can potentially be transferred into a variety of gram-negative bacteria to allow the transfer of genes in pBR-oriV plasmids from one species to another. Two potential restriction endonuclease genes have been cloned from *Z. mobilis*. Inactivation of these genes may greatly enhance the ability to transfer of foreign genes into *Z. mobilis* to convert the organism into a more useful biocatalysts in exploitation of potential renewable energy sources for fuel ethanol production. The experimental approach developed in this study for the enhancement of the genetic manipulation of *Z. mobilis* should provide a general approach to modify and improve the genetics of other organisms that may be useful in generation of energy sources or organic substrates from renewable resources.

Impacts:

Source of Federal Funds: Hatch

Title: STRESS FACTORS OF FARM ANIMALS AND THEIR EFFECTS ON PERFORMANCE

Critical Needs:

National Objectives: 1

Key Themes: early weaning; transportation; beef cattle; calves; environmental stress; livestock management; management systems; immunology; animal nutrition; measurement; performance evaluation; pastures; lolium; body weight; temporal distribution; feedlot cattle; grazing; hemarthria altissima; paspalum notatum; blood samples; puberty; heifers; data collection; carcass quality; production costs; animal growth; *animal health*; *animal production efficiency*

Summary: The majority of all weaned beef calves in Florida are transported immediately upon separation from their dam. This management procedure compounds the stress of transportation. The purpose of this study is to examine the differences in transportation associated stress tolerance of early-weaned beef calves compared to freshly weaned contemporaries. To investigate this, we will compare the performance of early weaned versus normal weaned beef calves upon arrival to a Kansas feed yard. Measures of growth, feed intake, health, and carcass quality will be achieved.

Progress: The effect of early calf weaning on the productivity of beef calves was investigated. Forty crossbred steers (Brahman x English) were weaned at two ages, 1) early weaned (EW; n = 20), and 2) normal weaned (NW; n = 20). Calves were 89 and 300 d of age at the time of EW and NW, respectively. Early weaned calves were kept on-site (University of Florida, Ona), provided supplement (1% BW), and grazed on annual and perennial pastures until NW. Upon NW, all calves were loaded onto a commercial livestock trailer and transported to the North Carolina State University Research Feedlot, Butner (approx. 1200 km). Upon arrival, calves were stratified by BW and randomly allotted to 4 pens per weaning age treatment, such that each weaning treatment had two pens of light and two pens of heavy calves. Individual calf BW and blood samples were collected at weaning, upon arrival to feedlot (d 1; 24-h following weaning), and d 3, 7, 14, 21, and 28 of the receiving period. Individual BW was collected at the start and end of the growing and feedlot periods. Feed intake by pen was measured daily. As an estimate of stress during the receiving period, plasma was harvested from blood samples and analyzed for the acute phase proteins, haptoglobin and ceruloplasmin. Early weaned calves were lighter ($P = 0.03$) at normal weaning than NW calves (221 vs 269 kg; SEM =

10.6). By d 28, BW was similar (242 vs 282 kg for EW and NW calves, respectively; P = 0.12; SEM = 14.1). Feed efficiency was greater for EW than NW calves during both the receiving and growing period (F:G = 0.16 vs. 0.08, and 0.16 vs. 0.14 for EW and NW calves during receiving and growing periods, respectively; SEM =) There tended to be significant (P < 0.10) weaning age x day interactions for each of the APP. Ceruloplasmin concentrations increased in NW, but not EW calves, and peaked on d 7 (27.6 and 34.2 mg/100 mL for EW and NW calves, respectively; P < 0.05). Haptoglobin concentrations increased in both groups and were highest (P < 0.05) in NW calves on d 3 (7.63 vs 14.86 HgHpB/100 mL). No differences in ADG or feed efficiency were detected during the finishing phase; however, overall calf efficiency was greater (P = 0.03) for EW vs. NW calves (0.15 and 0.14, respectively; SEM =). Measures of carcass quality did not differ between treatments. These data suggest that EW calves, which are maintained on-site prior to shipping, are more tolerant to the stressors associated with transportation. This improved tolerance results in improved feed efficiency in the feedlot.

Impacts: These results will allow cattle producers to better optimize calf handling and management during periods of increased production stress. The efforts will likely improve animal health and welfare.

Source of Federal Funds: Hatch

FLA-PLP-03305

Title: COMPARISON OF TWO MANAGEMENT PROGRAMS ON THE GROWTH AND INCIDENCE OF DECLINE (BLIGHT) OF CITRUS

Critical Needs:

National Objectives: 1, 4

Key Themes: #jc95 05; citrus; oranges; fruit trees; blight (citrus); decline (citrus); tree diseases; plant disease control; plant pathology; soil fertility; soil ph; physiological stress; plant nutrition; linear descriptive traits; disease incidence; disease prevalence; disease management; *plant health; nutrient management; soil quality*

Summary: In Florida, Brazil, and other countries, citrus trees are declining at an alarming rate. The presence of a pathogen has not been found despite intensive study for over 100 yrs. To test the hypothesis that citrus decline is a problem of stress; i.e., stress from too much or too little water, improper rates and N-P-K ratios, too much liming, etc.

Progress: The citrus trees in the nutrition experiment were 11.35 yrs. old in November 2001. The trees on the conservative program made considerable recovery from the erroneous

application of high amount of fertilizer with an atypical N-P-K ratio. For the IFAS recommended fertility program, 20 trees had zero yield (all due to decline), five trees had less than 1 box of fruit per tree, and 10 trees had >1 to <2 boxes per tree. For the conservative fertility program, 17 trees had zero yield, four trees had less than one box per tree, and seven trees had >1 to <2 boxes per tree. Overall, the yield from trees on the conservative fertility program had 33% more fruit than trees on the standard program. Thus, the evidence is accumulating that the IFAS recommended fertility program is detrimental to tree health and yield.

Impacts: With the determination that various stresses are the cause of citrus decline, growers can now modify their fertility practices and grove management strategies to reduce stress to their trees. These changes will lead to trees with a longer productive life and with lower input for fertilizer.

Source of Federal Funds: Hatch

FLA-PLP-03336

Title: PHYLOGENETIC RELATIONSHIPS OF PEZIZALES (CUP-FUNGI) AND TUBERALES (TRUFFLES)

Critical Needs:

National Objectives: 1

Key Themes: fungi; phylogeny; pezizales; truffles; discomycetes; mycology; fungus genetics; molecular biology; systematics; ultrastructure; spores; organelles; asci; hyphae; spores; pores; rna r; microbiology; *plant genomics, plant germplasm*

Summary: Continue field work to obtain cup-fungi and truffles necessary for ultrastructural and molecular studies; examine the ultrastructure of spores, septal pores and other apothecial organelles, and expand molecular studies of taxa discovered in these studies. Transmission and scanning electron microscopy will be applied to the study of septal pore organelles in asci, ascogenous hyphae, and excipular tissues of each species. When available, the ontogeny of spore wall development will be examined ultrastructurally.

Progress: This represents the final report on this project that was initiated several years ago and has been maintained, with modifications, until the present. This project has supported 5 MS, 6 PhD, and 4 postdoctoral students in studies of phylogenetic relationships in epigeous (cup-fungi) and hypogeous (truffles) Pezizales. Seven book chapters, 1 monograph, and 70 refereed publications have resulted. We have determined that the ultrastructural features of septa in apothecial tissues are very conservative characters that enable us to determine natural families and orders of Pezizales. These data correlate completely with the results of

molecular studies. During the current year we completed and published data on spore wall development in three species of *Tuber*, showing that two species were taxonomically aligned with *Trichothecium* and one with the *Morchellaceae*.

Impacts: Truffles have been shown to be polyphyletic, have evolved from different groups of epigeous *Pezizales* (cup-fungi). Ultrastructural aspects of spore wall development is useful in determining the proper alignment of various taxa.

Source of Federal Funds: Hatch

FLA-PLP-03524

Title: IDENTIFICATION, MANAGEMENT, AND CONTROL OF VIRUSES INFECTING ORNAMENTAL AND RELATED CROPS

Critical Needs:

National Objectives: 1

Key Themes: ornamental plants; plant diseases; virus diseases (plants); foliage plants; orchidaceae; plant disease control; planting stock; plant pathogens; pathogen identification; virus identification; virus characterization; virus detection; cost effectiveness; aroids; gladiolus; liliaceae; *ornamental/green agriculture, plant health*

Summary: To identify and characterize important viral pathogens, develop effective means for detecting them, and to implement commercially feasible strategies for their control.

Progress: A *Caladium* isolate of DsMV was cloned as cDNA from genomic RNA extracted from purified virions, and the sequence of the 3 prime-terminal 3158 nucleotides was determined. Phylogenetic alignment of the CP sequences indicated that DsMV is closely related to members of the bean common mosaic Potyvirus subgroup. The CP gene was amplified by polymerase chain reaction from plasmid DNA and subcloned into an expression vector. The recombinant CP thus obtained in *E. coli* was used as an immunogen for antiserum production. Direct tissue blot (DTB) and ELISA techniques were used to ascertain distribution of dasheen mosaic potyvirus (DsMV) in certain varieties of *Caladium hortulanum* plants. DsMV, detected in tubers of all tested, was not found in all petioles or leaves. Similar studies with lily symptomless carlavirus revealed much higher titers in lily corm tissues than in above ground plant parts. DTB techniques were applied for the detection of cucumber mosaic virus (CMV) in gladiolus corms. While positive antibody-virus reactions were observed in all CMV-infected tissue, none were observed in blots of healthy tissue. Corm tissue was more reliable than leaf tissue for detecting this virus. Cymbidium mosaic potyvirus and odontoglossum ringspot tobamovirus was detected in all 18 orchid

Comment [RM1]: This is actually the "approach" field, but it seems to suit

collections surveyed in 1998-1999. Cymbidium ringspot tomosvirus, however, was not detected in any of the 420 plants tested. The presence of lily X potexvirus in the United States was confirmed.

Impacts: Obtaining viable DsMV antiserum will facilitate efforts to detect this virus in various commercially grown aroids, especially foliage aroids, such as dieffenbachia and caladium. Direct tissue blot studies involving viruses of aroids, lilies, and gladiolus provide valuable information regarding which tissues to index when attempting to determine whether or not plants are infected with any of the aforementioned viruses. Repeated efforts to find any orchids, wild or cultivated, infected with cymbidium ringspot tomosvirus failed. Either this virus is extremely rare in orchids or, contrary to its name, it does not infect orchids.

Source of Federal Funds: Hatch

FLA-PLP-03588

Title: SANITATION IN POST HARVEST HANDLING PRACTICES FOR FRESH FRUITS AND VEGETABLES

Critical Needs:

National Objectives: 1, 2

Key Themes: fruit; vegetables; food; fresh produce; post harvest losses; handling systems; *food handling*; sanitation; *food safety*; packinghouses; food packing; disease control; *food quality*; quality maintenance; chlorination; tomatoes; bacterial contamination; washing; food microbiology; cleaning agents; *plant production efficiency*; *foodborne illness*; *foodborne pathogen protection*

Summary: Postharvest pathogens accumulate at sites where fruits and vegetables are packaged. Water used to wash or handle freshly harvested fruits and vegetables may contaminate them with harmful microbes. The project explores ways to prevent the accumulation of pathogens at packinghouses. Various methods to sanitize wash or handling water will be explored.

Progress: Tests with a simulated, scale model flume confirm that chlorinated water (150 to 200 ppm, pH 6.0 to 7.0, 24 C) will prevent cross contamination (movement of bacterial cells or fungal spores from a source to potential infection courts such as wounds). Hydrogen peroxide (27 ppm), peroxyacetic acid (80 ppm) and solutions of chlorine dioxide (5 ppm) did not prevent cross contamination. Gas phase chlorine dioxide was more effective in preventing decay development at inoculated wounds than were 30-sec washes in chlorinated water (100 ppm, pH 6.5). The cardboard of standard tomato boxes was a significant sink in gas phase chlorine dioxide treatments.

Impacts: Water chlorination remains the best way to achieve sanitation in water handling systems in tomato packinghouses. The proposed alternatives to chlorine were not effective.
Source of Federal Funds: Hatch

FLA-PLP-03623

Title: BIOLOGY AND MANAGEMENT OF DISEASES AFFECTING VEGETABLE CROPS IN NORTH FLORIDA

Critical Needs:

National Objectives: 1, 4

Key Themes: plant pathology; vegetables; plant disease control; plant disease resistance; plant genetics; late blight; nature of resistance; fungicides; bacterial wilt; cultural control (diseases); green manures; cover crops; epidemiology; fungus diseases (plants); corky ringspot; phytophthora infestans; early blight; potatoes; tomatoes

Summary: Plant diseases cause losses in crop production. This project develops control measures for plant diseases.

Progress: No new research was performed during this time period.

Impacts: Data in publications will simplify assessment of late blight resistance in potato and in managing late blight in Florida potato and tomato crops.

Source of Federal Funds: Hatch

FLA-PLP-03925

Title: BIOLOGICAL CONTROL OF SOILBORNE PLANT PATHOGENS FOR SUSTAINABLE AGRICULTURE

Critical Needs:

National Objectives: 1, 4

Key Themes: soil borne diseases; vegetables; ornamentals; bacillus; streptomyces; pseudomonas; trichoderma; methyl bromide; fungicides; biological control (diseases); plant disease control; sustainable agriculture; integrated pest management; plant pathology; peppers; optimization; performance evaluation; application methods; cropping systems; environmental influence; cultivars; field studies; disease incidence; disease severity; crop yields; crop quality; application timing; application rate

Summary: Soilborne plant pathogens cause serious economic losses in the United States. Several soilborne pathogens are difficult to control due to lack of effective products. Development of biological control agents may provide some solutions. This research aims to test and develop biological control agents for

some vegetables and ornamentals grown in Florida The purpose of this project is to develop suitable biological controls to manage some soilborne plant pathogens of vegetables and ornamentals

Progress: 2002/10 TO 2003/10

None at this time

Impacts: 2002/10 TO 2003/10

A project on the effect of controlling certain weeds that harbor some deleterious soilborne pathogens will be developed. .

Source of Federal Funds: Hatch

FLA-PLP-03934

Title: BIOLOGICAL CONTROL OF ARTHROPOD PESTS AND WEEDS

Critical Needs:

National Objectives: 1, 4

Key Themes: *biological control* (weeds); weed control; fungus diseases (plants); rust; plant pathogens; herbicides; uredo eichhorniae; eichhornia crassipes; schinus terebinthifolius; solanum; natural enemies; performance evaluation; sustainable agriculture; exotic species; native species; non target organisms; quantitative analysis; habitat manipulation; life cycle; host range; field testing; laboratory tests; quarantines; performance testing; mass production; production systems; systems development; *invasive species*

Summary: Exotic weeds threaten Florida's ecosystems and cause economic losses to the state's agriculture, recreation industries, and land and water resources. Certain plant pathogens can be used for a safe, effective, and natural form of weed control. This project aims to develop such a biological control method to manage some of the exotic weeds in Florida.

Progress: *Uredo eichhorniae* Gonz.-Fragoso & Ciferri, a pathogen of waterhyacinth (*Eichhornia crassipes* [Mart.] Solms, Pontederiaceae), was described in 1927 from the Dominican Republic, but presently it appears to have a restricted, patchy distribution in parts of Argentina and southeastern Brazil. Rust fungi attacking plants in the Pontederiaceae represent a small group of morphologically similar members whose taxonomic relationships are unknown. In addition to *Uredo eichhorniae*, this group consists of *Uromyces pontederiae* Gerard on *Pontederia cordata* L. (= *P. cordata* L. and *P. lanceolata* Nutt.) and *Eichhornia azurea* Kunth, *Uromyces heterantherae* Syd. on *Heteranthera reniformis* R. & P., and an undescribed rust on *Pontederia rotundifolia* L.f. (= *Reussia rotundifolia* [L.f.] A.Cast.). *Uromyces pontederiae* is distributed in North and South Americas on *P. cordata*, whereas *Uredo eichhorniae*, the *E. azurea* form of *Uromyces pontederiae*, *Uromyces heterantherae*, and the undescribed

rust appear to be restricted to a region bounded by 20o S and 40o S. To understand the host range and taxonomic relationships of these fungi, repeated surveys were done in southeastern Brazil and the northeast of central Argentina and collections of rusts and host plants were made from several sites. The plants were cultured in an outdoor aquatic plant nursery in Jaboticabal, Brazil. The rusts were maintained on their respective hosts and uredospores collected from these plants were used in cross-inoculation trials. The results indicated that the rust accessions from *E. crassipes*, *E. azurea*, and *P. cordata* were specific to their respective hosts. These observations provide the first experimental proof that these fungi are distinct, host-specialized species. This information should enable redescription of the rust species attacking plants in the Pontederiaceae.

Impacts: Waterhyacinth continues to pose problems in the southeastern United States. This project has made progress in characterizing the life cycle of a potential biological control agent, *Uredo eichhorniae*.

Source of Federal Funds: Hatch

FLA-PLP-04031

Title: *DEVELOPMENT OF PLANT PATHOGENS AS BIOHERBICIDES FOR WEED CONTROL*

Critical Needs:

National Objectives: 1, 4

Key Themes: amino acids; bacterial diseases (plants); biological control (weeds); fungus diseases (plants); grasses; methyl bromide; fermentation; formulations; stress tolerance; weed control; cyperus; pueraria; portulaca oleracea; amaranthus; euphorbiaceae; product development; plant pathogens; integrated pest management; epidemiology; product evaluation; phomopsis; pseudomonas syringae; myrothecium; asteraceae; field trials; alternatives; virulence; prototypes; cooperative research

Summary: The use of plant pathogens as bioherbicides has been a feasible method of weed control in several cases. Two registered bioherbicides, Collego and DeVine, are sold in the United States. Development and use of bioherbicides can help to diversify weed control options, supplement chemical herbicides, and provide an alternative to methyl bromide. This project attempts to develop several bioherbicide agents shown to be effective in small-scale and noncommercial trials.

Progress: A bell pepper crop (*Capsicum annuum* 'Camelot') infested with 60 purple nutsedge plants/m² was sprayed with the potential mycoherbicide *Dactylaria higginsii* (1 x 10⁶ conidia/ml) in single applications at 0, 7, 14, 21, or 28 days after nutsedge

emergence (DAE) or repeated applications (8, 8+18 DAE, or 8+18+25 DAE), in order to determine the effect of the treatments on bell pepper yield and grade. Unchecked nutsedge interference resulted in about 70% yield loss, as compared to weed-free pepper. Purple nutsedge interference affected Fancy (extra-large) fruit yield more than US1 (large) and US2 (medium) fruit yield. Bell pepper yield loss was about 50% when *D. higginsii* was applied once at 7 DAE, and higher than 60% when *D. higginsii* was sprayed once later than 7 DAE. Application of *D. higginsii* two times (8+18 DAE) and three times (8+18+25 DAE) reduced yield loss to 31% and 24%, respectively, as compared to weed-free pepper. Pigweeds (*Amaranthus* spp.) are among the most abundant weeds occurring in vegetable crops throughout the world. Biological suppression of pigweeds is desirable in organic and/or conventional production systems in which selective chemical herbicides are lacking, limited or not efficacious. In several field experiments, the fungus *Phomopsis amaranthicola* was evaluated as a post-emergence bioherbicide to control *Amaranthus lividus* in bell pepper (*C. annuum*), and *A. dubius* in Caribbean-bonnet pepper (*C. frutescens*), and eggplant (*S. melongena*). In all experiments, the fungus was sprayed at run-off volume on the weed/crop canopy at a rate of 1.0-1.5 million conidia per ml. Pigweeds that survived inoculation with *P. amaranthicola* were allowed to interfere with the crops season-long. In eggplant and Caribbean-bonnet pepper, spraying *P. amaranthicola* 10 days after weed emergence (DAE) caused about 30% mortality in different population densities of *A. dubius*, and resulted in yield loss reductions of about 25% in pepper and 16% in eggplant, as compared to the untreated weedy crops. In the bell pepper experiments, the results were similar when using a *Psyllium mucilloid* or an agricultural oil (PCC-588) as a surfactant in the spraying mix. In bell pepper, two applications of *P. amaranthicola* (10 and 20 DAE) were more effective than one application (10, 20, 30, or 40 DAE) in suppressing *A. lividus* growth and interference with the crop. When *P. amaranthicola* was applied more than twice, improvements in pigweed control and pepper yield were negligible. Maximum weed mortality, growth suppression, and yield-loss reduction in these crops were obtained with 1 or 2 early applications of the fungus (10 DAE in eggplant and Caribbean-bonnet pepper and 10 and 20 DAE in bell pepper). Further enhancement in the efficacy of *P. amaranthicola* as a post-emergence bioherbicide may be possible through the use of improved formulations.

Impacts: Two plant pathogens are expected to be developed as bioherbicides to control pigweeds and purple nutsedge, which cause serious economic losses in various crops.

Source of Federal Funds: Hatch

FLA-QUN-03609

Title: INTRODUCTION AND EVALUATION OF ORNAMENTAL PLANTS

Critical Needs:

National Objectives:1

Key Themes: ornamental plants; floriculture; woody plants; landscape plants; native plants; wild flowers; native grasses; annual plants; perennial plants; foliage plants; screening systems; plant breeding; plant genetics; plant introductions; plant evaluation; new varieties; information collection; information dissemination; *plant production efficiency; plant germplasm; agricultural profitability*

Summary: Use of herbaceous native plants is increasing; however, there is little information about the adaptability of these species to landscape or roadside situations. Appropriate seed sources are lacking. Florida ecotypes of herbaceous native plants will be evaluated (growth and physiology) under landscape and roadside conditions. Seed of Florida ecotypes of herbaceous native plants will be increased.

Progress: NORCINI-In general, Florida ecotypes of native wildflowers are more sustainable than plants derived from nonFlorida seed sources. Statewide evaluation of several southeastern U.S. accessions of *Trifolium reflexum* showed that this species perform best in the Florida panhandle. *Muhlenbergia capillaris* and *Tridens flavus* were the top performers in a 3-yr evaluation of several native and nonnative ornamental grown under low input landscape conditions in northern Florida. Imazapic is least phytotoxic to native wildflowers, regardless of seed source, when applied prior to wildflower seed germination. KNOX- New multi-site evaluation plantings were established for 10 *Nandina domestica* taxa, 20 *Camellia* spp. taxa, 25 taxa of ornamental grasses and 32 new taxa of *Lagerstroemia* spp. Ongoing, long-term evaluation of *Lagerstroemia* cultivars is indicating those cultivars that perform well in north Florida. To date, this information has been disseminated through conferences and extension outlets. Evaluation of Magnoliaceae taxa has identified superior cultivars for USDA Zone 8 (Gulf Coast). Two of these taxa have been distributed through USDA SERA-IEG 27 for evaluation throughout the southeast U.S.

Impacts: NORCINI-Native wildflowers plantings derived from seed collected from native Florida populations not only should be less costly to maintain over the long term because they are sustainable but also helps to preserve natural resources and enhance roadside and natural habitats. KNOX- Plantings of *Lagerstroemia* cultivars, large-flowered deciduous *Magnolia* cultivars and other trees and shrubs were established for long-term evaluation of growth, flowering, pest resistance and other ornamental characteristics. Results of these evaluations are helping consumers and the nursery and landscape industries select the best species and cultivars for production and landscape use in Florida.

Source of Federal Funds: Hatch

FLA-QUN-03854

Title: SELECTION AND ADAPTATION OF GRASS AND LEGUME SPECIES FOR FORAGE PRODUCTION IN THE SOUTHERN COASTAL PLAIN AND PENINSULAR FLORIDA

Critical Needs:

National Objectives: 1

Key Themes: photoperiod; forage; setaria; paspalum; paspalum notatum; plant adaptation; selection systems; forage grasses; regional research; forage production; coastal plains; plant genetics; *plant germplasm*; plant evaluation; plant breeding; plant improvement; forage yields; plant pest resistance; transgenic plants; plant response; seasonal growth; plant growth; plant accessions; festuca arundinacea; endophytes; forage persistence; clover; lolium; soybeans; forage legumes; grazing; *plant genomics*; *added value to new and old agricultural products*;

Summary: The forage production in the southern Coastal Plain and Peninsular Florida is severely limited in the fall of the year. Efforts through plant breeding to develop varieties to fill this void would be advantageous to livestock production in this region. The purpose of this project is to integrate research with a number of plant breeding programs in the southeastern U.S. to cooperatively address fall season forage production constraints. Concentration on breeding for physiological traits, specifically photoperiod, will be the major focus of this project.

Progress: Photoperiod insensitive, cold adapted (PICA) Cycle 4 (diploid, 2X) forage and turf populations were evaluated at the Range Cattle REC, Ona, at the NFREC, Marianna, and at the CPES, Tifton, GA. Ramets have been selected from these populations for resistance to fungal disease and improved forage or turfgrass characteristics and are being polycrossed in the greenhouse at Marianna during winter 2003-2004 to produce PICA Cycle 5. Plans for 2004 include testing the yield and survival of Cycle 5 plants in 2004 in TX, LA, FL, and GA. New sexual polyploidy (tetraploid, 4x) bahiagrass plants were developed by using colchicine, trifluralin, and oryzalin to double the chromosome numbers of diploid bahiagrass in Gainesville. These new genotypes were evaluated for several morphological features. Crosses have been made with 50 verified tetraploid plants (selected from this doubled-diploid material) with Argentine, Paraguay 22, Tifton 7 and Claudina bahiagrass at the NFREC-Quincy during 2003. Research to evaluate leaf tissue reaction to frost and freezing in bahiagrass has identified leaf anatomical structures possibly involved in tolerance. Crosses were made between freeze resistance and susceptible bahiagrass genotypes to evaluate the inheritance of this characteristic. Efforts to continue to monitor mole cricket pests of bahiagrass continue. Several new mole cricket pit-fall traps were installed in Escambia and in Madison counties in Florida in 2003 to increase sites for monitoring the mole cricket distribution in the Florida Panhandle. This is part of a current research project to introduce *Steinernema scapterisci*, a biological control nematode for mole cricket, into bahiagrass pastures in north Florida. New Paspalum species were evaluated for winter survival, frost tolerance, forage yield, forage quality, and seed production at Marianna, Ona, Brooksville, and Live Oak, FL. Three bahiagrass and two Paspalum nicorae plant introductions have performed well at most locations. Further evaluation of these introductions will be conducted to determine their usefulness for forage or turf. Experimental lines of rye, ryegrass, wheat, and oats were tested at the NFREC-Marianna. Results from these yield trials were reported in NFREC research report format and on the web at the Georgia Variety Testing site (<http://www.griffin.peachnet.edu/swvt/>). One oat, two triticale, and two rye cultivars were released by FAES in 2003. Three breeders seed increases of forage soybean experimental lines were grown and harvested in cooperation with the Florida Seed Producers Inc. during summer 2003. A preliminary study evaluated annual peanuts as a forage crop for cattle. Initial composition of the peanut, including crude protein, ADF, NDF, and lignin was determined, along with yield. The peanuts initially were an excellent forage for grazing, but the lack of adequate regrowth resulted in poor animal performance late in the grazing period. A 2-year study evaluated prepared seedbed vs overseeding winter forages on bahiagrass pasture. The results indicate that

under dryland conditions, cultivation method may impact availability of cool season forage in the southern Coastal Plain.

Impacts: This project fosters forage plant research and breeding improvement for the southern Coastal Plain and Peninsular Florida. Collaborative efforts will increase profitability of livestock enterprises in the region through new research on improving forage management and releases of new cultivars. Cultivars and germplasm resulting from this collaborative work, released in 2003, include FL-SYNT tetraploid spring rye, 2003 (germplasm). R.D. Barnett, A.R. Blount, and P.L. Pfahler. FL91142-A19 triticale, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland. FL94128-Y1-A8 triticale, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland. FLNF94 Sel rye, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland. FLPL97P20 rye, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland. FL9708-P37 oat, 2003 (cultivar). R.D. Barnett, A.R. Blount, P.L. Pfahler, J.W. Johnson, B.M. Cunfer, G.D. Buntin, and D. Bland.

Source of Federal Funds: Hatch

FLA-QUN-03934

Title: *BIOLOGICAL CONTROL OF ARTHROPOD PESTS AND WEEDS*

Critical Needs:

National Objectives: 4

Key Themes: *biological control* (insects); biological control (weeds); weed control; insect control; natural enemies; harmonia; coccinellidae; performance evaluation; insect collection; invasive species; exotic species; native species; *sustainable agriculture*; environmental impact; cooperative research; quantitative analysis; non target organisms; habitat manipulation; insect rearing; insect release; field studies; data collection; data analysis; insect traps; overwintering; performance testing; greenhouse production; *integrated pest management*

Summary: Control of pests in agricultural crops is imperative. Alternative methods to use of chemical pesticides are direly needed. This project evaluates the impact and efficacy of an exotic biological control agent.

Progress: *Harmonia axyridis*, the multicolored Asian lady beetle, is an exotic predatory insect that has become widely distributed in the U.S. It is an important natural enemy of aphids, mites, scales and other arthropod pests. *H. axyridis* has become the dominant predator in many crop and landscape systems. However, in the fall and winter this beetle seeks overwintering shelters where it aggregates, often in large numbers, in human dwellings. As a result, *H. axyridis* becomes a nuisance pest as well as a health hazard due to allergic reactions in humans. *H. axyridis* are attracted to and enter buildings through cracks and crevices. Besides sealing the entry points and applying insecticides to prevent the beetles from entering the building, little else is currently effective to manage the problem. During the overwintering flights, *H. axyridis* orient to structures in the landscape that provide contrast to the background. Light colored buildings are often used repeatedly by the beetles, but any structure that provides contrast may be used. The goal of this

project is to determine and exploit the behavior of *H. axyridis* during overwintering flights in an effort to trap the beetles in large numbers. Research of this type is extremely difficult because the overwintering flights occur at different times from year to year and place to place, take place for only a few days and the number of beetles responding varies dramatically. Traps with a broad range of characteristics such as size, color, texture, orientation and other factors have been evaluated. Trap catch has improved from capture rates of 10-15% of responding beetles to 35-50%. The latest experiments incorporate new modifications of the traps to further improve the trap capture rate.

Impacts: Capturing *H. axyridis* in large numbers as they seek overwintering shelters would have several significant impacts. Removal of *H. axyridis* from entering buildings would mitigate the problem for homeowners. In addition, overwintering beetles may be stored for 12-14 months with little mortality. Due to their value as predators, these beetles could then be used for biological control purposes in greenhouses and in other venues.

Source of Federal Funds: Hatch

FLA-QUN-04012

Title: *BIOLOGY AND MANAGEMENT OF ARTHROPOD PESTS OF VEGETABLES*

Critical Needs:

National Objectives: 4

Key Themes: *biological control* (insects); insect control; tomatoes; peppers; cabbage; melons; cultural control (insects); *integrated pest management*; insecticides; insect pests; economic thresholds; insect biology; insect ecology; vegetables; estimation; monitoring; insect population; crop production; environmental impact; risk management; plant disease control; disease transmission; economic analysis; comparative analysis; educational materials; extension; information dissemination

Summary: Insect and the diseases they transmit are serious problems on vegetable crops. Growers rely on high-risk insecticides for controlling these pests, because sound economic thresholds and reduced-risk tactics with sound economic and environmental benefits have not been developed. This project examines the environmental and economic benefits of reduced-risk tactics for managing these pests. Additional studies evaluate the ecology of pests and the impacts of their damage to crops.

Progress: A randomized complete block experiment was conducted to evaluate the benefits of UV-reflective mulch and reduced-risk insecticides in reducing *Bemisia argentifolii* populations in tomato and to determine the impacts of each tactic on natural enemy populations. Populations of the pest were greatly reduced by the UV-reflective mulch and the insecticides. Parasitoids provided little natural control, parasitizing less than one percent of the nymphs and pupae in all treatments. The entomopathogen *Paecilomyces* primarily infected populations of adults. Little infection was noted in the nymphs. Although populations of the pest greatly exceeded the recommended thresholds, effects on fruit quality were not significantly affected by reductions in populations by the UV-reflective mulch or insecticide treatments. *Thripinema fuscum* is an

important natural enemy of *Frankliniella fusca*. Laboratory experiments were conducted to determine the reproductive biology of *T. fuscum* as affected by gender and stage of development of the host and to determine the effects of parasitism on host longevity, fecundity, and mortality. The adult females of *F. fusca* were the most readily parasitized in the laboratory experiments followed by the second instars, the first instars, and the adult males. One generation of *T. fuscum* developed within the parasitized larvae and adults, with the males and females emerging as fourth-stage juveniles from the host only during the adult stage. Parasitism did not cause mortality of the host. Parasitism significantly affected male longevity but not the longevity of females. The adult females that were parasitized as first or second instars did not lay eggs, and the adult females stopped laying eggs within three days of being parasitized. The female to male sex ratio of *T. fuscum* emerging from parasitized male and female *F. fusca* was 21.6 and 18.3 to 1, respectively. Significantly more *T. fuscum* emerged from female hosts than from male hosts. Significantly more emerged from hosts parasitized as larvae compared with hosts parasitized as adults, but the intrinsic capacity of increase of *T. fuscum* was greater when parasitizing the adult males and females. The intrinsic capacity of increase of *T. fuscum* is greater than the intrinsic capacity of increase of *F. fusca*, and this explains its ability to suppress *F. fusca* populations.

Impacts: These tactics are highly efficacious and they are being implemented by growers as economical and efficacious against vegetable insect pests and the viruses they vector.

Source of Federal Funds: Hatch

FLA-SWS-03596

Title: ANIMAL MANURE AND WASTE UTILIZATION, TREATMENT, AND NUISANCE AVOIDANCE FOR A SUSTAINABLE AGRICULTURE

Critical Needs:

National Objectives:4

Key Themes: waste; animal waste; waste treatment; manure management; *sustainable agriculture*; engineering; anaerobic digestion; dairy farms; waste water; water treatment; optimum practices; odor control; effluents; biological treatment; microbiology; methanogenesis; biogas; films; *agricultural waste management*;

Summary: Flushed dairy manure is a potential source of odor nuisance concerns and new technology must be applied for treating this waste in an environmentally sustainable and acceptable manner. The purpose of this project is to demonstrate the feasibility of anaerobic digestion, using a fixed-film reactor, for treating flushed dairy manure, controlling manure odors and generating an energy by-product in the process.

Progress: The objective of this project is to demonstrate the use of fixed-film anaerobic digester technology to simultaneously treat flushed dairy manure (FDM) and produce energy in the form of methane gas. A full-scale digester facility, tailored to meet the needs of the typical Florida dairy farm, has been constructed at the IFAS Dairy Research Unit (DRU) in Hague, Florida. The complete digester system consists of a 100,000-gallon, fixed-roof digester tank; a biogas collection and flare system; an influent feed pump (powered by an air compressor); a recycle pump; a desludging pump; a liquid level control structure; and a mechanical building for housing

pump controls and biogas utilization equipment. The full-scale fixed-film anaerobic digester has been operated continuously since May, 2000, to treat FDM. The continuously fed digester is operated in upflow mode at ambient temperature (25oC-31oC) and a 3-day hydraulic retention time, producing 6,000 cu.ft. of biogas/day at 80% methane/20% carbon dioxide. Soluble COD is reduced by 60-70%. Initially, the biogas produced from the digester was flared to reduce odors and methane emissions. A gas-fired water heater was installed in the mechanical building and operated on a slipstream of the biogas in order to evaluate the potential corrosiveness of the digester biogas. Following successful operation of the water heater, the biogas line was extended to the milking parlor and the water heater was relocated to provide hot water for direct use in the milking parlor. After over fifteen months of continuous operation, the digester was opened in order to retrieve media samples for biofilm studies, which are currently ongoing. Biofilm formation was fairly uniform on all media sections sampled, averaging 2 mm in depth. Potential impacts on water quality and public health have heightened concern about management of livestock wastes. With the advent of recycle flush systems for water conservation, the effect of wastewater recycling on animal health is also a concern. Anaerobic digestion provides a means to reduce pathogenic and indicator microorganisms in animal wastes. Therefore, we investigated microbial indicator and pathogen removal from FDM using the full-scale fixed-film anaerobic digester. At steady-state operation, an average 84% reduction of total coliforms, 86% reduction of fecal coliforms, 83% reduction of fecal Streptococci, 72% reduction of Enterococci, 89% reduction of Staphylococcus aureus, and 75% reduction of Salmonella spp. were achieved. An average 90% reduction of somatic bacteriophages and a 78% reduction of male-specific bacteriophages were also attained. These reductions may be due to the high density of biofilm organisms resulting in microbial competition for available substrates within the digester. Also, the digester operates at a sub-optimum temperature for the bacterial indicators and pathogens to proliferate and, as the concentration of soluble organic matter (represented by soluble COD) decreases, the population density of bacterial indicators and pathogens is reduced.

Impacts: Anaerobic digestion under controlled conditions, as in a fixed-film reactor, has many practical advantages for animal feeding operations. This holistic manure treatment system not only stabilizes the wastewater, but also produces energy, controls odors, reduces pathogens, minimizes environmental impact from waste emissions, and maximizes fertilizer and water recovery for reuse. The fixed-film anaerobic digester is a model for the Florida dairy industry.

Source of Federal Funds: Hatch

FLA-SWS-03820

Title: *PEDOLOGICAL RESEARCH IN FLORIDA*

Critical Needs:

National Objectives: 4

Key Themes: soil classification; soil genesis; soil surveys; remote sensing; geology; soil properties; spatial distribution; vegetation; hydrology; stratigraphy; landscapes; internet; field studies; laboratory tests; soil taxonomy; physical properties; chemical properties; soil mineralogy; urban areas; waste disposal; information dissemination

Summary: Soil is a basic, nonrenewable resource of utmost importance in the world. This natural resource is particularly important in Florida because of the competition between agricultural and urban uses

for soil. Therefore, it is important to conduct field and laboratory investigations that allows for us to interpret the associations among soil patterns, distributions, properties, and behavior of soils as a function of vegetation, hydrology, stratigraphy, and landscape position for basic and applied inquiries.

Progress: There are two main research project both involving the study of subaqueous soils. 1) Methodology to Determine the Attributes of Subaqueous Soils as Related to Existing and Potential Submerged Aquatic Vegetation. The objectives are: Map submerged aquatic vegetation (SAV): The 2001 aerial photography provides an excellent base map at the 1:24,000 scale. Based on photo tone and ground truthing, polygons are being digitized. These polygons will be populated with ground cover attributes such as SAV species, percent cover, etc. Quantify soil attributes throughout various tides/seasons: Some soil properties are expected to change with seasons such as pH, temperature, total P and possibly with tidal fluctuations while other properties are expected to remain constant such as particle size and percent OM. Develop several classes of subaqueous soils that reflect soil properties that are the least temporal: Classes based on temporally unstable properties are useless. After determining which soil properties are temporally stable, we will focus on interpreting the range and variability of those properties so that useful classes of soil can be created. Develop a methodology for mapping subaqueous soils: Together, the maps and descriptions of map units along with interpretations of those map units with respect to land use will comprise the soil survey. The tasks will be summarized into a guide for mapping subaqueous soils. Already we have determined a preferred method of sampling deep soils for the purpose of describing soils. We are refining our sampling method for retrieving soils to be sent to the lab for physical and chemical analysis. 2) Biogeochemical Characteristics of Subaqueous Soils as Related to Aquatic Vegetation in Three Gulf Coast Rivers. The research is designed to cross the terrestrial-aquatic interface in order to confirm established hypotheses and to better understand the biogeochemical cycling within the river systems. Overall, the purpose of this proposed research is to complement the recently renewed vegetative study by quantifying the subaqueous soils and their biogeochemical role in the Homosassa, Weeki Wachee, and Chassahowitzka Rivers. A need for information crossing the terrestrial-aquatic interface has required the development of innovative sampling methodologies designed in order to understand the inherent complexities of surface-subsurface interactions. As a result of this investigation, information will be acquired as to: 1) the physical, chemical, and biological properties of subaqueous soils in these rivers, and 2) the association between soil physical, chemical, and biological properties and the abundance and distribution of submerged aquatic vegetation in the Homosassa, Weeki Wachee, and Chassahowitzka Rivers, and 3) the role of hydrology in

connecting the surface and subsurface environments and the ecological significance and consequences of their interaction.

Impacts: Submerged Aquatic Vegetation (SAV) is among the most productive ecosystems in the world. In saline areas SAV includes both true seagrasses and freshwater angiosperms in lower salinity zones of estuaries. They perform irreplaceable ecological functions that include food and shelter for commercial, recreational and ecologically important organisms, chemical cycling, and physical modifications of the water column and sediments. Due to their ecological and commercial importance, SAV communities are provided significant legal protection and impacts to these communities are highly regulated. Understanding the environmental conditions that influence SAV establishment, survival and proliferation are paramount to success. Substantial efforts in recent years have focused on the affects of water quality on SAV establishment and light attenuation on depth distribution. Another environmental variable may be substrate characteristics due to the fact SAV species are rooted. In 1999 the USDA-Natural Resources Conservation Service changed the definition of soil. Now sediments that are below 2.5m or less of water and have pedological features are called subaqueous soils. Therefore, near-coast marine sediments are now subaqueous soils, and their properties could have an impact on the type and distribution of SAV. Thus, an opportunity exists where newly defined soils within the coastal environment may provide a significant resource similar to our understanding of SAV dynamics as well as attributes and functionality of other near shore marine habitat.

Source of Federal Funds: Hatch

FLA-SWS-03834

Title: *CHEMISTRY AND BIOAVAILABILITY OF WASTE CONSTITUENTS IN SOILS*

Critical Needs:

National Objectives: 1

Key Themes: soil chemistry; soil pollution; waste management; nutrient uptake (plants); nutrient transport; nutrient availability; water quality; phosphorus; sludge; trace elements; soil plant nutrient relations; toxicology; forage production; pollution control; soil amendments; soil properties; soil physics; soil mineralogy; manures; soil characterization; molybdenum

Summary: Certain agricultural practices contribute to the problem of phosphorus in water. This project examines the relative availability of residuals-borne and fertilizer- nutrients.

Progress: A manuscript quantifying the relative phytoavailability of biosolids-P (compared to fertilizer-P) was submitted and approved for publication. Efforts to field-validate the greenhouse data described in the manuscript have, so far, been thwarted by delays

in a major field study. The field study is finally underway and should generate data in 2004. Simulated rainfall studies confirm limited biosolids-P runoff, and confirm the need to adjust P Index determinations for differences in biosolids-P solubility.

Impacts: Land application of biosolids and manure at rates based on N typically apply (total) P far in excess of crop needs, so P accumulates in soils and represents potential sources of water contamination (eutrophication). Not all total P in waste sources is equally soluble or labile. This project evaluates biosolids- and manure-P solubility, bioavailability, and susceptibility to runoff and, thus, provides information needed to wisely recycle the wastes without endangering the environment.

Source of Federal Funds: Hatch

FLA-SWS-03897

Title: SOIL MICROBIAL TAXONOMIC AND FUNCTIONAL DIVERSITY AS AFFECTED BY LAND USE AND MANAGEMENT

Critical Needs:

National Objectives: 4

Key Themes: soil microbiology; soil bacteria; soil fungi; microbial ecology; species diversity; communities (ecology); community structure; rhizosphere; mycorrhizae; arbuscular (fungi); reclamation; functional analysis; soil contamination; bioremediation; nutrient availability; taxonomy; disturbed areas; urban areas; polyaromatic hydrocarbons; bacterial genetics; fungus genetics; glomalin; *land use; soil quality*;

Summary: Biodiversity is crucial to ecosystem processes, including the maintenance of fertile soils and the control of nutrient cycles. It is unclear how management practices affect biodiversity and ecosystem structure. We determine how rhizosphere-enhanced bioremediation of organic contaminants affects biodiversity and soil community structure. We also determine how disturbed lands and urban landscapes affect bacterial and mycorrhizal community structure.

Progress: ARSENIC UPTAKE ENHANCEMENT VIA MYCORRHIZAE Directly related to plant nutritional needs, mycorrhizae are important for arsenic hyperaccumulator. Mycorrhizae have a well-documented role in increasing plant uptake of P and other poorly mobile elements and are recognized as important components of bioremediation strategies for heavy metals. Mycorrhizal symbioses are the best examples of compatibility between plants and microorganisms; however, we still have a poor understanding of the interactive plant and fungal factors that contribute to these associations. Generally, ferns are known to be colonized by arbuscular mycorrhizal fungi. We assume that mycorrhizal association enhances arsenic uptake by Brake ferns. This study has multiple objectives: to determine if arsenic uptake is enhanced by mycorrhizal colonization, if arsenic accumulates in mycorrhizal structures, what these arsenic species are, and if AM isolates become adapted to high arsenic levels, are they better able to take up arsenic from soil more than the non-adapted isolates.

Impacts: We found that mycorrhizal association increase brake fern biomass and Arsenic uptake per plant.

Source of Federal Funds: Hatch

FLA-SWS-03917

Title: *REDUCING THE POTENTIAL FOR ENVIRONMENTAL CONTAMINATION BY PESTICIDES AND OTHER ORGANIC CHEMICALS*

Critical Needs:

National Objectives: 4

Key Themes: biodegradation; fate; environmental impact; pesticides; organic compounds; bioremediation; agricultural chemicals; pollution control; bacterial genetics; plasmids (bacterial); soil microbiology; quantitative analysis; spatial distribution; temporal distribution; sustainable agriculture; evolution; gene transfer; mathematical models; soil bacteria; predictive models; cooperative research

Summary: Organic chemicals, including agrichemicals, pose threats to human and environmental health if they are released into sensitive environments. The purpose of this project is to identify sources of environmental contamination from organic chemicals, to model the fate of these chemicals in the environment, and to mitigate their dispersal.

Progress: Our laboratory and field research has demonstrated the effectiveness of in-situ flushing techniques for the remediation of aquifers contaminated with nonaqueous phase liquids. We have also coupled these aquifer flushing experiments with innovative site characterization techniques. The use of interwell partitioning tracers to quantify the amount of nonaqueous phase liquid (NAPL) in porous media has been demonstrated in several laboratory and field tests. The primary emphasis of work to date has been on the use of first temporal moments of tracer breakthrough curve (BTC) data to estimate the average NAPL saturation. Here we extend the data analysis to the use of tracer BTC second and third temporal moments to estimate the statistical parameters characterizing the NAPL spatial distribution. In particular, we examine the fraction f of the streamlines that contain NAPL and the mean and standard deviation of the distribution of streamline trajectory-average NAPL saturations. Two models are presented based on discretizing tracer swept volumes into contaminated and uncontaminated zones. The models are applied to data from three-dimensional numerical simulations, two-dimensional flow laboratory experiments, and field tests at two sites (Hill Air Force Base, Utah, and a dry cleaner in Jacksonville, Florida). For all cases considered here, good agreement was found between expected (measured) and estimated values of f , the fraction of the tracer swept zone that contained NAPL. The effects of

nonlinear and nonequilibrium partitioning as well as correlations between NAPL saturation and saturated hydraulic conductivity are also considered. Our current research is focused on the benefits of partial removal of contaminants. These benefits are being considered within the framework of contaminant flux reduction associated with a given reduction in contaminant mass. Analytical and numerical solutions have been developed that demonstrate that substantial reductions in contaminant flux can be realized from technically feasible reductions in contaminant flux.

Impacts: In-situ flushing remediation technologies show promise for clean up of groundwater aquifers contaminated by nonaqueous phase liquids. Flushing aquifers with mixtures of water, alcohols and surfactants removes a significant fraction of the contaminants. Implementation of this technique may clean up contaminated sites in much faster time frames than using conventional techniques

Source of Federal Funds: Hatch

FLA-SWS-03919

Title: *MECHANISMS AND MITIGATION OF AGROCHEMICAL IMPACTS ON HUMAN AND ENVIRONMENTAL HEALTH*

Critical Needs:

National Objectives: 4, 3

Key Themes: soil microorganisms; plasmids (bacterial); bacterial genetics; soil microbiology; soil contamination; biodegradation; decontamination; detoxification; bioremediation; agricultural chemicals; fumigants; soil bacteria; pesticides; herbicides; environmental health; environmental impact; *human health*; soil moisture; rate determination; fate; soil types; soil temperature; *soil quality*

Summary: Certain agricultural practices may result in unacceptable adverse impacts on human and environmental health. Additionally, improper use of agrochemicals may be ineffective in controlling pests. The objectives of this study is to mitigate adverse impacts of agrochemical use, while preserving the effectiveness of the treatments. Specifically, we want to use microorganisms to reduce agrochemical residues in soil and to clean up contaminated soil.

Progress: We conducted two field studies to: 1) compare diffusion and emissions of methyl isothiocyanate (MITC) (the biologically active product of metam sodium), its efficacy on nematode control, and tomato yield in field plots treated with metam sodium by three application methods and covered with two different plastic films, and 2) determine the effect of two injection methods and two plastic covers on distribution and emissions of the three biologically active compounds, cis-1,3-D, trans-1,3-D, and chloropicrin (CP) of Telone C35, their nematode control efficacy, and tomato yield after treatment of the fumigant. Distribution of MITC in the subsurface of bare beds and polyethylene (PE) or virtually impermeable film (VIF) covered beds treated with metam sodium by broadcast or one drip tape were fairly variable, especially in the broadcast

applied beds. Distribution of MITC in the beds by two tape drip application was somewhat more uniform. Subsurface diffusion of MITC was mainly upward in all the treated beds, especially in the beds treated by broadcast. Very little downward movement below 20 cm was observed for all the treated beds. Little or no volatilization of MITC was observed from all the surface of VIF covered beds, regardless application methods. Volatilization of MITC from bare bed and PE covered bed applied by broadcast was instantly observed and declined rapidly 24 hours after application. Low volatilization rates of MITC was observed from the bare beds and PE covered beds applied by one drip tape or two drip tapes. Tomato yields were the highest from the two tape drip treated beds and the lowest from the broadcast treated beds. Root galling indices for tomato plants in all the beds were generally very low. Even though main transport of the three biologically active chemicals of Telone C35, cis- and trans-1,3-D and CP, in PE or VIF covered beds treated with Telone C35 by shank injection or Yetter coultter injection was upward diffusion, significant downward movement to 40 cm depth, but no below 60 cm depth, was observed for all the treated beds. Virtually impermeable film reduced volatilization of the three chemicals better than PE film. Concentrations of the three chemicals in the shallow subsurface (5-30 cm depth) of the VIF covered beds were larger than that in the PE covered beds. Tomato yields in all the treated beds were good and tomato root galling indices from all the beds were very low. In conclusion, Telone is a better a fumigant than metam sodium/MITC for control of soil nematodes in Florida sandy soil. It is expected that combination of VIF and Yetter coultter injection reduced volatilization loss of the three biologically active compounds resulting in good pesticidal efficacy and good tomato yield.

Impacts: This study provides useful information on injection methods and reduction of volatilization loss of the fumigants Telone C35 and metam sodium optimal pest control and tomato production.

Source of Federal Funds: Hatch

• Extension Impact Statements

FL-SMP-101

Title: Practices for Competitive Agronomic Crop Production in Florida

National Goals: *1*

Key Themes: Adding Value to New and Old Agricultural Products, Agricultural Competitiveness, Agricultural Profitability

Situation/Program Rationale:

Escalating costs of production, historically degraded soils, and stagnant yields have resulted in fewer farms in the Southeast and Florida, leaving agricultural suppliers without a customer base and increasing pressures on rural economies. Producers depend upon one or two crops grown in the same 100-120 day period for the entire farm income, resulting in high economic risks and increased reliance on government programs. Production of agronomic crops has changed dramatically over the last few years due to world market influence. Trade agreements (NAFTA and GATT), either directly or through federal farm programs, will result in greater imports of some commodities, such as peanuts, and more exports of some commodities such as cotton and grains. World demand and supplies are affecting commodity prices and the resulting acreage that will be planted. Farm programs are becoming more market oriented. Numerous rules and regulations require farmers to be knowledgeable as to how they are affected. Transgenic crop varieties are being introduced that are changing pest management strategies. Other new varieties that require specific production practices are being introduced. The public is more concerned about food safety, water quantity and quality, soil erosion, pesticide impact and other environmental issues, which must be addressed by extension programs. Economic changes could be tremendous and may result in farms being consolidated into larger units or more diversification. Diversification may allow smaller farms to exist but they will need information on integrated systems and be more knowledgeable about many different things.

Program Objectives:

To provide up-to-date information on farming systems and aspects of these systems including variety test results, management, pest controls strategies and economic analysis of agronomic crops grown in Florida.

To evaluate diversified farming systems to keep Florida growers competitive.

To improve the standard of living of all Floridians through environmental stewardship.

Summary of Programs for Clientele:

Summary of Impacts for Clientele:

Success Stories:

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Source of Federal Funds: Smith Lever

FL-SMP-102

Title: Florida Forage Production for Livestock and Dairy

National Goals: 1, 4

Key Themes: Agricultural Competitiveness, Agricultural Profitability, Animal Production Efficiency, Grazing, Invasive Species, Plant Germplasm, Rangeland/Pasture Management, and Tropical Agriculture, Agricultural Waste Management, Biological Control, Integrated Pest Management, Natural Resources Management, Nutrient Management, Recycling, Water Quality, Wildlife Management.

Situation/Program Rationale:

Forage produced in Florida is the major source of nutrition that drives the beef cattle industry and to a large extent the dairy industry in Florida. Lack of adequate nutrition is one of the major problems in the beef industry for most classes of beef animals. Cows may fail to re-breed, replacement heifers may develop too slowly and also have trouble re-breeding after their first calf, and weaning weights of calves may be lower than their potential-all due to an inadequate supply of forage of acceptable quality. At the present time, interest is increasing in the use of certain legumes (to increase pasture quality and reduce energy/nitrogen input), in forage testing and in the adoption of new higher yielding, higher quality forage species. Ranchers need to optimize utilization of native range through proper range management practices such as burning, chopping, controlled grazing, and judicious use of feed supplements during the winter. The cost of fertilizer and other inputs for a beef enterprise have increased. Increased efficiency in the use of fertilizer and other production inputs will be needed. By FY2003, some improvement (5%) may be realized due to improvement in forage programs.

Some dairymen are using silage either purchased or homegrown. Several are growing and using low-energy grass silage. By FY2003, it is expected that more dairies (90%) will be growing and harvesting some type of forage crop due to the need to control or recycle the nutrients in manure. In order to economize some "grazing dairies" will be developed whereby the producer significantly increases the use of pasture as a source of feed (nutrients) for the milking herd. A small increase in the number of dairies (5%) planting improved, high-quality forage for dairy

Program Objectives:

The broad objective of the forage program is to teach our Extension customers how to produce and/or utilize forages in sufficient quantity and of sufficient quality to meet the nutritional needs of their livestock and to do so in such a way that it is economical, and environmentally friendly.

Summary of Programs for Clientele:

State Specialists; Carrol Chambliss, Ann Blount, Martin Adjei, Bob Sand, John Arthington, and others, participated in state, regional and national meetings to exchange information on forages. Knowledge gained is helpful to state and county agricultural extension programs.

State Specialists conducted or participated in various state forage educational activities and programs such as the Beef Cattle Short course, Range Cattle REC field day, Florida Cattlemen's association's Annual Meeting and quarterly board meetings, Forage Worker's Tour, Corn Silage Field Day for farmers and dairy producers, Annual Goat Conference Perennial Peanut Field Day in Moultrie, Ga. and eight annual Cow Calf Seminars across the state as well as assisting county faculty with county programs.

County Faculty have organized themselves into four regional groups and work cooperatively to develop and present Forage educational programs, events and informational material to producers. These groups are: South-Florida Beef Forage Program, Central Florida Livestock Agents [CFLAG] organization, Northeast Florida Beef Forage Group, and the Northwest Florida Ag Agents Team.

County Faculty across the state conducted many educational programs and events in 2003 Some of the venues used to present information and topics covered are mentioned below.

Hay field days were conducted at three locations. Many subjects related to forage and cattle production were taught. These include choosing the best variety for hay production, producing

quality hay, sampling and testing forages for protein and digestibility, preventing hay storage losses, weed control, proper fertilization of hay fields, insect control etc.

A Corn Silage Field Day was held at the Animal Sciences Dairy Farm in Hague Fl. Various topics were presented related to corn production, harvesting, storage and utilization.

Corn Silage Production Meetings for farmers and dairy producers were held in Branford Community Center and at the Okeechobee County Extension Office.

A field day dealing with Alfalfa production for Dairymen was held in Lafayette County.

Beef/Forage Allied Trade Shows: A. Northwest Florida Beef Conference and Allied Trade Show in Marianna, Fl and B. The Florida Cattlemen's Institute in Kissimmee, Fl. These meetings provide an opportunity for county and state faculty to present information to producers or to visit one on one concerning their forage questions or problems.

Spring and Fall Forage Meetings and/or Field Days were conducted by several counties, to inform producers of timely topics for the coming season.

Timely information in monthly newsletter is sent to producers.

County Cattlemen's Meetings with forage updates.

Two grazing tours in Hardee County –dealing with grass-legume mixtures and managed intensive grazing.

Distribution of EDIS Publications on Forages and The Florida Forage Handbook.

Information on forages is disseminated in the counties through county newsletters, such as the "Jackson Stockman Livestock and Forage Newsletter, written by Mr. Doug Mayo.

Hay directories were developed in two or more counties

Tropic Soda Apple Management / Control: This subject has been presented at many educational venues throughout the state in 2003.

Pasture management topics: such as Grazing Management Systems, Insect and weed control (including Tropic Soda Apple) in pastures have been presented in county programs.

Poisonous Weed workshops have been presented by county faculty in several counties.

Sludge application to Pastures

Horse pasture Development and Utilization

Pasture and Hay Field Weed Control Trials in Counties.

Biological control of Tropic Soda Apple.

Use of anhydrous ammonia on stored forage to enhance the nutritional value.

Problem Solving: Established test plots to study the pasture production problems resulting from the over-application of municipal lime stabilized biosolids (sludge).

Dr. Tom Kucharek, has provided a web site with color pictures of plant diseases, and works with the Corn Silage Production Program.

Other-Display at the Annual Cattlemen's Convention. Discussion of Pasture Best Management Practices and Water Quality.

Harvesting, management, and storage of Corn Silage.

Soil Testing, liming, and fertilization.

Demonstrations:

A. Establishment of a Whole Ranch Demonstration at the Rodeheaver Boy's Ranch in Putnam County. Demonstrating the value of winter grazing, improved hybrid bermudagrasses and also perennial peanut for hay production.

B. Cooperative work with chemical companies(Dow) to control pasture weeds.

C. Demonstration Plots of new pasture and hayfield herbicides.

D. Biological control of Tropic Soda Apple

E. Pasture establishment (grass planting) demonstration.

F. Biological control of Mole Crickets in Bahiagrass Pastures.

G. "On farm forage variety demonstration, utilizing 16 different forage varieties and blends."

Introduction of new improved varieties to producers is vital for the advancement of animal agriculture in the state.

- H. Wildlife Forages demonstration plots.
- I. Water Conserve II Forage Demonstration.

Summary of Impacts for Clientele:

Success Stories:

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Source of Federal Funds: Smith Lever

FL-SMP-103

Title: Improving the Production, Efficiency and marketability of Beef Cattle in Florida

National Goals: 1, 2, 4

Key Themes: Adding Value, Agricultural competitiveness, Animal Genomics, Animal Health, Animal Production Efficiency, Grazing, Invasive Species, Managing Change in Agriculture, New uses for Agriculture Products, Niche Markets, Rangeland/Pasture Management, Risk Management, Small Farm Viability, Food Accessibility and Affordability, Food Quality, Food Safety, Foodborne Pathogen Protection, HACCP, Agricultural Waste Management, Biological Control, Drought Prevention and Mitigation, Natural Resources Management, Nutrient Management, Pesticide Application, Riparian Management, Sustainable Agriculture, Water Quality, Weather and Climate, Wildlife Management

Situation/Program Rationale:

Florida is a cow-calf state that produces and ships over 500,000 calves each year to other states for growing and/or finishing. In recent years there has been heavy economic pressure on Florida cattlemen due to declining calf prices and increasing production input costs. Much of this decline is the result of normal fluctuations caused by the cattle cycle-after a few years of profitability, number increase until there is an oversupply, profitability is lost and then numbers decline and the cycle starts over. The normal decline in prices which started in 1994 was exacerbated in 1995 and 1996 by a short feed grain crop resulting in a significant increase in the cost of feed grains and a corresponding decrease in calf prices. Following some improvement in 1997, a large increase in total meat supply compounded by a decline in exports due to economic turmoil in our major foreign markets resulted in lower calf prices during 1998. Calf prices were better in 1999 and improved significantly in 2000 as the national cow herd became smaller and demand for beef improved. Another factor in the market value of beef cattle is the keen competition from pork and poultry for a share of the consumers protein dollar. Beef has lost market share in recent years primarily due to the cost of beef relative to its competitors. Other concerns have been product convenience, consistency, safety and quality. As a result, if beef is to maintain market share, we must improve safety, consistency and quality of our product, while increasing production efficiency to lower the cost of production. While doing this, we must remember that we are a calf producing state depending on other areas of the U.S. to grow, finish and slaughter the calves we produce.

Each year, Florida ships over 500,000 feeder calves to the west and north. Texas, Oklahoma, Kansas, Alabama, and Georgia receive approximately 92% of the out shipments of our calves. Rounding out the top 10 states receiving feeder calves from Florida in 1999 were New Mexico, Mississippi, Colorado, Tennessee, and Arkansas with 5.7% of the total. These calves have another 150-300 days of growing and finishing before slaughter and are expected to perform in a

predictable manner. They are expected to reach a desired weight and grade within a specified time. Anything that prevents these calves from performing in a predictable manner results in price "discounting" at purchase. The "best" feeder calves are only worth their market value.

"Premiums" are not paid for calves; however, "discounts" are applied to calves that are perceived to be less desirable. To perform in a predictable manner, calves purchased in loads of 50,000 lbs., must be UNIFORM, HEALTHY and REMAIN HEALTHY. Calves within the load must be of the same sex, similar weight, age, frame size, and body condition; vaccinated for feedyard diseases; treated for parasites; over the stress of castration and dehorning; and trained to eat supplemental feeds. Based on 2000 USDA data, 90% of the Florida beef producers have less than 100 cows and account for approximately 28% of the beef cows in Florida; whereas, 72% of the Florida beef cattle are owned by 9.5% of the operators and are from herds of greater than 100 cows. Beef producers that have 100 or less cows will usually sell their calf crop through a local livestock auction market or order buyer because of their inability to provide 50,000 lbs. of uniform calves at weaning times.

In contrast, the beef producer with over 500 cows has the ability to provide load of uniform calves and can make private sales to buyers representing the western cattle feeders. The decision to market direct depends upon their contacts with the western buyers and the past performance of their calves in the western stocker and feedlot operations. A recent survey of 9 south Florida counties indicates that 85% of the producers are selling a portion of their calves at the local livestock auctions; a much higher percentage than expected in the large ranch area of south Florida. When a large number of calves are being sold through livestock auctions, the western feeders must depend upon order buyers to purchase calves and sort them for size, body condition, frame size, and sex before shipment west. Sorting does not take into consideration the need for uniformity in breeding nor the lack of health conditioning of the calves. This co-mingling of calves from numerous sources, to achieve some degree of uniformity in the load, usually results in compromising the health of the calves. Co-mingled calves are exposed to numerous stress related diseases at the market, during sorting, and during shipment. Improperly health conditioned calves are often sick on arrival, experience a high death loss, or require expensive treatments to survive. The reputation established by the co-mingled calves can result in price discounting at the markets, and this perception can reduce the price of other Florida calves. To minimize discounting, the Florida cow-calf producer must market loads of calves that will be predictable in performance at the western cattle operations. The loads of calves must be UNIFORM, HEALTHY and REMAIN HEALTHY.

Draft Report

Florida cattlemen can improve efficiency, lower costs and produce loads of calves that are UNIFORM, HEALTHY and

REMAIN HEALTHY by incorporating into the cow-calf operation cost effective practices from the following areas:

A. Herd Management

1. Reproductive Management Practices:

Defined breeding seasons of 120 days or less

Estrous synchronization

Artificial insemination

Pregnancy examination and culling

Bull breeding soundness examination

Vaccination for reproductive disease

2. Nutritional Management for:

Heifer development

Cow body condition

Cow age considerations

Weaned calves

Bull maintenance

Feed a complete mineral supplement

3. Herd Health program for the breeding herd:

Appropriate timing of health practices in relation to production cycle

Vaccination of the breeding herd using appropriate vaccines

Use recommended vaccination sites and techniques

External and internal parasite control

Supply appropriate nutritional (including complete mineral) supplements

4. Genetic Management:

Use bull with above average EPD's for traits of "economic" importance

Capture the benefits of heterosis through planned crossbreeding

Selection of herd sites and replacement heifers

B. Marketing Management

Castration, dehorning, implanting, and possibly spaying prior to weaning

Appropriate feeder cattle vaccination program following beef quality assurance guidelines

Weaning calves and teaching them to eat from a bunk and drink from a water tank

Examine marketing alternatives including cooperative marketing of loads of calves

C. Economic impacts needed:

Lower unit cost of production

Value of marketing groups/loads of calves vs. individuals

Evaluate unit cost of production locally, regionally, and nationally through the use of tools such as SPA

D. Major obstacles to the adoption of these practices are:

Producers lack of knowledge and motivation concerning the need for efficiently producing loads of calves that are uniform, healthy and will remain healthy. Inconsistencies in information provided by the allied industries because of selling a product rather than an integrated management program.

Currently, Florida cattle producers have many influences on their decision making. They are influenced by peer groups, county extension faculty, extension specialists, veterinarians, livestock auction owners, animal health distributors, feed store personnel, state and federal regulatory personnel, and manufacturing representatives, most of which can be categorized into the "allied industries." A major problem has been that each group of the allied industry (or each person in the allied industry) is advising the producers without regard to the total management of the cattle operation; each proposing different management practices and programs. This has resulted in some Florida cattle producers being confused about what production practices and management programs to use on their cattle.

Program Objectives:

The objectives of the Design Team is to coordinate the transfer of technology to the beef cattle producers of Florida in order for them to improve their production, efficiency, and the marketability of Florida Beef Cattle. Florida FIRST Imperative-Global Competitiveness of Current and Emerging Agricultural and Natural Resources-Improving competitiveness of Florida beef industry in a changing national and international environment.

Summary of Programs for Clientele:

Over the four year period county faculty with support from state faculty provided educational programming on a regional basis as well as in county to address the issues identified by the design team in the situation statement. Emphasis has been placed on the areas/topics identified as having the greatest impact on profitability that producer action could influence. As a result programs were presented every year and in nearly all areas of the state on improving reproduction and utilizing marketing opportunities. Other areas covered frequently included weed control,

grazing management, selecting breeding stock, heifer management, pest control, health management . Alternative income sources and wildlife management were other topics frequently addressed.

Summary of Impacts for Clientele:

Northwest Florida Beef Conference and Trade Show--104 beef cattle producers from Northwest Florida, Southwest Georgia and Southeast Alabama participated in the Beef Conference. Of those attending, 20 producers received CEU's toward their pesticide applicators license. The theme of the Conference was Pasture Management, with specific presentations on grazing management, hay production and storage, the value of legumes in pastures and pasture insect and weed control. Exit survey responses indicated that: 100% of the participants gave the program a satisfactory rating (54% Excellent, 33% Very Good, 13% Good). 96% said they had learned something new by attending. 98% intended on making at least one practice change as a direct result of the information presented at the Conference. Producers who attend Extension Livestock related functions, they have learned the value of body condition scoring (BCS) of cattle for greater economic management. BCS, as a whole have increased from 3-4 to 4-5 as evidenced by visual evaluation and producer comments. Producers have been overheard commenting on BCS of cattle relative to the available feed supply. Cattlemen have learned that low input doesn't necessarily mean low cost production. Forage programs have increased the feed supply and the BCS of cattle and thus the bottom line. Producers have begun balancing forage nutrients with supplementation to achieve increased calving weight and "breed back" of cattle. Stocking rates have been adjusted so that the pounds of live cattle better reflect the carrying capacity of the environment. Sire genetics have improved as noted by at least five cattlemen changing the parameters of their selection criteria and the amount they are willing to pay for improved genetics. Producers learned strategies to reduce economic inputs, while improving herd health and productivity. As a result producers of large herds and small herds have developed greater uniformity of calves within herds. Genetic selection has improved as evidenced by heavier weaning weights and greater uniformity. They stated that it costs more to improve cattle condition rather than to maintain it as are result, several producers have changed their supplementation program.

Phosphorus Management Workshop for South Florida Beef Cattle Operations.

The workshop was attended by 32 cattle producers from eight counties in South Florida. These producers represented over 100,000 cattle and over 600,000 acres of pasture. In addition, there were 12 attendees from the South Florida Water Management District, USDA Natural Resource Conservation and other Extension offices. As a result of this program 32 cattle producers and 12 people from the South Florida Water Management District, USDA Natural Resource Conservation and other Extension offices learned the following: a. That cattle phosphorus nutrient needs can be met without excess phosphorus being released into the environment. b. Beef cattle operations can demonstrate that they can achieve a nutrient balance with phosphorus inputs and phosphorus removal. c. Beef cattle stocking rates have very minimal effect on the phosphorus content of runoff water. d. How phosphorus moves in the soil and how to use soil amendments to reduce phosphorus in runoff water.

Maintaining a Healthy Herd Program:

It is estimated that losses to the Florida Cattle industry due to diseases can exceed \$ 2.5 million. Producers attending both of these programs gained a better understanding of the diseases of importance, including parasites, in the state and area that need to be considered in herd health programs, what their effects on the herd are, how they enter the herd, and how to develop a whole herd vaccination and prevention program. Producers reached an understanding that prevention of diseases can be equated to an insurance policy against loss.

19th Annual Reproductive Management School:

Pre-Test-22% Post-Test-85 A 63% improvement of Reproductive Knowledge. Improved Understanding of Breeding Herd Management: Excellent 78%, Good 17%, Fair 6%, and Poor 0%.o Better Prepared to Work With Veterinarians: Excellent 72%, Good 28%, Fair 0%, Poor 0%.o Do you think as a result of this course, you will be able to improve reproductive management in your beef cattle operation: Yes 100%, No 0%.o Do you feel this course was worth your time and expense: Yes 100%, No 0%

Success Stories:

Brevard County: : *As a result of consultation with this Extension Agent on herd health and other management practices, a small beef cattle producer in northern Brevard County reduced their breeding season from 270 days to 45 days while increasing their pregnancy rate from 50% to 100%.

Hamilton County: Eight (8) producers off of five (5) farms sold 3000 head of cattle through the group marketing process (an alternative marketing option) during FY03. These producers received an average of 3¢/pound above market price (an economic impact of 800 lbs/head @ \$.03 extra/lb. = \$24/head X 3000 head = \$72,000).

Hendry County: BEEF CATTLEMEN SAVE MONEY AND IMPROVE WATER QUALITY

This CED initiated a pasture fertilizer demonstration about seven years ago that proposed a massive reduction in the use of P2O5 in pasture fertilizer programs. When the demonstration was initiated, a survey of the cattle producers revealed they were applying about 24 pounds of P2O5 fertilizer per acre annually on their pastures. The first phase of the demonstration, which lasted three years, was to reduce the P2O5 fertilizer rate to 12 pounds per acre annually. The second phase emphasized a further reduction in P2O5 fertilizer from 12 pounds per acre annually to six pounds per acre annually. Two years ago this CED entered into the third phase of the demonstration by reducing the P2O5 fertilization rate from six pounds annually to one application of 12 pounds of P2O5 once every eight years. This third phase amounts to an additional reduction of 4.5 pounds of P2O5 fertilizer per acre annually. During the last two years, at least 20 of these cattle producers have initiated the new phosphorus fertilizer program of 12 pounds of P2O5 every eight years. These producers have over 46,750 acres of improved pasture and this accomplished the following:1. The landowners have saved an additional \$0.90 per acre annually. Based on an estimated total of 46,570 acres, the land owners realized an additional savings of \$40,075 annually. 2. The landowners were able to further enhance the quality of the runoff water from their pastures with an additional reduction of P2O5 fertilizer by 4.5 pounds per acre annually for a total reduction of 210,375 pounds of P2O5 per year.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. The methods used to reach minorities vary according to the situation in each county, examples of some of the efforts are: Use of all available mass media to inform potential recipients of the program and of opportunity to participate. Hold activities to remove barriers to minority participation, including holding meetings, demonstrations, workshops, and field days at locations which are easily accessible to minorities.

The Livestock Extension Promotional brochure as well as a bi-monthly newsletter has been sent to every livestock owner in Hardee County describing the services provided by the Extension Service. Additionally, newsletters are regularly placed at all veterinarian offices, feed stores, the Hardee County Livestock Market and the Hardee county library.

Source of Federal Funds: Smith Lever

FL-SMP-105**Title:** Management of Water and Nutrients in Florida's Nursery Industry**National Goals:** 4**Key Themes:** Nutrient management, water quality**Situation/Program Rationale:**

Agricultural irrigation consumes over 40% of the fresh water used in Florida and one half of the nurseries are located within one mile of urban centers. Nurseries are producing plants in urban areas and must be environmentally conscious. Florida's limited water resources and increasing urbanization leads to competition between the public and agriculture for potable water. It was determined that 50 to 100 inches of water per acre per year may be applied as irrigation. In addition, nutrient loss due to leaching and runoff from production areas can be excessive. It is estimated that plants grown in small containers use 15-60% of irrigation water applied overhead and less than 50% of applied fertilizer.

Preferably, environmental horticultural industries should strive to use water as efficiently as possible to prepare for any future water shortages that may result from drought, reduced water quality, or reduced allocations. Additionally, nutritional management strategies such as monitoring the crop nutritional status and monitoring nitrate content of ground water or surface water leaving the nursery property should be practiced on a regular basis.

Program Objectives:

Improve irrigation application and fertilizer use efficiency in Florida nurseries. Long-term objectives will be facilitated by educational programs conducted by extension personnel and will result in a 15-20% reduction in quantity of water applied per acre and an 8-10% reduction in fertilizer applied per acre at container nurseries in ten counties. Each year participating container nurseries will reduce quantity of irrigation water applied 4% as a result of: changing irrigation frequency or run time, using cyclic irrigation, or implementing management strategies such as grouping plants by irrigation requirements, irrigating according to water holding capacity of the container media, using rain shut-off devices, monitoring amount of irrigation applied, or improving irrigation system uniformity. The amount of fertilizer used will be reduced by 2% as a result of monitoring nutritional levels in the container and applying fertilizer only when needed.

Summary of Programs for Clientele:

Educational programs were coordinated and conducted along with development of supporting educational resources needed for county faculty to assist container nursery producers with implementing irrigation and fertilization interim measures or BMPs.

Interim Measures Discussion Meetings:

- 9 Apr 2003 Interim measure discussion. Central East Coast FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Deland FL (audience 34).
- 22 Apr 2003 Interim measure discussion. Dade Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Homestead FL (audience 37).
- 6 May 2003 Interim measure discussion. Broward Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Davie FL (audience 19).
- 12 May 2003 Interim measure discussion. Big Bend FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Quincy FL (audience 46).
- 19 May 2003 Interim measure discussion. Pinellas Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Largo FL (audience 36).

- 29 May 2003 Interim measure discussion. Treasure Coast Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Stuart FL (audience 31).
- 25 Jun 2003 Interim measure discussion. Coastal Springs Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Brooksville FL (audience 23).
- 30 Jun 2003 Interim measure discussion. West Palm Beach Chapter FNGA and Palm Beach Wholesale Growers Association. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. West Palm Beach FL (audience 45).
- 8 Jul 2003 Interim measure discussion. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Pan Handle Chapter FNGA. Crestview FL (audience 24).
- 5 Aug 2003 Interim measure discussion. Lake Region Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Bartow FL (audience 19).
- 12 Aug 2003 Interim measure discussion. Action Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Apopka FL (audience 59).
- 21 Aug 2003 Interim measure discussion. Manasota and Tampa Bay Chapters FNGA. . Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Ruskin FL (audience 76).
- 23 Sep 2003 Interim measure discussion. Highland Heartland Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Zolfo Springs FL (audience 34).
- 14 Oct 2003 Interim measure discussion. Royal Palm Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Naples FL (audience 37).
- 3 Nov 2003 Interim measure discussion. Graco Fertilizer Co. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation Quincy FL (audience 6).
- 11 Nov 2003 Interim measure discussion. Front Runners Chapter FNGA. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Gainesville FL (audience 37).
- Other Programs
- 5 Feb 2003 Container nursery BMPs. Now and for the Future. Nursery operators developed competency on BMP implementation. Martin Co. BMP Farm Tour. Invited. Stuart FL. (audience 73).
- 14 Feb 2003 Container nursery BMPs. Now and for the Future. Nursery operators developed competency on BMP implementation. Jacksonville Horticultural Trade Show. Invited. Jacksonville FL (audience 22).
- 13 May 2003 Save water in nursery today. Nursery personnel received update on water conservation techniques. Tampa Bay Wholesale Growers. Ruskin FL. (audience 29).
- 5 Jun 2003 Predictable occurrences for plant procedures. Nursery operators received research information to implement that will improve plant production. Turf ornamental academy. Tampa Springs FL. Invited (audience 47).
- 9 Jul 2003 Foliar fertilization of oaks. Southern Tree Conference Summer. Nursery operators discussed implementation of the interim measure and developed skills during hands-on participation. Gainesville FL. (audience 40).

- 13 Oct 2003 Selecting plants to purchase. Master Gardner Training Statewide. Key factors altering plant quality were presented. Gainesville FL Invited (audience 50).
- 28 Oct 2003 Possible areas of BMPs for production. Nursery operators discussed potential BMPs. Davie FL (audience 15).
- 3 Nov 2003 Irrigation uniformity green industries. Nursery operators received information on how to modify their systems to make efficient irrigation applications. Quincy FL (audience 86). invited
- 11 Dec 2003 Discussion for BMP development. Nursery operators outlined potential BMPs topics. Davie FL (audience 24).

Summary of Impacts for Clientele:

Educational efforts resulted in 65 nurseries or 3247 acres committed to the interim measures program for protecting ground water. This is a noteworthy accomplishment for the first year of a new educational initiative where a typical learning experience resulted in 75% of respondents gaining new knowledge. Commitment from most of the ≈2000 FNGA members would result in millions of dollars in savings.

Success Stories:

: A major producer of container foliage crops is now totally committed to using controlled-release fertilizer in the container substrate in place of reliance on solution fertilizer applied in overhead irrigation water. This practice change resulted from an onsite demonstration where controlled-release fertilizer reduced nitrogen loading to ground by 98 % compared to fertilizer applied in overhead irrigation water.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Newsletters and program announcements are provided to all persons.

Source of Federal Funds: Smith Lever

FL-SMP-111

Title: Tropical Fruit Crops Management in Florida

National Goals: 1, 4

Key Themes: Adding Value to New and Old Agricultural Products, Agricultural Competitiveness, Agricultural Profitability, Home Lawn and Gardening, Innovative Farming Techniques, Niche Market, Plant Germplasm, Plant Production Efficiency, Precision Agriculture, Small Farm Viability, Tropical Agriculture, Urban Gardening, Biological Control, Drought Prevention and Mitigation, Integrated Pest Management, Natural Resources Management, Nutrient Management, Pesticide Application, Soil Quality, Sustainable Agriculture, Water Quality, Weather and Climate, Wetlands Restoration and Protection

Situation/Program Rationale:

Florida's subtropical and tropical fruit industry situation:

Estimated commercial acreage is 13,700

About 85% of the acreage is in Miami-Dade County

Other counties include-Lee, Collier, Palm Beach, Indian River, St. Lucie, Broward, Martin, Charlotte, and Sarasota

Estimated gross value (1997-98) in Miami-Dade County is \$73.5 million.
Estimated economic impact is \$137 million (actual statewide economic value is higher-add other counties, increased
production from new plantings, and the tropical fruit nursery industry)
Demographics for Florida's tropical fruit industry
Educational status of industry ranges from high school/vo tech to Ph.D./M.D.
Current and/or previous career background from everything imaginable
Second and third generation family farmers
Experienced entrepreneurs and novice producers
People on their second and third careers
Full-time (~35%) and part-time producers (~65%)
Ethnic background includes European Americans, Hispanic American, Asian Americans, African Americans, and Multi-ethnic/racial Americans
Major constraints facing the industry
Natural resources
Land use and sustainability
Water issues-management, access, and quality
Loss of citrus acreage to citrus canker (~2,700 acres)
Need for identification and extension of "new" crops
Regulatory Issues
Water issues
Land issues
Chemical availability/use
Labor issues
Technological
Cultural production-new cultivars, nutritional deficiencies, fertilizer and irrigation use/leaching, environmental sustainability, and reliable and off-season fruit production
Pest management
Development of IPM strategies/programs
Numerous insect pests and plant diseases that are the limiting factor to production
Environmental stresses periodically limiting production
Floods
Drought
Freezing events
Wind/hurricane
Postharvest handling and value-added technology
Basic information-temperature, RH
2003 FL111-Tropical Fruit Crops Management in Florida Design Team Draft Report
Development of new information and processes
Marketing
Lack of unified marketing structure and strategy
Off-shore competition, market research and promotion
Off-shore market information
Economic analysis for planning and strategy
Documentation of socioeconomic impact
A brief summary of the needs of the tropical fruit industry if it is to remain viable and thrive
Assist in research and extension effort to identify land areas suitable to particular crops
Continue to cooperate in irrigation/plant water use research and extension programs on irrigation management

Continued and expand search for, development and introduction of new crops and cultivars
Expanded whole-plant and production BMP research
Continue IPM programs and pesticide registration
Expanded program on postharvest handling
Expand marketing research and information assistance to Florida industry
Methods
Determining the needs and issues by strategic planning with the industry
Disseminate information through workshops, seminars, field days, meetings, and print and electronic media
Document the FL111 extension program and make changes and improvements on an annual basis

Program Objectives:

Purposes and Goals:

Organize, assist, educate, and inform commercial producers and homeowners about current production practices, IPM strategies, postharvest handling and processing, and marketing
Facilitate information transfer through meetings and distribution of written and electronic information from educational institutions, and regulatory and assistance agencies
Organize and participate in the USDA IR-4 Project and in-service training programs
Objectives: Assists the industry improve their socioeconomic status and sustainability
Produce meaningful programs that impact the necessary information for the industry to successfully compete on a national and international level

Summary of Programs for Clientele:

During 2003, members of the FL111 design team developed programs to promote knowledge, improve commercial and urban fruit production practices, and extend pertinent information on tropical fruit crops management in Florida:

Tropical fruit production workshops and seminars (25 programs)
BMPs for irrigation and nutrient management
Innovative production practices, crop growth and manipulation
General practices for improved production
Good agricultural practices, postharvest handling and food safety
Field day demonstrations (3 demonstrations)
Papaya production and evaluation
Carambola production and evaluation
IMP in tropical fruits and pesticide safety (37 programs)
Food safety, quality, and technology in Florida (2)
Master Gardener training (4 training opportunities)
Economics of tropical fruit crop production (3 programs)
Web site development and maintenance (7 websites)
Educational festivals (3 events)
Radio programs (3 periodic/weekly programs)
Newsletters (5 faculty with newsletters)

Summary of Impacts for Clientele:

Tropical fruit production workshops and seminars:
30% increase in the use of tensimeters to monitor and manage irrigation scheduling by commercial growers.
7% increase in the use of low volume microsprinkler irrigation by commercial growers.
Over 75 producers began utilizing leaf nutrient analysis to improve fertilizer practices.
About 125 commercial producers were trained successfully in insect and weed identification to improve pest control practices.

About 211 agricultural workers were successfully trained in worker safety.
Over 400 producers and packinghouse staff were trained in food safety.
Over 1 million unique visitors to web sites relevant to tropical fruit culture (production, IPM, economics, etc.).
Well over 8,000 people attend 3 educational festivals on tropical fruit culture in the home landscape.

Success Stories:

FL-SMP-113

Title: Tropical Fruit Culture and Management

Success Stories:

The adoption of tensiometers and other soil moisture sensing devices continues to increase and there are now 399 acres being monitored by these devices resulting in 30 to 50% savings (11970 in.) in water. Leaching of nutrients is also reduced.

Workshops and seminars on water management in tropical fruit groves has resulted in a greater awareness of how water behaves in agricultural soils of south Florida and more importantly in the use of soil water content monitoring as a tool to better manage irrigation scheduling. The consequences of improved irrigation management are reduced leaching potential of agrichemicals into the aquifer and more efficient use of fertilizers.

Participants at the lychee and longan workshops focused on the requirements for flowering will result in improvements in irrigation and fertilizer management and crop yields during the 2004 growing season. The information on longan fruit thinning should result in more marketable fruit being produced in the future.

Disaster relief program from the USDA Farm Service Agency (FSA). Through the efforts of the design team, USDA-FSA has accepted the scientific and climatological data demonstrating lychee and longan require cool non-freezing temperatures to flower and fruit properly. This led to producers successfully petitioning for disaster relief from the abnormal 2001-2002 crop season. Irradiation for control of the Caribbean fruit fly as a quarantine treatment. Through the effort of the Specialist, irradiation as a quarantine treatment for Caribbean fruit fly may be a viable option for Florida's tropical fruit industry in expanding their markets in California.

Program Title: Fertilizer Management for Tropical Fruits in South Florida

Success Stories:

More than 280 tropical fruits and vegetable growers participated in workshops and field days related to nutrient and water management. 93% of participants of lychee and Logan workshop reported information provided will lead to improving their crop production. 97% rated the workshop good to excellent.
Program Title: IPM in Tropical Fruits and Safety

Success Stories:

A large Spanish speaking clientele in South Florida is being trained in pesticides, safety with pesticides and in the work environment. About 64-67% is passing the pesticide license test. About \$76650 (511 clients, \$10 per hour and 15 hours) are saved by clientele by training through extension. USDA/UF entomologists demonstrated that green mangos were not a host of the Caribbean fruit fly allowing shipments of green mangos to

Western States. About \$19000 (\$20 x 950) was estimated to be saved by growers through direct pest identification.

Program Title: Tropical Fruit Crops Management in Florida

Success Stories:

Approximately ten producers of tropical fruit provided production and marketing cost data for the most significant tropical fruits. High levels of participation reflect considerable interest in the study, which will identify

ways to make agriculture in South Dade more profitable, thereby retaining farmland.

Program Title: Managing Competitiveness in Florida Through Management, Finance, Marketing, and Policy

Success Stories:

The educational efforts are still underway; it is too early to quantify results. However, because agriculture generates approximately \$1 billion in economic activity for Miami-Dade County, if the study could be

credited with saving a small percentage, for example, only 10 percent of the overall agricultural activity, the impact

would be approximately \$100 million annually for the foreseeable future.

Program Title: Featured Creatures

Success Stories:

During 2003 the Featured Creatures Web site recorded 1,211,557 distance visitors and 2,157,516 page views. (note also includes crops other than tropical fruits).

Program Title: Florida Keys Tropical Fruit Fiesta

Success Stories:

The homegrown fruit contest is a popular and competitive activity at the FKTF. The grand prize winner stated he had purchased his pineapple plant at last year's event and followed our care practices to produce the prize winning fruit this year.2. In the weeks prior to the event, phone calls were received from people all over the country. They were planning their vacations around attending the FKTF.3. Our first ever tropical fruit cooking contest attracted 30 entrants. Nine new in-kind or cash sponsors were brought on board. Photos were taken by a UF photographer for future educational purposes.

Program Title: Tropical Fruit Selection/Management for Commercial Growers and Homeowners in Palm Beach County

Success Stories:

Each year the Extension Service partners with the Rare Fruit Council International, Fruit and Spice Park (Homestead), TREC Homestead and local tropical fruit producers in holding one of the biggest tropical fruit shows in the United States. The show is held at the Palm Beach County Extension office and the Mounts Botanical Garden and consists of the following: A large display of over 100 different tropical fruits with information on use and propagation, a series of lectures on specific fruits by fruit experts, demonstrations by local chefs on how to use tropical fruits and fresh tropical fruits for sale to the public. In addition, persons attending the show can tour the tropical fruit plantings in the Mounts Botanical Garden. The annual Tropical Fruit Festival held Saturday June 28, 2003 had an attendance of over 4,000 people. Lectures had standing room only attendance and much of the fruit for sale was sold out before the show was half over. Guided tours of the tropical fruit areas of the Mounts Botanical Garden were overfilled and many people said the show was one of the best Extension events of the year.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Some faculty is fluent in Spanish and notices of programs and programs are provided in Spanish.

Some ethnic clientele (e.g., over 12,000 Hispanic American clientele) are contacted directly to invite and increase their attendance at programs.

Many press releases are placed in English and Spanish.

Some publications have been translated into Spanish.

Source of Federal Funds: Smith Lever

FL-SMP-112

Title: Ornamental Plant Production and Integrated Pest Management in Florida

National Goals: 1, 4

Key Themes: Adding Value to New and Old Agricultural Products, Ornamental/Green Agriculture, Biological Control

Program Objectives:

Long-Term Objectives*:

1. Increase the number of commercial nurseries using IPM practices, specifically:
 - a. Increase the number of nurseries using biological control by 5%
 - b. Apply pesticides in response to observed pest infestations and reduce the reliance on preventative spraying for pest arthropods by 5%
2. Promote selection of pesticides for use in nurseries to minimize:
 - a. Adverse effects on biological control agents
 - b. Health hazards to applicators, nursery workers and the public
 - c. Adverse environmental effects
 - d. Economic losses to pests
 - e. Minimize risks of developing pesticide resistance in target pests.
3. Increase the number of trained pest management scouts available for nurseries in Florida

*Long-Term goals depend on having input from Extension Specialists in Entomology, Nematology, Plant Pathology and Weed Science. Several of these critical positions are currently vacant.

Short-term Objectives:

1. Increase the number of deliverables for use in commercial nurseries, specifically:
 - a. Complete "Scouting Manual"
 - b. Complete "Detection and Identification of Insects and Related Pests of the Commercial Foliage Industry"
 - c. Produce slide sets, web sites, and Power Point Presentations that will aid in scout training programs.

Summary of Programs for Clientele:

A wide variety of educational programs and instructional methods were undertaken including: Workshops, Trainings, Field Days and Tours were conducted throughout the state on site and through distance education technology in nursery plant production and management; nursery plant pruning; Integrated Pest Management (IPM) scout training; insect, mite, nematode, weed and plant disease updates, identification, biology and management; methyl bromide alternatives; banker plants; beneficial rearing; banker plant use; pesticide applicator; worker protection standard (in English and Spanish languages); natural insect enemies; invasive pests; professional association; OSHA emergency response, new crop production, cut flower production; entering the nursery or cut foliage business; and, plant propagation. The largest, most successful single

program was the Pest Management Update workshop series conducted in four counties and transmitted to three distance education sites around the state for a total of seven counties. This program reached all the major production areas of the state. Continuing education units were provided for many trainings.

Publications, Training Manuals, Power Point and Slide Instructional Materials and Trade Show and Fair Displays were developed and utilized. Printed publications included EDIS and other fact sheets, newsletters, and journal articles. Several publications were generated in both English and Spanish languages.

Internet Web Sites and Electronic Media were used by many county faculty for interactive distribution of IPM and nursery production information. The most prominent of these was the Mid-Florida REC web site developed to provide pest, pest alert and IPM information to county faculty and growers. Considerable additional progress was made at this site to add new chapters of the Scout Training Manual, currently also available in hard copy. Insect information was also made available through the extensive Featured Creatures web site and the Tropical Research and Education Center web site.

List Servers were operated from the Mid-Florida REC with considerable use by county faculty. The three list servers were in the areas of pest alerts, biological control information exchange, and the pink Hibiscus mealybug.

Site Visits, Clinics, Telephone and E-mail Consultations included crop production, diagnostic, pest and beneficial identification and management recommendations. Active participation was undertaken with the use of the Digital Diagnostic Information System (DDIS) plant problem diagnostic system. One county (Manatee) provided field scouting services to nurseries and another (Hillsborough) provided and advised trained scouts for the Tampa Bay Wholesale Growers Association nursery support effort.

Plant Variety and Pest Management Trials and demonstrations were conducted for bedding plant production, wild flowers, ornamental grasses, lobate lac scale, Myllocerus weevil, cycad scale, and pink Hibiscus mealybug.

Summary of Impacts for Clientele:

In Florida, 345 nurseries implemented integrated pest management techniques into their operations as a result of programming. Of these, 51 implemented scouting, 46 improved pest and disease identification, and 25 reported changed pesticides used to more environmentally compatible products. In addition, 60 % of Florida's Caladium growers used alternatives to methyl-bromide, representing 1200 acres of production and approximately \$9 million in annual sales.

In Palm Beach County alone, 31 nurseries adopted IPM as a result of programming, representing approximately 713 acres of production and 1302 employees. Hundred of thousands of dollars in cost savings, due to better cold weather forecasting, resulted for fern and other nursery production operations as a result of using the FAWN web site. Other successful websites included Pest Alert, with more than 32,000 visits in 2003, Whitefly with 37,210 visits and the Woody Pest web site with 134,249 visits.

Additionally, at least 50 nurseries indicated that they were implementing measures to protect employees from human hazardous insects as a result of programming.

Success Stories:

Faculty Name: Brinen, Gary-Alachua

Program Title: Improving Ornamental Nursery Production Efficiency

Success Stories:

As a result of the pest management update, six nurserymen were better able to identify new pests,

three planned to implement new pest management strategies to better monitor and control new pests, five planned to better protect employees from human hazard insects, and three would implement better control methods to decrease hazardous insect populations. .

Faculty Name: Brown, Stephen-Lee

Program Title: Establishing Professionalism in the Commercial Green Industry

Success Stories:

From 2000 through 2003, more individuals in the Lee County Green Industry successfully passed pesticide certification exams than all but two Florida counties. Participants reported that classes offered at the Lee County Extension office was the only way they were able to obtain a pesticide applicator license. In several class surveys, participants reported improved incomes because of business diversification and personal improvement due to pesticide licensure. The city of Fort Myers awards a 3% salary increase for landscape maintenance workers who received pesticide licenses. Inspectors from FDACS Division of Agriculture and Environmental Services reported that Lee County has fewer golf course and nursery pesticide violations than any other southwest Florida County. This is directly attributed to the pesticide certification classes offered by the agent. Inspectors from FDACS Bureau of Entomology and Pest Control reported that Lee County landscape pesticide applicators are now more than ever in greater compliance. This is directly attributed to the pesticide certification classes offered by the agent. The director of the Lee County Environmental Science, Planning Department, responsible for enforcing pruning ordinance in the county reported that the arborist certification course has done more for urban forestry in Lee County than any other single act. He stated that the program has elevated the value of tree in the county. The County Environmental Science, Planning Department, also reported that hundred of Sabal palms have been successfully relocated because of information from the fact sheet, Transplanting Sabal Palms. The fact sheet was written in 2000 by the agent and Rick Joyce and is distributed to all contractors at the time of permitting. The University of Florida palm fertilizer analysis, 8-2-12, is now commonly produced by ProSource One a regional distributor of palm fertilizer. The change was in large part driven by recommendations made at several conferences and the agent's personal contact with

Faculty Name: Chen, Jianjun-Central Florida REC-Apopka

Program Title: Best Water and Nutrient Management Practices for Foliage Plant Production

Success Stories:

Our demonstration of 'Fire Flash' production in a local nursery changed the fate of this plant and changed the minds of growers producing it. Because of commonly occurring leaf chlorosis and scorching, one tissue culture laboratory stopped micro propagating 'Fire Flash', and growers who used to be interested in this plant started phasing it out of production. I visited several growers and felt their frustration. Even though I informed them that reduced light level could improve this plant's production, they seemed to decide to give up. So, I selected a local nursery and conducted a demonstration experiment on site with varied light levels and N rates. Five months later, growers witnessed the differences of plants grown under different light levels. They changed their minds by increasing this plant's production, and the tissue culture laboratory is now starting to micro propagate this plant. The grower where our demonstration experiment conducted increased acreage of this plant's production from 0.5 acre to 3 acres. And this plant, formerly on the edge of being discarded is now a popular plant in propagation, production, and interiorscaping. Our estimation is that at least 350,000 tissue culture liners of 'Fire Flash' are produced. Finished plants are sold at \$3.00-5.00 per 6" pot. The estimated wholesale value for 'Fire Flash' is at least one million dollars.

Faculty Name: Fasulo, Thomas-Entomology and Nematology
Program Title: Web Site Development

Success Stories:

The Mole Cricket Web site is used in courses at North Carolina State University and at Ohio State University. The Featured Creatures site has attracted attention from around the world. Comments from numerous users are available on the Web site. The School IPM Web site has received funding from the EPA for several years. Federal and state school IPM coordinators and consultants acknowledge this Web site as the national leader for school IPM information. For example, a School IPM manual published by Michigan State University states that "The National School IPM website-sponsored by EPA and maintained by the University of Florida... is the number one resource site for school IPM." A School IPM manual published by Michigan State University states that "The University of Florida's Best of the Bugs Website... provides links to websites judged by entomologists at the University of Florida to be the best that the web has to offer on insects. Excellent sites for teachers and kids. "Various Florida state agencies use my Pest Alert as an additional means for distributing information. Their informational officers contact me on a regular basis to either link to their sites or to provide me with information to

Program Title: Computerized Training

Success Stories:

Sales of my software generated \$15,239 for 2003.
Faculty Name: Garofalo, Joseph-Miami-Dade
Program Title: Ornamental nursery production practices

Success Stories:

Relevance: proper pruning of trees and palms in nurseries results in strong trees which will resist wind damage, grow well, and live for many years. In addition, properly pruned trees meet the highest grades in the "Grades and Standards," demanding the highest prices. Response: growers were taught how to grade trees in the nursery, proper fertilization, irrigation, pest and disease management, and other production practices. Three hands-on trainings were provided at two nurseries demonstrating to workers how to prune trees in production. Results: about 50% of production workers at one nursery which had their crew trained in the field have started using the pruning techniques demonstrated. Supervisors report that they are pruning a little more slowly using the new techniques, but that they are gaining speed as they become accustomed to the new techniques. The quality of the pruning being done by crews is at least 25% better as judged by inspection of the pruned blocks. These trees, pruned for strength, will improve the quality of the urban forest. Already, landscape installation crews report improved satisfaction of customers with the trees delivered. Landscapers also report that fewer trees have to be replaced after inspection due to not meeting grade specifications. "Now that we understand better what a 'Florida No. 1' tree looks like, we are clearly able to satisfy landscape inspectors better."
Program Title: Integrated pest management, safety, and pesticide use in production (wholesale) nurseries

Success Stories:

Relevance: using IPM principles, scouting, and educating the workforce can improve quality of plants produced, reduce costs by using less pesticides. If local nurseries improve their substrate handling techniques to reduce disease problems caused by contamination, fewer pesticide treatments will be required, and environmental degradation will be reduced. Response: classes were taught on pest and disease identification, both at seminars and in nurseries. Scouting techniques were taught in nurseries, and a reference manual was provided to attendees. The latest chemical and biological treatments were taught by industry leaders and University of Florida

personnel. Results: through properly identifying pests and diseases, using appropriate management measures, and choosing chemical treatments wisely, plus other practices--one nursery manager has improved the quality of his finished products. He reports that sanitation in production areas and proper handling of substrate (keeping it off the ground), his disease problems have been reduced. "I had no idea that keeping the substrate off the ground and sweeping up production areas between crops could reduce my disease problems so much. I hardly see any dead plants in the nursery any more." He has also sent most of his labor force to pesticide certification classes, which has enabled them to scout for pests and diseases as they perform their usual duties in the nursery. Reduced chemical use at his three locations has resulted in less degradation of the water supply.

Faculty Name: Gasparini, Vera-Orange

Program Title: Ornamental Plant Production & IPM in Florida

Success Stories:

Within my first week of employment with the Extension Department, I assumed the responsibility of organizing and planning for the Nursery Scouting program, an intensive 4 day program that had been held for the prior six years. The programs and registration forms were ordered, picked up from the printer and sent out. Speakers were lined up and the class room and audio visual equipment was booked at the MREC. Printed material was ordered from the University of Florida and educational material from each speaker was copied and placed in folders for the 25 registered participants. Sponsors were obtained for hand lenses that would be given to the participants and for two days of lunches. Two nurseries were chosen for scouting, one a foliage greenhouse and the other a shade house, field grown woody grower. Refreshments were purchased for the four day period. I prepared power point presentations for three segments of the training of which I was assigned to teach. The 4 day program was facilitated by myself and Juanita Popenoe, Lake County Woody Ornamental Extension Agent, with the assistance of Liz Felter. The purpose of the program is to increase the use of interdisciplinary approach to insect and disease management that emphasizes frequent monitoring and effective integration of cultural, mechanical, biological, genetic and chemical control methods, in order to improve production capabilities and increase environmentally sound choices for growers. In the past, this program has been held to 20 growers. This year the response was so that it was decided to limit the class size to 25 persons. The program was at full registration within two weeks of the registration forms being mailed out and four other registrants had to be denied the opportunity of taking the class. Of the 25 participants, 13 were greenhouse growers and 12 were woody growers. The program addressed cutting edge research

Faculty Name: Gilreath, James-Gulf Coast REC-Bradenton

Program Title: Methyl bromide alternatives program for cut flower and ornamental bulb growers in Florida

Success Stories:

Sixty percent of the Florida caladium growers have tried at least one methyl bromide alternative on their farms, representing some 1,200 acres of crop and about \$16 million. Virtually 100% of the growers are aware of at least one methyl bromide alternative as a result of these programmatic efforts. Grower interest in alternatives has increased and there are more requests for information on alternatives as well as orders to custom applicators for application of one or more alternatives in order to learn more about them on an individual farm basis. This indicates a shift in practices to acceptance of fumigant and herbicide alternatives by more growers. A similar trend has been seen with the gladiolus industry in Florida. A trial with the state's largest gladiolus producer introduced him to the best alternatives for glads and the proper application procedures for best efficacy. Similar results have been obtained as a result of several cooperative research/demonstration trials with one of the state's largest producers of asters. Work on

herbicide alternatives for oryzalin has taken on a new emphasis with the news that the plant which produces oryzalin was only partially rebuilt after a devastating fire in 2000. Loss of registration of the one brand of this herbicide with an aerial application registration for caladiums has impacted the largest caladium producers. Research demonstrating the efficacy and safety of Factor herbicide has become important to the caladium growers and they have relied upon that work and what they saw to guide them in herbicide selection during 2003 and will continue to do so in the future. Perhaps the most successful thing I have done during my 22 year career has been the development of the Yetter coulter rig for broadcast application of soil fumigants in caladiums and other ornamental crops. This equipment, and the practices built around it, allow Telone products to be quickly and effectively applied broadcast to nontarped soil. It results in less out gassing than conventional application equipment and modification techniques and is thus safer for the applicator and workers near the application site. This reduction is significant enough to encourage the manufacturer of Telone products to submit a label amendment request to EPA to allow a reduction in buffer zones when this equipment is used. This will eliminate one of the major concerns of growers regarding Telone as an alternative to methyl bromide for ornamental crops.

Faculty Name: Grace, Patricia – Putnam

Program Title: Commercial Horticulture

Success Stories:

I was able to update The Putnam County Plant/Fruit/Produce Locator this year with the help of a summer intern, Rachael Lyons. This publication helps local nurseries market their product. It also helps Putnam County residents locate locally grown materials.

Faculty Name: Harbaugh, Brent-Gulf Coast REC-Bradenton

Program Title: Integrated Crop Management for Floricultural Crops

Success Stories:

The success of this program can be measured in a number of ways such as request to write in commercial trade magazines, changes in grower practices and use of new crops, and grants from industry sources. Examples of the success of this program follow: A. Three prominent trade journals routinely request articles from me. Similarly, I am currently invited to give oral presentations at local, state, and national meetings because of the need to apply research findings to grower operations. B. We have responded quickly to new pest problems and provided solutions that have gone into effect immediately. For example, in 1996, we discovered that Fusarium crown and stem rot was a new disease that caused as high as 70% loss in lisianthus production in the state. After intensive research efforts, we were able to deliver management practices quickly through oral presentations and popular press. By 2003, the disease was considered a minor problem due to the adoption of management practices we recommended to plug and cut lisianthus producers. The rapid dissemination of research findings is an extremely important service that has allowed growers to select and produce new crops rapidly, and develop new markets before other parts of the country can intrude into the marketplace. For example, lisianthus was virtually an unknown crop 15 years ago. I have developed a comprehensive series of articles dealing with production concepts and given many oral presentations on the merits of lisianthus for Florida. In 2002, lisianthus was second only to poinsettias for number of pots produced by the largest flowering pot plant producer in the state. Approximately 60% of the lisianthus crop was in 'Florida Blue', an F1 hybrid released from my new crops program. Similar production numbers were achieved by two of the largest plug producers in the state. Prior to our research on the cultural requirements of lisianthus, most growers had difficulty in producing lisianthus. Many growers have modified their cultural practices in response to the educational meetings held through out the state. For example, following our recommendations, most pot-lisianthus growers now add additional liming material to their potting media prior to planting to

prevent micronutrient imbalances that once were a common problem during production. C. In 2002, our interdisciplinary team received
Faculty Name: Holmes, David-Marion
Program Title: Commercial Agriculture

Success Stories:

Success Stories:

Minority Success Story: A minority citrus producer contacted the Marion County Extension Service about why some of his citrus trees seemed to have poor nutrition. The agent conducted a visit to the grove, which is a young grove, and asked a number of questions relative to the irrigation and fertilization practices. As Dr. Steve Futch was scheduled to be in Ocala for a workshop, the agent arranged for a visit to the grove by Dr. Futch. Upon examination by Dr. Futch, it was determined that several of the trees had foot rot, which was inhibiting the ability of the tree to take up nutrients. Recommendations were also given for proper irrigation practices. The agent followed up the visit by providing a source from which quality replacement trees could be obtained for those infected with foot rot. Agricultural Hall of Fame: An individual from the agricultural industry approached the Marion County Administrator about naming one of the buildings at the Southeastern Livestock Pavilion Complex for an individual who had contributed much to agriculture in Marion County. The administrator convinced this individual that many individuals could be recognized, over a long period of time, through an Agriculture Hall of Fame. The County Extension Director was appointed to put together a committee to obtain support and input in developing this idea. Committee members included representatives from the Cattlemen's Association, the Youth Fair, the Peanut Producers' Association, Chamber of Commerce Agribusiness Committee, Youth Fair Alumni Association, Marion County Farm Bureau and the Board of County Commissioners. The Committee functioned well to develop criteria for admission, an application form and the recognition method. Two individuals were appointed as the initial nominees and were honored at the Extension Volunteer Recognition Banquet in April. In late summer, the CED met with the Chamber CEO and arranged for the Ag Hall of Fame to be shepherded by that organization. One meeting has been held by the Chamber and plans for the 2004 nomination class are underway. Under terms of the agreement, the Ag Hall of Fame recognition event will be held as part of the Extension Volunteer Recognition banquet each spring.

Faculty Name: Howard, Forrest-Ft. Lauderdale-REC

Program Title: General extension activities in entomology and pest control.

Success Stories:

Public awareness of the lobate lac scale, which has recently become a major pest of trees and shrubs in urban and natural areas of southeastern Florida, has been increased through our extension activities, including talks described under Extension Activities, and an article on the Internet published in English and Spanish. Feedback from the public has indicated that there is now widespread awareness of the problem and how to control it until biological control can be established.

Faculty Name: Ide, Bruce-Citrus

Program Title: Commercial Agriculture

Success Stories:

Agent worked directly with a local retail grower to solve nutrient problems on his container plants. Plants were exhibiting deficiency symptoms despite being fertilized with a standard slow-release fertilizer. Tissue analysis was done and the soil was also checked. The problem was eventually traced to a load of potting media that had an excessively high pH, causing the fertilizer

elements to be unavailable to the plants. Agent interacted with commercial nurseries to address problems with pests, diseases and fertilization in their nurseries. Agent visits nurseries to discuss problems with insects, pests, diseases and fertilizer problems. Suggestions are offered on the spot or problems are researched and solutions suggested.

Faculty Name: Jackson, John-Lake

Program Title: Florida Automated Weather Network (FAWN)

Success Stories:

Budget cuts to the IFAS budget have resulted in a 10% reduction in the operation and maintenance budget. To compound the problems, FAWN added 12 sites with FEMA funds, thus increasing the maintenance requirement. Bottom line, FAWN needed to secure at least \$50,000 from outside sources in order to keep the high quality data available every 15 minutes. A sponsor program was initiated to encourage contributions to FAWN. A rotating icon on the web page thanks the sponsors. The sponsor program has generated \$13,000 in gifts. Southwest Water Management District and the Florida Department of Agriculture and Consumer Services has funded a 3 year Agricultural Irrigation Efficiency and Cold Protection Project for \$220,000. In addition Southwest Florida, South Florida and St. Johns River water management districts have funded 3 year projects at \$15,000 per year to support on going activities. This \$45,000 a year will allow FAWN to maintain the entire network, from towers to web site. The grant will allow additional personnel and development of management tools. It appears FAWN now has the outside dollars to allow for proper maintenance of the system and development of management tools.

Faculty Name: Leppla, Norman-Entomology and Nematology

Program Title: IPM Coordination

Success Stories:

The faculty member designed, implemented and leads the first comprehensive, statewide integrated pest management program for Florida. Coordination is essential to mobilize and focus Florida's exceptional research and extension talent to manage pests of agriculture, communities and natural areas in ways that are effective but cause minimal non-target effects in the environment. Delivery of information and technologies is primarily intended for county extension faculty and secondarily extension specialists but other clientele are directly involved and ultimately the citizens of Florida are the benefactors. The objective is to shift pest management practices from relatively high to low health and environmental risk by providing information and training on the use of pest management alternatives, including the acceptance of pests when their damage is minimal. Research needs for new, more biologically based pest management technologies are identified and communicated. This new program has helped to cause documented reductions in the use of high-risk pest management practices, such as the application of broad-spectrum pesticides, in vegetable and ornamental plant production, public schools, and other contexts. It has involved county extension faculty, master gardeners, extension specialists (researchers) and students. The faculty member has directly assisted producers of ornamental plants, sod, vegetables, and cattle; managers of schools and municipalities; and stewards of natural areas to adopt biologically based IPM practices. He is currently working with the IPM Institute of North America and the Florida Nurserymen and Grower's Association to train and certify landscape maintenance personnel, woody ornamental plant producers, school and municipal pest managers, and others in the use of IPM. The IPM Florida Website has been enhanced (<http://biocontrol.ifas.ufl.edu>). It is divided into categories of IPM information and divided into sections for agriculture, community IPM, and natural areas. The IPM Florida program includes a way to make contact, a mission statement, general concepts of IPM and biological control, lists of projects and reports, and so forth. The website can be browsed by crop, pest, natural enemy and pest type. Education and extension materials are classified as

demonstrations, meetings, newsletters, news releases, photo galleries, presentations, proceedings, tutorials, use of natural enemies, and videos. Cooperative extension leads clientele to county offices, the pesticide information office, publications, diagnostic clinics, and the Distance Diagnostic Identification System. Categories of information currently include applicator training, biocontrol agent release, biopesticides, pesticide compatibility with natural enemies, labels, pest management tutorials, scouting, associations, ecology, entomology, nematology, pesticide information, plant pathology, suppliers of beneficial organisms, UF, USDA, invasive weeds and miscellaneous. There are success stories for Melaleuca, mole crickets, ornamentals, and tomato IPM. There is a search engine for information on the site and at all University of Florida Websites. Links include online resources for general IPM and biocontrol-related information, the Florida Automated Weather Network (FAWN), reports about IPM activities in Florida and the nation, and information on specific pests, natural enemies, or pest cycles, including "Featured Creatures" fact sheets from the University of Florida Entomology and Nematology website and a list of contacts who have agreed to answer extension faculty IPM and biological control questions. The International Organization for Biological Control, Global Working Group on Arthropod Mass Rearing and Quality Control (IOBC, AMRQC) has been revitalized. The Website (www.amrqc.org) has been relocated from Florida to the University of Ghent, Belgium. Additionally, a comprehensive 10th Workshop of the IOBC, AMRQC was conducted in France, September 2003. This conference provided an unprecedented opportunity to discuss issues that are critical to the future of commercial biological control. Directions were determined for harmonizing quality control standards in North America, Europe and throughout the world. Subjects of common interest were laboratory and field quality control tests, new technologies and products, regulatory challenges, and ways to promote biological control. The conclusion was a brainstorming session on international cooperation and action. The conference was attended by the major international leaders in commercial biological control, along with their collaborators in allied industries and government. Representatives from the IOBC Global Body, IOBC, AMRQC, U.S. Department of Agriculture, state departments of agriculture, U.S. and European universities, and other affiliated groups. Members of the Australasian Producers Association and South African Insectaries Association have been invited and colleagues from Asia and South America participated. A model project is commercialization of a nematode, *Steinernema scapterisci*, imported from South America and patented by UF to control pest mole crickets, also from South America. These mole crickets invade bahiagrass and other grasses in pastures, golf courses, sod farms, athletic fields and a variety of other habitats. They also damage young vegetable seedlings. IPM of mole crickets involves the selection of grasses (prevention), maintenance (cultural practices), biological control (nematodes), chemical control (insecticides), and mechanical disruption (physical control). These tactics are integrated by entomologists, nematologists, agronomists, horticulturists, weed scientists and others cooperating with extension agents, farmers and land managers. Systems of this type are being developed and perfected in Florida for ornamental plant production (spider mites, fungus gnats), greenhouse vegetable production (aphids, thrips), small

Faculty Name: Mannion, Catharine-Tropical REC-Homestead

Program Title: Management of Ornamental Pests in South Florida

Success Stories:

Working closely with state and federal regulators in providing important information on pink hibiscus mealybug through presentations and interactions with growers has undoubtedly helped in reducing the spread of this extremely important pest. The IPM Training Workshops which included hands-on exercises have resulted in positive feedback from the attendees. All attendees reported that the information provided will increase their ability to identify and manage their pests using IPM. Several county agents around the state have expressed an interest in

participating in the development of the IPM Training for nurseries and associated website that will be used for monitoring key pests, pest alerts, and other pertinent information.

Program Title: Plant Diagnostic Clinic-Insect Identification

Success Stories:

Several insect samples from the clinic were sent to taxonomists for identification or verification. Three insects (one scale and two mealybugs) were reported on new host records or as new county records. Two insects (May beetles) new to Florida were identified. One of these insects is from Honduras and the second is common in the southeast US but had not been reported in Florida. Pest alerts were subsequently released on these.

Faculty Name: Melton, Frank-Manatee

Program Title: Ornamental Plant Production and Integrated Pest Management in Florida

Success Stories:

One poinsettia grower had 65% whitefly in one block. He did not apply any pesticides on that area, and within one month, his whitefly were reduced to 9% by parasitic wasps. Also, 66% of the whitefly had been parasitized. The wasps were part naturally occurring and some that had been released two years ago. Another block had been sprayed regularly for whitefly, and it did not have reduced numbers of whitefly. This is another example of beneficial insects providing better pest management than regular pesticide applications. We were able to help nurseries avoid being quarantined, by identifying insects they had to kill immediately to keep from spreading them. We have had two new infestations this year: cycad scale and pink hibiscus mealybug.

Faculty Name: Miller, Laura-Hillsborough

Program Title: Adoption of Best Management Practices for Ornamental Plant Producers:

Success Stories:

Sun City Tree Farm received the Commissioner of Agriculture's Ag Environmental Leadership Award. The owners and employees of Sun City Tree Farm have participated in several extension programs in 2003 that have helped them reduce water usage. The farm is currently the site of an ongoing irrigation demonstration project and has hosted both a grower meeting on innovation in water conservation and the 2003 Operation Agriculture Tour. Sun City Tree Farm employs one of the IPM scouts trained last December and continues to utilize Integrated

Faculty Name: Nesheim, Olaf-Food Science and Human Nutrition

Program Title: Pesticide Impact Assessment Program for Florida

Success Stories:

The development of crop/pest management profiles for Florida crops continues to be a success story. With the assistance of IFAS county, Research and Education Center, state faculty and commodity groups we are able to develop detailed information on Florida crops and the production and pest management practices used by growers in Florida. Information of this nature does not exist in a single source. The input from faculty (county, REC, and state) and commodity associations made the success of this effort possible. The Environmental Protection Agency's Benefits & Economic Analysis Division finds the crop profiles to contain valuable information for their work in support of registration, re-registration, tolerance reassessment, emergency exemptions and reduced risk decisions.

Faculty Name: Norman, David-Central Florida REC-Apopka

Program Title: Outreach and Public Relations with the Ornamental Plant Industry

Success Stories:

I have no extension appointment; however, I have between 3 to 5 growers call or visit my office each work day (approximate yearly number between 720 to 1200). In addition to grower visits, every Thursday I conduct a grower clinic with extension agents from Orange and Lake counties. For public relations and for insight into problems in the nursery industry I diagnose plant samples. This usually entails the use of standard isolation techniques along with a number of simple biochemical tests. The following table list the number of samples handled each year of my employment at MREC. The following is a list of samples processed each year at MREC 1995-1996 (350 samples) 1996-1997 (392 samples) 1997-1998 (296 samples) 1998-1999 (339 samples) 1999-2000 (294 samples) 2000-2001 (459 samples) 2001-2002 (380 samples) 2002-2003 (474 samples) 2003-2004 (608 samples).

Faculty Name: Popenoe, Juanita-Lake

Program Title: Commercial Plant Production & Integrated Pest Management

Success Stories:

Of the respondents to the survey after the IPM Nursery Scouting class, 17 felt the program was definitely helpful to them and 4 felt it was helpful to some degree. 18 felt the material was definitely presented in a clear manner and 3 felt it was clear to some degree. 14 felt the information was definitely presented in enough detail and 3 felt it was in some degree enough detail. 16 felt they definitely received the information they came for and 5 felt that they received the information they came for in some part. 20 said that they would definitely attend future extension programs and 1 said they possibly would. All said that they would implement some of the principles discussed in the program in the next year and many felt that the program was so good that they wanted an advanced

Faculty Name: Price, James-Gulf Coast REC-Bradenton

Program Title: INTEGRATED PEST MANAGEMENT IN FLORICULTURE

Success Stories:

Was awarded sectional "Best Paper" award of the Fla. State Hortic. Soc. for the paper, "Mode of Action Codes to Aid Ornamentals Growers in Developing Control Programs to Manage Pest Resistance" by E. McCord, J. F. Price and C. A. Nagle. 2003. University of Florida ornamentals extension agents report that growers now are very interested in the modes of action component of developing pest management programs now. Additionally, these agents report to me that they find the new EDIS Ornamentals Pest Control guides to be very, very useful in recommending more effective and safer products for ornamentals IPM programs.

Faculty Name: Skvarch, Edward-Saint Lucie

Program Title: Best Management Practices For Green Industry Professionals

Success Stories:

On September 30, 2003, Commercial Horticulture Agent, Ed Skvarch, spoke to a class of Master Gardeners on Integrated Pest Management (IPM) including Lyle Finn. One of the new trainees, Lyle became instantly excited with the IPM concept prompting him to review his property owners association existing fertilization and insecticide contract. Mr. Finn recognized that the current contract was limiting the contractor to a strict schedule for application of fertilizer and insecticide. No room was provided for a management program based on inspection of plants and identification of pests. On October 7, 2003, Mr. Finn asked the current pest management contractor to meet with him and provide him with a prototype contract with provisions for IPM. Due to the additional labor required for inspection of additional plants which were not covered before, the proposed cost was 40% higher. On October 8, 2003 Mr. Finn presented the concept and cost of the IPM system. At this time he also explained to the landscape committee that an outside expert was needed to help with the process. It was decided that an expert with no financial involvement would be best. It was also decided that the committee must have

confidence in this expert as a reference. In Mr. Finns words "IFAS was the answer"! On October 31, 2003 the IFAS Commercial Horticulture Agent in St. Lucie County was invited to speak to the recently formed Granada Landscape Committee on IPM and the steps needed for the process to be successful. While at this presentation many of the committee members related insect pest horror stories so interest was high. By the end of the meeting it was unanimously accepted that IPM was the better way to go. The committee voted to recommend IPM to the Budget Committee. On November 11, 2003 regardless of the 40 percent increase the Isle of Granada Budget Committee agreed with the landscape committee, and recommend to the Isle of Granada Board of Directors that additional monies should be allocated for an IPM program for the 2004 budget. This decision was based on IFAS information provided to the committees, and the assurance that the IFAS agent will work alongside the Isle of Granada POA. On November 12, 2003 the Isle of Granada Board of Directors approves the new budget with additional money for an IPM approach to landscape pest

Faculty Name: Stamps, Robert-Central Florida REC-Apopka

Program Title: Ornamental Plant Production and Integrated Pest Management in Florida

Success Stories:

Growers and landscapers have stated that they have saved considerable time and money by following our weed management practices.

Faculty Name: Venrick, Dana-Volusia

Program Title: Production of Cut Foliage Crops

Success Stories:

The Foliage Advisory committee became more active this year, met three times and designed, sent out and collected a cut foliage planning survey that resulted in relevant and effective programs that growers themselves wanted to have. The programs helped growers reduce fertilizer use and leaching to the ground water, implement effective and safer disease and insect control methods, bring better pest control at a lower cost, introduce profitable new crops in demand by florists and increase monitoring of pH and fertility. The Foliage Advisory Committee was instrumental in planning a series of grower-driven programs that were well attended. The weed control and pesticide training program on January 15 was attended by 59 people. The Extension "Learn and Earn CEU's" program on March 12 attracted 37 participants. The program on propagation techniques on May 14 had 23 in attendance. The July 30 insect and mite control and "Worker Protection Standards" training had 35 in attendance. The October 15 Forum on alternative foliage crops had 24 participants. Fifty growers attended the December 10 Forum on Silicon for nutrition and disease protection. The grower-driven combination of varied formats, interesting topics and presentations, and the awarding of CEU's resulted in excellent turn-outs from the cut foliage industry. Last year IFAS testing of nitrate leaching at five sites, several of which were cut foliage operations, found that some samples tested above a ten parts per million threshold. By the end of 2003, no samples from these five sites exceeded this threshold. IFAS in-field studies by Dr. Stamps of MREC that showed more nitrogen was absorbed by fern at lower fertilizer rates. Through a cooperative educational effort by Dr. Stamps, the Foliage Advisory Committee and Agent's educational efforts, growers reduced nitrogen fertilizer inputs and fertigation run times. These cooperative efforts lowered the levels of nitrate leachates while at the same time achieving higher levels of nitrogen in the leaf tissue, better leaf color and longer shelf life of cut foliage crops. A fern grower was having difficulty in getting his tree ferns (*Asparagus virgatus*) to grow to normal size and "green-up". Through the use of suggested pesticides, a biological fungicide and improved nutrition, the crop is now in very good condition with improved marketability.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Faculty Name: Andrews, Robert – Highlands

Program Title: Home Horticulture in Florida Outreach to Minorities: All programs are publicized in two newspapers and on two radio stations. All programs are available to anyone regardless of race, color, age, gender, handicap or national origin. 6% of the Master Gardeners are minority members.

Program Title: Commercial Ornamental Nurseries Outreach to Minorities: Because parity has been achieved, no special activities are needed to involve minorities or

Faculty Name: Bolques, Alejandro-Gadsden

Program Title: Management of Water and Nutrients in Gadsden County's Nursery Industry Outreach to Minorities: Program announcement via agents' county newsletter, UF/IFAS NFREC Newsletter online, as well as personal contact.

Program Title: Other Activities Outreach to Minorities:

Faculty Name: Brinen, Gary-Alachua

Program Title: Improving Ornamental Nursery Production Efficiency Outreach to Minorities: Insure that all minority growers are identified, added to mailing lists and notified of all

Faculty Name: Brown, Stephen-Lee

Program Title: Establishing Professionalism in the Commercial Green Industry Outreach to Minorities: Parity was achieved between male and female audiences. Parity was also achieved with respect to minority contacts. This agent will continue to approach nursery supervisors and managers in an attempt to contact more minority audiences. Direct, word of mouth, appeal is perhaps the best way to increase minority

Faculty Name: Chen, Jianjun-Central Florida REC-Apopka

Program Title: Best Water and Nutrient Management Practices for Foliage Plant Production Outreach to Minorities: The outreach methods in my extension programs included (1) on-site visits, (2) telephone calls, (3) emails and faxes, (4) weekly plant clinic activities, and (5) short talks and presentations. During the course of these activities, I have served clientele from different ethnic groups including African-American, Hispanic, and

Faculty Name: Garofalo, Joseph-Miami-Dade

Program Title: Ornamental nursery production practices Outreach to Minorities: Minority clientele and females attended all of the short courses, workshops, and other educational programs, but special effort was also made to reach minority audiences; these efforts included sending news-releases about each program offered, with attached fliers, to the predominantly minority newspapers, radio stations, and television stations. Because parity has been achieved, no special activities are needed to involve

Program Title: Integrated pest management, safety, and pesticide use in production (wholesale) nurseries Outreach to Minorities: Minority clientele and females attended all of the short courses, workshops, and other educational programs, but special effort was also made to reach minority

audiences; these efforts included sending news-releases about each program offered, with attached fliers, to the predominantly minority newspapers, radio stations, and television stations. Because parity has been achieved, no special activities are needed to involve

Program Title: Nursery business management Outreach to Minorities: Minority clientele and females attended all of the short courses, workshops, and other educational programs, but special effort was also made to reach minority audiences; these efforts included sending news-releases about each program offered, with attached fliers, to the predominantly minority newspapers, radio stations, and television stations. Because parity has been achieved, no special activities are needed to involve

Faculty Name: Gasparini, Vera-Orange

Program Title: Ornamental Plant Production & IPM in Florida Outreach to Minorities: All program fliers and newsletters are distributed to all nurseries registered with the Division of Plant Industries. The President of the Korean American Growers Association is notified in advance of all programs that are being offered so that he can make his association members aware of the opportunities available in their native language. All announcements, news letters and programs conform to AA and ADA guidelines.

Faculty Name: Gilreath, James-Gulf Coast REC-Bradenton

Program Title: Methyl bromide alternatives program for cut flower and ornamental bulb growers in Florida Outreach to Minorities: Minorities receive trade magazines and any extension newsletters that are prepared. Any minorities in the caladium and cut flower businesses are welcome to come to any meetings held with the industry and notices of these meetings are provided through the local county extension office. Additionally, contacts of an individual nature are always welcome.

Faculty Name: Howard, Forrest-Ft. Lauderdale-REC

Program Title: General extension activities in entomology and pest control. Outreach to Minorities: I translated into Spanish an article that I published with co-authors last year describing the lobate lac scale problem along with current control methods with photos for identifying the insects. The article was posted on the Department of Entomology and Nematology's online publication Featured Creatures in October 2003. I answer correspondence and telephone calls in Spanish where appropriate.

Faculty Name: Leppla, Norman-Entomology and Nematology

Program Title: IPM Coordination

Outreach to minorities:

Several research and extension projects are being conducted with minority faculty members from UF and FAMU. The Mississippi State University short course is attended predominately by women and minorities. Many of the grape growers are limited resource farmers and some are under-represented groups. Key members of the mole cricket working group are female and African-American. A considerable amount of guidance is provided to female and minority students. Three of the five IPM Florida employees are female; the IT specialist is African-American, Multi-County: Mole cricket project (29 counties), Green teams (4), cattlemen's meetings (Hernando, Osceola and other central Florida counties), master gardener activities are multi-county, multi-disciplinary: The primary disciplines (IFAS departments) included in the

extension activities were Entomology and Nematology, Plant Pathology, Horticulture, Environmental Horticulture, Agronomy, Agricultural and Biological Engineering, and Food and Resource Economics, Multi-Institution: This extension program supports the CSREES Southern Regional Project S-303, Biological Control of Selected Arthropod Pests and Weeds. Other multi-institutional partners are listed under "Organizational Linkages. Multi-State: The Florida IPM program is part of the national and regional CSREES IPM program. S-303 includes participants from all states in the Southeastern Region. Additionally, there was cooperation with New York, Maryland, Colorado, Mississippi, California, Arizona, and a few other states. Integration with Research Projects.

Faculty Name: Melton, Frank-Manatee

Program Title: Ornamental Plant Production and Integrated Pest Management in Florida Outreach to Minorities: Newsletters and program announcements are provided to all involved in nursery or sod growing businesses. All programs are open to any employee, manager, or owner.

Faculty Name: Miller, Laura-Hillsborough

Program Title: Adoption of Best Management Practices for Ornamental Plant Producers: Outreach to Minorities: Minority operated firms currently participate in extension programming for ornamental plant producers at rates greater than the participation rate of nurseries as a whole. It is fair to say that parity has been achieved. Programming was offered to everyone in the nursery industry, with out regard to race, creed, religion, gender, age or disability. Special accommodation for disability was offered on each promotional piece for each educational event. Affirmative action was discussed at the Hillsborough Polk Ornamental Plant Production advisory committee meeting on August 15, 2003.

Faculty Name: Palmateer, Aaron-Tropical REC-Homestead

Program Title: Volunteerism in Extension Outreach to Minorities:

Program Title: Quality and Management of Florida State Diagnostic Services Outreach to Minorities: Notification of programs and meetings in local newspapers, news letters, and online announcements. Programs were held in different geographic locations and at sites accessible by all people.

Faculty Name: Price, James-Gulf Coast REC-Bradenton

Program Title: INTEGRATED PEST MANAGEMENT IN FLORICULTURE Outreach to Minorities: The groups I have targeted include more than 60% women and include, Hispanic, African American, Korean and other under represented minorities. Some physically handicapped clientele benefit.

Faculty Name: Schall, William-Palm Beach

Program Title: Nursery Integrated Pest Management Outreach to Minorities: Record minority and gender participation in workshops, seminars, office and nursery contacts, telephone communications and newsletter mailings. Offer programming to everyone in, or entering the industry regardless of race, creed, religion, gender, age or disability. Identify affirmative action and special accommodation for disability on all program flyers and publications. Discuss minority participation at least annually on advisory committees. Mailings will be sent to all

nurseries in the county identified on the Florida Department of Agriculture and Consumer Services, Division of Plant Industry nursery list regardless of race, creed, religion, gender,

Faculty Name: Skvarch, Edward-Saint Lucie

Program Title: Best Management Practices For Green Industry Professionals Outreach to Minorities: Educational programs are conducted in accordance with the University of Florida's policy of equal opportunity / affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities through the use of mass media (i.e. newspaper, television, radio, Internet).

Faculty Name: Venrick, Dana-Volusia

Program Title: Production of Cut Foliage Crops Outreach to Minorities: Reasonable steps are being taken to reach persons of all races and gender by sending semi-monthly newsletters to all cut foliage growers and interested parties involved in the industry and recipients are being asked to share the information with employees and all interested parties. Surveys were sent to those in the cut foliage industry asking for their input and involvement. Programs are held close to the growers at the Lions Club in Pierson and the Ag Center in Deland. News releases have been sent to 33 news media outlets in Volusia County to encourage more participation by all segments of the public. The Commercial Horticulture Extension Agent makes personal visits to a variety of clubs and organizations and cut foliage growers to encourage participation. Pesticide safety classes are being made available at no cost or low cost to all participants. Information is being sent out on a regular basis in the newsletters and press releases to make all races and gender aware of the types of financial assistance that are available for business start-ups in the cut foliage industry as well as other types of assistance, such as the New Hope farm worker housing and childcare facility in Seville.

Source of Federal Funds: Smith Lever

Title: Sustainable Communities Development and Enhancement of Natural Systems in Florida

National Goals: 1, 4

Key Themes: invasive species, Air quality, Energy Conservation, Weather and Climate

Situation/Program Rationale:

Florida ranked 27th in population nationwide in 1940. Today it ranks fourth. Growth rates during the twentieth century have ranged from 29 to 79% per decade, compared to 10 to 20% for the nation as a whole.

Rapid population growth has changed the state from a largely rural state to one of the most highly urbanized in the country; 85% of Florida's population is now urban, compared to 76% nationally, making it ninth most urbanized in the country. The number of Metropolitan Statistical Areas (total population of 100,000 or more) grew from only seven in 1960 to twenty in 1990. However, over half of the population resides outside the central city core in most MSAs in the state. Florida is a classic example of uncontrolled urban sprawl or ex-urban development. The very high growth rate accompanied by the "urban sprawl" pattern of development, places severe stress on the state's natural systems.

Currently, 100,000 new homes are being built in Florida each year. These homes are rapidly changing the blended inventory of Florida homes and the average rates of domestic water and energy consumption. They are also changing the blended risk of Florida's average home to termite infestation and damage and vulnerability to windstorms. Florida's rapid population growth and urbanization, expected to continue well into the 21st century, define critical issues and needs

for the state. Preserve green space and natural environments.

Using population projections and data from aerial photography and satellite imagery, it is estimated that 130,000 acres per year will be converted from rural to urban uses between 2000 and 2020. Of the 81 kinds of natural communities found in Florida, nearly 80% are threatened by human activities. About 90% of the state's native longleaf pine forests have disappeared and almost 20% of the state's animal species are under some sort of protection due to decreasing numbers and a potential threat of extinction. Destruction of open space and natural habitats threatens to undermine the state's economic health. People come to Florida more than to just escape bad weather and deteriorating urban environments. People vacation in Florida in part to enjoy its natural beauty. Reduce energy through support of Energy Star and other energy conservation programs. The EPA/DOE Energy Star program is rapidly becoming a recognized standard for energy efficient homes nationwide. It is a performance-based program with third party verification. It has the potential to measurably reduce energy consumption in Florida's newly constructed homes. It also supports builders and developers in their efforts to differentiate themselves in the marketplace. Protect the water supply. The average Florida resident uses 170 gallons of fresh water per day, over 50% more than the average for the United States. Further, use is highest where population is the greatest. In South Florida, where fresh water resources are already under severe pressure, use averages 210 gallons per person per day. About half of all water use in Florida is for lawn and garden irrigation. In essence, we are mining our water supplies. Some water supplies are also polluted. Florida's population cannot be sustained without a safe, abundant water supply. Promotion of the Florida Yards and Neighborhoods program and planning at the community development level can significantly reduce consumption of installed landscapes. Promotion of water conserving dishwasher and clothes washers can reduce consumption in homes.

Program Objectives:

To educate and empower Florida's citizens, including business and government professionals, to create communities that are environmentally sound, economically productive and resource efficient. Environmentally Sound: Improve decision making to reduce the impacts of population growth and development on Florida's natural resources and environment. Economically Productive: Encourage communities to make local capital investments to sustain local human, fiscal and natural resources. Resource Efficient: Support programs, products and professionals in designing and constructing homes that are measurably termite and windstorm resistant and that conserve energy and water.

Summary of Programs for Clientele:

Summary of Impacts for Clientele:

Success Stories:

Faculty Name: Kruse, Lynda-Lee

Development is proceeding very rapidly in southwest Florida. Lynda Kruse in Lee County has developed a Builder/Developer Outreach program. Her educational activities include: Presented FY&N principles to owner and landscape designer for Centex Homes, the owners of Bellagio Builders, key personnel from Bonita Bay Group, and key personnel from WCI (four separate presentations). Reviewed landscape plans for the above builders and developed recommendations to improve landscape design based on FY&N principles. Toured new development called Hope Gardens with Ericka Cousley from the City of Fort Myers Redevelopment Agency. Presented Ms. Cousley and the builder with information and education as to FY&N principles they could apply as this development is put in place. Working to put together a packet to provide residents

with information about maintaining a Florida-friendly yard. Also working to develop a list of preferred and prohibited plants for the community, as well as a long-range landscape plan for the future. This is a success story because of its effort to reach the developers and builders prior to final decision-making and follows up with program development for homeowners.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Most FL-113 programs are designed to provide continuing education hours for professional license holders. These programs are equally advertised via direct mail to all license holders using lists provided by Florida's Department of Business and Professional Regulation.

Source of Federal Funds: Smith Lever

FL-SMP-116

Title: Florida Turfgrass Management

National Goals: 1, 4, 5

Key Themes: Home Lawn and Gardening, Invasive Species, Ornamental/Green Agriculture, Plant Germplasm, Precision Agriculture, Small Farm Viability; Urban Gardening, Drought Prevention and Mitigation, Integrated Pest Management, Nutrient Management, Pesticide Application, Water Quality, Yard Waste/Composting, Agricultural Financial Management, Jobs/Employment, Promoting Business Programs, Enhancing Customer Service/Satisfaction

Situation/Program Rationale:

The turfgrass industry in Florida encompasses 4.4 million acres of managed turf. Over 3 million acres of turf are managed by homeowners and Florida has more golf courses than any state in the Union. Turf produced on the 53,000 acres of sod production makes its way on to golf courses, athletic fields, cemeteries, roadsides, and in the landscape. Because of the massive acreage covered in turf, a concomitant amount of inputs (fertilizers, pesticides, and water) are also used. Proper fertility and cultural practices associated with turfgrass maintenance influence turfgrass vigor and physiological functioning, including photosynthetic rates, light attenuation, and carbon assimilation. Properly fertilized turfgrass develops deeper, denser root systems that are better able to cope with environmental conditions such as drought, shade, cold temperatures, and other adverse conditions. These grasses will not only cope better with environmental stresses, they will also have fewer associated problems with weeds, insects, and diseases, and will require fewer curative chemicals as a result of this. There will likewise be less potential for leaching or runoff of fertilizers or pesticides in these areas due to their denser root and shoot systems, which will result in less potential contamination of ground and surface water. Without the development of Turfgrass BMPs based on sound research / demonstration, the turfgrass industry will be relegated to unnecessary regulation developed under political motives, motives that are often not based on sound science. Furthermore, once BMPs are developed for the turfgrass industry, the transfer of this information to the end user, whether it is a professional turfgrass manager or home landscape enthusiast, and its subsequent adoption are imperative to assure successful turfgrass management with the least environmental impact.

Program Objectives:

1. Develop methods for minimizing environmental impacts of turfgrass chemical use. UF/IFAS turf faculty are actively conducting basic and applied research to develop integrated pest management practices. These research/demonstration activities serve as the basis for the recommendations contained in numerous print and electronic media. Similarly, turf faculty (and

affiliates) have actively pursued development of natural and biological control agents for several turf pests including weeds and insects.

Summary of Programs for Clientele:

Program Objectives:

1. Develop methods for minimizing environmental impacts of turfgrass chemical use. UF/IFAS turf faculty are actively conducting basic and applied research to develop integrated pest management practices. These research/demonstration activities serve as the basis for the recommendations contained in numerous print and electronic media. Similarly, turf faculty (and affiliates) have actively pursued development of natural and biological control agents for several turf pests including weeds and insects.

Success Stories:

Pesticide Applicator Training Most counties conduct an extensive number of training events aimed at reducing pesticide usage through providing proper training to pesticide applicators. Comments from those surveyed indicated that they plan to make changes such as: "Learn more about pesticides", "Spray less", "Use pesticides only when needed", and "Monitor pests more carefully." *Development of Accurate Recommendations* Faculty work closely with basic manufacturers of pesticides to test products under real-world situations. These results are then conveyed to county extension faculty who, in turn, make relevant recommendations to end-users. Because "ground-truthed" recommendations are used, optimal pest control is achieved and pesticide use can be reduced. *Adoption of IPM and Biological Control Agents* Faculty have been invited to work with end-users who are adopting the use of biological control agents for mole crickets which reduces the dependence on synthetic chemicals. Work with regulatory agencies to develop and adopt Best Management Practices for Landscape Turf, Golf Courses, Sod Farms, and Athletic Fields. Members of FL116 along with representatives from Florida Department of Agricultural and Consumer Services, Florida Department of Environmental Protection, Water Management Districts, and industry leaders developed Turfgrass Management BMPs that have been endorsed by these regulatory agencies. The document focuses on four areas: Nutrient / Cultural Practices; Pesticides; Irrigation Management; and Education / Training.

Success Stories:

Improved Communication and Coordination Results in Greater BMP Adoption A significant number of landscape personnel have received training related to the Green Industry BMPs. Once these attendees complete their training, they are eligible to train employees at their place of business. This multiplier will greatly enhance the adoption rate of the BMPs. *Provide Scientific Support to Shape Public Policy* Turf faculty interact with industry leaders to provide research-based information to shape public policy. Agencies include St. Johns County, the Village of Wellington, the South Florida Water Management District/ C-11 Canal Work group, Nitrogen Remediation Work group, and Southwest Florida WMD to enact ordinances that would reduce fertilizer impacts and that were achievable in practice. 3. Development of the BMP Educational Program for the Green Industry Members of the team developed, at industry and DEP request, a 4-part educational module for teaching the green industry workers how to use the BMP manual in their daily activities. Train-the-Trainer events were conducted throughout 2003 to train county faculty, industry management training personnel, Water Management District reps, and local government decision makers in use of the BMPs. Each attendee received materials needed to 1) improve their ability to manage lawns and landscapes in an environmentally friendly manner and 2) to conduct programs to train their employees in the BMPs.

Success Stories:

A significant number of landscape personnel have received training related to the Green Industry BMPs. Once these attendees complete their training, they are eligible to train other employees at their place of business. This multiplier will greatly enhance the adoption rate of the BMPs. Trainees receive certificates of completion certifying that they have been trained in how to use the BMPs. **4. Develop regional fertilization recommendations.** Turfgrass

fertilization continues to be an area of great concern because of perceptions of enhanced environmental impact. Turf faculty continue to conduct research and demonstration projects to determine nutrient requirements of turf.

Success Stories:

Consumers Shifting to Fertilizers with No Phosphorus as a Result of Extension Education.

Phosphorus is a major factor in the pollution of Florida lakes. As a result of the BMP development and outreach program, Lesco fertilizers have been developed and distributed for sale in FL with 0-2% P to fall in line with BMP recommendations. Conversations have been initiated with the Scott's Co., who are expected to follow suit in 2004.

Commercial Lawn Care Services are Adopting the BMP Recommendations. Results from the 2003 training sessions are summarized below:

Did program meet expectation?

Yes	97	%
No	3	%

Do you know more about topics than you did?

Yes	96	%
No	4	%

Do you feel prepared to teach topics?

Yes	87	%
No	13	%

Will training and materials fit into future training plans?

Yes	98	%
No	2	%

Please rate the specific topics covered for both content and presentation.

Overview

Excellent	58	%
Good	39	%
Fair	2	%
Poor	1	%

Irrigation

Excellent	48	%
Good	45	%
Fair	6	%
Poor	1	%

Turf Fert

Excellent	67	%
Good	31	%
Fair	2	%
Poor	0	%

Lands Fert

Excellent	52.6	%
Good	43.6	%
Fair	3.8	%
Poor	0	%

Pesticide

Excellent	56	%
Good	42	%

Fair	2	%
Poor	0	%

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Educational programs are conducted in accordance with the University of Florida’s policy of equal opportunity/affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities through the use of mass media. Minorities are encouraged to participate in all extension programs. In some counties where a large number of the clientele is Hispanic, programs and publications are done in Spanish. Some agents appear on Spanish radio and television. Agents sometimes do direct or personal contact with minority growers, nurseries or other individuals to promote programs. Agents report using Equal Opportunity and ADA statements on meeting announcements. Some counties report using minority newspapers when available. Meeting sites are selected where there is commonality and local support. The BMP Summary Guide has been translated into Spanish and translation of the manual is underway.

Source of Federal Funds: Smith Lever

FL-SMP-119

Title: Business Management for Horticulture Enterprises in Florida

National Goals: 1

Key Themes: agricultural competitiveness, agricultural profitability, managing change in agriculture, niche marketing, ornamental/green agriculture, plant production efficiency, risk management

Situation/Program Rationale:

. Environmental horticulture products and services are a major and expanding agribusiness industry in Florida. The industry is one of the few growing sectors of American Agriculture. A recent study by UF/IFAS economists estimated total sales of \$9.9 billion (Bn) by Florida ornamental horticulture firms in year 2000, including \$2.25Bn for wholesale plant producers, \$3.64Bn for horticultural retailers, and \$3.11Bn for landscape services firms. Value added by the horticulture industry to the regional economy was estimated at \$6.40 billion, and the total employment impact was 188,000 jobs, including the multiplier effects on other businesses and households. Historically, the background and training of most owners and managers in this industry have focused on the production and technical issues, as opposed to economic aspects of the business. As the industry has matured, profitability of wholesale nurseries has declined. Also, markets for ornamental plant products have been dramatically consolidated in the large general merchandise chain stores. Therefore, significant opportunities exist to strengthen the long-term viability of the industry by improving management effectiveness in key performance areas.

Program Objectives:

The objectives of this program are to generally improve the awareness and implementation of strategic business management skills and techniques by owners and managers in the environmental horticultural industry. Four primary areas of management to be addressed are: 1) strategy/general , 2) finance, 3) marketing, and 4) human resources. General management issues include strategic business planning, business management professionalism, business decision making, and total quality management. Financial management includes managing for

profitability, risk assessment, and cash-flow management. Marketing management includes marketing strategies, strategic selling, and managing sales and the sales team. Human resource management includes basic supervisory management, communicating effectively, and employee involvement.

- **Summary of Programs for Clientele:**
Summary of County Programs (Educational Activities and Impacts)

Andrews, Robert – Highlands. program title: Commercial Ornamental Nurseries.

Educational Activities: Agent organized and planned with several faculty members from the Gulf Coast REC, one seminar for caladium growers. They were attended by over 90% of the producers of caladium bulbs. In 1997 the caladium growers instituted a box tax to support research at the Gulf Coast REC. A number of projects were initiated, including several disease studies, water management, and weed control. New variety development, fertilizer and nutrient runoff studies are continuing. The seminars were organized to discuss and recommend the best practices to solve the problems the growers were having with production. An IPM Ornamental Plant Seminar was held in January for nurserymen to earn CEU's. This seminar was designed to assist growers in using the best management practices for controlling pests. A pesticide training program was held in March for people who needed a limited certification license. Two training programs were held during the year for lawn pest control and landscape maintenance personnel. These programs were planned in cooperation with supervisors to provide the information they wanted their people to learn. Agent helped three new growers in planning to establish nurseries in Highlands County. Assisted more than 30 nurserymen and growers with various production problems of sod, trees and caladiums. Agent also notified nurserymen about programs of interest in other counties.

Impacts: Caladium growers have a number of problems, particularly with diseases, which are affected by water management. To solve these problems, the growers decided to institute a box tax in 1997 to support research at the Gulf Coast REC. Seven researchers at the REC have projects on caladiums to solve problems. There is a lot of support and good cooperation among the growers, the researchers at the REC and myself to solve the various problems that have been identified. Attendance at the meetings held have been high. Various tuber treatments were tried this year. Some showed good results. It is likely that most growers will follow the recommendations made this fall for the best tuber treatments prior to storage and before planting in the spring. Based on the IPM Ornamental Plant Seminar evaluation after the program, the participants indicated a 75% increase in knowledge of the subjects covered and 87% said they would change some of their practices. At the pesticide training program for the limited certification license, 100% of the attendees passed the test. The pest control and landscape maintenance personnel who attended the four training sessions, indicated the program was interesting and useful. They said they would make some practice changes.

Garofalo, Joseph-Miami-Dade.

Program Title: Nursery business management.

Educational Activities: Group Learning Events:--Four seminars were produced by the agent with Ray Rafie. The advisory committee suggested topics and general content.--The main topics included e-commerce, finding new markets, staying competitive, and new crops/marketing new crops. There were 125 participants and 16 hrs of instruction. Other Activities--A quarterly newsletter was published four times.--32 letters and faxes were sent; and 250 phone consultations, 40 consultations in the office, and 30 on-site consultations.--Spoke on business management once, and with Ray Rafie, prepared one fact-sheet relating to nursery business.

Agent prepared four articles relating to the nursery business for the local trade newsletter.--
Prepared and presented 5 PowerPoint talks.

Impacts: The annual objectives are: Of the 100 production (wholesale) nurseries targeted: 1. Ten nursery firms in Miami-Dade County will begin preparing and using nursery cost-analysis figures of their operations. 2. Ten nursery owners will learn and apply practical marketing skills.
Significance: the need to establish accurate costs of production and active, informed financial management have become essential for long-term survival in the industry, as is a high level of marketing sophistication. Knowledge of, and participation in, regulatory initiatives are necessary for a business to remain competitive in this industry. Role of Extension: agent and Ray Rafie conducted seminars, prepared handouts, and made site-visits to guide clients through the business and crop management processes. Nature of educational program: clientele were taught how to conduct cost analyses and how to manage finances through several seminars on business management. Invited UF and industry speakers covered marketing, business management, e-commerce, and other topics. Additionally, fact-sheets were prepared and several demonstration projects were conducted with known leaders in the industry detailing how to produce a new crop, and how to determine the cost of production of that crop. Changes made by participants: one cooperator who grew a new crop, Asiatic lilies, learned how to produce the crop, including a hard lesson learned on proper disease management, when part of the trial failed. He is now planning to grow this new crop during 2004. Another industry leader who grew a new crop, Blood-lilies, in trial was not convinced to grow the crop as part of his business. He is, however, still interested in cooperating in trials, so he may still be convinced. Impact of changes: Several new nurserymen have stated that they now see the importance of good business management, especially their marketing skills, and have gained confidence in their ability to earn a living as nurserymen. They attribute this in part to the knowledge gained through CES programming. There has been an increase in the number of nurseries using e-commerce and off-shore marketing. One of the two cooperating nurserymen has proven to himself that he can make a profit on at least one new crop, Asiatic lilies, which will help offset losses in income this year due to infestation by pink hibiscus mealybug in some of his woody-ornamental species.

Grace, Patricia – Putnam.

Program Title: Commercial Horticulture.

Educational Activities: This program was executed by newsletters, short courses, classes, demonstration, individual consultations on site, in the office, and by telephone and letters. Four main educational/programmatic areas were addressed. These were: 1. Nursery Management (including cultural practices and pest control) 2. Marketing 3. Entering the Nursery Business 4. Environmental Protection Group Learning Events:-Seventeen group learning events were held during which 1,632 educational contacts were made.-Two sessions of "Entering the Nursery Business Shortcourse" were conducted in conjunction with agents from Clay and Duval counties. Topics covered in the short course included: How to Be Legal, Marketing, Basics of Setting Up a Nursery Operation, Sources of Supplies, Protection of Natural Resources, Dealing With Pests, Alternatives in the Nursery Business and Plant Propagation.-New program "Successful Landscape? The Two Year Test" at the Jacksonville Horticultural Trade Show.-Presented program "Why Landscapes Fail" to DOT landscape and maintenance personnel. Publications-Compiled and published The Putnam County Plant/Fruit/Produce Locator. Five hundred copies were printed and approximately 450 have been distributed.-Four issues of the commercial newsletter "Putnam Grows" mailed to 237 retail and/or wholesale nurseries, garden supply stores, landscape maintenance personnel and local FFA and Ag programs.-Distributed the "Putnam County Commercial Nursery Handbook" to 22 nurseries in the county this year. This is an indexed compilation of 50 IFAS publications for use by commercial nursery clientele in Putnam County. It contains approximately 200 pages. Consultations-Consulted (via telephone, walk-in or site visit) with 154 commercial clientele on issues related to nursery operations, cultural and pest control practices, business and marketing practices and propagation techniques. Survey-

Conducted survey to determine areas in which Extension might better serve the commercial nursery clientele in Putnam County. All Putnam County Nurseries were contacted.

Impacts: Entering the Nursery Business Short Course: Twenty-six participants in two short courses learned basic skills related to successful nursery operations including nursery management and marketing and business practices. Fifteen (out of a possible 17-88% response rate) completed written evaluations after participation in one of the shortcourses. Several practices which had been emphasized in the course were listed and course participants were asked to indicate whether they intended to adopt the practices. The results were as follows:-67% of participants said they intended to prepare a marketing plan.-67% of participants said they would pay more attention to media quality.-80% said they would use mostly non-restricted pesticides-87% said they would employ scouting techniques in pest management. In addition:-80% rated the quality of the program in terms of subject matter as "Excellent", 20% as "Very Good"-73% rated the effectiveness of program presentation as "Excellent", 20% as "Very Good"-60% said that the program exceeded their expectations, 40% said it met their expectations-100% said they would recommend this program to other people in their profession-73% strongly agreed and 27% agreed that the information presented would help them in their work or business. Successful Landscape? The Two-Year Test-Twelve horticulture professionals attended the session. Nine of the twelve completed written evaluations which indicated the following:-100% gained new knowledge (the highest % of any of the presentations made that day)-100% of the respondents indicated that the presentation met their needs. Why Landscapes Fail-Forty DOT landscape and maintenance personnel attended the session. Thirty completed written evaluations which indicated the following:-97% gained new information/skills/knowledge-77% rated the training as "Excellent" or "Good"-63% said they would use all or most of the practices learned at the session on their jobs and 37% said they would use some of them. Nursery Survey-The completion of the survey will enable us to develop a Plan of Work that is specific to the expressed needs of the targeted audience.The Putnam County Plant/Fruit/Produce Locator-I have spoken to a number of the commercial horticulture clientele who have indicated that they are very pleased with this publication. In particular, a number of the U-Pick grape growers expressed their satisfaction at a recent meeting.

Ide, Bruce – Citrus.

Program Title: Commercial Agriculture.

Educational Activities: Two Environmental Landscape Management classes were offered to county parks and recreation staff. Classes covered soils and Fertilizers and fertilization, Turfgrass selection, maintenance and diseases, Integrated Pest Management, beneficial insects, Principles of FY&N and proper pruning. The entire 25 member staff of the maintenance department attended these classes.The same class was offered twice to local landscape maintenance companies. County regulations require completion of this class for any company that wants to bid on county landscape maintenance contracts. Since many companies were excluded from the county.

Impacts: The entire county parks and recreation department maintenance staff attended Environmental Landscape Management training. This totaled some 25 people and a total of 200 teaching hours. The head of the parks maintenance department is a strong believer in ELM and in Extension programs. He is working to ensure 100% compliance with ELM principles and practices. Ninety-five percent of class attendees have adopted proper landscape maintenance practices. This results in a major reduction in the amount of water, fertilizer and pesticides used in the county. Classes were also offered to business owners. Those who attended also learned the environmentally friendly ways to manage landscapes. This will be carried over into their contracts in the private sector as well in their dealings with the county. At least 50% of those

attending the classes have changed their landscape practices to reduce the use of fertilizers, pesticides and water.

Kirstein, Arthur IV-Palm Beach.

Program Title: Agricultural Economic Development.

Educational Activities: Palm Beach County Tree Canopy Restoration Program: An ongoing project initiated in 2002, the program was directed at compensating Palm Beach County residents for losses of citrus trees under the State's program. This residential voucher-program was designed to supplement payments for all trees after the initial removal. The value of the voucher was agreed on at \$45.00 per tree. \$750,000.00 was approved on July 9, 2002 and the Ag Economic Development Program was directed to administer the program. Public awareness of the program was done through newspaper advertising, the County's web site, and by flyers distributed to all county offices, libraries, and schools. Flyers are also being distributed by the State crews at time of tree removals. Palm Beach County requested State reimbursements for this program but funding was not approved. Therefore, the Board of County Commissioners terminated the program as of September 30, 2002. This office issued 3,938 vouchers under the program and answered over 260 phone inquiries over the year. Additionally, this office organized, in conjunction with the Florida Department of Agriculture and Consumer Service, a Canker Informational meeting in Delray Beach to answer questions on the program. Palm Beach County's Agricultural Reserve Project. In March 1999 the citizens of Palm Beach County approved a \$100 million Bond issue with the goals of acquiring and maintaining agricultural properties within this important agricultural-producing area. The Agricultural Reserve area is a 20,000-acre section in eastern with a long history of primarily fresh vegetable production. The per-acre return of this area is significantly higher than any other area or crops within the county. The land acquisition program has completed the purchases of 2,811 acres to date. This acreage has been leased on a long-term basis to farming interested and will continue to be in agricultural production. The program continues to provide considerable staff time in the implementation process of the Palm Beach County Agricultural Reserve Master Plan. Palm Beach County's GreenMarkets: During 2003, four municipalities (Palm Beach Gardens, Riviera Beach, Wellington and Royal Palm Beach) decided to start new GreenMarkets for in their cities. With the current ones in West Palm Beach, Delray Beach, and Boca Raton, the Palm Beach County GreenMarket Association now total seven markets. These Winter-month outdoor markets with the dual purpose of a sale outlet for small specialty growers and as a means of promoting county-grown products to the community. Attendance with the original markets has dramatically increase over the last for year, with an estimated total attendance of 174,000 for the last winter season. With all seven GreenMarkets presently operating, our attendance projection for the 2003-04 season is over 300,000. This office secured \$20,000 funding for the Association plus an additional \$16,000 in a matching interlocal agreement with the Villages of Wellington and Royal Palm Beach arranged by the local county commissioner. The total number of vendors and growers for this year total 212 for all seven markets. Swank Hydroponic Farm: New hydroponic farm. Secured \$10,000 grant from program funding to assist in capital purchases. NFT growing operation, it has presently 30,000 sq. ft. Under shade and growing over 18 different varieties of leaf and herbs. Provided additional management and marketing assistance and organized a tour by various distributors and chef to the locality. This has created 3 full-time and 14 seasonal jobs. Presently investigating crops that can be economically grown on a year around basis. TKM Project: a major leaf-processing plant in Belle Glade that requested assistance from the County's Office of Economic Development. It was requested that our office provide agricultural feasibility estimates to the project. Located in a State's Enterprise Zone, the plant and its supporting agricultural operation will employ approximately 450 seasonal workers and 40 full-time employees. \$95,000 grant secured thru the Palm Beach County Office of Economic

Development. PalmFind.com, Inc. Boynton Beach-based ecommerce site for horticultural products. It provides, for a yearly fee, the ability for any interested wholesale and retail buyers and sellers to search for inventory and availability of specific listings. Assisted in providing \$20,000 grant for capital investment that will create 6 new full-time jobs. Palm Beach County's "get fresh" Promotional Campaign: On-going promotional campaign to educate the public the important role agriculture plays in the County. Also directed at local consumption of locally-grown products. We have distributed 42 large "get fresh" sign for locations and PalmTran, the county bus unit, is presently displaying 36 "get fresh" signs on the sides of buses. Anthony Groves, Inc: Local citrus retail operation that has requested expansion funding. Company dedicated to fresh citrus, juice, and gift packages sales. Presently working to request grant approval. Designated Marketing Area (DMA): Multi-county project. Provided assistance in generating local database of chefs and farmers interested in the Farmer-to-Chef DMA program. Directed UF intern in the acquisition of specific local data. Western Palm Beach County Farm Bureau: Provided funding and administrative assistance in the corn promotional project that included an eating corn contest (featured in ESPN) and in Harvest Day in Delray Beach. Attendance estimated at 16,000. Palm Beach County Agricultural Training Center: A start-up equestrian educational non-profit 501 (c-3) corporation dedicated to providing a curriculum of equestrian courses. This office has provided administrative and promotional assistance and is currently assisting in securing a county grant. SaladFeld Farm: New hydroponic small farm located in Delray Beach, this office assisted in establishing a floating commercial system for growing specialty leaf and in securing a marketing outlet at the local GreenMarket. Palm Beach County Extension Long-Term Planning Report: This office was responsible for consolidating all program information and generating the report and PowerPoint presentation of the data. New Business Recruiting Campaign: In cooperation with the Business Development Board of Palm Beach County, this program is participating in efforts to recruit food and ag-related industries to the county. We have provided funding in generating promotional magazines for national distribution. This office is the representative for the Agriculture Cluster in the Board. "agINFOnow". Palm Beach County Cooperative Extension Agricultural email Information Access Project Since access to immediate information has become ever important in agricultural decision-making, the program designed this project as a joint effort for various ag departments of PBC Extension has developed a format to provide timely email information on important and relevant regulatory, governmental, financial, and environmental data. Reece Hydroponic Farm: Small farm supplying hydroponic leaf and herbs to the West Palm Beach and Wellington GreenMarkets. Introduced him to the floating hydroponic garden system developed by our vegetable agent. Provided \$4,700 in grant funding assistance. The Economics of Agriculture in Palm Beach County: Informational course on the specifics of Palm Beach County agricultural industry and its economic impact to our economy.

Impacts: Palm Beach County Tree Canopy Restoration Program: Although the program is discontinued, it allowed us to show the commitment of this County to the important role citrus plays in our state's economic. 1,416 total trees were replaced under the program which were purchased from county nurseries at an estimated total cost of \$69,000. Palm Beach County's Agricultural Reserve Project. This project is unique and the first in the nation in which a county attempts to control urban development while at the same time making farmland affordable to farmers. With 2,811 acres acquired and still in agricultural production, the County has retired the development rights to this acreage. It sets an excellent example on how farming can survive and profit under urban development pressure. Palm Beach County's GreenMarkets: With an additional four new markets, the total municipal GreenMarkets now total seven. I have estimated that GreenMarket attendance will increase during the 2003-04 to over 300,000 with 212 total growers and vendors. Western Palm Beach County Farm Bureau: Extensive promotion of fresh sweet corn grown in Palm Beach County. Set precedent in working together with Farm Bureau

for future projects. New Agricultural Business: (Swank Hydroponic Farm, Reece Hydroponic Farm, SaladFeld Farm, Palm Beach County Agricultural Training Center, PlantFind.com, Inc) Resulted in approximately 19 new full-time and 14 new part-time jobs.

Landrum, Linda – Volusia.

Program Title: Environmental Landscape Management in Florida. Educational Activities and Impacts: Program activities/benefits were: 1. Assorted horticultural programs for SMP 114. Growing Roses Successfully taught by Master Gardeners who are also Rosarians with 73 participants. 25 clients responded to a post program survey noting:-96 % of the respondents stated that this program met / exceeded their expectations and that 100 % said they would recommend this program to others.-knowledge/skills gained were: saved time through proper maintenance(19) and money (2), improved fertilizer usage (13), saved water(5), made better plant choices(18), reduced pesticide usage (12), and attracted wildlife(1).-The clients used this information to: buy quality plants locally and from mail order catalogs, add more organic debris and mulch regularly, have a soil test done and fertilize accordingly, better maintenance practices such as pruning, watering, planting and how to propagate roses. Orchid Seminar and Sale taught by orchid society members and Dr. Tom Sheehan, Professor Emeritus (UF) with 70 participants. 15 clients responded to a post program survey noting:-100% of the respondents stated that this program met/exceeded their expectation and that they would recommend this program to others.-knowledge/skills gained were: saved time and money (4), became less fearful about growing orchids by knowing what kinds of orchids to buy and how to care for them properly (15) and appropriate pest control strategies (12).-The clients used this information to: repot orchids (7), reduce pesticide usage (4), make better plant and location choices (3) , water and fertilize correctly. For SMP420, Native Plants that Attract Wildlife Seminar taught by a local botanist and this agent with 86 participants. 23 clients responded to a post program survey noting:-100% of the respondents responded that this program met/exceeded their expectations and would recommend this program to others.-knowledge/skills gained were: saved time and money (7), reduced fertilizer use (8), greatly reduced pesticide use (16) and how to identify beneficial insects (2), made better plant choices (19), learned to recognize the more common invasive plants (3), saved water (13), discovered wildlife features such as snags(1), baking rock or puddling area for butterflies(4) and brush piles(10) resulting in attracting more wildlife (15).-The clients used this information to: plant more natives especially with wildlife in mind (10), use water such as a pond, dripping water and puddling areas to attract wildlife (6), quit using pesticides completely (1) and created more wildlife habitat such as snags(1), compost pile (2), bird and frog houses (2) and brush pile (1). Butterfly Gardening taught by Master Gardeners with 15 participants. 2 clients responded to a post program survey noting:-that they both loved the program and would recommend it to others.-knowledge/skills gained were: saved gardening time (3 hours), better fertilizer and pesticide usage(1), improved plant choices(2) and they definitely had attracted more butterflies(2).-They used this information to: construct a butterfly garden, supplemental feed with fruit/mud puddles and now know how to eradicate slugs. 2. Library Series SMP 114, 116, 420, Eight topics were presented at 6 area libraries throughout Volusia County. Each month a single topic was developed and presented by Master Gardeners. Total attendance for these 48, 1-hour programs was 619. A post-program survey was sent to 331 clients, with 143 responses. Of those responding, 75 were repeat attendees for this gardening series. Overall, the 143 respondents noted:-97% felt that this series met/exceeded their expectations and 98% said they would recommend these programs to others.-knowledge/skills gained were: saved time (23) and money (21-\$1,010.00), improved fertilizer use (84), reduced pesticide use (50), improved plant choices (66), saved water (46) and attracted more wildlife (52). The clients used this information by specific topic to: Vegetable Gardening-improve soil through composting-select right varieties for Florida-get the timing correct-try a few new vegetables/varieties each year-handle nematode problems-use newspaper as a mulch-successfully grow tomatoes in containers-recognize

pests/how to control without using pesticides-rotate crops each season-use literature as a reference-plant other veggies in containers. Cold Protection-use step ladder as a frame/support for frost cloth-not prune until frost chance has passed-use cloth not plastic to cover plants -use mulch to protect roots/lower stem-purchase frost cloth-pass along information learned to retail customers-use native plants which tolerate freezesSoils/pH-have soil tested-recycle yard waste-select plants compatible with soil type-add sulfur to almost finished compost pile -fertilize based on bulletin received-start a compost pile-switch to timed released fertilizer-use bloom booster for container grown flowers-moderate effects of high soil salts caused by salty irrigation water-solarize the soil to reduce pests-keep mulch away from building to reduce termite problems Fertilizing Your Landscape-use specially blended palm fertilizer-use ironite regularly-use mulch and less fertilizer-use bulletin received-use less fertilizer more frequently Pruning Practices-cut back hibiscus no later than August to prevent cold injury-where to make pruning cuts-care for and select proper pruning tools-how to prune various fruit trees-prune flowering plants properly-know when to prune freeze-damaged plants-prevent diseases from entering trees after pruning-prune no more than 1/3 of the shrub off each year-properly trim crape myrtle Lawn Care-put out pest control in a timely fashion-use milorganite and ironite during the summer months-determine when lawn needs to be watered-have soil tested-add lime to soil after pH test-use slow release fertilizer-apply sulfur-coated fertilizer to help reduce pH-deal with armadillos-raise lawn mower blades for better health-relocate sprinklers for better coverage-control bugs!-control dollarweed in yard-fertilize properly and in timely fashionCitrus-keep mulch 6-8 inches away fromyoung tree trunks-not be fearful about using milorganite on my citrus trees-not to over-fertilize young trees-ignore leafminers and whiteflies -identify pests of citrus-select the best citrus types for my yard-apply fertilize in correct amount and at right timeAdditional programsVeterans series consisted of four programs for the Day Patient VA Facility in Daytona Beach and was presented by this agent and the program assistant .The 15 to 20 clients who participated each time learned "hands-on" how to install and care for bedding plants, plant and care for a succulent container garden, grow and use culinary herbs and create a holiday themed color bowl. This type of "hands-on" interaction often helps these handicapped clients to reconnect to the environment. According to staff, the horticultural programs are the clients' favorites. There is always a great deal of interaction between this agent and the clients. Twenty-five programs (each about 1 hour in length) were given for various groups in Volusia County and surrounding areas. They included topics such as: pruning, vegetable gardening, integrated pest management, herbs, container gardening and FYN principles. Participation in these programs was 735 clients. Landscape Projects. This agent has worked with other county departments in designing "Rain Gardens" at two libraries and done a total landscape retrofit at Deland Library using mostly native plants. EPCOT's International Flower Festival. This agent was an invited speaker for the 2003 show. Presented six-30 minute programs on the 9 principles of the FL Yards and Neighborhood program with 208 participants. Gambuzia Giveaway. In order to reduce the number of mosquitos breeding in ornamental water features, 17 clients took advantage of our "Gambuzia Giveaway" offer. At several programs we gave clients colorful fish cutout coupons (for later redemption) and in newspaper articles, advertised these native mosquito eating fish as free. All folks had to do was come to the Agricultural Center and staff would dip the right number fish out of our pond depending on the size of the water feature. This has been a very popular "freebie" with some folks coming back months after they heard about the giveaway to get their fish. We will continue this project indefinitely. City of Holly Hill Beautification Board. This agent has assisted this group/staff with landscape issues such as plant selection/placement, individual business retrofits and reviewed the city's landscape grant program. I continue to give input on grant proposals as to the suitability of submitted landscape palates. Butterfly/Bloomers Resource Garden Renovation We've gutted the Garden! After 5 years in it's present form, the Butterfly /Bloomers Resource Garden will again be retrofitted over the next 3 to 4 months. The major changes planned are:*installation of mostly native plants for the butterfly/hummingbird area, the shade garden,

bog, scrub area and rain garden.*decking constructed from recycled plastic with railing and handicap accessibility.*a rain collection shelter to show folks how to collect and reuse water in the landscape.*retrofit of the outdoor classroom with a rain-proof roof. A \$24,900 grant was obtained from Volusia County Environmental Management department to do the renovation. Projected completion date is April 1, 2004. Commercial Activities for SMP 114, 116 and 119 were: In cooperation with Natural Resources Agent Dave Griffis and Agricultural Program Assistant Linda Evans, this agent helped to plan, conduct, teach and evaluate 2 Best Management Practices for the Central Florida programs attended by area commercial landscape maintenance/installation personnel and government employees. Total attendance for these classes was 35.. Twenty-nine participants completed a pre and post program test and survey .- 95% of the respondents showed an increase in their knowledge of the Green Industries BMP's and how these affect the lawn care industry.-73% said they will use the recommended fertilizer rates and application methods presented in the BMP manual.-71% will inform clients of recommendations (where appropriate) contained in the BMP manual. After pre and post tests of 31 clients , 29 showed a gain in knowledge of the materials presented in the BMP manual. An average of 20 points in improved test scores was realized by the participants. This information is used by clients to: put plants in the right place, better store and use pesticides, avoid drift, select both native and more drought tolerant plants, use more mulch, irrigate more efficiently and prune correctly. Other activities were :-46 on-site visits to diagnose landscape/ maintenance problems.- a bimonthly landscape newsletter reaching 405 clients.-Member of the FL 119 Design Team for Horticulture Enterprise Management. Other Master Gardener Activities included:1. Daytona Beach Home Show-Sixteen MGs helped to man a Question/Answer booth for this 4 day event reaching over 300 clients. They answered questions, gave out bulletins, collected soil samples and identified plants and pests.2. Gardening, Florida Style-Two MG's planned and implemented this 4 week gardening series. This intensive 12 hour program was patterned after new MG training. Assorted topics (both lecture and "hands-on" labs) were taught by MG's, guest speakers and this agent. Only fifteen clients were allowed to participate in this inaugural class (due to space constraint), but we have a waiting list of over 25 people who want to attend the next series in 2004. Each participant was given a FYN Booklet, numerous publications, hand lens and laminated insect sheet as part of \$20.00 registration fee. Nothing but rave reviews from all the participants! An end of class evaluation showed that:-100% of participants felt the program met their learning objective.-100% of participant felt the notebook of handouts was very useful and would be a good gardening reference.-100% of participants said they would share knowledge gained with others.3. Daytona Beach Garden Show-80+ MG's participated in designing, setting up, manning and dismantling the UF/IFAS area. They answered gardening questions, handed out bulletins, some presented programs and others worked in the Children's Gardening Activity Center. Approximately 5000 people interacted with the MG's. One result is that we identified many potential Master Gardener candidates for the 2004 training. The Daytona Beach News-Journal, who sponsors this show, provides a 10x30 ft. booth space, a children's area and signage for this effort. Due to the continued success of this display, we will be doing this event in 2004.4. International Flower Festival at Epcot-8 MG's manned the UF/IFAS Q/A booth for 2 days this past April and May . They spoke to interested gardeners primarily from Florida, but national and international folks as well. 5. 5th Annual Master Gardener Plant Sale In order to raise money for the Butterfly/Bloomers Resource Park renovation and other MG activities, a plant sale was held. MG's contributed plants they had grown, solicited plant donations from area nurseries and manned the sale. Additionally, a children's activity area and hourly "mini" educational programs were added. Approximately 1000 people attended and \$5500.00 was raised.6. Volusia County Fair Display For the 11 day run of the Fair, the MG Display committee designed an educational display focusing on Edible Landscaping in a 10 x 20 ft. area. This display was to encourage residents to incorporate more food-producing plants into their traditional landscapes. These additions can add more fruit and vegetables to folks' diet, reduce exposure to pesticides and

provide more exercise. The display was manned each day by MG's, reaching 1000 people.7. Botanical Gardens of Volusia series was planned and conducted by Master Gardeners. The topics included Native Plants, Birding in Central FL and Butterfly Gardening. These programs were attended by over 130 clients. Local nurseries donated items for demonstration and to give away. An additional benefit to the Garden is the opportunity to get more members and participation from the community.

Mayer, Henrique-Miami-Dade.

Program Title: Efficient Environment Landscape Management for Professionals.

Educational Activities: There were 6 activities related to this program attended by 156 clients. Sep. 19-Cooperated with Carlos Balerdi on the Farm Worker Safety Workshop in Spanish held at the Miami-Dade Cooperative Extension Service office. 36 people attended. Sep. 26-Cooperated with Joe Garofalo on the Palms under Stress, 2003 seminar held at the Miami-Dade Cooperative Extension Service office. I gave a 20 minutes presentation on Pruning Palms. 39 people attended. Oct. 18-Cooperated with Joe Garofalo in a demonstration training about Florida Grades and Standards and pruning young trees, held at the Arazoza Brothers Nursery. 15 people attended. Oct. 22-Taught a 3-hour presentation on Pruning Trees and Palms at the Master Garden class. 22 people attended. Nov. 12-Cooperated with Joe Garofalo in a demonstration training about Florida Grades and Standards and pruning young trees, held at the Manuel Diaz Farm. 20 people attended. Nov. 21-Taught the 2-hour, chapters 3 & 8 of the Arborists' Certification Study Guide for the ISA Certification Review Class & Exam. Homestead. 24 people attended.

Impacts: There were 233 consultations via telephone, office and field visits, some from experienced but most from inexperienced landscape industry people. At only \$25 per consultation, these landscape personnel saved \$5,825. There were no charge directives for taught and coordinated hours, but this agent had 10 teaching hours and approx. 1,560 client hours.

Miller, Laura – Hillsborough.

Program Title: Development of a Stable, Educated Work Force and a Safe, Productive Workplace.

Educational Activities: Inservice training in horticultural career opportunities and necessary skills was provided for Hillsborough County Agribusiness and Natural Resource Education Teachers on July 28, 2003. Four \$500 scholarships were awarded by the Tampa Bay FNGA chapter in 2002 to Hillsborough County students studying horticulture at the University of Florida, Florida Southern College and Hillsborough Community College. The Nursery, Landscape and Floriculture Career Development Event provides youth in Hillsborough County FFA and 4-H programs an opportunity to demonstrate proficiency in ornamental plant, pest and tool identification, ornamental horticulture subject matter, decision making and problem solving. This activity provides training and skills necessary for employment in production nurseries and landscape service operations. The Youth Plant Show and Sale provides an opportunity for youth to have and agricultural production enterprise and be rewarded for quality efforts. This event is held at the Florida Strawberry Festival and approximately 500,000 visitors to the Festival have an opportunity to see the project plants which are on display for four days. The plants are sold at a public auction. Rules require strict quality standards to participate in the show. Many young people maintain ongoing plant production projects as a result of participation in the show and sale. The Ag Venture program gives third grade students from all schools in Hillsborough County an opportunity to learn about the environmental horticulture industry and its contribution to the total agricultural economy of the county. This a cooperative project of the Hillsborough County Cooperative Extension Service, The Hillsborough County Farm Bureau, Hillsborough County

Schools, and the Florida State Fair Authority. Classroom activities prepare students for the day long experience and evaluation after the event.

Impacts: Inservice training in horticultural career opportunities and necessary skills for Hillsborough County Agribusiness and Natural Resource Education Teachers has resulted in increased participation by their students in horticultural events. Seventy-two students from eleven schools and two 4-H clubs participated in the Nursery, Landscape and Floriculture Career Development Event on January 29, 2003. The Youth Plant Show and Sale was very successful. 122 students participated and earned a total of \$37,725 through the sale of their plants. Each student entered a record book detailing the progress of their projects. The long term impact of youth activities over time is substantial and has no doubt contributed to current vigor of the ornamental plant production industry in this area.

Palmer, David – Hillsborough.

Program Title: Urban Commercial Horticulture / IPM.

Educational Activities: ProHort Website-(<http://prohort.ifas.ufl.edu>) 32,687 visits, 70,493 pages viewed. Asian Cycad Scale Website – (<http://acs.ifas.ufl.edu>) 4,206 visits, 3117 pages viewed. South Central Extension District Website-(<http://district4.extension.ifas.ufl.edu/>)-data not collected Horticulture Agents Conference Website-

(<http://hortconf.ifas.ufl.edu>)-data not collected. 43 Programs presented and/or facilitated from 1/01 through 10/31/03 represents 1635 participants and 1431 instructional hours. Representative sample listed below. Limited Commercial Maintenance Exam Prep Class, Limited Lawn & Ornamental Exam Prep Class, Fla Certified Horticulture Professional Class (comprised of 20-3hour classes), Fla Turfgrass Ass'n Pesticide Certification Training, Landscape Design for Homeowners, FrontPage Web design training, Microirrigation class, Customer Service in Retail Gardens, Best Management Practices-Train the Trainers, Cycad Scale Presentation, Fla Turfgrass Ass'n Pesticide Certification Training, Youth Career Development Event, Technology Toolkit for Agents (District Faculty Mtg), Tree & Landscape Short Course, Right of Way Pesticide Exam Prep Class, Youth Plant Auction, Green Industries Business Class, Horticulture Training Class (Bilingual), NPDES (Nat Pollution Discharge Elimination System) Training, County Listening Session, Environmental Horticulture Conference, Alternative Pesticides.

Impacts: 2953 phone calls were received in 2003, taking a total of 215+ hours, for an average of 4 minutes per call. 62,387 people visited the ProHort website during 2003 as compared with 43,000 in 2002, a 45% increase. 685 applicants were tested for pesticide certification during 2003 in Hillsborough County. 1985 professionals attended.

Schall, William-Palm Beach.

Program Title: Nursery Business Management, Marketing and Sustainable Operations

Educational Activities: Workshops Facilitated Transportation Issues for Agriculture and Nurseries, with the Florida Department of Transportation and the Palm Beach Farm Bureau, 6.5 hour training for 24 individuals, January 10. Groundcovers for Tropical Gardening School, 0.5 hour training for approximately 100 individuals, March 1. Facilitated Nursery Best Management Practices for Nitrate Interim Measures, with Tom Yeager, Ph.D., 1 hour training for 45 people, June 30. Southeast Florida Nursery Production, 1 hour training for 19 individuals, October 23. Facilitated Agricultural and Nursery Supply Chain Management with the United States Department of Agriculture, the Palm Beach Farm Bureau and Zimet Marketing in collaboration with Darrin Parmenter, Ph.D. for 35 individuals, November 13. Tours Tropical Plant Industry and Exhibition Foliage Safari Tour of Mounts Botanical Garden, presentations and hour long tours for 125 individuals, January 16. Educational Visits, Email and Telephone Communication. Educational and Diagnostic telephone calls and emails – 310. Internet and Newsletter

AgINFOnow, electronic issue information distribution system was utilized 5 times for a total of approximately 1000 recipients. One newsletter with 75 percent of the articles related to this CMP was generated in July and distributed to 600 growers and Extension professionals. Nursery Marketing Products. Agent, via participation on the Florida Nurserymen and Growers Association, Foliage Division helped in the development of nursery marketing tools including and educational CDROM of foliage plants for retail nurseries and garden writers. The agent also helped select the Florida Plants of the Year for promotion of new or interesting plant materials by the FNGA.

Unruh, Joseph-West Florida REC-Jay.

Program Title: Leadership of the UF/IFAS Turfgrass Science Program. Educational Activities: I represent the UF/IFAS Turfgrass Science Program by being involved with the turfgrass allied associations and attending their functions. I provide insight and direction on various committees and I help these organizations meet their objectives of providing education and research on turfgrass management. I am often called on to provide an opinion or to give insight on decisions that will impact the turf organization which ultimately impacts the UF/IFAS Turfgrass Program. I serve as a member of the Florida Turfgrass Association (FTGA)-IFAS Advisory Committee and serve as a liaison to the Awards Committee that has funded over \$1 million in research. I also chair the FTGA Conference Committee and am on the Education Committee where I help coordinate the annual conference.

Impacts: A renewed interest in the UF Turfgrass Science Program has been spawned and many industry leaders are pleased with UF's commitment to them. As a result of improved coordination, UF's Turfgrass Science Program is quickly becoming a leader amongst the Turfgrass Science programs across the country, resulting in national notoriety. The three major national funding sources for turfgrass research include the Golf Course Superintendents Association of America, the United States Golf Association, and the International Turfgrass Producers Foundation. All three of these organizations are now funding research with UF/IFAS Turfgrass Scientists.

VanSickle, John-Food and Resource Economics.

Program Title: Managing Competitiveness in Agriculture Through Management, Finance, and Marketing.

Educational Activities: International trade and agricultural policy are issues that require constant attention within the agricultural industry. Several publications and presentations have been made to elevate the understanding of growers and policy makers within the Florida agricultural industry. A web site has also been maintained as part of this program. The Market Information System is a market news site that organizes data published by the USDA. This site has been available for several years. It is one of the premier market news web sites. It received almost 600,000 hits in 2002. A major conference was also hosted to bring together producers and policy makers and discuss the major trade and policy issues facing the Florida agriculture. The 2nd International Agricultural Trade & Policy Conference was held November 14-15, 2002, in Gainesville and attended by 150 members of the agricultural community and policy making groups. The conference was sponsored by the International Agricultural Trade and Policy Center and supported by the Florida Farm Bureau, Farm Foundation, CIBER, Florida Fruit and Vegetable Association, Florida Tomato Committee, Florida Citrus Mutual and Florida Nurserymen and Growers Association. Registration fees and sponsorships netted \$5,000 in additional monies that are being used to support activities in the International Agricultural Trade and Policy Center that support the objectives of this State Major Program. I was also appointed to the Florida Agriculture Trade Advisory Committee by Congressman Adam Putnam. This Committee met with the Congressman and with Ambassador Robert Zoellick to discuss the

critical issues facing the Florida agricultural industry as the U.S. moves forward in negotiations toward a Free Trade Area of the Americas (FTAA) and a new agreement on the World Trade Organization (WTO). Several presentations were made to growers associations and county extension meetings. "International Trade and the Safety of the U.S. Cattle Industry" R-CALF Annual meetings. Kansas City, Missouri. January 23, 2003. "Economic Outlook for USA Horticultural Crops." Forum on Mechanization and Robotics for the Horticultural Crops. National forum sponsored by the University of Florida and the Florida Department of Citrus to discuss opportunities for collaborative research initiatives.

Impacts: Much has been done to help policy makers understand the unique characteristics and needs of Florida agriculture. We participated in the Farm Policy Survey administered by Kansas State University, giving our growers an opportunity to have their voice heard on the new Farm Bill that is under consideration in Congress. We also organized the First International Agricultural Trade and Policy Conference held in Gainesville, Florida October 31, 2001 to November 2, 2001. There were 160 participants attending these meetings from several states throughout the southeast. The meeting was successful in giving attention to the needs of Florida producers and helped in securing a \$1,000,000 grant from the state that is to help the International Agricultural Trade and Policy Center develop

Williams, Larry – Okaloosa.

Program Title: Commercial Environmental Landscape.

Educational Activities: The agent and county director cooperated with agents in Escambia, Santa Rosa and Walton Counties in presenting a Regional Advanced Training for Restricted Use Pesticide Applicators. This four-hour training was coordinated, planned and carried out by the agriculture and horticulture agents in the four county area. The agent, Sheila Dunning (Florida Yards & Neighborhoods Agent) and county director, Gerald Edmondson planned and provided two multi-county eight-hour trainings with tests to certify landscape personnel in the Limited Commercial Pesticide Applicator License category. Dan Mullins and Beth Bolles, horticulture agents in Santa Rosa and Escambia Counties, taught portions of these classes. The agent was an invited speaker at the Florida Turfgrass Association (FTGA) Gulf Coast Turf Conference in Milton, Florida. The agent, county director and Stan Rosenthal, extension agent in Leon County, provided a seminar (Bugs & Rot of Trees) for pest control operators, foresters, arborists and others involved with tree management. Dr. Ed Barnard, Forest Pathologist with Florida Department of Agriculture and Consumer Services (FDACS) and Dr. Bud Mayfield, Forest Entomologist with FDACS, provided the technical information. The agent was an invited speaker at the UF/IFAS 9th Annual Gulf Coast Turfgrass Expo & Field Day conducted at the West Florida Research and Education Center. The agent assisted Sheila Dunning with a multi-county training on Scouting the Commercial Ornamental Nursery. The agent planned and provided a training program for landscape personnel at Eglin Air Force Base on Trees and Construction as a result an invitation to do so.

Impacts: Through planned programs, phone calls, on-site visits and newsletters, the agent made 3741 contacts with commercial horticulture customers providing them environmental landscape maintenance information. Forty-four producers and green industry personnel attended the Regional Advanced Training for Restricted Use Pesticide Applicators. The agent, Dan Mullins, Santa Rosa County horticulture agent, and Beth Bolles, Escambia County horticulture agent, co-taught the sessions "New Pests and Pesticides" and "Why Landscapes Fail." Thirty-seven program evaluations were completed after the training. The following results were obtained:- 100% learned new information as a result of the training.-97% indicated that the information presented would be helpful in their business or occupation.-54% indicated they would change a method or practice based on the information presented. A few of the changes listed included:-

Change watering practices.-Scout for new pests.-Fertilize at right time and use correct analysis.-Transplant trees and shrubs a little higher.-Use new pesticides reviewed.-48% indicated they would share information learned with others. The agent, county director and Florida Yards and Neighborhoods agent identified this training as a need in Okaloosa County. The agents planned and provided an eight-hour program for people interested in obtaining their limited commercial pesticide license. Dan Mullins, Santa Rosa County extension agent and Beth Bolles, Escambia County extension agent also participated in the training by teaching portions of the program. The agent included the following objective in his 2003 Plan of Work. "For twenty potential pesticide applicators to obtain eight hours of approved training to qualify them to take the Limited Commercial Pesticide Test." Forty people from six North Florida Counties attended this training at the Extension Office in Crestview. One hundred percent of the participants completed and passed the Limited Commercial Category exam. All of the participants were involved in the green industry prior to attending this training. As a result of the agent providing this training, these participants can legally apply pesticides in their license categories. As an invited speaker, the agent presented information on Right Plant, Right Place and Key Plant, Key Pest Concepts to the more than two hundred fifty pest control and turfgrass professionals that attended the Florida Turfgrass Association Gulf Coast Turf Conference in Milton. This opportunity allowed the agent to introduce and encourage the use of IPM practices to these turfgrass managers and pesticide applicators as part of their overall pest management program. Twenty-seven pest control operators, foresters, arborists and others involved with tree management attended the Bugs & Rot of Trees Seminar. Participants gained knowledge in the areas of recognizing and controlling tree diseases and insects. Participants learned new pesticides and techniques to use in the management of tree pests. Ninety-four people learned to identify common plant pests and the proper pesticides to purchase for their control as a result of attending the agent's presentation on Insect Identification and Management at the Gulf Coast Turfgrass Expo & Field Day. As a result of being invited to present a program on trees and construction, the agent developed a PowerPoint presentation on the topic. Twenty-two landscape personnel at Eglin Air Force Base participated in the Trees and Construction Seminar. One hundred percent of the participants indicated they learned information helpful in managing trees on the military base to prevent construction injury. One hundred percent of participants increased their knowledge of how trees are negatively impacted by construction practices. All participants said they planned to incorporate information learned into their management of trees on the military base. This is significant since Eglin AFB is the largest military base in the free world with a total land area of 724 square miles. Seventeen nursery personnel from four counties attended the Scouting the Commercial Ornamental Nursery training. Participants learned the mechanics of nursery scouting during this hands-on workshop conducted at Skinners Nurseries. Participants gained knowledge to help them in developing and implementing pest scouting programs in their own commercial greenhouse and container nursery operations. The agent assisted more than 298 commercial horticulture, turfgrass and pest control business personnel with troubleshooting.

Success Stories:

Garofalo, Joseph-Miami-Dade. Due to the large (and growing) number of growers in the county, new crops offer growers an opportunity to pioneer in crops not available from other growers. Due to the increased competition, successful growers must constantly seek new crops to maintain their share of the market. Response: Growers were taught the basics of finding new markets, and how to determine their cost of production of new crops. They were also given detailed information on how to grow locally good crops of Asiatic lilies, paperwhite narcissus and blood-lilies. The production practices were developed locally, and included pest and disease management. Results: as a result of the new ornamentals seminar and one-on-one consultation, one grower this year is growing a crop of paperwhite narcissus. This is his second year trying the

crop. He showed the finished crop to potential buyers early in 2003, and they have indicated that they will purchase what he produces. This same grower is preparing for a crop of Asiatic lilies, a direct result of his participation in a production trial begun last January. He has found some success in marketing this crop, but sees a major drawback due the quality and low price of lilies produced elsewhere and sold locally as loss-leaders. He feels that his proximity to the market and assured freshness of his product will enable him to compete. He found that local buyers prefer the crop he produced early in 2003--one plant per pot, with large, sturdy plants and flowers (as compared to the product offered by the competition--several plants per pot, with smaller, weak plants and flowers). Of the 25, only seven (3%) have actually done so. Of the seven, two growers can be mentioned who are growing the new crops. The first put in 100 blood-lilies as a trial, and plans to grow several hundred this Winter. The second grower has planted more than 300 Asiatic lilies, and is in the process of planting several hundred paperwhite Narcissi.

Grace, Patricia – Putnam. I was able to update The Putnam County Plant/Fruit/Produce Locator this year with the help of a summer intern, Rachael Lyons. This publication helps local nurseries market their product. It also helps Putnam County residents locate locally grown materials.

Ide, Bruce – Citrus. Agent worked directly with a local retail grower to solve nutrient problems on his container plants. Plants were exhibiting deficiency symptoms despite being fertilized with a standard slow-release fertilizer. Tissue analysis was done and the soil was also checked. The problem was eventually traced to a load of potting media that had an excessively high pH, causing the fertilizer elements to be unavailable to the plants. Agent interacted with commercial nurseries to address problems with pests, diseases and fertilization in their nurseries. Agent visits nurseries to discuss problems with insects, pests, diseases and fertilizer problems. Suggestions are offered on the spot or problems are researched and solutions suggested.

Kirstein, Arthur IV-Palm Beach. Palm Beach County Tree Canopy Restoration Program, Palm Beach County's Agricultural Reserve Project, Palm Beach County's GreenMarkets, "agINFOnow" Palm Beach County Cooperative Extension Agricultural email Information Access Project ,AgRegs.com, Swank Specialty Produce, Western Palm Beach County Farm Bureau Sweet Fresh Corn Promotional projectagINFOnow.

Landrum, Linda – Volusia. In an effort to reach more minorities, this agent has partnered with the Family and consumer Science agent, Kathy Bryant, in teaching a FL Yards and Neighborhood component (one hour) for homeowners who qualify for either partial or full rehab money for their homes from the County. This will be a monthly series which started in September 2003 and will continue until no longer needed. To date, 2 classes have been taught by this agent with 22 participants, with 81% being both African-American and female. I also use this program to encourage clients to participate in the Master Gardener program and other horticultural learning opportunities such as seminars, phone calls, office visits, soil/water testing and bulletins. I hope to expand this contact opportunity by teaching FYN .

Mayer, Henrique-Miami-Dade. In the Tropical Palms under Stress, one participant wrote: "this was one of the best seminars I have attended ", and also "don't change anything". 34 of the 39 participants considered the seminar between excellent and very good. In the Farm Worker Safety Workshop, 86% of the participants said they learned how to lift weight appropriately. In the Pruning Trees and Palms Seminars 100% said they will be able to utilize the information, and 92% said will share the information with anyone else.

Miller, Laura – Hillsborough. The Nursery, Landscape, and Floriculture Career Development Event doubled in number of participants from 2002 to 2003 and included 4-H groups for the first time in several years. Students from East Bay High School who participated in the event went on to become state Floriculture Career Development Event winners and to compete at the national level. The weekly email newsletter "Weekend Update" has been very well received. Safety and

Labor related topics are regularly featured, along with information about upcoming educational and industry events. Each weekly edition has produced at least one email response with a question, comment, or request for more information. The supervisor of the Hillsborough County School District Agribusiness and Natural Resources Education program regularly forwards the email to the 57 teachers at 35 middle and high schools that have agricultural education programs. One teacher used the information in an email as the basis for a lesson on cold protection. Many recipients have remarked that they appreciate the timeliness or the information that is distributed via email and that they have attended an extension or industry event because of the email notification and information provided.

Palmer, David – Hillsborough. In response to a severe outbreak of Asian Cycad scale during 2001-2002: 1) I created an Asian Cycad Scale website, The website (<http://acs.ifas.ufl.edu>) was visited nearly 5,000 times in the past 9 months. 2) A publication containing the most recent information and control suggestions. 3) Billie Lofland (our staff videographer) and I created a 20 minute video for broadcast on the Hillsborough county TV channel. It was broadcast several times a week for 2 months. 4) Staff and I set up a phone line with an automated message giving details of the Asian cycad scale and directing callers to the website and publication. I developed and continue to maintain the ProHort website (<http://prohort.ifas.ufl.edu>). This website was visited 62,387 times, and the visitors viewed a total of 70,493 pages, between Nov 1, 2002 and Oct 31, 2003. This represents an increase of 45% in visits from the previous 12 months. Celeste White, commercial horticulture agent in Orange County, and I developed a survey of the Limited Commercial Maintenance pesticide certificate holders. The survey came from questions encountered at numerous exam prep classes for this certification. 1650 surveys were sent out and 672 surveys were returned, a stunning response rate of 41%, reflective of the importance of these issues to the survey respondents.

VanSickle, John-Food and Resource Economics. Met with 3 members of the Bush Cabinet, USDA Secretary Ann Venneman, HUD Secretary Mel Martinez, DOC Secretary Don Evans, USTR Robert Zoellick, and his Chief Political Advisor Ken Mehlman, to discuss trade issues and their importance of Florida agriculture. The meetings were organized by the Trade Advisory Committee of Congressman Adam Putnam. I also served as the senior author on a report that provided a legal and economic analysis of the Country of Origin Labeling (COOL) legislation that was passed by Congress. I worked with Neil Harl from Iowa State University, John Connor from Purdue University and Bob Taylor from Auburn University in putting together this analysis. This report has been cited several times in Congress and in the press during the debate on implementing COOL. I published the report on the International Trade and Policy Center web site as a Policy Brief and also published a short summary as an EDIS publication. I have been asked to present the results of this work.

Williams, Larry – Okaloosa. After reading one of the agent's newspaper articles, Bryan Grimes (owner of Bryan Pest Control) called the agent and asked permission to duplicate and use the article as a handout to his customers. Bryan Pest control is one of the largest pest control businesses in Okaloosa County. The article titled Growing a Happy, Healthy, Environmentally Friendly Lawn was originally written by Dr. Laurie Trenholm, UF/IFAS Extension Turfgrass Specialist. The article originally ran in the spring 2003 issue of the Environmental Horticulture News The Bulletin of the Environmental Horticulture Department at the University of Florida. After reading it, the agent received permission for Dr. Trenholm to run it in his newspaper column. The agent shortened the article to fit the word count of his newspaper column and gave Dr. Trenholm Credit. Because the article did such a nice job summarizing basic lawn management practices, the agent also used it as a handout. As a result of the above, the article was made available to over 50,000 people in Okaloosa and surrounding counties providing the readers with researched based environmentally friendly

Outreach to Minorities:

Garofalo, Joseph-Miami-Dade. Minority clientele and females attended all of the short courses, workshops, and other educational programs, but special effort was also made to reach minority audiences; these efforts included sending news-releases about each program offered, with attached fliers, to the predominantly minority newspapers, radio stations, and television stations. Because parity has been achieved, no special activities are needed to involve

Grace, Patricia – Putnam. Program meets parity requirements.

Ide, Bruce – Citrus. The minority population of the county is quite small. Only 2% of the population is Black and 3% is Hispanic. 1.5% of program participants were Black and 1.6% were Hispanic. This percentage is within the 4% required for parity. However, we are still trying to increase minority participation, all meeting announcements, course information and other information relating to Extension programming are provided to minority media outlets. All organizations dealing with minority clients are on the mailing list and will receive a monthly notice of all extension activities and a quarterly newsletter with extension activities.

Landrum, Linda – Volusia. Educational programs are advertised through "grass roots" outlets as well as through traditional media, and held in easily accessible locations either in heavily populated minority areas or at public facilities. Additionally, news articles appear in a variety of free publications distributed through local libraries and

Mayer, Henrique-Miami-Dade. A large number of the clientele are minorities:82 women; 205 hispanics; 15 blacks, and 1 asian attended programs or received telephone consultations, office assistance or field visits. Due to incomplete and incorrect demographics used to estimate the population of the various groups this agent educates each year, i.e. landscape architects, landscape maintenance personnel, arborists, lawn maintenance companies, parity was not achieved this year. Every attempt will be made to achieve parity next year by reaching out to the various and disparate groups via newsletters, newsprint, radio advertisements, news releases and contacts through the multiple outlets.

Miller, Laura – Hillsborough. Programming was offered to everyone in the nursery industry with information available in Spanish when needed and to every student in Agribusiness and Natural Resources Education in Hillsborough County and in every 4-H club, with out regard to race, creed, religion, gender, age or disability.

Palmer, David – Hillsborough. 1) 170 blacks, 236 hispanics, 27 asians, and 854 females participated in my 2003 programs (46% of the total audience)2) Non-discrimination statement included on all publications.

Schall, William-Palm Beach. Record minority and gender participation in workshops, seminars, office and nursery contacts, telephone communications and newsletter mailings. Offer programming to everyone in, or entering the industry regardless of race, creed, religion, gender, age or disability. Identify affirmative action and special accommodation for disability on all program flyers and publications. Discuss minority participation at least annually on advisory committees. Mailings will be sent to all nurseries in the county identified on the Florida Department of Agriculture and Consumer Services, Division of Plant Industry nursery list regardless of race, creed, religion, gender.

Williams, Larry – Okaloosa. Use of all available mass media to inform potential recipients of program and of opportunity to participate. Use of personal letters and circulars addressed to defined potential recipients inviting them to participate, including dates and places of meetings and other planned activities.

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defined potential recipients inviting them to participate, including dates and places of meetings and other planned activities.

Source of Federal Funds: Smith Lever

FL-SMP-121

Title: Small Farm Sustainable Agriculture alternative Opportunities and Crops in Florida

National Goals: 1, 2, 4

Key Themes: Food handling, food quality, food safety, Agricultural waste management, biological control, land use, nutrient management, soil quality, water quality, sustainable agriculture, pesticide application, yard waste/composting.

Situation/Program Rationale:

Small farms are critical to the agricultural economy of the state, to the management of the state's natural resources, and to the social and economic health of rural communities. We define small farms as farms with gross sales of \$250,000 or less and on which the majority of the management and labor is supplied by the farm family. This definition is used by the United States Department of Agriculture for its overall small farm research and extension programming effort and was developed by the National Commission on Small Farms commissioned by Secretary of Agriculture Dan Glickman in 1997. Small farms account for 91% (31,810) of all farms in Florida. Small farmers own farms throughout the state and small farms account for 75 to 100% of the farms in all counties in Florida. They account for about 15% of the market value of agricultural products in Florida. Small farmers probably own and manage the majority of non-urban, privately owned land in the state, although the USDA/ERS data base is not sufficiently detailed to derive the exact acreage on small farms in Florida. Critical Issues and Needs: County faculty, state faculty, collaborators from around the state, including Florida Farm Bureau, Florida A&M University, and NRCS contributed to defining these critical issues. In addition, the University of Florida conducted (through Pandion Systems, Inc.) focus groups with small farmers in five locations around the state. Based on this input, we have defined the following critical issues facing Florida's small farm population. Access to profitable markets Entrepreneurial and business skills development Farmer-to-farmer communication and networks Readily accessible technical information, including information on alternative crops and enterprises Access to labor Public/consumer relations, perceptions of farming, and support for farmers

Program Objectives:

The overall goal of this extension program is to enhance the economic viability of small farms, improve small farmers' management of natural resources and the environment, and strengthen the role of small farms in Florida's communities, including both rural communities and ties between rural farmers and urban consumers. The specific objectives are:

To assist small farmers develop markets for their products, including farmers' markets, green markets, community based markets, cooperative marketing associations, institutional markets, community supported farms, and food circles.

To provide research-based information about alternative crops and enterprises, including value added processing and packaging. To provide entrepreneurial and business skills training for small farmers.

To help develop small farm networks, stressing enhanced opportunities for exchange of information among small farmers throughout the state.

To improve the flow of technical information to small farmers, including materials appropriate for beginning farmers and stressing sustainable management practices and alternatives for small farms.

To build partnerships with other state agencies and programs, such as WAGES, to help small farmers gain access to labor.

To improve the whole farm planning process, including planning for the inter-generational transfer of resources and improved information delivery about state and federal programs important to small farmers.

To build community support for small farms, including marketing approaches such as community based markets and community supported farms, and community support for land use planning and economic development to support the establishment and growth of small farms.

Summary of Programs for Clientele:

County and state faculty conducted programs to educate small and alternative-crop growers in the following areas: 1) small farm economy and marketing; 2) alternative crops, production systems, and enterprises; 3) small farm safety; 4) harvesting and post-harvest handling; 5) food safety; 6) sustainable and organic agriculture; 7) best management practices; 8) integrated pest management; 9) conservation of water and other natural resources; and 10) small farm business management.

Educational programs provided information on a number of alternative crops and commodities, and for conventional commodities produced by unconventional methods to take advantage of Florida's early market, or to make their production more suitable to Florida conditions. For these alternative enterprises to be economically viable in Florida, new or alternative production methods are often needed. Some examples of new/alternative production methods and systems addressed during 2003 include hydroponic vegetable and herb production, protective tunnel culture of vegetables and fruits, methyl bromide alternatives, plastic mulch culture for vegetables and herbs, and bark culture for early-season blueberries.

Educational methods used included field days, intensive short courses, seminars, demonstrations, on-farm research, newsletters and other mass media, Extension fact sheets and circulars, web site development, and individual analysis and problem solving. Programs were commodity (i.e. blueberry), discipline (i.e. marketing), or concept (i.e. sustainable agriculture) driven and reached a wide audience of small and alternative farmers throughout Florida.

Summary of Impacts for Clientele:

As a result of leadership for FL 121, the following educational materials and activities were produced and conducted at the county level:

221 educational programs attended by 13,185 participants.

94 educational materials produced that were distributed to 21,822 recipients.

54 mass media educational efforts that reached 420,468 Florida residents.

13,950 individual consultations with farmers.

The following changes in practice resulted from the educational programs and materials delivered through FL 121:

114 farmers adopted practices that reduce environmental impacts.

122 farmers adopted alternative enterprises.

142 farmers adopted new marketing approaches.

Success Stories:

1. Small Farm Production Technology:

Success Story: Growers in northern Florida have traditionally used plastic mulch culture with overhead irrigation and have depended upon pre-plant fertilization to supply nutrients for the growing season. With heavy rainfall or excessive irrigation this practice is inefficient and has resulted in nutrient deficiencies at the end of the growing season in part due to nutrient leaching, especially nitrogen. Extension programs in this production area have emphasized teaching growers the benefits of using drip irrigation as a tool

for improved water and nutrient management. On-farm Extension demonstrations throughout the 1990s provided opportunities for growers in the Suwannee Valley area and northeastern Florida to learn how to use drip irrigation for water and fertilizer delivery resulting in increased yield and quality. Drip irrigation is now used by over 95% of the growers in this region of northeastern Florida. Information was collected during over 40 visits during the spring fruiting seasons (Feb-May) from 1998-2003 indicated the benefit of IFAS fertilization programs. Potassium levels were within the ranges in 80% of the samples without drip fertilization, but were within the recommended ranges in 100% of the samples when UF/IFAS drip fertigation recommendations were used. As growers adopted drip irrigation and used recommended fertigation practices, nitrogen and potassium levels were maintained within the recommended ranges. This overall Extension program effort has resulted in reductions of water use by 50% on 30 acres of strawberries adopting drip irrigation. In addition, improved fertilizer management programs are reducing fertilizer amounts by at least 20% through more efficient use. Fertigation programs are also improving crop yields and quality by maintaining proper nutrient levels for the duration of the harvest season. This work also was the basis for a new EDIS document.

2. Food Safety:

Success Story: A grower/packer in Baker County is providing bagged cut collard greens to major grocery chains. Problems with post packaging shelf life arose in the spring of 2003. Premature breakdown was observed in product in stores and the grower/packer solicited help through the Baker County Extension office. A preliminary visit to the cutting and packing facility by Micheal Sweat and Robert Hochmuth identified a possible concern with an insufficient chlorination program in the wash water. This problem was confirmed by testing the free chlorine levels every 10 minutes. Free chlorine levels should be maintained at 50 to 200 ppm according to the UF/IFAS Extension publication, Water Chlorination for Packing Houses. In the old method, the levels dropped to less than 50 ppm in only 20 minutes and remained at near zero for the remainder of the day. To correct this food safety concern, the water chlorination program was calibrated and set to maintain free chlorine levels at 50 to 200 ppm. The grower/packer was taught how to test the wash water and make adjustments in the chlorination program. This adjustment resulted in correcting the premature breakdown of the product and increasing a stable shelf life to the product to 7 to 10 days. This result allowed the packer to keep marketing contracts that affected this packer/grower and four other growers providing product.

3. Alternative Crops:

Success Story: Small farmer continue to seek out alternative crops that provide high returns on their investments. In Florida, early-season blueberry production is one such crop. Florida blueberry acreage and production continues to increase. Harvested acreage has increased from 1600 acres in 2002 to 1900 acres in 2003 (USDA National Agricultural Statistics Service). Significant new acreage has been planted during 2003 that is not yet considered harvested acreage. Hence harvested acreage is likely to continue increasing in the near future. Production has increased from 3.1 million pounds in 2002 to a record high of 3.8 million pounds in 2003 (USDA NASS). The 2003 value of the industry was just over \$18,000,000. Use of improved cultivars and better knowledge of and attention to cultural practices such as freeze protection, pruning, and leaf spot disease management have resulted in increased profitability for several consecutive years which has encouraged additional planting and continued expansion of blueberry acreage. Improved cultivars have allowed for more concentrated, early, harvests. Widespread use of Dormex has also contributed significantly to the increased early fruit production and resulted in higher per pound fruit prices to the growers.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Some common methods of reaching minorities are given below. Not every method listed is used in every county.

1. Insure that all minority growers are identified, and are on mailing lists and are notified of all meetings.
2. Cooperative relationships with minority community leaders were sought and cultivated.
3. Public service announcements for upcoming programs were released through local mass media.
4. Minority representation was sought/maintained on Advisory Committee.
5. Program locations convenient to minority neighborhoods were sought.
6. In some counties with significant Hispanic populations, educational activities are conducted in Spanish.
7. In some counties with significant Hispanic populations, letters, announcements and other correspondence in sent in English and Spanish.

Source of Federal Funds: Smith Lever

FL-SMP-122

Title: Pesticide Applicator Training in Florida

National Goals: 2, 4

Key Themes: Food Quality, Food Safety, Agricultural Waste Management, Endangered Species, Hazardous Materials, Integrated Pest Management, Pesticide Application, Water Quality

Situation/Program Rationale:

Pesticide applicators who wish to use pesticides classified as restricted use by the U.S. environmental Protection Agency (EPA) and the Florida Department of Agriculture and Consumer Services (FDACS) must demonstrate that they meet certification standards established by these agencies under the authority of the respective federal and state laws. Approximately 20,000 pesticide applicators are licensed by FDACS.

In Florida, applicators must pass a written examination to be certified. Applicators must recertify every one to four years (depending on the license category) by re-examination or by attending pesticide educational programs to acquire continuing education credits.

The Florida Cooperative Extension Service offers pesticide educational programs and opportunities to take certification examinations to pesticide applicators in all 67 Florida counties. The educational programs include lectures, audio-tutorials, and training manuals. These programs are available for initial certification and for re-certification.

Program Objectives:

To provide educational programs designed to assist pesticide applicators to use safe, environmentally sound pesticide application practices To improve pesticide applicators' knowledge and attitude about personal safety and protection of the environment when using pesticides and about the regulations that affect pesticide use. To assist pesticide applicators in meeting federal and state pesticide applicator certification and licensing requirements to use pesticides in Florida.

Summary of Programs for Clientele:

County Extension agents provided initial certification training for General Standards (Core), Private Applicators and the following categories: Right-of-Way Pest Control, Aquatic Weed Control, Natural Areas Weed Management, Agriculture Row and Citrus Pest Control, Limited Commercial Landscape Management, Ornamental and Turf. Agents also provided or sponsored educational programs approved by the Florida Department of Agriculture for Continuing Education credit for pesticide applicators seeking to renew their certification and license. These programs provided Continuing Education Credit for General Standards (Core) and

17 categories. County Extension Agents also responded to clientele questions related to applicator regulation and licensing, pesticide safety, agricultural worker safety, and pest management issues related to the various applicator categories in Florida. Several county programs offer applicator training in Spanish to applicators whose primary language is Spanish. State regulations require that pesticide applicators take an exam for licensure. Regulations require the exam to be in English due to the fact that EPA approved pesticide labels are in English. Providing training in Spanish has helped more Spanish speaking applicators meet the licensing requirements for Florida.

Extension Specialist faculty, also, delivered training for initial certification and continuing education. The Extension Specialists participated in county extension programs, regional and state wide programs, and association sponsored programming. The topics and categories addressed by Extension Specialists included pesticide law and regulation, pesticide safety, environmental protection, application technology, household and structural pest control, lawn and ornamental pest management, aquatic and natural areas weed management, right-of-way pest control, agriculture row and tree crop pest management, and other topics related to various aspects of pest management and environmental protection. Specialists provided support for county extension faculty in the form of information on pest management topics, pesticide safety, pesticide regulations, and pesticide registrations. This support was in the form of fact sheets and other publications, computer tutorial programs, talks & lectures for county extension programming and telephone and email responses to specific questions or information requests. Specialists also responded directly to telephone and email questions from clientele on pest management topics.

County Extension Offices administered certification examinations for applicators seeking applicator licensing from the Florida Department of Agriculture and Consumer Services. Examinations were provided at county offices in several ways: by appointment, on a schedule, or following training programs. Most applicators must take at least two exams to qualify for a license. Applicators must retake examinations if they score less than 70% on the examinations. Work continues on new applicator training manuals for the Ornamental and Turf and Right-of-Way categories. These manuals will replace current publications that have been in use for over 20 years.

Funding is being secured from the Florida Department of Agriculture and Consumer Services and the Pest Control Industry for the development of a Termite Training facility at the UF/IFAS Mid Florida Research and Education Center at Apopka to train termite control technicians in proper treatment of structures infested with termites. The facility will train termite technicians who treat structures in FL as well as technicians from other states. Plans and equipment for facility have been donated. Several instructors have been identified to serve as faculty.

Agents continued to offer Pest Control Technician training programs to address state requirements for the technician (unlicensed person working under the supervision of the certified operator) to have 4 hours of specified training.

Summary of Impacts for Clientele:

* During the period of January 1, 2002 to December 31, 2003, 7,011 exams were administered at UF/IFAS County Extension Offices for 14 applicator categories plus General Standards.

*As a result of passing the required examinations, FDACS issued licenses to 421 new applicators in 2003 to apply pesticides on their farm, grove or ranch, or that of their employer, to control pests on crops or livestock.

* As a result of passing the required examinations, FDACS issued licenses to 1,011 public/commercial applicators in 2003 to apply pesticides as a part of their job with a government agency or with a commercial/for hire application business.

* An estimated (based on county reports) 6,466 persons attended training in 2003 designed for applicators seeking initial certification/licensing.

*During FY 2003, 7,629 applicator training manuals for 16 applicator categories including General Standards (Core) were sold by the UF/IFAS Extension Bookstore. These materials are used by persons as study references for certification examinations.

* UF/IFAS County Extension programs and UF/IFAS extension specialist faculty provided over 75% of the 484 programs approved by FDACS for continuing education for licensed pesticide applications in 2003. These programs offered 1,877 non-duplicative CEUs and a total of 4,505 CEUs for 16 categories.

* FDACS renewed the licenses of 660 private applicators to apply pesticides on their farms, ranches, grove or that of their employer. FDACS also renewed the licenses of 897 commercial/public applicators to apply pesticides as a part of their job with a government agency or with a commercial/for hire application business. The continuing education programs offered by UF/IFAS Cooperative Extension provided the most of the CEUs for applicators to renew these licenses. Licensed applicators are required to earn between 4 and 16 CEUs to renew their license depending on the application category for their license.

* An estimated 12,000 persons participated in educational programs approved by FDACS in 2003 for continuing education credit for licensed applicators.

* An estimated 30,000 persons received pesticide safety education training in 2003 from programs that are not designed for the applicator certification and licensing program. This audience includes master gardeners, residential users of pesticides, and other non agricultural and non professional users of pesticides.

Success Stories:

Spanish pesticide applicator training for applicators who want to be licensed to apply pesticides to landscape plantings has been valuable in helping such applicators pass the state certification exams so that they can legally do this work in Florida. Several counties report specific examples where persons now can legally do this work in FL and obtain the necessary insurance for their business. Spanish training for pesticide applicators has resulted in increased pass rates on the exams. (62-67% of persons who take the exams)

One county reports participants in county applicator training programs reported personal improvement and improved incomes due to the ability to diversify their business due to the pesticide license they were able to obtain as a result of the applicator training they received.

A nursery grower reports as a result of sending his employees to pesticide applicator training classes at the county office, his employees can now scout for pests and diseases as they work in the nursery. This has significantly reduced the plant disease problems in the nursery which has improved his products (plants). Reduced pesticide use has also resulted in less degradation of his water supply.

On line applicator training in one county has proven popular with some of their clientele due to convenience, low cost and content.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Educational programs are conducted in accordance with the University of Florida's policy of equal opportunity/affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities through the use of mass media.

Minorities are encouraged to participate in all extension programs. In some counties where a large number of the clientele is Hispanic, programs and publications are done in Spanish. Some agents appear on Spanish radio and television. Agents sometimes do direct or personal contact with minority growers, nurseries or other individuals to promote programs. Agents report using Equal Opportunity and ADA statements on meeting announcements. Some counties report using minority newspapers when available. Meeting sites are selected where there is commonality and local support.

Source of Federal Funds: Smith Lever

FL-SMP-124

Title: Prevention and Preparedness: Agricultural Safety and Disaster Management

National Goals:

1, 4 and 5

Key Themes: Bioterrorism, Home Lawn and Gardening, Managing Change in Agriculture, Risk Management, Small Farm Viability, Urban Gardening, Drought Prevention and Mitigation, Hazardous Materials, Weather and Climate, Wildfire Science and Management, Child Care/Dependent Care, Farm Safety, Home Safety, Workforce Safety, Youth Farm Safety

Situation/Program Rationale:

Prevention — Agriculture remains one of the nation's and the state's most dangerous occupations. Typically, farmers are more likely to be injured or killed on the job than policeman or firefighters. Contrary to the popular image, agriculture is an industrial activity which exposes Florida's 200,000 farmers and farm workers to a wide variety of hazards - some obvious and some well hidden. Through education of students, training for employees and managers, and dissemination of the latest health and safety information, the University of Florida's Extension Agricultural Safety Program plays a unique and crucial role in ameliorating this situation. No other organization or agency plays this role for the state of Florida.

Like safety in general, agricultural safety is a widely diverse topic which covers the range of mechanical, natural, and chemical hazards that farmers and ranchers face. Subjects from animal behavior to bacteriology to physics come into play. A comprehensive safety program for Florida must address the pattern of exposures experienced by workers in over 40 major commodity groups, on small private family farms in the Panhandle and large corporation operations in central and south Florida, taking into account cultural barriers, literacy levels, language barriers, etc. All this in a continually evolving regulatory environment.

Also, the face of agriculture is changing. The majority of farm and ranch workers was once farm families. Now, most farming and ranching is done by corporate concerns, and many of their workers are recent immigrants from Central and South America. We are actively working to produce and deliver programs in both English and Spanish.

We want safety to be the first consideration of every agricultural manager, not the last; we want our agricultural engineers to "design with safety in mind," not tack on labels and shield as an afterthought. We want employers to realize that proper attitudes and training in safety improve the bottom line by increasing worker productivity and reducing liabilities. We want workers to realize that proper awareness and understanding of safety is not a waste of time, it is an investment in themselves and their future. Accomplishing this means changing minds and changing behaviors.

Preparedness — For anyone who lives in Florida, natural disaster is a natural part of life with our annual hurricane season. In fact, Florida consistently ranks at the top of the list in terms of the economic impact of natural disaster, with an average cost per year of \$1.7 billion (1999 dollars; data for 1955-1999). The Florida Extension Service has always played a role in disaster, primarily in providing publications related to recovery of household goods.

In the last 20 years, American society's attitude and approach to disaster have changed. Before about 50 years ago, government response to disaster was strictly limited to local governments, and occasionally state efforts. In the 50's that began to change, and in the 70's, President Carter created the Federal Emergency Management Agency (FEMA) in response to the realization that some disasters required faster and more comprehensive response than any locality or many states

could muster. FEMA also took on the role of coordinating the response of various federal agencies to disaster.

Disaster and risk management are now a standard component of many companies, and emergency management is a well established part of state and local government, especially in Florida.

Disaster is also now a subject of study for several academic disciplines. The appearance of research results for both Extension into play as that arm of the University whose job it is to formulate research results for both general and professional audiences and then deliver that information through publications and training.

During and after Hurricane Andrew, the Extension Service played an important role in Miami-Dade County, assisting citizens and linking people and resources. This prompted IFAS, with its unique focus and expertise on the relationship of people to the natural world, to expand its involvement in the area of disaster.

This effort was initiated in three ways: 1) Disaster Preparedness and Recovery was added to State Major Program 124 (formerly titled Farm and Home Safety) - this formally made the subject a part of the IFAS mission, and placed this program effort under the leadership of the State Extension Safety Specialist; 2) IFAS mandated a greatly expanded disaster information program; and 3) The Florida Cooperative Extension Service, the Florida Department of Agriculture and Consumer Services, and the Florida Farm Bureau formed an alliance called the Florida Disaster Management Team (FDM) to provide a coordinated information-sharing and timely response among these parties to disasters in Florida.

The key to disaster response is coordination. The need for coordination between the numerous agencies that can respond to disaster led to formation of FEMA in the first place, and the story of disaster management over the last twenty years is largely a story of understanding the needs created by disasters, the individual roles of agencies, and how to coordinate them.

Florida Extension's Disaster Preparedness and Recovery programs and products are highly respected nationally, and this IFAS program is looked to as a national leader.

Program Objectives:

Prevention — The overall objective for the Prevention part of FL124 is to inform people about ways to be safe and secure, and thereby reduce the number of deaths, injuries and occupational diseases, particularly to agricultural workers and their families. We seek to build a safety infrastructure for Florida through five activities: training of workers, training of students, publications, networks, and linkages. We are increasing our safety programming to encourage adoption of safe practices among employees and clientele. Every employee or client should be exposed to a safety tip or safety practice on a regular basis.

Preparedness — The objective of the Preparedness part of FL124 is the mitigation of losses, both in life and property, due to disasters of any kind in Florida. To accomplish this, Florida Extension has several programs and linkages in place.

Summary of Programs for Clientele:

Agromedicine

Agromedicine Field Day, July 2003, Carol Lehtola, State Safety Specialist.

Biosecurity

Southern Plant Diagnostic Network. Larry Halsey, Jefferson County.

In-service training: DDIS First Responders (SPDN), Larry Halsey Jefferson County.

BioTerrorism Threats to Agriculture. Larry Halsey, Jefferson County.

Children

Suwannee County Safety Day.

Marianna Safety Day Camp.

4-H Congress, Safety Presentation Competition - Judge, Carol Lehtola, State Safety Specialist.

Progressive Farmer Farm Safety Day Camp. Laura Powell, Palm Beach County. 253 Participants.

Youth Safety Day. Nola Wilson, Marion County.

Farm Safety Day Camp. Laura Powell, Palm Beach County.

Disaster

Get Ready 2003! June 2003. Bill Brown and Carol Lehtola, Alachua County. 2500 Participants.

SWIM Presentations, Miami-Dade County. April 2003. Don Pybas. Bill Webb, graduate student, Agricultural and Biological Engineering.

Disaster Planning For Agriculture: 2002 Cold Weather Update Seminar. Don Pybas, Miami-Dade County.

Maintenance and operation of four remote radio-connected weather stations. Don Pybas, Miami-Dade.

Turkey Point Nuclear Power Plant radiation drill. Don Pybas, Miami-Dade.

Agriculture Flooding Issues in Miami-Dade County. Don Pybas, Miami-Dade County.

Windstorm Damage Mitigation (numerous sessions). George Rogers, Escambia County.

Hurricane Preparedness. George Rogers, Escambia County.

Disaster Preparedness in a Coastal Community. Gayle Whitworth, Brevard County.

Disaster Preparedness: Are You Ready? Whitworth, Gayle - Brevard County.

Disaster Preparedness Showcase Whitworth, Gayle - Brevard County.

Hurricane Night at the Stadium Whitworth, Gayle - Brevard County.

Home News and Views (newsletter with disaster features) Whitworth, Gayle - Brevard County.

Hurricane Night Whitworth, Gayle - Brevard County.

Disaster-Animals

Columbia County Horse Disaster Assistance Team

Large Animal Disaster Planning Peters, Mary - Broward County.

Disaster-Emergency Management

Assist Miami-Dade County Office Emergency Management update GIS records as to what crops are in area. Don Pybas, Miami-Dade County.

Safety – Equipment/Machinery

Chain Saw Safety. David Holmes, Marion County. 123 Participants.

Alachua County Extension Landscape Short Course. Bill Brown, Alachua County.

Equipment Safety. Stephen Futch, Hardee County. 167 Participants.

Machinery Safety for the Aquatic Plant Program. Broward County.

Forklift Certification Programs. Laura Powell, Palm Beach County.

Safety and Health – General Training

Farm and Pesticide Safety Training. William Oswalt, Polk County.

Improving the Health and Safety of Agricultural Workers (9 sites). Laura Powell, Palm Beach County.

Blue Print for Safety. George Rogers, Escambia County.

Respiratory Protection. Laura Powell, Palm Beach County.

Safety – Tractor/Vehicle

Tractor Safety for IFAS Employees at Citra Plant Science Research and Education Unit. Carol Lehtola, State Safety Specialist.

Worker Protection

Worker Protection Standards – Train-the-Trainer. Stephen Futch, Hardee County.

Summary of Impacts for Clientele:

Safety – Impacts

In Marion County, Nola Wilson coordinated a Youth Safety Day. At this event, 350 4th grade students learned proper safety habits, including ATV safety, home fire safety, horse safety, sun

safety, 911, basic first aid, dog safety, hand tool safety, tractor safety, electricity safety, chemical safety, water safety and bicycle safety, and more!

Disaster – Impacts

In Brevard County, Gayle Whitworth works to keep citizens alert to the dangers that hurricanes pose to their coastal county. Through her “Are You Ready?” class, the Disaster Preparedness Showcase, “Hurricane Night at the Space Coast Stadium,” and the “Home News and Views” newsletter, Whitworth’s message directly affected about 300 Broward residents. Whitworth says that the challenge is keeping people focused on preparedness after several hurricane seasons which have been very light for Broward County.

Success Stories:

Safety – Success Stories:

Rob Brown, a student from Carol Lehtola’s Safety in Agriculture course at the University of Florida, developed a safety commitment program that has been adopted by the Pasco County School Board and The Career and Technical Training Department. All ag students and their parents in Pasco County are now required to complete and sign the program at the beginning of each school year. The program teaches students about safety and asks them to sign a commitment to work safely.

Kelli Veal, a student from Carol Lehtola’s Safety in Agriculture course at the University of Florida, put her safety lab training to good use when the gas oven in her sister’s apartment ignited. Kelli’s sister panicked, but Kelli was familiar with the use of a fire extinguisher and was able to put out the blaze. When the fire department arrived, they wanted to know where Kelli had learned to put out a fire. She was pleased to tell them that she had learned this skill in her agricultural safety class the previous summer.

In late 2002, Florida Agsafe, the University of Florida Agricultural Safety Program, released the video: *Rhythm of the Seasons: A Journey beyond Loss*. In 2003, this video was widely distributed and enthusiastically received by the ag safety community. The video won a ASAE Blue Ribbon Award. The Blue Ribbon is the highest award offered by ASAE. Lehtola received a congratulatory letter from C. Everett Koop, former Surgeon General of the United States, who gave the introduction in the video.

Disaster – Success Story

Dr. Carol Lehtola and her associate, Charles Brown, were recipients of the 2003 Secretary of Agriculture’s Award for Excellence for their work with the Extension Disaster Education Network (EDEN). This is the highest honor given by USDA. Over the past few years, this organization has played an important role in connecting and networking Extension services all over the U.S. in times of disaster. EDEN is emerging as the key organization in coordinating the CSREES response to Homeland Security issues. This award certainly indicates the national significance of this component of FL124. Both Lehtola and Brown were on the EDEN Executive Committee 2001-2003.

A mare in Broward County owes her life to the Large Animal Disaster Training provided by Mary Peters. A member of her large animal disaster team, Leslie Kastner, was called to a scene where a 30-year-old mare had become mired in muck, and was exhausted after an apparent overnight struggle to free herself. Using equipment and techniques gained through the Broward county program, Kastner was able to direct a successful rescue.

The Escambia County Windstorm Damage Mitigation Training and Demonstration Center has become known as an important place for continuing education. George Rogers, an Extension agent who focuses on windstorm effects and mitigation, reported that in 2003, over 650 designers, builders and inspectors received almost 2800 hours of continuing education. The Center is a program of IFAS, University of Florida Energy Extension Service, and the Florida Department of Insurance.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Safety – Outreach to Minorities

Marion County reports that there were 27 minority participants in a 2003 program on chain saw safety.

Florida Agsafe, the University of Florida Agricultural Safety Program, reaches out to minorities primarily by providing training and information materials in Spanish. Examples include the Safety/Jeopardy training game and selected publications in the Safer Tractor Operations series. The Farm and Pesticide Safety Training Program in Polk County reaches minorities by sending meeting notices and newsletters to citrus landowners and citrus management firms on the extension coded mailing list to Polk and Hillsborough Counties. Meeting notices of meetings and programs are published in multiple sources in an effort to generate the largest possible participation. This includes, but is not limited to: Florida Citrus Mutual, Citrus Industry Magazine, Citrus & Vegetable Magazine, Polk County Internet Web Site and other outlets as appropriate.

Disaster – Outreach to Minorities

The Disaster Planning for Agriculture Program in Miami-Dade County reaches out to minorities primarily by providing programs and materials in alternative languages as required. Promotional materials and notices are also distributed through minority community media.

The Windstorm Damage Mitigation Program in Escambia County reaches minorities in a number of ways. Minority members make up 10% of the Windstorm Damage Mitigation/Energy Advisory Committee. The Center uses mass media to inform the widest possible audience of its programs. Marketing incentives, such as well-known presenters, door prizes, and food, are used to draw participants. All construction licensee holders receive literature and announcement/registration flyers through mass mailing.

Source of Federal Funds: Smith Lever

FL-SMP-128

Title: Sustaining the Economic Viability of the Florida Dairy Industry

National Goals: 1

Key Themes: Adding Value to new and old agricultural products, Agricultural Competitiveness

Situation/Program Rationale:

Dairy farming is an important part of Florida's agricultural industry. Milk and cattle sales from dairies contributed about \$390 million to Florida's economy in 2002, about \$72 million (17%) less than 2001. Of that decrease, 3% was due to decreased production while 14% was due to decreased at-farm milk price.

Situation/Program Rationale:

The Florida Agricultural Statistics Service has indicated that there were about 147,000 dairy cows in Florida at the start of 2003 compared to 152,000 cows on 209 dairy farms at the start of 2002. That reflects a decline of 5,000 cows during 2003 and an 8,000 cow decrease since the start of 2001. A factor in this smaller herd size was a relatively higher cost of replacement cows. The 2002 average price per head for replacement cows was \$1,800 up 23% from \$1,460 in 2000. The Dairy Business Analysis Program (DBAP) is a cooperative effort of the Universities of Florida and Georgia, Southeast Milk Inc., and Southeast DHIA. This project annually surveys participating dairy farms relative to levels of revenues, expenses, and investments. DBAP data of 2002 showed that the average mailbox milk price received was \$16.08, compared to \$18.27 in

2001. The total revenues were \$17.53, total expenses were \$18.34 and net farm income was -\$0.80. Further, debt per cow at the end of 2002 was \$812 (59%) higher than at the start of the year. This level of profitability was the lowest since 1995 in the DBAP series. Further, 2003 data is expected to show performance similar to or worse than 2002.

Background information, the challenge of dairying in Florida

Production challenges

Florida's warm and humid climate is not ideal for dairy cattle that evolved during centuries of selective breeding in the relatively moderate climates of northern Europe. Heat stress has been shown to reduce production by 25% by reducing feed intake and increasing health problems such as mastitis, lameness and reproductive delay. Mastitis has been estimated to cost producers at least \$300/cow/year. Udder, feet and reproductive health challenges cause the culling of nearly 30% of cows each year. This constrains herd replacement dynamics, causing less productively-efficient cows to remain in the herd.

Economic challenges

Florida's dairy producers operate under a difficult economic situation. Despite a geographic difference and a product that's difficult to transport, they increasingly compete in a national and international marketplace. Florida's dairy cooperative has the difficult task of negotiating consistently profitable milk prices because larger handlers from outside the southeast would like to gain market share and ultimately control a growing market with its high fluid utilization rate and resulting higher price.

The size of Florida's dairies requires large investments, over \$1.5 million on average. But the return to invested capital is generally insufficient. The DBAP participating dairies average return on assets ranged from 0% in 1995 to 9% in 2001. This rate of return discourages new investments. Florida lost a third of its dairy farms in the 1990's.

Environmental challenges

Dairies face increased regulation due to social pressure. While cows on pasture invoke warm, fuzzy feelings with many Americans, the increasing size of herds causes the public to be concerned with odors, flies and real or imagined losses of nutrients that influence water quality. The greatest reason for the environmental issues facing Florida dairy producers is the high concentration of animals on farmland. High producing cows may consume 100 pounds of feed and 50 gallons of water per day. They may excrete 195 pounds of manure and urine. Florida dairies average nearly 730 cows and about 50% of them raise young replacement cattle as well. Thus, there is an extremely high volume of nutrients flowing through the dairy system. Even minuscule percentages of these nutrients, if lost, could command attention of regulatory agencies. Further, if cow densities on land become fixed by regulatory action, these new constraints to herd size will negate the opportunity to increase herd size on most farms, dooming them to eventual inefficiency and discontinuation.

The cost of nutrient handling systems that will meet the future requirements of environmental regulatory agencies is unknown and perceived to be a major constraint to dairies as they commit to the future. These costs have two parts; (a) the original investment costs of engineering and putting the new systems in place and (b) operating and maintaining the systems well into the future. These systems, incorporating significant levels of new technology, have been implemented to ensure that dairies efficiently handle nutrients in an environmentally-friendly manner. The UF/IFAS Extension Service is helping to determine the cost of implementing and operating these new systems so as to aid management decisions for these dairies. Also, the information will be valuable to many others that have yet to develop their best responses to environmental regulation.

Size and location differences among dairies have resulted in significantly differing nutrient handling system expense. Additionally, different types of systems have differing initial investment and operating expenses. Dairies that employ such new systems take on a competitive disadvantage since investing in these new systems generally does not generate a positive return.

Program Objectives:

Provide educational programs and technical assistance to Florida dairy farmers in the areas of:
Reducing environmental stress
Improvement of business management practices
Cost-effective nutrition and animal health practices
Use of forages and grazing for profit

Summary of Programs for Clientele:

All Dairy agents participated in gathering on farm financial data on 207 dairies state wide, the agents gathered all the data it was analyzed by specialists in Gainesville and the results given back to the dairymen by the agents and the specialist. The Agents also fielded other financial questions, such as return on investment for building new facilities or remodeling existing facilities, this service is very important to our dairymen.

County faculty have been instrumental in keeping up with livestock waste management issues from state and federal agency's, DEP, FDACS, SFWMD. Ten meetings have been held in the Lake Okeechobee area alone.

Agents and specialists work together also in the areas of dairy cattle nutrition, not only individual dairymen's problems but in transmitting specialists research on carbohydrate's in preventing acidosis in dairy cattle, other ration formulations to not only provide the dairy cow the best ration for milk production and the cows health and her output of nutrients into the environment. The DHIA program provides the dairymen with production records, both agents and allied industry people are trained in this area which provides the dairymen with workable records to make management decisions.

Agents select dairies who request to have milking procedures videos made on their individual dairies for only their dairy in both English and Spanish, these videos are then edited by a specialist and returned to the counties for distribution.

Summary of Impacts for Clientele:

DHIA information has been provided to 130 participating dairy farms in a comprehensive and complete form. Data is collected during on-farm visits by DHIA personnel. The data are entered into laptop computers, summarized and immediate management reports printed on site. A data file is Transmitted directly to the DHIA computer system at DRMS at NCSU in Raleigh NC. There these data are edited and audited, collated with data from USDA and the participating milk analysis laboratories. Data from over 13,500 cooperating herds are then pooled and made available for benchmarking, comparison, research projects and other educational efforts. One new feature which is being developed, called DAIRYMETRICS, makes comparison of data to selected cohort averages via world-wide-web access. Herds on DHIA use the information to improve herd performance. Comparison of herds in Florida shows over 3,400 pound advantage for participating herds. Upon presentation of their 2000 DBAP report saw that their purchased feed costs and machinery costs were 20% and 78% higher than the average of other DBAP dairies. After recommendations on ways to lower the costs in these two areas the dairy was able to lower its purchased feed costs from \$8.76 to \$8.11 a decrease of 7% and their machinery cost from \$2.03 to \$0.87 a decrease of 57%. Overall this dairy was able to increase its net farm income from a loss of \$42,894 in 2000 to a profit of \$228,646 in 2001. Showing an increase of \$271,540 in net farm income an increase of 118%. Overall 6 dairy operation (85%) of the 7 that participated in the DBAP program this year showed an increase in net farm income totaling over 1.06 million dollars.

Success Stories:

Developing multi-lingual milking procedures video tapes

The twenty dairies are now able to train new help and retrain new help in the proper way to milk cows on their dairy. On more than one dairy's, the owners had no way of

communicating with the help on how to do herd health procedures, they had to do much all the work themselves. Because antibiotics are often used and they can get into the milk supply if withdraw times are not correctly followed, the milk will be destroyed and no payment will be made, if this milk would contaminate other milk in a tanker truck of milk, the costs could be \$10,000. Over 40 large dairies in Florida now have resident foot trimmers trained at The Master Foot Care Seminars, these trimmers have saved these Florida dairymen \$50,000 each in foot and lameness losses. : Worked with a producer on problems with the herd's ration that appeared to be related to Carbohydrates, Modification of the diet increased production ~5 lb per cow/day x 300 cows x \$0.15/lb milk x 7 days = \$1575 more milk income per week than on the previous diet. The Florida State legislature was considering the need/value in providing cost share monies to Dairies in the Lake Okeechobee basin for the installation of BMP have to reduce Phosphorus runoff from farms. The Current economic climate of dairying in Florida is quit dismal with few dairies above breakeven. Dairies simply could not afford to shoulder the entire cost of these BMP's. The legislature asked that a paper be prepared analyzing the cost to dairies of these practices. The paper "The Impact of New Best Management Practices on Profitability of Dairies in the Lake Okeechobee Drainage Basin" presented to the interagency meeting in Tallahassee has been credited in large part to the success of the agency personnel's understanding of the dairy economic situation in the Okeechobee area, and therefore their eventual successful support for cost share monies from the state for Implementation of BMP's mature dairy with little debt has a reluctance to grow, unsure about investing a significant Amount of capital while uncertain about the cost of environmental regulations and the overall economics of the industry in this price-volatile period. After DBAP analysis, it was recommended the dairy attempt to increase volume Per cow and reduce debt. Suggestions have been made concerning management practices. Over the 7 years of Participation, the dairy has increased sales per cow by 7%. Equity growth has risen from \$1,717 to \$5,685. Debt per Cow has declined from \$940 to \$560 per cow.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Source of Federal Funds: Smith Lever

FL-SMP-129

Title: Profitable and Sustainable Sugarcane Production in Florida

National Goals: 1, 4

Key Themes: Agricultural competitiveness, agricultural profitability, biotechnology, GIS/GPS, plant germplasm, precision agriculture, tropical agriculture. biodiversity, integrated pest management, natural resources management and nutrient management.

Situation/Program Rationale:

Sugarcane production has increased considerably in the state of Florida since 1960.

Approximately 50% of the cane sugar produced in the U.S. comes from Florida, and this accounts for about 20% of all sugar consumed (cane and beet) in the country. The Florida sugar industry employs over 14,000 people has an annual income over \$800 million, and a total economic value (from direct and indirect effects) of over \$2 billion.

The total planted area is approximately 440,000 acres, making sugar cane the most extensively grown row crop in Florida.

Florida sugarcane production is primarily on land along or near the southern half of Lake Okeechobee. Most of the production is in Palm Beach County, but sugarcane is also grown in

Hendry, Glades and Martin counties Eighty percent of the crop is grown on organic soil and 20% is grown on sand. Acreage planted on sand soils has increased over the past 10 years. There is greater need for more research and information on nutrient management on both muck and sand soils. Farms in the Everglades Agricultural Area (EAA) have been implementing best management practices (BMPs) for nutrient management, but calibrated soil test recommendations are lacking.

Growers need to continue to implement and adopt new technologies (such as GIS) and improved sound management practices in order to be efficient and profitable. Adoption of sustainable practices will contribute towards maintaining acceptable production and will minimize environmental impacts.

Weed control is decreased and herbicide use is increased by inappropriate selection of herbicides. These mistakes are often caused by poor weed identification skills, or poor herbicide selection. If a decision-maker does not correctly identify the target species present in the field, it is impossible to determine what the optimal herbicide choice would be, or if the weed species present needs to be controlled at all. Several factors affect attitudes regarding weed identification. Many decision makers have little training in weed identification, especially identification of seedling grasses. A lack of understanding of the basic morphology of the plants can make many of the available identification resources (taxonomic keys, morphological descriptions) difficult for the decision maker to use. Another factor is the large number of weed species present in Florida. Many decision makers can easily identify the most common weed species, but are challenged when faced by those that are less common.

Insect pests attack above and below ground portions of sugarcane. Wireworms and beetle grubs must be controlled prior to or at planting to minimize lodging and reduced stands and growth. Lesser cornstalk borer attacks tillers and young shoots beneath the soil surface making this pest difficult to control. There is legitimate concern over the potential loss of some of the most affective insecticides used for control of below soil insect pests. Recent reductions in rice plantings, with their associated long term flooded acreage, has reduced the potential for non-chemical control of such pests. Sugarcane borer attacks the stalks thereby reducing yield. Sampling and control strategies may be at risk of compromise with the recent elimination of professional level entomologists with U.S. Sugar Corporation, whose support of a borer parasite rearing facility may also be at risk. Various aphid species either cause stunting and reduced yield due to direct feeding damage or vector plant viruses that reduce yields. While an effective insecticide (e.g., Furadan) is currently labeled for aphid control, it kills virtually everything in the field, including natural enemies of aphids and other insect pests. Registration of more selective aphicides is needed before it is lost to the EPA re-registration process. Even more damaging species of insects are present in sugarcane grown elsewhere in the United States (e.g., Mexican rice borer) and the world. Florida is susceptible to introductions of such pests due to the high volume of legal and illegal agriculture imports. Vigilance and support is required to prevent and to quickly identify and react to such introductions. Sustainable sampling programs and control strategies are needed for some of Florida's current insect pests.

The University of Florida participates in a tripartite cooperative breeding program agreement with USDA and the Florida Sugar Cane League to produce the Canal Point ("CP") sugarcane clones. These cultivars are grown on > 70% of the total sugarcane acreage in the Everglades Agricultural Area and thus generate over \$525 million in annual revenue for sugarcane producers in the region. Grower interest in improved sugarcane germplasm is tremendous. The use of a given cultivar is limited over time because disease pressure reduces production within a few years after release for commercial production. New cultivars with both improved agronomic characteristics and disease resistance must be continually developed to sustain the sugarcane industry of Florida. In addition, existing germplasm should be examined to determine the most economical harvest time based on sucrose accumulation characteristics.

The industry harvests all sugarcane for the mill mechanically. This reduces labor inputs, but has shortened the number of ratoon crops that can be grown due to damage to the field by harvesters and haul-out equipment. Extraneous plant material (i.e. leafy matter, immature cane tops and stalks as well as soil) coming to the mill has also increased.

There is a recent trend toward mechanical planting. Approximately 40% of the acreage planted in 2003 was done by machines of several different designs. This often results in irregular stands of plant cane due to poor control of metering seed coming from the machine and mechanical damage to the cane used for seed during cutting, loading and dropping operations. Mechanically cut seed-cane fields can also introduce weeds into new plantings through vegetative propagation of weeds.

Since the late 1970s, rice has been grown on sugarcane fallow land. Current rice area in the EAA amounts to 7,000 acres. Although the rice-sugarcane rotation makes economic and environmental sense, it presents a series of agronomic challenges from planting to harvesting. Sugar production in the United States is supported by federal legislation. Public opinion has been divided in two major groups. One group supports the status quo because of economic benefits, employment and stable sweetener prices. Opponents argue a high cost to American consumers and the isolation brought about by protectionist policies in an increasing global economy. The future resumption of full diplomatic and commercial relations between the United States and Cuba will have a tremendous impact on Florida agriculture. Recent sales of agricultural commodities by U.S. agribusiness firms to Cuba, which include some in Florida, seem to indicate the direction of future trade and investment. Sugar and rice appear to represent challenges and opportunities, respectively.

Environmental issues have been a major feature of the cane industry for the past 30 years. To understand why, in part, environmental issues have been used to oppose sugarcane agriculture, it is necessary to understand the political/social environment of the region. The cane industry is adjacent to a very densely populated string of coastal cities, with population in the millions. It is also adjacent to highly prized natural features such as Lake Okeechobee and the Everglades. Even though Palm Beach County is ranked about third in the U.S. for agricultural income, most coastal residents have no contact or involvement with the western agricultural area where sugarcane is grown. The perception held by many south Florida residents is that declining environmental quality is due in large part to sugarcane production, and the industry is controlled by a few stakeholders with a lot of political influence. Specific contentions are that water quality leaving the EAA is so poor that it is polluting (with phosphorus) the Water Conservation Areas (WCA) located in the Everglades ecosystem and that agriculture in this region wastes water. Currently there are efforts to address both of these conditions, although there is still disagreement between the sugar industry and their critics as to what is really happening and who is responsible. Many aspects of production are affected by environmentally-related considerations. Three of these – water quality, water quantity and to a lesser degree air quality – have substantial influences on production practices. The main water quality issue is phosphorus content in drainage water. Water must be constantly monitored for P concentration. Water quantity is extremely variable both within and between years. It is possible to be in flooded conditions and within the same year have water use restrictions imposed. The air quality issue is related to burning of cane before harvest. All burning is monitored and permitted, but in general, burning is not allowed when winds can carry smoke or ash to coastal cities. The feasibility of green cane harvest appears to be an increasingly important issue to growers.

Subsidence of the organic soils in the EAA resulting from drainage, compaction and oxidation limits the productivity of the soil over time. The EAA muck soils overlay a continuous layer of lime rock. The result of soil subsidence has been shallower soils, and water control (both irrigation and drainage) has been restricted resulting in crop stress for extended periods of time. In the longer term, continued loss of soil could lead to land being taken out of agricultural production.

Rationale

Sustainable sugarcane management information for growers and managers is needed, including best management practices (BMPs), alternative fertilization practices, modified tillage practices and techniques for maintaining environmental and crop health. Information needs to be transferred to growers on nutrient requirements for sugarcane grown on mineral soils.

Widespread availability of a range of different weed identification and herbicide selection resources would assist decision makers in making appropriate herbicide choices, resulting in increased weed control and decreased herbicide use. By providing a range of resources to assist with weed identification and by providing hands-on training in weed identification, the use of inappropriate or less than optimal herbicides can be reduced significantly, increasing weed control and decreasing unnecessary herbicide use.

New insecticides are being evaluated for control of sugarcane insect pests. Host plant resistance to aphids and viruses is being evaluated in clones that reach stage IV in the variety development and release program. Growers need a program to develop and then disseminate sampling programs for detection and decision making for control of several of Florida's sugarcane insect pests.

New sugarcane germplasm has been released over the last 45 years at the average of one clone per year. Average sugar yield has increased by 1.6 tons acre⁻¹ from 1968 to 2000. New CP cultivars with improved agronomic yields and disease characteristics need to continue to be released to growers, along with extension recommendations for their most effective use in terms of recommendation domains, risk of deterioration following freezes and optimum period of harvest maturity.

Growers require an increased knowledge base on advanced technology in sugarcane management practices (for example GIS technologies and precision farming). Growers will need education on the use of precision agriculture based on yield maps generated from GPS equipped mechanical harvesters and soil/tissue analyses, similar to what is being done in Australia and Mauritius.

A better knowledge of management practices for the rice-sugarcane rotation is needed. Since the public perceives rice as an environmentally-friendly crop, increasing rice acreage would benefit Everglades agriculture.

From producers to the general public, there is a need to explain the complexities of domestic sugar policies, and the current status and future prospects of pending international trade agreements.

Assessing both benefits and costs of future trade with Cuba for Florida sugar and rice producers should be a priority. Awareness of current developments in Cuba's agricultural production will help in future decision-making processes.

The emphasis on nutrient management and other environmentally-related production practices has been the result of several years of accusations, lawsuits, proposed constitutional amendments and simply poor public image. In particular, the issue of managing P-enriched drainage water in the EAA resulted from a lawsuit brought by federal prosecutors. The current effort by sugarcane growers to project an environmentally-friendly image is in part due to the failed constitutional amendment proposal that was going to tax growers one cent per pound of sugar to pay for Everglades restoration. It appears that engaging these issues, addressing problems when necessary, and emphasizing the benefits of sugarcane agriculture over other land uses, such as urban development, may result in a more balanced view of the sugarcane industry by the public. A better public understanding of the positive aspects of sugarcane agriculture will be a major determinant of the crop's future in Florida.

Program Objectives:

- 1) To provide educational leadership and support to Florida sugarcane growers in the adoption of sustainable practices

that will maintain or improve commercial production practices while minimizing environmental impacts.

2) To provide information concerning sustainable commercial production practices that will be cost-effective, including practices such as fertilization, crop protection, and rotational crops. It is anticipated that 40% of the growers will adopt such practices within the next four years.

Summary of Programs for Clientele:

Objective 1. To provide educational leadership and support to Florida sugarcane growers in the adoption of sustainable practices that will maintain or improve commercial production practices while minimizing environmental impacts.

The FL-129 design team has been instrumental in grower adoption of sustainable practices that will contribute towards maintaining acceptable production and will minimize environmental impacts. These practices include integrated pest management, calibrated soil nutrient tests, and precision agriculture. The implementation of best management practices (BMPs) for reducing P loading in the EAA proposed by the University of Florida will greatly reduce the amount of P in agricultural drainage waters.

Some examples of design team impact:

The Everglades Soil Testing Lab (ESTL) continues to provide improved service to the UF/IFAS agricultural industry and grower clientele. From 1991 through 1995 (pre-BMP regulatory period), soil sample submittals averaged 5,709 samples per year. In recent years, growers have increasingly used soil sampling as a tool in their efforts to adopt economically and environmentally sound nutrient management strategies for agriculture. In the recent 5-year period (1997-2001), soil sample submittals averaged 8,123 samples per year, representing a 42.3% increase relative to the pre-BMP period.

The design team has implemented a pest control program using barn owls as a means of sustainable rodent control in sugarcane. One NATURE episode on PBS, entitled "Extraordinary Birds", featured the EREC's barn owl program and grower participation in this program, posing a very positive view of agriculture with regards to environmental stewardship. "Extraordinary Birds" aired on November 10, 2002, and was watched by millions of PBS viewers.

Four workshops were conducted to inform managers of the latest BMP practices to reduce P export from their farms. The workshops were attended by approximately 220 participants. The BMPs covered in the workshops included Soil Testing and Soil Fertility, Fertilizer application and Spill Prevention, Particulate P Transport, and Farm Hydraulics and Drainage.

As a result of design team efforts, the following success stories have been documented:

Improvements in computerization, staff training, lab management, and analytical instrumentation continue to support a 4-day soil sample turnaround time (compared to 7 to 14 days in 2000) in the ESTL. Furthermore, the establishment of an electronic database allows for improved service delivery to clients, such as the computerized generation of billing invoices and emailing of soil-test results directly to growers.

Grower awareness has increased regarding the many agronomic and disease resistance benefits that accrue with silica fertilization. This practice is particularly important for sugarcane-rice rotations, with both crops widely recognized as silica accumulators that readily exhibit favorable responses to Si amendments. From 1991-1995, Si analyses averaged 339 per year, but during the 1997-2001 period, Si requests averaged a 14-fold increase to 4,787 per year.

In cooperation with Cornell University's Birdhouse Network, design team members have created a "Barn Owl Webcam" installed in an active barn owl nesting box at EREC. The only nocturnal bird featured on the website, the EREC webcam has been one of the most popular selections on the network. Upon visiting the Barn Owls at EREC, a board member of the Whitefish Point Bird

Observatory noted that the tour had “changed my perspective of agriculture being sterile and not supporting any wildlife.”

As a result of best management practices proposed by the design team, the amount of P measured in agricultural drainage waters has greatly declined. The P load discharged from the EAA basin in 2002 with BMPs in place was 55% lower than predicted using Water Year 2002 rainfall data.

Objective 2. To provide information concerning sustainable commercial production practices that will be cost-effective, including practices such as breeding improved cultivars of sugarcane, improved fertilization recommendations, and rotational crops.

Sugarcane is the most important row crop in Florida, with an estimated value of \$750 million in 2002. The Everglades agricultural area in Florida produces 25% of all sugar grown in the US.

This tremendously important sugarcane production area is dependent on a continuous supply of new sugarcane cultivars to both improve agronomic yield and increase resistance to diseases.

Most of the sugarcane in Florida is produced on the muck soils of Palm Beach County, but an increasing percentage is grown on the sandlands of Hendry and Martin Counties. A problem that sandland sugarcane growers face is considerable variability within fields, which results in drastic yield reduction in those areas. Knowledge on geographical location of these areas and on the factors that contribute to this variability, combined with new technologies such as precision agriculture, will allow growers to have a more cost-effective production while reducing environmental impacts.

The FL-129 design team is continually providing sugarcane growers with new technologies and sound management practices in order to be efficient and profitable. Design team members collaborate with USDA-ARS at Canal Point and the Florida Sugar Cane League to produce new “CP” sugarcane clones adopted by growers.

Some examples of design team impact:

Two sugarcane variety release committee (VRC) field days were held in 2002 in conjunction with USDA-ARS and the Florida Sugar Cane League. This participatory process involves a 23-person committee composed of representatives from grower, industry and research organizations. Three CP clones were released over the last 2 years. Recently-released clones CP 89-2143 and CP88-1762 are already grown on 43,490 acres in the EAA.

The sugarcane handbook, a compilation of over 60 fact sheets on sugarcane agronomy, economics, pests and diseases and water quality was completely revised and put online on the EDIS system in 2002. A mass mailing from the design team to sugarcane growers in August, 2002 informing them of the handbook contents increased web hits on the articles by 89%.

Due to workshops and seminars conducted in the previous year, Precision Agriculture Techniques are becoming more widely employed by sugarcane growers. At least four major growers are variable rate applying lime to their fields according to pH maps constructed using precision agriculture techniques. This makes soil pH variability less of a problem in their production systems.

As a result of design team efforts, the following success stories have been documented:

The design team, in collaboration with USDA-ARS and FSCL, plays an integral part in the release of the CP sugarcane clones for the sugarcane industry. These clones are currently grown on 75% of the entire sugarcane acreage in Florida, and generate \$550 million annually in farm income.

A Hendry County grower reported that the potassium application to his fields (> 9000 acres) has been reduced by at least 40% due to results of research conducted by IFAS and disseminated at grower's meetings.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Source of Federal Funds: Smith Lever

FL-SMP-131**Title:** Quality and Management of Florida State Diagnostic Services**National Goals:** 1, 2, 4**Key Themes:** Agricultural Competitiveness, Agricultural Profitability, Bioterrorism, Emerging Infectious Diseases, Invasive Species, Niche Market, Ornamental/Green Agriculture, Plant Health, Plant Production Efficiency, Tropical Agriculture, Food Quality, Food Safety, Integrated Pest Management, Pesticide Application, Water Quality**Situation/Program Rationale:**

Florida Extension Diagnostic Services (FEDC) is provided for plant diseases at four regional labs, soil analysis, plant identification, and insect and nematode identification. The clientele of these services are IFAS researchers, extension personnel, agribusiness, and the residents of Florida. The Plant Disease Diagnostic Clinic at the four sites processed and made recommendations for at least 4,000 samples in 1998. The clientele represented the major agricultural commodities of citrus, ornamentals, turf, vegetables, forage, greenhouse, landscaping, nursery production, and homeowner/urban residents. This provides a valuable service to the people of Florida and represents a substantial investment of time, money, and personnel by the state. Currently, the FDEC diagnostic labs operate as independent units. An improved system would allow for coordination of the diagnostic lab and planning of future needs between the various lab sites and services. The coordination of efforts would serve the clients by ensuring that the techniques and expertise unique at various sites are best employed. Improved access and communication between the different diagnostic services would improve processing and response time. New technological advances are available for improved diagnosis although in some cases, such as PCR, the implementation cost at each lab site may be prohibitive and the number of samples may warrant duplication. The program will allow for coordination of these and other efforts. Survey results from commercial and private clientele indicate the diagnostic services are highly valued (100% positive response). However, the survey indicated that clients felt there was some difficulty with the interpretation of diagnostic results. Another area of concern was the timelines of the results. These issues may be addressed by education and training.

Program Objectives:

The purpose of this program is to provide the framework for integrated management of the diagnostic services provided by the Florida Extension Diagnostic Services and to enhance the quality of services provided. The program will seek to enhance services by coordination of the diagnostic services at the various state locations and between specialties and to link these services by mutual effort. A major component of the program will involve the education and training of county extension agents and the clientele to evolve the most effective usage of the services.

Summary of Programs for Clientele:

During 2003, members of the FL131 design team developed and delivered programs to promote objectives of FL131. the control of termites Palm Lethal Yellow Inoculator's Class; 3 hr. (22 attendees); June 20 Proper Planting Reduces Plant Failure. Palm lethal yellowing disease; Lobate lac scale alert; Bug ID, diagnosis and how to make recommendations. Diagnosis and recommendations for nematode management: First Detector trainings. 2-day Geospatial / Precision Agriculture Seminar AFirst Responders and DDIS@ as part of Southern Pest Diagnostic Network In-Service Training, Plant Diagnostic Network, Gainesville American Phytopathological Society, Charlotte NC Training for Comprehensive Nutrient Management Planning for Technical Service

Soil & Nutrient Management: Development of the 'Florida Phosphorus Index' Soil & Nutrient

Management: B. Training Programs Extension of Plant Disease Diagnostics Nursery Integrated

Pest Management Arthropod Identification, Biology and Management in North Florida
"Introduction to Entomology" At the Bay County Master Gardner Program held at the North Florida Research and Education Center, Quincy, FL. January 22, 2003 "Insect Management Update for Agronomic Crops" At the 2003 Agronomic Crops In Service training held at NFREC Quincy. "Insect Management in Silage Corn" At the Corn Silage Production Meeting held at the Branford Community Center .January 31, 2003 "Insect Management in Silage Corn" At the Corn Silage Production

Turfgrass Field Day, July 24, 2003, Gainesville, FL-tours at Turf Field Lab, Envirotron, lunch and an afternoon seminar series on Landscape Management, with an optional tour of the Florida Extension Plant Disease Clinic. "Diagnosis and management of turfgrass diseases." Presented two workshops at the Florida Turfgrass Association conference and show in Tampa, FL, Sep. 8, 2003. Workshops were "Basic Disease Management" and "Advanced Disease Management" . A web site (<http://ddis.ifas.ufl.edu>) that contains publications, DDIS software, training materials, DDIS hardware specifications, and other resources related to pest diagnosis and identification.

Summary of Impacts for Clientele:

275 Licensed Pesticide Applicators attended one or more of 22 Vegetable Growers Meetings During 2003 the Florida Extension Plant Disease Clinic processed 1110 samples. Historical data shows that the FEPDC receives approximately 20% homeowners, samples and 80% commercial samples. A breakdown of this year's samples by commodity group is as follows: Ornamentals-45%, Turfgrass-40%, Vegetables-7%, Agronomic-5%, and Fruit-3%. The plant clinic processed 609 samples in 2003. Most of the plants processed in the clinic are ornamentals. I have assisted in or made identifications and recommendations on approximately 20% of the plant specimens sent to the clinic. Sixty-four of the samples sent to the clinic were identified with an insect or mite problem. I have consulted on the identification of insect pests for approximately 51 specimens. In 2003, there have been 718 plant disease samples (including 72 DDIS samples) from 24 counties in Florida and Georgia. Samples received were from vegetable, ornamental, and other crops. Many of these samples were legitimate disease crisis situations in which the crop yield was in jeopardy. Exact estimates of financial savings to producers are difficult to obtain due to the fact that economic damage thresholds are not available for most plant pathogens. With an annual farm gate value of \$200-280 million in the counties served (mainly from Duval to Typically the Extension Soil Testing Laboratory analyzes about 12,000 soil, tissue and water samples received from Florida residents to include commercial major, medium and small producers, landscape professionals, homeowners, consultants, etc. Based on these samples approximately 10,000 individual soil test reports have been generated and sent to as many people containing appropriate lime and nutrient application recommendations, and management information. The demand for ESTL services is rising due to increased understanding of crop nutrient needs, environmental regulations and general environmental consciousness among the citizens. Sample submission forms and the soil test reports are now available electronically through the web site and via email, respectively. Both the forms and the reports have been updated and re-designed for improved comprehension and easier readability. Web sites: Two web sites have been developed to disseminate information about nutrient management and extension soil testing program-nutrients.ifas.ufl.edu and soilslab.ifas.ufl.edu-that were accessed over 300 and 2600 times in the past year respectively. Teaching Activities: Internship training offered for 6 students enrolled in 'Doctor of Plant Medicine' for 80 hrs for 2 credit hours. Taught principles of soil fertility, soils of Florida, soil testing procedures, methodology and rationale, interpretations, lime and fertilizer recommendations and diagnostic techniques. The performance of the students was assessed based on a field project report for grading purposes. Results indicated that 40% of 79 total participants adopted 3 new IPM practices as a result of the workshops, and 60% adopted 2 new practices.

Success Stories:

DDIS is a success story of team efforts from agents, specialists, and IFAS/IT staffs and it played an important role to receive the USDA fund for SPDN. In 2003, many revisions have been made to the system. Now *DDIS* has been deployed in 44 out of 67 counties with a microscope or stereoscope, and all counties are equipped with a digital camera that can participate the program. In year 2003, over 460 digital samples (over 1200 images) were received for diagnosis and identification. With the new system, through interactions on the Internet between extension agents and specialists, problems can be quickly communicated and assessed. Specialists around the state can perform diagnosis and identification and provide best management practice recommendations to the users. Turnaround time is reduced from days, or sometimes weeks to hours compared to traditional, manual techniques for submitting biological samples. The system has potential economic impact on saving plant by quick identification. Also, an extensive archive of images with associated data is built statewide. These archived images become a reference to aid in the identification and understanding of plant, insect, and disease problems. Several insect samples from the clinic were sent to taxonomists for identification or verification. Three insects (one scale and two mealybugs) were reported on new host records or as new county records. Two insects (May beetles) new to Florida were identified. One of these insects is from Honduras and the second is common in the southeast US but had not been reported in Florida. Pest alerts were subsequently released on these The South Florida Vegetable Pest and Disease Hotline, which began in 1998 as the Southwest Florida Vegetable Pest and Disease Hotline is now entering its sixth year of publication and has emerged as the premier vegetable pest and disease newsletter in Florida. The 15-18 page hotline is produced bi-weekly during the South Florida Vegetable season from August to June and now reports on the occurrence of vegetable insect and disease pests on over 120,000 acres of vegetables in south Florida. The hotline is sent directly by e-mail fax and surface mail to over 1400 subscribers and is also reproduced and distributed by other extension agents and many other companies and businesses in Florida and throughout the country. The hotline has been critically acclaimed by the vegetable industry and is recognized as the definitive source of pest and disease information for south Florida. The hotline receives strong industry support and has received more than \$50,000 in contributions from sponsors since its inception. The hotline draws on thirty two collaborators from the vegetable industry and UF/IFAS Extension provide up to date information which is collated and provided to users every two weeks during the south Florida vegetable growing season. Growers call it a useful tool while industry users indicate it helps keep them on top of the overall pest and disease situation. In addition to real time situation reports the hotline provides users with research Nutrient Management Plans (NMPs) for a total of 148,500 acres of agricultural land in the state were prepared by the USDA-NRCS personnel that were trained through IFAS TSP Training Program during the FY2003 period. All the trainees that developed two nutrient management plans each are eligible to get certified by the state NRCS as 'Nutrient Management Planner'. The areas for which the nutrient management plans were developed will be considered for compliance procedures for cost share agreements or voluntary waivers of liability by various state agencies. A total 65 CCAs were trained for 3 hrs, including an hour of panel discussion and open questions on 'IFAS Soil Testing Procedures and the Florida P-Index' at the CCA CEU training sessions that were awarded 3 hrs of CEU Electronic delivery of newly designed soil test reports with lime and nutrient requirements, relevant fact sheets, revised comments, and background information on the web sites have resulted in vastly improving timely and informed decision making with regards to nutrient management at all levels. The implementation of new software has resulted in expedited delivery of over 12,000 soil test reports to clients and IFAS faculty.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Record minority and gender participation in workshops, seminars, office and nursery contacts, telephone communications and newsletter mailings. Offer

programming to everyone in, or entering the industry regardless of race, creed, religion, gender, age or disability. Identify affirmative action and special accommodation for disability on all program flyers and publications. Discuss minority participation at least annually on advisory committees. Mailings will be sent to all nurseries in the county identified on the Florida Department of Agriculture and Consumer Services, Division of Plant Industry nursery list regardless of race, creed, religion, gender, Educational programs and services are conducted in accordance with the University of Florida's policy of equal opportunity/affirmative action. Notification sent of programs and meetings in local newspapers and news letters. Programs were held statewide in different geographic locations and at diverse sites accessible by all people.

Source of Federal Funds: Smith Lever

FL-SMP-133

Title: Weather and Climate in Florida

National Goals: 1, 4

Key Themes: Risk Management, Weather and Climate

Situation/Program Rationale:

This SMP is designed for all users of weather and climate information and supports a number of extension and research projects. It is tied closely to two existing efforts within IFAS. The first is the Florida Automated Weather Network (FAWN) which has been in operation since 1998. FAWN has provided a vehicle to collect and disseminate real time weather data to a wide variety of users. Currently this information allows growers to better manage their cold protection and irrigation systems with annual estimated savings in excess of \$10 million (more details below). Future plans call for numerous agricultural management tools which will provide assistance with decisions in many areas of production, harvesting and marketing. In addition the data generated has been used by the Department of Emergency Management to produce weather advisories to replace agricultural forecasts which were discontinued April 1, 1996 when the National Weather Service stopped providing agricultural products. There have been many other reported uses of the data including construction (drywall company looking at temperature, humidity, and rainfall to estimate drying time), power company (degree days to manage generation demand), and the Mediterranean Fruit Fly eradication program (use data from a site within the treatment area), and many more.

The second project is the Southeast Climate Consortium (former Florida Consortium) which is a cooperative effort involving UF/IFAS, FSU/State Climatology Office, University of Miami marine sciences program and recently added University of Georgia, Auburn University, and the University of Alabama at Huntsville. The Consortium is involved with climate predictions and the impact of climate on agriculture and water resources management. Its initial focus was on Florida, but now extends into Georgia and Alabama. Ultimately it will include other states in the SE USA. SECC is designing and implementing several web-based decision aid tools to help growers mitigate production risks associated with climate variability.

Program Objectives:

To provide accurate and timely weather and climate information to all that need these data;

To work with those developing management tools, economic impacts, quality of life issues, etc. that have a weather/climate input. Assist is incorporating weather/climate information into projects, help with the development of final products, and find a method of disseminating the products.;

Provide training to those interested in understanding weather and climate, those wishing to incorporate weather and climate information into their programs, those needing assistance collecting weather information, and any other specific needs identified.

Summary of Programs for Clientele:

Summary of Impacts for Clientele:

According to the members of the Ag Weather Task Force, FAWN has had a multi million dollar impact on agriculture through more informed production, harvesting and marketing decisions. There has been no major attempt to document the overall impact, but feedback from non agricultural users indicates substantial use and value. NWS has used the data when evaluating fire risks, developing mesoscale surface maps; emergency management has used the data when making decisions regarding potential risks from weather events; Division of Forestry relies on the information to deal with fires; the UF/IFAS DISC project uses the weather data for input for their models; media has incorporated the data in numerous articles and presentations (NBC station in Orlando is a frequent user for early morning reports). No doubt that there are many more that we are not aware of and have no way of determining the impact.

Based on information from the Florida Agricultural Statistics Service, Florida Citrus Mutual, Florida Strawberry Association, Fern Growers, Florida Nurserymen and Growers Association and the Florida Fruit and Vegetable Association the following figures are available for the use of water for cold protection:

Average amount of water applied per acre per hour, acres protected and gallons of water used per hour:

Industry	Average Water Applied per acre (gph/acre)	Area Protected (acres)	Total Water Use (gph)
Citrus	2,100	500,000	1,050,000,000
Strawberry	16,200	6,200	100,440,000
Fern	13,500	7,400	99,900,000
Vegetables	10,800	40,000	432,000,000
Ornamentals	8,100	15,000	121,500,000
Total			1,803,840,000

At a cost of \$14.17 to pump an acre inch (from Economic Information Report 98-3) and at the irrigation rates provided the total cost per hour are:

Industry	Cost per hour per acre (\$)	Total Cost per hour(\$)
Citrus	1.10	550,000
Strawberry	8.48	52,576

Fern	7.09	52,466
Vegetables	5.66	226,400
Ornamentals	4.24	63,600
Total		945,042

Therefore the total impact from one hour of irrigation for cold protection for the horticultural crops above is: 1,803,840,000 gallons of water \$945,042

Cold Protection Tools on FAWN provide growers with a guide for when to start irrigation and an excellent method to tell when to shut down the system. Clearly the savings are tremendous every winter, a relatively warm winter will have 3 to 5 nights that require cold protection and FAWN can average 2 hours less operation per event for a total of 6 to 10 hours. A cold winter could have 15 to 20 nights requiring cold protection with the same 2 hours per event for a savings of 30 to 40 hours. Bottom line FAWN can save:

Hours Saved	Winter Type	Avg. Nights Protection	Total Volume Saved (gal)	Total Cost Saved (\$)
2	Warm	3	10,823,040,000	5,670,252
2	Cold	20	72,153,600,000	37,801,680

According to a source at the South Florida Water Management District if the cost of water was based on the \$5000 per acre foot the district pays to buy land for water storage the financial impact would be \$15 million an hour (their cost to store 1 billion gallons of water). Therefore if only 20% of the 40 hours was from South Florida, savings there would be \$120 million.

FAWN Web Impact:

The following table shows the number of visitors, how many pages they viewed and how long they were on line to the FAWN web site in 2003:

Month	Visitors	Hits Avg.	Time on Line
Jan	25,509	1,659,295	13:36
Feb	16,893	7,832,939	10:43
Mar	16,675	6,337,458	12:31
Apr	14,780	6,208,932	12:49
May	12,444	1,807,747	16:14
Jun	11,967	425,765	11:55
Jul	10,803	4,185,590	11:38

Aug	10,509	1,689,912	10:30
Sep	11,814	278,279	3:50
Oct	11,078	478,320	6:34
Nov	13,967	341,727	7:30
Total 11 months	156,439	31,245,964	

Success Stories:

Budget cuts to the UF-Institute of Food and Agricultural Sciences (IFAS) budget have resulted in a 10% reduction in the FAWN operation and maintenance budget. To compound the problems, FAWN added 12 sites with FEMA funds, thus increasing the maintenance requirement. Bottom line, FAWN needed to secure at least \$50,000 from outside sources in order to keep the high quality data available every 15 minutes.

A sponsor program was initiated to encourage contributions to FAWN. A rotating icon on the web page thanks the sponsors. The sponsor program has generated \$13,000 in gifts. Southwest Water Management District and the Florida Department of Agriculture and Consume Services has funded a 3 year Agricultural Irrigation Efficiency and Cold Protection Project for \$220,000. In addition Southwest Florida, South Florida and St. Johns River water management districts have funded 3 year projects at \$15,000 per year to support on going activities. This \$45,000 a year will allow FAWN to maintain the entire network, from towers to web site. The grant will allow additional personnel and development of management tools. It appears FAWN now has the outside dollars to allow for proper maintenance of the system and development of management tools.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Source of Federal Funds: Smith Lever

FL-SMP-135

Title: Food Safety, Quality and Technology in Florida

National Goals: 1, 2

Key Themes: Bioterrorism, Food Handling, Food Quality, Food Safety, Food Security, Foodborne Illness, Foodborne Pathogen Protection, HACCP

Situation/Program Rationale:

Program Objectives:

Summary of Programs for Clientele:

Summary of FL-135

FL-135 is divided into three distinct units, Consumer, Retail and Processing. Each sub-group targets specific clientele. Described below are a summary of county programs conducted for cliental chosen from the many reported for 2003. The summaries are meant to be a representation

of the work performed in the counties but does not list of the individual programs which were conducted.

Consumer Team:

In-service Training for County Faculty:

Training number	Date	Location	Training title	No. Of days	No. Of Attendees	Mean Eval. Score
32002	5/20/03-5/22/03	Conference call	Food Safety and Quality Update 2003	3 (2 hours each day)	> 150	4.7 (5)

A conference call multi-state in-service training using a new technology was organized for county faculty through out the state of Florida and the state of Georgia. A website and a CD were developed to facilitate the training. More than 150 people (county faculty, their program assistants, and para-professionals) attended the training, which otherwise only available to the county faculty for budgetary reason. The conference call in-service training, therefore was rated as highly successful. This type of training will continue to be offered in the coming years in addition to face-to-face training, when budgetary situations allows.

Retail Team:

The retail team conducted five Biosecurity workshop aimed at training county faculty. These workshops endeavored to introduce county agents to a user-friendly, comprehensive manual to provide food companies guidance on how to set up their internal procedures and processes, and guidance on how, along with the regulatory agency, to conduct a smooth and rapid recall of product. The goal was to offer a train-the-trainer program as a cost effective, multiplier of resources. To date, five sessions have been offered, with approximately 60% of Florida counties attending. The next phase of this work is to offered the recall manual, free-of-charge, to a nationwide audience, via the Internet-based University of Florida Extension Digital Information Source (EDIS) system and subsequently, on the website supported by the Cooperative State Research, Education and Extension Service, USDA, the Extension Disaster Education Network (EDEN) (Florida is a member state in the EDEN network

Processing Team:

The Annual Citrus Processing Short Course has served as the major technical meeting for scientists, marketers and managers of the juice and beverage industry for several decades. The conference, an official UF/IFAS event, is self-sustaining financially and receives significant industry sponsorship and support. Other citrus related activities include Packinghouse Day and Processor's Day. The focus is on the needs of specific audiences within the citrus industry. Programs such as these provide venues for extending the research of UF/IFAS scientists, as well as other collaborators.

Pesticide training programs continue to be a vital function of our county personnel for reaching our clientele involved in vegetable crop production. Programs are attended by a diverse cross-section from the nursery, vegetable, row crop and forage producers in our county. These pesticide trainings provide updated information, as well as CEU's. CEU credits were offered at a pesticide training session during Spring 2003, and a Worker Protection Standard Train-the-Trainer program was held later in the Summer

Program such as Vegetable Field Days and Certified Crop Advisors continue to draw large audiences and produce valuable CEU's for growers in the state. In addition Worker Protection Standard Handler and Worker Training were conducted in both English and Spanish.

Summary of Impacts for Clientele:

Summary of FL-135

FL-135 is divided into three distinct units, Consumer, Retail and Processing. Each sub-group targets specific clientele. Described below are impacts for clientele chosen from the many reported for 2002.

Consumer Team:

The Safe Produce Handler program entitled "Enhancing food safety and quality for Floridians" was an extension program at the state level that reached many Florida consumers. In 2003, from just an estimate based on request materials from EDIS (IFAS/EDIS statistic), a total of 129,511 requests were received on just for one set of document on food preservations. This number shows that the program had reached many people.

The Food Safety, Quality and Technology in Florida program had increased knowledge and behavior resulting in safe food handling practices from farm to forks. Increase cooperation among state agencies to address food safety issues. Effective informational systems to provide accurate recommendations on safe food and quality. Effective statewide infrastructure to provide food handler training programs. Increase incorporation of food safety materials and curriculums in Florida schools. Educational programs and media outlets that train consumers in safe food handling techniques, new food technologies, and a better understanding of current food systems.

Retail Team:

The Biosecurity Training program trained over 60 county agents and 150 industry person in 2003. The program generated a recall manual which will be available free of charge to anyone with internet access. The impact of having a guidance document for product recalls is person with training or access to the manual will be able to remove contaminated food items from the retail environment quickly and keep consumers safe.

The Advisory Panel for the Compendium of Guidelines for Retail Processing of High Risk Foods has completed 9 guidance documents which will be made available via the internet. This project was conducted to identify and address existing food safety gaps relating to manufacturing (processing, packaging, and labeling) high risk foods at retail and to provide consensus processing guidelines to assure safety. This provided a uniform framework nationally for state/local food safety programs to evaluate industry needed variances and exemptions as required by the Food Code or other state food safety codes, thereby enhancing an integrated approach to food safety at all levels.

Processing Team:

The extension program "Microbiological quality and safety of fruit juices" produces critical information and extension products serving the juice and produce industries in Florida. New federal and state regulations that govern juice production has created an information gap that requires UF workshops and training programs to assist the Florida juice and produce industries. In 2003, this extension program had direct interaction with over 600 industry and government personnel on issues related to important food safety/security regulations

The Small Farm Sustainable Agriculture Alternative Opportunities and Crops in Florida program increased income for small farmers who participate in the program Retention of land in agricultural land use. Additionally, an increased use of sustainable agriculture practices, such as reduced use of fertilizer and pesticides and enhanced soil management Growth of organic farming Development of alternative crop industries

The Vegetable Production, Harvesting and Handling Efficiencies and IPM in Florida program impacted vegetable growers and will remain competitive in the global market and the number of vegetable farms and acreage will remain stable at or increase from 1998 levels. Growers and industry clientele will make more informed management decisions resulting in maximum profit and minimal environmental impact using the latest IPM research and all available pest control tools. This will be accomplished through the adoption of combinations of new cultural practices,

production and post harvest technologies, and cultivars and/or crops into cost-effective sustainable

Success Stories:

Summary of FL-135

FL-135 is divided into three distinct units, Consumer, Retail and Processing. Each sub-group targets specific clientele. Described below are selected success stories chosen from the many reported for 2003.

Consumer Team:

The Reducing Health Risks With Good Nutrition program conducted the Culinary Camp For Kids for the fourth year by agents Dorschel and Britton. The camp was expanded to two weeks for a second year. A great deal of planning and preparation went into the activity of two week-long culinary camps. The camps were designed to provide support for the 4-H program. Lessons, activities, and labs were designed to provide instruction in culinary and food safety, nutrition, meal planning, and basic food preparation skills in breadmaking, preparation of main dishes, salads, breakfast items and desserts. The camps were taught by agents Dorschel and Britton and assisted by ninety-seven (97) Master Food and Nutrition Educators. Thirty-two youth were provided twenty-four (24) hours of culinary education in the program. The children showed a 17% increase in food safety knowledge and a 63% increase in basic knowledge in the above areas as a result of the camp. The camp earned the reputation among local 4-H leaders as a high quality experience for their children. We continue to get accolades from parents. One parent told a 4-H faculty member "I am so impressed with what my daughter learned and now I have to fight for space in the kitchen. It has made a difference in our family life." Due to the demand for the camp the agents will conduct two culinary camps again this next year.

The Health, Nutrition, and Food Safety program in partnership with the entire extension staff, created a spring garden at Bunnell Elementary School during the 2002-2003 school year. There were 275 students participating in this project with each class (6-first grades and 6-kindergartens) cooperatively gardening and donating their harvest to a local soup kitchen.

Retail Team:

The greatest success story relating to consumer food safety comes from an interview series with Dru Sefton of Newhouse News Service. Her article "Intern Puts Science Behind the Five-Second Rule" ran in over 40 papers around the US. It made the front page of the Birmingham News in Alabama. I never appreciated the impact until months later when, while on annual leave in New England and talking food safety with several persons from Seattle (always preaching the message), I realized these people started using my word and antidotes on me. When I asked where they heard that from, they said they read the recommendations in a newspaper article. They even knew about my daughter, whom I mentioned as an at-risk person being 3-years old. I had changed the habits of persons I never met, over 3000 miles away.

While the efforts of the Managing Competitiveness in Florida Through Management, Finance, Marketing, and Policy program, are still underway and are too early to quantify results estimates on impact on agriculture which generates approximately \$1 billion in economic activity for Miami-Dade County, the study could be credited with saving a small percentage, for example, only 10 percent of the overall agricultural activity, the impact would be approximately \$100 million annually for the foreseeable future.

Processing Team:

Juice HACCP Workshops have been conducted by members of the Juice HACCP Alliance Trainers, and data from the Alliance indicated the Florida group, led by UF (Goodrich, R., Parish, M., Schneider, K) but including industry (King, D.), DOACS (Williams, D.) and academic partners (Harris, L. and Worobo, R.) is the most successful of the university extension training teams. We have held 7 certification workshops since the inception of the Juice HACCP rule, have formally trained 123 members of the juice processing and related industries, and have

trained personnel in 100% of the Florida juice processing and packaging plants. We attribute the success of this particular program to the team approach, which capitalizes on the expertise and enthusiasm of the team members and that our students consistently rate as the best attribute of our training. Also, in contrast to most other FL Extension programs, we have structure our training to be fiscally self-sustaining, and we are able to recover all of our costs through workshop registration fees.

The Annual Citrus Processing Short Course attracted 512 attendees to this year's program, and was the single-largest UF/IFAS-led industry meeting in 2003. This large attendance was a result of a relevant and comprehensive program that heavily emphasized the critical issues of food safety and security, and economics and marketing issues to the global juice and beverage industry. In a post-event survey, 98% of the respondents indicated they had learned or been exposed to at least one practice or idea that would help them in their daily work. Additionally 95% of the respondents indicate that the structure and content of the conference meets or exceeds their expectations and that they plan to continue to attending this meeting. It cannot be overemphasized that this program, driven, led and organized by FL-135 Food Science & Human Nutrition extension faculty, consistently delivers on the Extension mission of providing relevant, timely and in-depth information and knowledge to our food and beverage processing clients, who represent much of the added-value of Florida's agricultural products.

The Tropical Fruit Culture and Management program reported the adoption of tensiometers and other soil moisture sensing devices continues to increase and there are now 399 acres being monitored by these devices resulting in 30 to 50% savings (11970 in.) in water. Leaching of nutrients is also reduced. The agent's Advisory Committee with help from the tropical fruit Specialist obtained a \$630,000 grant to promote tropical fruits. The local weather system and the FAWN station at TREC are saving \$138,000 to growers (based on 1380 growers and \$100 for private weather service). Growers saved \$39040 by getting a problem diagnosed without going through a clinic at \$20 per sample/problem.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Summary of FL-135 Within the three distinct groups of FL-135, all efforts were taken to inform minority clientele of program being conducted. Efforts focused on direct mailing and the use e-mail, as well as mass media outlets. All educational programs were conducted in accordance with the University of Florida's policy of equal opportunity/affirmative action. In select counties, the Food Manager Certification program has attracted both Hispanic and Asian clientele. When available, materials in several languages are routinely distributed at workshops and other training opportunities. One such example is the use of Spanish language versions of the Good Agricultural Practices training materials. Agents do direct or personal contact to target minority clientele groups, such as programs targeted specifically at the Seminole Native Americans. Agents used Equal Opportunity and ADA statements on meeting announcements. Some counties reported activities using minority newspapers when available. Meeting sites are selected where there is commonality and local support.

Consumer Team:

Programs have been offered in different libraries around the county to encourage participation from all areas. Times and locations have varied to make programs more accessible. Materials and presentations highlighted ethnic foods whenever possible. Programs are advertised in free and subscription newspapers, use of banners, the marquee and flyers. All news releases are sent to all known minority newspapers. Classes are advertised on the Government Channel which is available to everyone in the county with cable. Each newsletter, flyer, and news release leaving the Family and Consumer Science office carries the affirmative action statement and the ADA notice is attached to all course offerings.

ServSafe™ is advertised across the state to all food service industries. Head Start/Early Head Start serves at risk children, both minority racially and those at risk due to low income or other familial or societal problems. Their staff reflects the racial makeup of their students. The classes are also advertised through Child Care Licensing and the two sponsoring church ministries to all child care homes and centers in their programs, regardless of race. Participants in the classes were 58% African-American, 17% Hispanic, and 1% Asian. RCMA staff is mostly Hispanic, with some African-Americans.

Several research and extension projects are being conducted with minority faculty members from UF and FAMU. The Mississippi State University short course is attended predominately by women and minorities. Many of the grape growers are limited resource farmers and some are under represented groups. Key members of the mole cricket working group are female and African-American. A considerable amount of guidance is provided to female and minority students. Three of the five IPM Florida employees are female.

Safe produce handler program has as a target audience for this project as mainly minorities who works in the packing house situation. The program is designed to suit a wide variety of audiences. The program will be adapted for use for people with different ethnic backgrounds and/or languages.

The Family Nutrition Program has outreach to underserved individuals was exceeded in the female, Black, and Hispanic population. The female population in Monroe County is 47% of the total population and in FNP programs the attendees were 63% of the total who attended. The Black population is 5.1% of the population and in FNP programs the attendees were 9% of the total who attended. The Hispanic population is 15.8% and in the FNP programs the attendees were 30% of the total who attended.

Processing Team:

Hispanic workers were provided GAPs training and workshop materials in Spanish.

Tropical Fruit Culture and Management had a large number of the clientele are minorities: 815 women, 969 Hispanic, 470 black and 146 Asians attended programs. Many meeting, consultations are also done in Spanish. The agent appeared in 2 radio and 2 TV programs in Spanish.

Managing Competitiveness in Florida Through Management, Finance, Marketing, and Policy program interacts with a significant proportion of agricultural producers in Miami-Dade County which are of Hispanic origin and a few are of Asian descent. Mail surveys to approximately 2,800 farmers and agribusiness firms included cover letters that were written in Spanish and English to ensure a high degree of Hispanic participation. The Spanish letter encouraged Hispanics to call a toll-free number to speak to a Spanish-speaking interviewer. Further, several members of the Citizens' Advisory Committee, a specially constituted committee to provide community input to the Miami- Dade study, were of Hispanic descent.

IPM Coordination has Outreach to minorities via several avenues: Several research and extension projects are being conducted with minority faculty members from UF and FAMU. The Mississippi State University short course is attended predominately by women and minorities. Many of the grape growers are limited resource farmers and some are under-represented groups. Key members of the mole cricket working group are female and African-American. A considerable amount of guidance is provided to female and minority students. Three of the five IPM Florida employees are female; the IT specialist is African-American. Multi-County: Mole cricket project (29 counties), Greenteams (4), cattlemen's meetings (Hernando, Osceola and other central Florida counties), master gardener activities are multi-county. Multi-Disciplinary: The primary disciplines (IFAS departments) included in the extension activities were Entomology and Nematology, Plant Pathology, Horticulture, Environmental Horticulture, Agronomy, Agricultural and Biological Engineering, and Food and Resource Economics. Multi-Institution: This extension program supports the CSREES Southern Regional Project S-303, Biological Control of Selected Arthropod Pests and Weeds. Other multi-institutional partners are listed under

"Organizational Linkages." Multi-State: The Florida IPM program is part of the national and regional CSREES IPM program. S-303 includes participants from all states in the Southeastern Region.

Source of Federal Funds: Smith Lever

FL-SMP-201/701

Title: Preparing Florida's Youth for an Employable Future

National Goals: 5

Key Themes: Communications Skills

Jobs/Employment

Workforce Preparation-Youth and Adult

Youth Development/4-H

Situation/Program Rationale:

FL 701 Preparing Youth for the World of Work focuses on providing educational programs and resources that enhance career development and employability skills of Florida's youth. These programs and resources are targeted directly at enhancing: 1) the individual skills among and within youth; and, 2) the family and community capacity in providing opportunities and support in workforce preparation and employability.

The youth population (ages 0-19) continues to increase in size in Florida, and constitutes approximately 3.6 million or 23% of the state's population. The changing demands of our current and emerging economy dictate a need for a more educated and skilled workforce. Educational attainment plays a critical role in virtually every labor market outcome. On the average, the more education, the more likely earnings will increase. While poor paying jobs will continue to be created, economic and social well-being will be directly tied to the competencies that individuals bring to the workplace. Not all will require a college education. Many, however, will demand interpersonal skills, flexibility, and problem-solving capabilities that can be offered through either formal and/or informal channels. Programs designed to equip youth, particularly those who are less inclined to attend college, with the knowledge and tools needed to facilitate their successful entry into the working world are needed.

Program Objectives:

To provide youth with the opportunity to explore and understand career opportunities and decision-making that are consistent with the high demand jobs of the future.

- To provide educational programs that teach employability skills that can facilitate future career opportunities for Florida's youth.
- To expand family and community involvement in supporting the career education and exploration opportunities of local youth.
- To expand (where appropriate) community interest in exploring and implementing strategies for keeping its educated youth in the community.

Summary of Programs for Clientele:

During FY 2003, over 1736 youth (K-12) in fourteen (14) counties were enrolled in 4-H Career Development project experiences in out-of-school settings. A wide variety of delivery methods, curricula and experiences are used within this program initiative within Florida 4-H Youth programs. A comprehensive program model that encompasses 1) youth career exposure for K-3 youth; 2) awareness through structured experiences within communities for elementary grades; 3) guided exploration for middle school youth; then 4) skill-based development during high school years is used. Exploration, employability skills and entrepreneurship experiences are the central themes of most programs.

- All fourteen (14) counties reported 4-H Career Development experiences were specifically designed for youth to increase their knowledge of career options and improve their employability skills by these methods:
- Four (4) counties reported conducting career fairs, field trips, job volunteer and mentoring programs for 1,476 youth to explore career opportunities within their communities.
- Twelve (12) counties reported conducting special interest or school enrichment programs for 224 youth to learn and practice entrepreneurship or employability skills.
- Additionally, a statewide Career Exploration Day for 544 youth from fifty seven (57) counties for them to learn and practice employability skills.

Summary of Impacts for Clientele:

Gadsden County: "On My Own" Simulation

At Florida A&M's summer enrichment camp, 28 teens participated in the "On My Own" simulation. During 4H Congress 2003, 54 teens and adults participated in the "On My Own" simulation. In the classroom portion, the teens learned about using credit, balancing a check, reading a pay stub, and career awareness and compatibility. During the life simulation, the teens had to put what they had learned to work. A debriefing was conducted at the end of the program to get feedback from the teens about their experience, feelings, and the program. The data gathered from the feedback showed that the majority of the teens did not previously have these skills and learned them at the simulation.

Duval County: Portfolio Workshops

Duval county offered portfolio workshops to prepare teens for state competition. These workshops instruct teens on creating a resume, interviewing skills, and submitting a suitable record book for state competition. The county found these workshops met with great success. On hundred percent of those who attended were satisfied with what they learned and felt more confident in their resume skills. As a result two youth developed portfolios for state competition. One received approximately \$3000 in scholarships and the other was awarded two national trips. Jonathan K. was one of those fortunate young teens. He attended the Portfolio workshops held to assist teens to prepare their state portfolios for scholarships and national award trips and participated in individual help sessions. In addition to his personal project work over his 4-H career, Jonathan was active throughout his teen years on the County Council and countywide competitions. He was awarded \$2800 in scholarships and the National Congress trip on the basis of his ability to present his accomplishments through his Florida 4-H Portfolio.

Charlotte County: Life Skills Programs

To offer youth-at-risk quality life skills programming, this county worked with the directors of the Department of Children and Families (foster youth), Kelly Hall Residential Center (incarcerated teen males), The Academy (classes for teen parents), the Homeless Coalition (homeless youth) and the Charlotte Youth Shelter (teens in crisis) to determine the program needs of the county's youth at risk. Programs included: nutrition and comparison shopping, budgeting and money management, conflict resolution, workforce readiness, career exploration, horticulture, and independent living skills. A total of 122 at risk youth participated in these programs. Foster teens, with an average of 15 participants each session, were tested before and after each lesson, either with written pre-and post-test, or by using skill-a-thons material. All showed improved knowledge and skills after each of the 12 lessons. Kelly Hall houses 40 teen males at any one time, and these residents focused on horticulture and career exploration. Observation was most often used to evaluate new or improved skills, with over 50% demonstrating specific skills. Homeless youth and teens housed in the crisis center are given 4-H literature to use on a personal basis. An average of 15 pieces of literature will be used a month for these two groups. As a result of networking with other youth-serving organizations to offer youth-at-risk quality life skills programming, 122 youth have a better understanding of basic life skills. These youths were also able to explore career options, have positive role models, and experience positive leisure time activities.

Success Stories:

Jefferson County-There was a two percent increase in 4-H Volunteer Leaders C. According to the pre and post test given, the 18 Exceptional Education Students (these students have learning disabilities, however, some of them have part-time jobs) at Jefferson County High School twice a month in the "World of Work" program indicated an increase in knowledge and skills by being able to: a. Complete job applications without errors b. Create an effective resume c. Youth were able to dramatize during the mock interview session the proper techniques of interviewing d. Write a check correctly.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Educational programs are conducted in accordance with the University of Florida's policy of equal opportunity/affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities through the use of mass media. Minorities are encouraged to participate in all extension programs. In some counties where a large number of the clientele is Hispanic, some programs and publications are done in Spanish. Agents sometimes do direct or personal contact with minority leaders, business owners, ministers, youth workers, or other individuals to promote programs. Agents report using Equal Opportunity and ADA statements on meeting announcements. Some counties report using minority newspapers when available. Meeting sites are selected where there is commonality and local support.

Source of Federal Funds: Smith Lever

FL-SMP-212/712

Title:

National Goals: 1,5

Key Themes: Plant health, Plant production Efficiency, Youth development/4-H

Situation/Program Rationale:

The science of living things, especially plants, can be an important component in the lives of young people. Through studies and projects in plant biology, youth can acquire scientific and

technical competencies through experiential learning situations. Life skills, such as selecting proper foods, food safety and handling, and environmental conservations, are also learned through the exploration of living things and enable youth to be and become more informed, productive, citizens. With technological advances and ever increasing urban/non-farm populations, many individuals are now several generations removed from an actual working knowledge of agricultural production. Youth are not prepared to make

Program Objectives:

The FL712/212 Plant Science Design Team strives to meet the educational needs of Florida 4-H youth, agents, and volunteers through interactive programs and written curriculum. Providing opportunities for youth, and the adults who work with them, to participate in experiential learning activities ensures that today's young people will not grow up uninformed and misled about issues that are affecting and threatening agriculture today. Issues such as food safety, pesticide usage, and basic understandings of plant identification, usage, and production critically need to be addressed with a growing population that has never been exposed to agriculture. Competitive events that challenge skills and knowledge, extensive workshop programs, in-service trainings, and curriculum provided by the FL712 Design

Summary of Programs for Clientele:

Educational programs were provided through public schools, summer camps, state/county fairs, and local 4-H clubs. School enrichment programs included kindergarten through high school. Programs are designed to help youth develop life skills such as team leadership, communication skills, preparing for competitive events, record keeping and organizational skills time management, and self discipline. To address these life skills, the educational programs emphasized basic plant science, food and ornamental plant production and use, plant identification, career awareness, natural resource conservation, ecology and environmental and food safety concerns, thereby illustrating the importance of agriculture to the quality of life of Florida citizens.

Summary of Impacts for Clientele:

Approximately 30 counties and several specialists reported educational activities under FL 712/212 during 2003. Approximately 37,600 youth were enrolled in numerous plant science-related county programs conducted throughout Florida during 2003. Enrollment categories are as follows: Ag in the Classroom – 15399; Flower Gardens and House Plants – 1024; Fruit and Vegetable Gardening – 7053; Plant Science – 13791; Ornamental Horticulture – 198; and Crops and Weeds – 133.

Life skills which were increased for youth who participated in the programs included:

Essentials of record keeping.

Money management.

Time management.

Communication skills, both written and verbal.

Reading skills.

Citizenship skills.

Team leadership skills.

Conflict resolution.

Knowledge was increased for youth participating in this program in the following areas:

Gardening skills, fruits, vegetables and ornamentals.

Plant identification.

Agricultural career awareness.

Recycling methods.

Ecological and environmental aspects of plants and agriculture.

Agricultural technologies including hydroponics, fertilization, and pest management.

Food safety.
Water use and conservation.
Importance of agriculture to rural economies.

Success Stories:

(Hamilton County). According to evaluation results, there has been a 45% average increase in knowledge gained by 4th grade youths over the past seven years in the area of several farm production systems and other farm enterprises represented at our annual "Ag Day" program such as goat, beef, dairy, poultry and pork production, corn growing, cotton growing, vegetable production, forestry, soil conservation, bee keeping and improved farming equipment. This greater understanding of agriculture and its importance in Hamilton County will be very important to these youths as they form opinions and make decisions as adults that may effect the survival of the agriculture industry as we know it today. Having the opportunity to teach youth about agriculture, science and the miracle of life all in one project is very rewarding.

(Hernando County). Two Master Gardeners wrote and received a grant for \$1000.00 from Ag in the Classroom for the Learning Barn. The Hernando County Master Gardeners have always supported youth education, but were so excited by the idea that they were willing to buy the barn even if the grant fell through. The Hernando County Master Gardeners gave an additional \$700.00 to be used for educational materials. Two hundred eighty volunteers hours were given to build, paint, shop for materials and catalogue the learning barn materials. An additional 16 hours have been logged for setting up the barn in two schools. The grant requires the barn to be moved to five different schools during the year. The educational materials cover a broad range of topics with the importance of agriculture as the main theme of the materials. The materials were selected for children from kindergarten to fifth grade as well as materials the teachers to use in their lessons. The barn will be on display this spring at the Hernando County fair.

(Hillsborough County). The Nursery, Landscape, and Floriculture Career Development Event doubled the in number of participants from 2002 to 2003 and included 4-H groups for the first time in several years. Students from East Bay High School who participated in the event went on to become state Floriculture Career Development Event winners and to compete at the national level. The weekly email newsletter "Weekend Update" has been very well received.

Safety and Labor related topics are regularly featured, along with information about upcoming educational and industry events. Each weekly edition has produced at least one email response with a question, comment, or request for more information. The supervisor of the Hillsborough County School District Agribusiness and Natural Resources Education program regularly forwards the email to the 57 teachers at 35 middle and high schools that have agricultural education programs. One teacher used the information in an email as the basis for a lesson on cold protection of plants.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Some common methods of reaching minorities are given below. Not every method listed is used in every county.

- 1) Each minority church is mailed a copy of the 4-H newsletter;
- 2) Through school enrichment programs, minorities are encouraged to participate in 4-H County events
- 3) Key minority leaders are personally contacted about 4-H programs and activities;
- 4) Programs and meeting are scheduled at the requested time and date of the minority adult or key persons;
- 6) Advisory committee members are aware of the need to make sure everyone is included in all Extension programs.

- 7) Personal invitations to the Advisory Committee were extended to the minority families that are already involved in 4-H programs.
- 8) All of the press releases to the local newspapers, as non-discriminatory media sources, contain the affirmative action statement, and the newspapers usually include the statement in the body of the stories they publish.
- 9) The 4-H Agent appeared at several elementary and middle school events and functions.
- 10) School Enrichment and other programs provide all youth the opportunity to participate in 4-H and follow-up materials that are provided to the youth and their parents encourage them to become active.

Source of Federal Funds: Smith Lever

FL-SMP-214/714

Title: Environmental Education

National Goals: 4, 5

Key Themes: Agricultural Waste Management, Biodiversity, Endangered Species, Energy Conservation, Forest Resource Management, Global Change and Climate Change, Land Use, Natural Resources Management, Recycling, Soil Quality, Water Quality, Wildlife Management, Yard Waste/Composting

Situation/Program Rationale:

A pleasant climate and a diversity of ecosystems from coral reefs, estuaries, beaches, pine forests, scrub and wetlands makes Florida's environment unique and in some cases fragile. This unique environment has contributed to rapid population growth and an annual tourist population of approximately 38 million. The human population coupled with tremendous development, impacts many aspects of the state's natural resource base including water, air, fisheries,

wildlife and agricultural lands. Improved environmental literacy is needed to emphasize the understanding of human dependence on the land base and natural resources for both a healthy environment and strong economy. Overall, youth development programs in Environmental Education should help individuals understand their interdependence with the environment, local ecosystem, energy and other natural resources. Information that addresses all perspectives of critical issues should be presented with emphasis on maintaining the quality of human

life as well as the quality of the environment. Individuals can then make informed decisions for remediation of environmental issues with a better understanding of the long and short term consequences of their choices.

Program Objectives:

The major goal of the Extension Environmental Education program focuses on the need to improve environmental literacy of Florida's youth with science/research-based information, which is delivered through proven educational methods. The educational objectives that define and ultimately measure environmental literacy require that as a result of the program, youth participants will have:

- **acquired a substantial amount of science and social foundations that directly relate to Florida's environmental.**
- **problems, issues and changes increased their awareness of the varied and critically important environmental problems, issues and changes that exist within Florida and extend beyond its borders.**
- **acquired and applied the skills needed to understand the complex and multiple perspectives that surround environmental issues .**
- **acquired investigation skills needed for the independent investigation and evaluation of environmental problems, issues and changes.**
- **developed and evaluated community based action plan focused on the need for responsible citizenship behavior related to environmental issues.**

Ultimately, these objectives are operationalized and implemented through the educational methodology employed in the program.

Summary of Programs for Clientele:

The SMP FL 714/214 Environmental Education reported 48 counties and the Seminole Tribe participating and/or providing programs for clientele in 2003. These counties included: Bay, Bradford, Brevard, Broward, Charlotte, Citrus, Columbia, Dixie, Duval, Escambia, Flagler, Florida Sea Grant College, Gulf, Hamilton, Hardee, Hendry, Highlands, Hillsborough, Holmes, Jackson, Jefferson, Lafayette, Lake, Leon, Levy, Manatee, Marion, Martin, Miami-Dade, Monroe, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Putnam, Saint Johns, Santa Rosa, Sarasota, Seminole Tribe, Taylor, Union, Wakulla, Walton, Washington.

The youth environmental education programs and associated activities offered by these counties were varied and may include the use of national, state or county 4-H curricula. In some counties the use of other nationally or state recognized environmental education curricula (e.g. Project Learning Tree, Project WET) are employed dependent on clientele needs and requests. According to the Florida 4-H 2002-03 "Annual ES 237 Youth Enrollment Report" generated for Federal reporting purposes, youth enrolled in environmental education projects during this period total 44,288 for all environmental education and earth science projects and 9,452 for all marine science projects.

The county 4-H environmental education programs are organized and presented via several delivery modes for youth clientele including: youth organized in clubs, short term special interest activities, day camps, overnight camping programs, school enrichment, individual study, instructional TV and video programs. Typically, each county will have a mixture of these delivery modes that it uses to present activities and programs to its clientele.

Summary of Impacts for Clientele:

Impacts: * Observational data from the wildlife activity session held at Camp Cherry Lake showed 81 youth increased their skills and knowledge in how to identify trees by their leaves, locate and identify birds, and how trees compete for food by 75%. Research shows that by obtaining these skills, it not only expands their awareness of environmental issues but also youth will have a better appreciation of the environment and eventually become environmental stewards * In the past year, as a result of the 4-H agent's involvement with the 4-H clubs that are focused on wildlife, and forestry, the youth have increased their skills and knowledge in the following areas by 50%: Tree identification, water conservation, how to plant a garden, and the importance of preserving wildlife habitats. *

As a result of the 165 that participated in the Annual 4-H Ecology Field Day, the results of the pre and post test showed a 75% increase in knowledge in the following areas: recycling, insect identification, reptiles, fresh water fish identification, and natural resources. Oral testimonials reflected 100% of the participants also agreed to become environmental stewards by recycling, stop littering, and to protect and respect our wildlife and natural resources.*

Observational Data showed the 105 Elementary Education majors at Florida A&M that attended the Project Learning Tree workshop that was co-facilitated by the agent, increased their knowledge of Tree nomenclature and science teaching methods by 85%. The participants also gained skills and knowledge on how to teach and involve physically challenged youth in a variety of outdoor science related activities. As a result of the students participating in the training, 3000 youth may potentially gain citizenship and leadership skills by becoming environmental stewards. *

The 11 youth that completed project books in Environmental Education and Forestry not only increased their knowledge in their respective project areas but they have also increased their skills in record keeping, leadership, communication and cooperation as shown by their comments in their "4-H Story" at the back of their project books.* Oral testimonials from the six youth that participated in the 4-H Horticultural Contest at the North Florida Fair shows that the youth not only enhanced their knowledge of plant identification and plant quality, but they also improved their sportsmanship, cooperation, teamwork, and leadership skills by attending the trainings arranged by the leader and competing in the actual contest.*

Pre and post test results of the twelve youth that participated in the Archery/Forestry Day Camp showed an 80% increase in determining how to identify native trees and their leaves. These youth also increased their skills and knowledge by 95% in the archery range commands, how to identify archery equipment, and also other opportunities that are involved in the 4-H Shooting Sports program *

Observational data from the archery classes reflected a 98% increase in skills and knowledge by the 75 participants in bow and arrow safety, range commands, responsibility, and shooting techniques. As witnessed by the agent, the participants have also increased their skills in communication and cooperation by 50%.Multi-County Impacts*

Testimonials from the archery activity provided at the district county directors meetings showed the participants increased their skills and knowledge by 100% of how the statewide 4-H Shooting

Sports Program instructs its participants as well as show shooting sports is used as a vehicle to teach leadership, safety and responsibility.State Wide Impacts*

Post evaluations from the 4-H camp staff archery training facilitated by the agent reflected an increase in knowledge of 98% of on range safety, responsibility, and archery knowledge. All ten participants were certified as archery instructors and collectively taught over 4000 youth at each of the four 4-H camps throughout the state of Florida, the safe and responsible use of a bow and arrow.

Impacts: For 250 youth to increase their awareness, understanding, knowledge and use of current and emerging scientific principles by participating in science related projects.Fourteen youth attending Camp Cherry Lake participated in a variety of educational environmental classes giving them the opportunity to explore first hand the ecosystem around Cherry Lake. Based on evaluations and comments, they all had a positive experience.

Nineteen youth participated in a 4 day - 28 hour environmental day camp taught by the agent. The theme was "YES to Science". Through hands on activities, and guest speakers, these youth learned about the surface tension of water and bubbles, the study of insects, specifically the mosquito, air and the environment. From a pre-post test there was a 28% increase in knowledge and understanding of our environment, and a 15% increase in knowledge of West Nile Virus and mosquito control. Trash from lunch and the various activities was weighted each day. These youth generated 15 pounds of trash over a 4 day period. Based on follow-up conversations, with some of these youth and their parents, they are now more aware of how just throwing things away can affect the environment.

Impacts: Youth have increased their knowledge of local and regional ecosystems and natural resources through environmental education programs that have included endangered /threatened species and their rehabilitation, development of native wild life species from birth to adulthood, water quality issues, indigenous fish, native reptiles and amphibians, water and hurricane survival and hands on science demonstrations and activities. Volunteers have made over 13500 educational contacts in the environmental education for youth program. Youth have a greater awareness of the environmental concerns they will face now and in the future. They are better prepared to address these concerns with educated ideas and potential solutions as evidenced by the solutions they have offered as part of the educational programs they have participated in. Knowledge of environmental concerns and potential solutions has increased by 25% to 60% (depending on the program attended) as indicated by pre/post test scores, exceeding the objective of 15%. Participation in school enrichment environmental education has maintained its growth.. (Zero requests in 1994-95, 1785 participants in 1995-96, and 13500 participants in 2002 and 2003).Interest in environmental education has continued to increase by more than 20% as indicated by the increased number of requests for environmental education programming and the waiting list for Environmental Education Day Camp.98 volunteers have been recruited and trained to educate youth in environmental issues. \$92728.00 in grants and in-kind contributions have been secured to provide environmental education experiences and materials for youth.

In one county 75% of grade school age youth have formed potential solutions to environmental education problems as a result of environmental education programming. Minority participation in 4-H sponsored programs has increased by 20% Volunteers have increased their shooting sport/environmental education knowledge and skill as indicated by the increased number of volunteers that have acquired certification through 4-H Shooting Sport Training, the increased number of volunteers serving as educators and facilitators for environmental programs.

Impacts: 1. Environmental Day Camp-- 100% (15) of participants indicated they had increased awareness of aquatic life, and Pitcher Plant eco-system. Wildflower Field Day -- 100% (5) of

participants indicated by verbal challenge/response that they had learned at least 5 new wildflowers by name and at least three new insects by name. 3. Blue Bird Nest Box Workshop, Rock Eagle 4-H Center -- 27 participants responded to critique indicating that each had learned at least one new fact or technique on establishing nest sites for blue birds.

Impacts: According to the survey that was given to the students the day after the 4-H Ecology Field Day, 90% of students indicated the following: a. Improved their knowledge about the environment as a result of the hands-on activities b. Students were able to identify most trees and shrubs on the nature trail E. As a result of the pre & post test: a. Youth were able to identify at least 70% of fresh water fish at each fishing site b. Youth were able to identify 32% of aquatic weeds at each fishing site c. Youth were able to demonstrate how to cast and sink their linesG.

Additional impacts related to the 4-H Youth Science effort include: 767 youth demonstrated mastery of science-based standards through classroom evaluations of participation in 4-H school enrichment programs. 596 youth were introduced to traditional 4-H science related projects through participation in 4-H day camps or through programs presented by Extension faculty, staff, and volunteers for other youth groups. 4-H Family Fun nights and traditional judging team contests involved traditional club members in demonstrating mastery of science-based standards in project work.

Success Stories:

Give Forests a Hand (GFAH) In the growing trend of standardized testing and eliminating field trips in the public school system, the Extension Agents in Walton County partnered with 4th grade teachers at a local elementary school to implement the Give Forests a Hand (GFAH) program. Give Forests a Hand is a youth program that blends service learning with the goals of environmental education to provide young people with opportunities to make decisions about how to help their communities. The School of Forest Resources and Conservation at the University of Florida developed this curriculum. Additional goals of GFAH are to involve youth in the investigation of forests and related environmental concerns, help young people develop projects that contribute to their community, support young people in using their skills and interests, establish links between youth and community natural resource professionals, and give youth an opportunity to learn and practice life skills in decision making. Walton County Extension Agents built on the GFAH foundation partnering with elementary school teachers, Master Gardeners, Florida Division of Forestry, and the local Soil and Water Conservation District to implement a five-month school enrichment program with 106 fourth grade students. Collaborating agencies enhanced this program with specialist knowledge, resource assistance, and classroom instruction. Students developed life skills while engaging in hands-on learning experiences in the following subject areas: forest management, dendrology, designing a nature trail, soils and erosion, water cycle, ecology, orienteering, composting, butterfly gardens, and tree planting. Classroom instruction was enhanced with hands-on learning activities and outdoor applications on school grounds. Students designed and planted a school butterfly garden and nature trail. Students then researched, developed, proposed, and completed a community service action plan. Upon approval of the plan by the school principal and local county commissioner, students took action by planting eight native tree species, totaling more than five hundred trees, at a newly developed county government and education center in their community. The planted area is part of a greenway trail being developed as part of the new center. Students reported that this program instilled a sense of responsibility for their natural resources and pride in their community enhancement efforts. Teachers noted that this program provided important learning memories for students, something missing from today's school curriculum. This service-learning project produced new forest resources and lifetime stewards as well. As a result of this program, a Junior Master Gardener program is planned for the participating school and other area schools are

interested in implementing GFAH In response to several requests for an adult program similar to the marine 4-H summer camps offered in northeast Florida, the Sea Grant Extension Agent developed a 5-day environmental education program called "Exploring our Environment." The program was developed in partnership with education staff from the Guana Tolomato Matanzas National Estuarine Research Reserve, Marineland, UF's Whitney Lab and the state park service.

The theme of the program is coastal ecology, with an emphasis on the ways that human actions affect the coastal environment. It was promoted through county extension offices, newsletters and local print media. The inaugural program filled up a month before it began. The 20 participants in the first "Exploring our Environment" adult environmental program all gave the program excellent reviews. The following are some comments from their evaluations: "Well planned out--well done--lots of powerful information for life--it would be wonderful if more people learned." "The hands on approach is excellent. The week was a 1st rate learning experience." "Great mix of lecture/presentation and activities to reinforce learning." "There was an excellent diversification of information and all was handled in a very thorough way. The week was run at an enthusiastic pace which held my interest the entire time, easy to understand and very professional." The March version of this same program is already more than half filled, without any advertising in the local media. Forest Resource Boxes were produced to accompany the new 4-H Project Books so agents, club leaders, and teachers can more easily conduct the activities with youth. The new 4-H Project Books have been well-received and appear to be just what the agents requested. They won a Gold Award for Long Publications at ANREP, 2002. The Florida Forest Ecology Website won an award from the Southern Extension Forest Resource Specialists (March 2001), See Honors and Awards.

:A large number of teachers and nonformal educators received and use Project Learning Tree materials to educate youth about natural resources. The urban PLT supplement is the key for obtaining new funding from DOF. PLT Schools are applying for GreenWorks grants and contributing to conference presentations. STORIES 4-H Club Wins Environmental Award. The Endangered Damsels 4-H Club was recognized as the best "Environmental Exhibit" at the Santa Rosa County Fair. The youth had spent the past year in assisting with the line recycling project. They utilized the skills and knowledge they gained in their 4-H project work to create an educational exhibit to encourage others to recycle used fishing line. The club was awarded a \$100 premium for their efforts which they plan to use in a 4-H Community Service project.

Outreach to minorities: Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. The Shooting Sports Committee provided Scholarship dollars to help recruit minorities into the program. This Committee is dedicated to ensure efforts are made to include minorities in program planning and implementation.

Outreach to Minorities: Four 4-H clubs centered in the heart of the African American Community (Newtown) were actively supported. The Yes You Can Club, The Positive Teen Club, the Booker Clever Clovers and the Janie Poe 4-H Club continued to have minority youth members working on a variety of 4-H projects which included food and nutrition, marine biology, horticulture, citizenship and community service activities. Three minority adult leaders and one non-minority were trained to assume the role as organizational leaders of these clubs. Thirty-two youths entered projects in the Sarasota County Fair and received recognition as a result of their participation in a 4-H club. Summertime classroom science classes and educational field trips to the local coastal communities were organized for minority participation. The YMCA Youth shelter for runaway teens had minority youths participate in marine biology activities at South Lido Beach in Sarasota. Participants collected, identified and classified marine organisms in the field. The response by YMCA youths and staff to these types of activities were very positive. An unsolicited letter received from the educational director of this YMCA Program praised the

results of the 4-H marine science program. The letter stated that participating youths "had their self esteem greatly improved" during the 4-H program. Efforts continue to be made by the 4-H staff to initiate 4-H clubs in the local hispanic communities. FCS department staff and 4-H staff continue to work together to promote educational opportunities to members of the hispanic communities in Sarasota County. Community fairs and promotional events were attended to raise community awareness about these opportunities.

Outreach to Minorities: Big Brothers/ Big Sisters Fishing Event Lee County Professional Guides Association and Big Brothers/ Big Sisters of Lee County have put together this event to teach children how to fish and respect for our natural resources. These youth are taken for a morning of fishing via flats boat. While fishing, professional Guides review common themes of environmental stewardship, boating safety and ethical fishing practices. 49 children participate: 40 males, 9 females; 43% black, 22% hispanic, 35% white Yankee Beach Fishing Kiosk panel A bi-lingual kiosk panel was created for this popular urban fishing pier. Fishing regulations are posted in both english and spanish languages.

Outreach to Minorities: *A 4-H Growing Gardeners project has been implemented and a 4-H Special Interest club was also formed at the Milton Housing Project. The project has an ethnic breakdown of 55% Black, 15% Hispanic and 30 % white. The club is an integrated club with 12 members (9 black, 2 white and 1 Hispanic). School Enrichment projects on Marine Ecology and Dune Restoration, Ecology Field days, and Farm tours provide all youth the opportunity to participate in 4-H and follow-up materials that are provided to the youth and their parents encourage them to become

Outreach to Minorities: Outreach to minority clientele will be reached through volunteer and youth recruitment and training by various methods throughout the year in 4-H traditional and EFNEP 4-H clubs. Special recruitment booths at the Pensacola Interstate Fair (Red Barn and 4-H Foundation) and the GCA & NRA Livestock Show. 4-H Advisory Committee minority members suggested that minority participation is most likely due to the narrow program base and the current stereotypical view of the 4-H image. Advisory members' suggestion were used to develop a plan to promote diversity in 4-H which included the following methods to reach minorities: Publishing newspaper/brochure, exhibits, and presentation with pictures that include and/or feature minority participants. (Chautauqua News article and Escambia County Volunteer Leader Program) Creating partnership with other minority youth organization/support groups such as Catholic Social Services. Use of all available mass media to inform potential recipients of the program and of opportunity to participate. Hold activities to remove barriers to minority participation, including holding meetings, demonstrations, workshops, and field days at locations and public facilities which are easily accessible to minorities. The Langley Bell 4-H Camp has a long history of minority participation and has long been a successful meeting and activity location. Volunteer and youth recruitment and training by various methods throughout.

Source of Federal Funds: Smith Lever

FL-SMP-215/715

Title: 4-H Individual and Family Resources/Health and Safety Programs for Youth

National Goals: 2,3,5

Key Themes: Food Safety, Human Health, Human Nutrition, Child Care/Dependent Care, Children, Youth, and Families at Risk, Conflict Management, Consumer

Management, Family Resource Management, Home Safety, Parenting, Youth Development/4-H, Youth Farm Safety

Situation/Program Rationale:

The purpose of this programming initiative is to provide Florida's children and youth fundamental life skills to manage personal and family decisions that impact their health, well-being and quality of life.

The health and well-being of our youth is a growing concern throughout the state. Nutrition and fitness is of major importance to normal growth and development and to the maintenance of health throughout the human life cycle. Nutrition and health of young children, especially those growing up in poverty, and the special issues faced by adolescents are of a primary concern. Additional adolescent issues that compound their health and well-being include increased evidence of early sexual activity, drug and alcohol use, accidental and intentional injuries (including suicide), and teenage violence.

Difficulty with family finances is often a key factor in families. Today's youth are the fastest growing demographic group in the US under the age 65 with their direct spending estimated at \$275 billion annually. Teens control or influence \$458 billion of consumers spending each year. School-age youth (ages 4-12) directly influence more than \$160 billion in annual family household purchases. Peers pressuring teenagers for material goods not only impacts youth behavior but also the financial status of families.

Program Objectives:

Youth will learn lifelong skills and adopt lifestyle behaviors that promote health, well-being of themselves and their families in future. Life skills address decision-making skills, subject matter skills, practices and behavior sets relevant to each program area. Program areas of nutrition, health and fitness; consumer education and money management; child care and development; personal and family resources relating to home, clothing and individual health and safety provide the following outcomes among youth:

Improved eating practices; food preparation and food safety practices;

Improved health and safety practices;

Improved personal care, appearance, and clothing practices;

Improved resource management practices; and

Informed and wise consumer decisions.

Summary of Programs for Clientele:

Overall, during FY 2003, 66 counties conducted 4-H programming targeted at improving the health and well-being of 66,225 (with some duplication in projects) of Florida's youth by teaching life management skills.

Nutrition Education:

During FY 2003, 33,271 youth from 22 counties enrolled in 4-H project experiences where they learned to improve their daily nutrition choices; 1007 youth from 6 counties learned food safety practices; 270 youth from 8 counties developed skills in food preparation.

Additionally, 1486 youth in limited resource families, were reported in educational programs that are supported through other program initiatives by EFNEP (see FL 703 or FL 511).

Thirteen (13) counties reported conducting educational youth programs for 403 youth focusing on selecting nutritious food choices, food preparation skills, best practices in food safety. A variety of educational methods were used including day camps which such themes as Fun with Foods or A Culinary Camp for Kids; school enrichment programs in one (1) county used curricula to teach youth to make healthy breakfast choices.

Personal Development, Health and Safety Education:

For FY 2003, 46 counties conducted educational programs targeted at personal development, health and safety needs for 30,054 youth.

10,791 youth from 10 counties completed the Seatbelt Safety A Buckle Up educational school enrichment program, improving their seatbelt use.

Two (2) counties reported interdisciplinary programs on personal hygiene, manners, nutrition and etiquette for youth.

Talking With TJ programs that develop teamwork and provide conflict resolution skills to youth, K-6, was conducted for 490 youth as reported by 8 counties.

Two (2) counties (Okeechobee & Martin) reported teen at-risk youth populations targeted through special programs that focused on Teen Pregnancy.

Babysitting/Child Care Programs:

During FY 2003, 2,793 youth from 30 counties enrolled in 4-H Child Development projects to learn babysitting basics.

Three (3) counties (Okeechobee, Indian River, and Martin) reported conducting innovative and intensive Babysitting Basics Programs for FY 2003.

Clothing Construction, Selection and Decision-making:

During FY 2003, 4309 youth from 17 counties developed skills in clothing construction, selection and decision-making through enrollment in 4-H Clothing project experiences.

Clothing Selection Competitions and Skill-a-thons: This program initiative was implemented to expand the program to develop knowledge, skills and practices of youth in areas of clothing purchases/decision-making. As a result, 2 counties reported intensive program initiatives in these areas for 76 youth. Programs for clientele were provided primarily as special interest workshops, day camps or as after school programs.

Consumer Education and Financial Literacy Education:

During FY 2003, 11, 317 youth from 41 counties learned to make wise consumer decisions, manage their financial resources through their enrollment in 4-H consumer education project experiences. Eight (8) counties reported programming initiatives in areas of consumer education and financial literacy for youth during FY 2003. Consumer Choices, an interactive consumer decision-making educational experience, culminating in a competition for youth, was implemented for 2158 youth (8 counties reporting) via special interest workshops, after school programs and area fair competitions. Nine (9) counties reported programs to improve financial literacy of youth through the use of, Money Day Camps, Money Wise, school enrichment programming (K-12) or the High School Financial Planning Program.

Summary of Impacts for Clientele:

Teen Pregnancy Prevention Task Force (Okeechobee County) The educational programming that the teen pregnancy task force has delivered has resulted in an increased awareness of the serious local problem of teen pregnancy. Each year from 1994 (the formation of the task force) until 2000 the teen birth rate for Okeechobee County has continued to drop, however, the provisional data for the current year shows an increase in the birth rate for older teens but zero births to teens 14 and under. Statistics also show a decrease in the number of low birth weight babies born to teen mothers and a decrease in the number of repeat pregnancies to teenage mothers. The percentage of teenage mothers using prenatal care in the first trimester has continued to increase. The three year aggregate for infant mortality and low birth weight babies remains at its lowest since 1992. The number of non-pregnant teens expressing a desire to become pregnant or have a baby has also decreased.

Seatbelt Safety (Miami-Dade County) Youth were enrolled in the seatbelt safety program. The probability of being involved in a car accident during one's lifetime is 86% with a 30% to 50% probability of being injured. Of those wearing a seatbelt 64% received no injury. Additionally, these members were minorities and studies show minorities are less likely to wear seatbelts. This curriculum provides for a graphic demonstration using a raw egg and consequences of not being

strapped in the car. Those practicing seat belt safety will share the demonstration and knowledge with their families and friends reducing injury and death in auto accidents.

Money Camps (Okaloosa County) Fifteen youth attended a 2-day Money Camp held at a local Community Center. These youth visited a bank, a car dealership and a department store to learn about money and the importance of credit. Pre and post tests were given measuring concepts such as credit terms, banking, and department store policies. Youth missed on average half of the questions on the pre-test. On the post-test, 12 of 15 youth did not miss any questions.

4H Food and Nutrition (Gadsden County) In Gadsden County, two countywide "Food, Fun, and Fitness" day camps were conducted this past summer. There were 68 youth who participated in this program. The objectives were: youth increase their knowledge about sound nutritional choices, use reading and math skills during food preparation, engage in some sort of physical activity, and follow safe food handling when preparing food. The campers 8-11 years old completed the evaluations. There were a total of 27 participants during this week of camp. 19 campers submitted both a pre and post test. The following are the results: 11 of the 19 showed an increase in knowledge. All of the campers were able to follow instruction during food preparation activities. The youth did follow safe food practices. Overall satisfaction from both groups was good. The campers indicated that they wanted us to return next year to work with the same summer program.

Home Food Safety (Seminole County) Training including "fight BAC" food safety guidelines-clean, separate, cook & chill to: 60 High School Food Preparation students; 150 Middle School Teen Challenges students; 200 employees and consumers at two Albertson's Supermarkets for "fight BAC"/Central Florida Food Safety Education Partnership "Food Safety Saturdays" and 400 participants at "fight BAC" booth at Florida Restaurant Association Food Show. At least 50% of the participants will increase their knowledge of at least two safe food handling techniques during food manager and food handler trainings based on pre, post and delayed post tests.

4H Sew Young, Sew Fun (Gadsden County) There were 38 youth who participated in the two camps offered this past summer. The youth participated in machine sewing, hand sewing and recreation classes. All youth completed their hand and machine sewing projects by demonstrating the skills they learned in the classes. Evaluation was completed by 21 youth using the 4H Sewing Project evaluation tool developed by Dr. Lisa Guion. Those youth who rated themselves good or excellent prior to the camp are excluded in the results. Rank is as follows: 1=poor, 2=fair, 3=good, 4=excellent. For each question the average ranking is taken. Ability to set goals (n=6), Before = 2 After = 4; Complete my obligations/finish what I started (n=8), Before = 2 After = 4; Take measurements (n=10), Before = 2 After = 3; Sew clothing using a pattern (n=8), Before = 2 After = 3. Overall for the group 15 of 21 participants gained knowledge and/or skills.

Success Stories:

Hillsborough County-One parent reported that her daughter who participated in a nutrition series "Food and Fitness" after eating a snack from the "extra" food group, suggested that they take a walk around the track because "exercise helps burn fat quicker." One parent stated, "My child has learned to wash her hands and to be cleaner, and she has wanted to help with cooking more!" "A mother commented how her child fixed lunch for them one day-stir fry. Later the child came to the 4-H meeting telling us with pride how she had cut the vegetables and made stir fry for her parents."

Okeechobee County-Teen Pregnancy Prevention-The teen pregnancy prevention task force has been very successful in educating the population about the epidemic of teenage pregnancy and instilling a desire to stop the epidemic. The following comments written by teens on a survey

after participating in teen pregnancy prevention task force programming say it all: "My mother and sister were both teen mothers. I am going to break the mold." "I already knew I didn't want a kid at my age, but the program made me think about a lot of other things." "Every choice you make impacts your future. "

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Educational programs are conducted in accordance with the University of Florida's policy of equal opportunity/affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities through the use of mass media. Minorities are encouraged to participate in all extension programs. In some counties where a large number of the clientele is Hispanic, some programs and publications are done in Spanish. Agents sometimes do direct or personal contact with minority leaders, business owners, ministers, youth workers, or other individuals to promote programs. Agents report using Equal Opportunity and ADA statements on meeting announcements. Some counties report using minority newspapers when available. Meeting sites are selected where there is commonality and local support.

Source of Federal Funds: Smith Lever

FL-SMP-216/716

Title: 4-H Citizenship/ Leadership

National Goals: 5

Key Themes: Character/Ethics Education, Communications Skills, Community Development, Conflict Management, Impact of Change on Rural Communities, Leadership Training and Development, Literacy, Workforce Preparation-Youth and Adult, Youth Development/4-H

Situation/Program Rationale:

A recent survey of citizens age 18-29 showed a generation that knows less, cares less, votes less and is less critical of its leaders and institutions than young people in the past. Only about one third of America voters voted in the last presidential election. The more educated that youth are about effective citizenship, leadership and communication, the more effective citizens they will be in the future.

4-H programs in citizenship, leadership, communication and community service strive to provide youth with experiences that will mold them into more effective citizens. 4-H Citizenship programs teach youth about how government works on the local, county, state and national levels. Also, for youth to function as aware citizens, they should have a broad understanding of the world and be sensitive to different cultures, and feel comfortable in a multi-cultural environment. Moreover, 4-H provides experiences for youth to develop and explore their oral and written communication skills and become more proficient in each.

A study conducted by Montana State University found that compared to other youth, 4-H members were more likely to be involved as leaders in their school and community, be looked up to as role models by other youth and to help in their communities. (Astroth, Kirk and George Haynes. The Montana Study. Montana State University, 2001).

Illinois Extension found that 60-86% of 4-H youth gained moderate to much leadership skills during their involvement in 4-H. Moreover, 53% of youth involved improved moderately in determining needs, using information to solve problems and demonstrating responsible attitudes. Nearly 50% improved their skills in considering alternatives, solving problems, considering input

from group members, being flexible and listening effectively (Clark, Charlie, Carol Wilcoxon, Cheryl Geitner, Dianne White, Sarah Anderson and Diana Baker).

Program Objectives:

The major program objective of this program is for youth to acquire the knowledge and skills necessary to be active participants at all levels of leadership and citizenship from interpersonal to international. These skills will help youth become contributing members of society and good citizens by:

- fostering moral development
- increasing cultural and global awareness
- developing leadership competencies
- youth involvement in community/program development
- increasing civic education, citizenship and community service

Summary of Programs for Clientele:

Overall, during FY 2003, fifty-five (55) counties in the state of Florida implemented programs that assisted youth to acquire citizenship and leadership knowledge and skills, the cornerstone of the 4-H curriculum and program.

Moral Development and Ethical Character

During FY 2003, 238 youth were involved in character education

Character Counts! Programs were implemented across the state, including in the counties of Santa Rosa, Indian River, Jackson, Bay and Gadsden Counties.

Multi-cultural education

Youth across the state received training on diversity and multi-culturalism through workshops, International Days and camp activities.

Citizenship Education and Understanding of Government

During FY 2003, 6,018 youth from 47 counties participated in citizenship projects

Four (4) counties reported involvement in Citizenship Washington Focus

The "A Know Your Government A Project" was completed by over 65 youth in three (3) counties.

Over 200 youth participants from 15 counties engaged in "A 4-H Day in the Legislature" for one day participating in a rally at the state capitol to announce priorities in youth development, touring government facilities, visiting state legislators and viewing the government process up close.

Approximate 250 youth from 38 counties participated in Florida 4-H Legislature for one week in Tallahassee, enacting a mock legislature. They learned how government works in a hands-on way and took leadership to act out the roles of legislators, lobbyists and the press. Youth participating learned writing, public speaking and presentation, persuasion and other skills.

Community Service and Action

In FY 2003, 1,381 youth participated in service learning projects throughout the state of Florida as a result of being in a 4-H club.

Additionally, 576 youth participated in community volunteerism.

Partnerships were formed throughout the year to foster volunteerism and service to the community. Some of these organizations include: Catholic Charities, United Way, Salvation Army and Habitat for Humanity.

Youth participate in community service activities as a result of being in a 4-H club. 4-H clubs are expected to complete at least one community service project annually. For FY 2003 this experience would have involved 22, 858 youth through 1403 organized community 4-H clubs.

Partnerships were formed throughout the year to foster volunteerism and service to the community. Some of these organizations include: Catholic Charities, United Way, Salvation Army and Habitat for Humanity.

The State 4-H Council initiates a youth-led statewide service project annually. For 2003, the project "Shine up the Sunshine State" was initiated. A Committee of 10 youth put together a resource packet containing ideas for completing this environmentally based project that was distributed to 67 counties plus Seminole Tribe.

Leadership Development for Youth

Various youth opportunities exist to develop leadership skills within youth including club, county, district and state officer events. The 22, 858 participating in 4-H clubs in FY 2003 learned about leadership through their peers or taking leadership through their own initiative, how a representative democracy functions and the role of citizens within a society. Twenty-five (25) counties reported conducting officer-training programs to support leadership development and club management.

During F.Y. 2003 1250 were enrolled in leadership development projects in 47 counties.

The State 4-H Council organized four leadership training weekends known as State 4-H Executive Boards and LAW (Leadership Adventure Weekend) attended by 369 youth, 41 volunteers and 26 agents. District Council officer training was held during September 2003 and included training in public speaking, effective meetings and strategic planning.

The eight state 4-H council youth officers were trained for three days in strategic planning and goal setting, effective meetings, communications and leadership skills.

The State 4-H Council held eight hours of meetings during Florida 4-H Congress attended by 120 youth. Approximately 20 youth ran for State 4-H Council office, gaining valuable experience in presentation skills, public speaking, persuasive skills, and campaigning and financial management. During these meetings youth heard speeches, learned about the voting and candidacy process, and participated in representative democracy.

Summary of Impacts for Clientele:

Scoping 4 Success in Pinellas County

Scoping 4 Success was a National Youth Leadership/Development Conference created for youth by youth hosted by Pinellas County 4-H. The conference offered youth and adult participants the opportunity to be educated, inspired, and motivated to reach their highest potential. "Youth are in constant search...a search for success". *Scoping 4 Success* provided an exciting and fun "road to success" for participants. National partners included Center for Youth As Resources, Innovation Center for Community and Youth Development, and the Academy of Educational Development. Local sponsors included Juvenile Welfare Board, National Conference for Community and Justice, Pinellas County 4-H Department, 61C Teen Center, TASCOS, and Youth As Resources. The conference drew in over 100 people from all over the state and around the country.

The first training Civic Engagement training took place in September 2003. The training included nine organizations and twenty-nine youth from around the county. The youth participated in a 15-hour training. The adults attended a six-hour training and meeting with the youth twice. Eight-one percent of youth attending at least one community forum reported that they learned about the community in which they live.

Marion County Honor Club (County Council)

Honor club is open to youth who have been active in 4-H for 2 years and are in the sixth grade or higher. They must have demonstrated leadership at the club level. Nine meetings were held and leadership training included public speaking, interviews for officer positions, recognition of graduating seniors and their accomplishments, event preparation, new member initiation, making 4-H pins for 4-H supporters, nursing home visit. The Ocala Toast Masters Club was the invited guest speaker and they showed the youth the importance of public speaking. A second guest speaker, a former South African Safari Guide, showed an incredible slideshow on African

wildlife. Officers met three times for planning and direction for their Honor Club program. Honor Club members gave leadership in the seven county, three district and one state 4-H event.

Miami-Dade County's Teen Leadership ...Teens Teaching Others

In an effort to enhance teen leadership and teaching skills, one agent provided three training's for 90 youth. These youth were trained with puppets, games, and illustrated dialog to conduct learning stations for four field trip days at the fair, and three disabled scout programs. These educational stations were in the areas of Water conservation, water and air pollution, sea turtles, butterflies, sea life, marine touch tank, and coral reef topics. Several of the members created and conducted marine science games, which were taught to school aged children during the year. The 90 4-H members reached an audience of over 9, 000 school aged students

Teen Court in Santa Rosa County

Thirty-seven (37) youth participated in Teen Court workshops, which were designed to inform youth about the Teen Court program and to help them to become more effective volunteers. Through observation of an actual court and participation in a mock Teen Court trial the youth learned about the legal system. The Teen Court Coordinator and Adult Volunteers reported that the youth participants who participated showed improve skills as Teen Court volunteers.

The Teen Court program has served over 100 youth defendants during 2003; the rate of recidivism for defendants who participate in the Teen Court program is 8-12%.

Over 75 youth served as volunteers providing over 2,400 hours of community service. 36 youth are members of the 4-H Citizenship Club.

29 4-H Youth were recognized as Outstanding Teen Court Volunteers.

Success Stories:

Marion County Honor Club Nursing Home Visit

The Honor Club Officers decided on and set up a Fall community service project. The members brought their pets and 4-H projects to share with residents at a local nursing home. One of the nursing home staff members commented on how one elderly lady had not been responding or asking for anything until one of the 4-H members showed this lady her rabbit and then the lady responded and kept asking for the rabbit. The residents were delighted with touching and petting a lamb, rabbit, goat, ferret and dogs.

I. Charlotte County Training Teens for Club Leadership

To achieve objective to increase teen leadership of project clubs, the agent identified fourteen senior 4-H members for Junior Leadership Training. Ten teen leaders completed twelve hours of training presented by the agent and program assistant. Included were the following topics: club management; team building skills; dealing with behavior problems; good manners and diplomacy. Of the ten senior 4-H members completing the Junior Leadership Training, six are serving as leaders of their clubs. Three are serving as co-organizational leaders in the 4-H Fur and Feathers Club, with membership of 43. Two are serving as activity leaders for the 4-H Speech Club, and one is serving as activity leader for the 4-H Clothing Construction Club. From a follow-up questionnaire, all six stated that they felt more comfortable in their roles as leaders, and that they have used three-to-five of the skills practiced during the training. Adult leaders in these clubs all report satisfaction with the teen leaders, as well as appreciation for the leadership of the teens.

Collier Teens Continue To Learn And Grow Through Participation In Florida 4-H Legislature

Collier County teens have a long tradition of being actively involved in 4-H Legislature. This year the Chair and several members of the Florida 4-H Legislature committee were from Collier County. They were instrumental in setting up and working with Green and White parties, and with the first bi-cameral legislature. Fourteen teens from Collier County participated, and *five* were nominated for Chris Allen awards. All learned a lot more about process, communication, the roles of lobbyists and legislators, and how laws are made. One Haitian youth told me "I didn't know I could talk in front of a group, but I did it!" She was referring to her role as a lobbyist and how she presented at a legislative committee in support of two bills. This young lady is now president of her club. The teens who attend Leg spend twenty hours of vacation time studying, preparing presentations, and attending training locally to get the most out of their trip.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Collier County's "Know Your county Government" program is designed to reach youth from all audiences. This was our most diverse group. Transportation is provided for Immokalee youth who might otherwise not be able to participate. This affected 6 youth this year. One Haitian youth earned a scholarship to 4-H Legislature (See success story). This young lady is the president of a new teen club and has recruited several of her friends to join.

Educational programs are conducted in accordance with the University of Florida's policy of equal opportunity/affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities through the use of mass media. Minorities are encouraged to participate in all extension programs. In some counties where a large number of the clientele is Hispanic, some programs and publications are done in Spanish. Agents sometimes do direct or personal contact with minority leaders, business owners, ministers, youth workers, or other individuals to promote programs. Agents report using Equal Opportunity and ADA statements on meeting announcements. Some counties report using minority newspapers when available. Meeting sites are selected where there is commonality and local support.

Source of Federal Funds: Smith Lever

FL-SMP-217/217

Title: 4-H Communication Arts and Sciences

National Goals: 5

Key Themes: Communications Skills, Youth Development/4-H

Situation/Program Rationale:

Communication technology has created new opportunities and changed the way we work, live and play. Yet one of the most basic forms of communication, public speaking, remains at the top of the list on national surveys asking people to cite their worst fears. Being able to speak in front of a small or large group remains a valuable skill in the workplace, even with the advances made by technology. If anything, being able to adequately represent one's ideas has taken on greater importance because of the rapid rise in technology use and high-speed communications.

The Florida Citizens Viewpoint Survey in 1999 was used to assess citizens' perceptions of community needs. The top ten priorities identified included 66% stating that life skills education for youth should be a high priority. One life skill recognized by educators is the development of communication skills – oral, written and visual. Deficiencies in communication skills are often cited by employers as critical to workforce employment.

In a survey conducted in 1998, the University of Nebraska Cooperative Extension Service found that youth involved in 4-H valued the public speaking opportunities provided for them within the 4-H program. Of 4-H program participants from the years 1988-1993, 95% said that their presentation and public speaking opportunities in 4-H led to increased self-confidence and 94% said it improved their ability to express themselves. 97% said that 4-H presentations and public speaking taught them how to stand before a group. 88% said that they learned skills that helped them in organizing and planning, and learned how to handle pressure.

In a 1999 report, the average amount of time young people (ages 2-17) spend using television, computers, video games and VCR totals 4.8 hours per day, 33.6 hours per week (Stranger and Garindina, 1999). These out of school hours, many spent home alone, represent risks for involvement in substance abuse, crime, violence, and sexual activity that have led many teenagers into a cycle of juvenile offenses. Providing youth positive choices for their use of time for leisure activities, arts and recreation, represents one alternative to how adolescents use discretionary time. This program area provides a way for young people to develop their expressive skills and share them with others. In a society that often discounts the impact of young people, using a communication arts as a vehicle for expression can give youth a voice. In Miami-Dade County, interest in this 4-H program area increased 35% in one year, evidenced by changes in project enrollment. In Jackson County, an evaluation survey revealed that 46% of 4-H community club members felt that participation in county competitive events and the 4-H/Tropicana Public Speaking contest helped them gain confidence to speak in front of a group.

4-H programs in communication arts and sciences focused on (1) developing public speaking and presentation skills, (2) photography and expressive arts, and (3) public outreach and media education.

Program Objectives:

Youth literacy relative to communication technology.

Youth skilled in application of personal/interpersonal communication methods that support individual, family, workforce and community actions.

Youth involvement in communication arts, leisure arts and recreation as a positive use of time.

Youth skilled in researching and making oral presentations.

Summary of Programs for Clientele:

Developing public speaking and presentation skills

In FY' 2003, approximately 104,423 youth from 65 counties were enrolled in Communication and Expressive Arts projects. The majority of youth were involved in public speaking.

The 4-H/Tropicana Public Speaking Contest is a school enrichment program that reached 100, 165 youth in 61 counties last year.

In Taylor County the 4-H/Tropicana Public Speaking Program has continued to grow in the past year as this agent has presented twenty-six workshops on researching a speech topic, organizing speech material, developing pleasing style before an audience, speaking with confidence, and developing poise, at the elementary and middle schools for youth grades 3rd-7th. Over 1,000 youth participated in this school enrichment program. A survey of 33 teachers revealed that 100% utilize the program to prepare students for the writing portion of the FCAT. Surveys also revealed that 100% of the participating teachers rate the program as a valuable method for teaching communication skills, preparing and presenting speeches, and increasing students confidence and self-esteem.

In Pasco county Tropicana Middle and High School Public Speaking Contests, and the Middle and High School Story Telling Contests were coordinated. The contest requires youth to recognize, organize and present information on a given topic of their choice. The timed speech must be orderly and thorough. Youth must acquire the ability to speak convincingly in public, expressing ideas effectively with poise and confidence. In 2003 4-H had 100% of Pasco County's

56 public schools, as well as one private and two charter schools, participating in school enrichment. This resulted in 18,958 students participating in 2003.

In Manatee County, 8,093 youth in 37 public and private schools (278 classes) developed, enhanced, and demonstrated their communication and expressive arts skills through participating in the 4-H Tropicana Public Speaking program.

In Indian River County, Five hundred forty five youth increased their writing, thinking, and public speaking skills through competing in the Tropicana/4-H Public Speaking competition at the classroom level in 2003. Eight elementary schools participated in the county contest, two for the first time. Also in this county, all 4-H Club members in Indian River County are required to give a demonstration or illustrated talk at their 4-H Club meeting. This increases their skills in thinking, organizing, writing and public speaking. Thirty-five youth increased their self-confidence and speaking skills through competing at Indian River County 4-H County Events.

In Sumter County 92% of the individuals in the Tropicana Public Speaking program had never presented a public presentation before they enrolled in the Tropicana program.

Due to their success in county and district events, 4 Levy county youth competed at state public speaking competitions. Three presented demonstrations and one in public speaking.

In Citrus County offered public speaking workshops for those youth preparing for demonstrations. All of the 37 participants reported that they felt better prepared to give a County Events demonstration as a result of having attended the public speaking workshop.

In 2003, many Taylor county youth participated in 4-H County Events Program: 11 were in Share-the-Fun, 18 in poster art, 7 in public speaking, 2 in Horse Public Speaking, 9 in photo contest, and 12 in demonstrations/illustrated talks. This helped many of the youth demonstrate a higher level of confidence and skills along with developing good sportsmanship.

Photography and expressive arts

In F.Y. 2003, of the 65 counties 31 reported enrollment in performing arts, 42 reported enrollment in arts & crafts, and 15 reported enrollment in photography. Approximately 548 youth were involved in the performing arts, 2,168 in arts & crafts, and 244 in photography.

In Manatee County, 281 youth enhances their communication skills by participating in performing arts, arts and crafts, photography, poster art, county events, district events, State 4-H Congress, record book judging, and awards program, and by submitting articles to the Cloverleaf newsletter. Six posters and photography entries were submitted to the State.

In Indian River County, forty youth enrolled in the 4-H photography project and developed their photography skills.

St. Johns County takes great pride in the ability of our 4-H'ers to represent themselves. The competitive events of St. Johns County are fashion review, share the fun, record-books, public speaking, demonstrations, crafts, poster art, and photography. One hundred and sixty youth participated in competitive events. Over 90% of all participants receive blue awards. A 4-H'ers won the state 4-H poster contest. The Share the Fun act went on to Congress to place third in the State.

In Levy County an "Acting Out with Theatre Arts Day Camp" was coordinated. The five day (40 hour) day camp instructed 17 participants.

At Cherry Lake 4-H Camp, Levy County leaders guided a committee of 17 youths ages 8-13 to coordinate an entirely youth-run Talent Show at Camp The youths promoted, served as emcees, gathered judges, and were responsible for other responsibilities surrounding the event.

In Brevard County Volunteers conducted summer music workshops in music theory, rhythm and timing, music instrument mastery. Summer music programs were partnered with 7 schools benefiting 450 youth.

Of the 35 Taylor County youth who participated in the Photography workshop, 80% of the participants revealed in a survey they learned more about how lighting affects photographs and how it can be manipulated. 75% of participants reported they have a better understanding of the different speeds of film.

Summary of Impacts for Clientele:

Youth literacy relative to communication technology.

Youth skilled in application of personal/interpersonal communication methods that support individual, family, workforce and community actions.

Youth involvement in communication arts, leisure arts and recreation as a positive use of time.

Youth skilled in researching and making oral presentations.

Success Stories:

Pasco County: Public Speaking Programs in Schools

Participation in public speaking in schools has increased from 10,000 students in 1998 to 18,958 students in 2003. This is a 99% increase. In 2003 4-H had 100% of Pasco County's 56 public schools, as well as one private and two charter schools, participating in school enrichment.

Tropicana Public Speaking is Pasco County's most successful programs, From 1999 to 2003 we have had 100% of the elementary and middle schools participating in this program. Due to the success of the Tropicana and 7th & 8th grade public speaking contest, the Pasco County School Board asked if the 4-H Foundation would sponsor a high school speaking contest. This was started in 2000 and in 2003 there were 100% of the high schools participating. Youth reported that they learned how to express themselves, gained self confidence and were much more comfortable to stand in front of a group. One child summed it up this way, "It is a really good program and that if every child in Florida tried it just once, then they would be a whole lot better as a speaker. Another child reported "I had fun but did not win!". Parents reported that their children "gained confidence" and "it was a great experience watching these children shine

Hernando County: Public Speaking Workshops

As a direct result of exposure to public speaking as well as leadership workshops and opportunities, a Hernando County girl once too shy to answer a question out loud took a chance and was elected president of both the 4-H County Council and her FFA Chapter this year. She joined several competitive teams including Parliamentary Procedure and Livestock Judging in both 4-H and FFA. She has earned ribbons and awards at each competition, consistently ranking among the top scorers. Her self-esteem and confidence are so high; she has become a leadership mentor and role model in both groups.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Educational programs are conducted in accordance with the University of Florida's policy of equal opportunity/affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities through the use of mass media.

Minorities are encouraged to participate in all extension programs. In some counties where a large number of the clientele is Hispanic, some programs and publications are done in Spanish.

Agents sometimes do direct or personal contact with minority leaders, business owners, ministers, youth workers, or other individuals to promote programs. Agents report using Equal Opportunity and ADA statements on meeting announcements. Some counties report using minority

newspapers when available. Meeting sites are selected where there is commonality and local support.

Source of Federal Funds: Smith Lever

FL-SMP-218/718

Title: Organizational Development in 4-H

National Goals: 5

Key Themes: Communications Skills, Leadership Training and Development, Youth Development/4-H

Situation/Program Rationale:

Program Objectives:

Summary of Programs for Clientele:

Sixth-seven (67) counties and the Seminole Tribe worked with 22,858 youth and 1403 community based 4-H Clubs. During the fiscal year 2003, youth were engaged in short-term educational programs (six hours or more) in 58 of the 68 Florida reporting units. There were 3,816 youth from 60 counties engaged in intensive week-long residential camping experiences statewide. School enrichment classroom programs were conducted by 60 counties for youth to learn skills and adopt practices in a variety of subject matter disciplines. This included 236,754 youth in more than 9,200 K-12 classroom reporting units.

4-H Programs throughout Florida sponsored advisory committees, Expansion and Review Committees, volunteer leader training, county councils, officer training, and numerous events and activities to enhance learning for 4-H youth. The State 4-H Office conducted three major events and 35 competitive events to supplement work at the county level. At the county level, youth demonstrate leadership, management, and organizational capabilities through an organized group structure by taking an offices in clubs, presented an educational demonstration, and participation in community service projects. 4-H Leaders have delivered educational programs to youth that include leadership, management, and organizational skills taught through 4-H projects and community service projects utilizing the skills and knowledge they received in workshops and leader training. Workshops that are taught, include; steer grooming and showmanship, horsemanship, dairy, horse judging, livestock judging, steer maintenance, dog care, animal maintenance, exhibitor workshop, rabbit, poultry, meat, ethics/showing animals, leadership, officer responsibilities, nutrition, rocketry, marine science, computer technology, photography, public speaking, food preservation, letter writing, team work, record book/portfolio techniques, gardening and environmental sciences. Many counties have judging teams (senior and junior) in most large animal species of livestock that compete in the offered judging opportunities and judging workshops. . Volunteers and youth have contributed a significant number of hours of volunteer service to the program and to their community in the 4-H program. Contributions are documented through volunteer logs submitted by 4H leaders and youth leaders.

Based on the 2003 ES237 data the following information reflects participation in 4-H during 2003.

22, 858 youth enrolled in organized clubs or units.

1403 organized clubs or units.

36,276 youth participated in 1392 special interest, short term, or day camp experiences.

3816 youth participated in 156 weeks of overnight camping programs at four 4-H camps.

251,245 youth (includes duplicates) participated in 4-H school enrichment programs.

519 youth participated in 4-H individual study / family 4-H.

1210 youth participated in at least 38 school-aged childcare programs.

2 youth participated in instructional TV/video programs.

The racial/ethnic background of youth in 4-H is as follows: 68% White; 19% Black/African-American; 11% Hispanic; 1.1% Asian; and .6% American Indian.

13,889 adults served as volunteers in the 4-H program.

1,204 youth were recorded as volunteers in the 4-H program.

Project enrollment in curricular areas were as follows:

Citizenship and Civic Education: 8,594

Communications & Expressive Arts: 104,423

Consumer & Family Sciences: 17,003

Environmental Education & Earth Science: 31,429

Healthy Lifestyle Education: 49,370

Personal Development & Leadership: 9,269

Plants and Animals: 58,726

Science and Technology 29, 985

SMP Program Goals:

1. 4-H youth participants will reflect the diversity of Florida's youth population; targeted youth populations, as identified by advisory committees, will have greater access to 4-H educational opportunities
2. Parents of current and potential 4-H youth participants will view 4-H as an available and useful resource in providing valuable out of school experiences
3. Community leaders will increase understanding of their critical role in youth development; they will increase their support for youth development through participation in the 4-H program and increased commitment of public and private funds
4. Citizens will have access to research-based information so that informed public policy decisions can be made that will positively impact youth in their communities

- **Summary of Impacts for Clientele:**
Special Interest:

Seminole County: Special Interest (SI) Programs continue to be a vehicle to promote 4-H involvement and to support 4-H club activities. Approximately 10% of all special interest programs are attended by non-4-H club members. 19 press releases were submitted for special interest programs this past year. Participants that attend workshops came away with a positive 4-H experience and gained knowledge on a specific topic that was taught. Often SI participants do not transition to 4-H clubs, however in an urban county with a variety of opportunities open to youth, having a positive exposure to 4-H is one of the best things to be accomplished in this area. Special interest enrollment increased by 55% this past year (from 74 to 166 youth).

St. Johns County: Ten (10) day camps were conducted on different topics targeted at different audiences. These camps were Canine College, AKC Good Citizen Test, Beginning Sewing, Marine Discovery, Old City Fun, Senior Environmental, Outdoor Adventures Cloverbud Camp, Operation Snack, Super Sitter, Friday Night Live, and Hastings Aero Camp. Over one hundred 4-H'ers took advantage of these daycamping opportunities. These 4-H camps have constantly received rave reviews from parents. Unsolicited comments include "My child came home telling me all about the fish that live in Florida. They have never been so excited about a camp!"

Lafayette County has been awarded \$10,000.00, annually, for 14 consecutive years, to administer the 4-H Environmental Education Programs. The purpose of the grant is to teach environmental awareness to the 4-H and youth in the county. A Program Assistant was hired to administer the 6 week Environmental Day Camp Program. The programs have evolved over the last 14 years with different focus areas. The past eleven years a Certified Teacher was hired to teach. The "Water Wise Guys" materials were used, along with craft projects using recycled materials, and food

demonstrations dealing specifically with nutrition and energy. Field trips to natural springs in the area are examples of the creative structure the youth enjoyed. The 4-H youth also had the opportunity to experience some techniques in Forestry Judging and learned to identify trees and insects native to North Florida.

The Summer Camp hosted an average of 16 kids each day from June 2-July 17, 2003. Each week was filled with crafts, games, learning activities, trips and special guests. The kids also spent time in the kitchen learning how to prepare snacks and make their own lunches. Wednesdays they participated in the County Library's Hats Off to Reading program where they were entertained with a variety of speakers and activities. Thursdays were dedicated to art. Mrs. July Bletard taught the basics of art. Kids created wonderful portraits to share with family and friends.

Because of the success of the Summer Environmental Education Program the County Commissioners purchased a portable classroom to permanently house the 4-H Environmental Program, and joined it to the County Extension Office. This building is used year round for after school programs.

Volunteer & Club Development:

Seminole County volunteers donated over 5665 (a 21% decrease from last year) hours of service and leadership at value of \$ 90,923. (based on \$16.05/hour) to *Seminole County*. This year's decrease can be attributed to the fact that we had no volunteers chaperone at week long or summer events this past year as well as losing a school in our school enrichment programs. Volunteers work to deliver 4-H community club programs, school enrichment and special interest programs.

In the check sheet evaluation of set criteria for successful 4-H club traits, 62 % of 4-H clubs exhibited 4 or more of the desired qualities (listed in objectives), this included new as well as existing clubs. Five of the seven new clubs that began in 2002 re-enrolled for 2003. Of these clubs who had been in existence 3 or more years, 73% exhibited 4 or more traits of successful clubs.

A parent survey was conducted by the 4-H Advisory Committee in May of 2003. A total of 46 usable surveys were returned. Parents responding had an average of 2 children involved in 4-H and had been involved with 4-H for an average of 4.1 years. 100% said they had seen a positive change in their child as a result of their 4-H participation with 96% thought 4-H had enhanced their child's self esteem. Of the seven skills listed, parents sited public speaking and the ability to make friends the highest with the greatest number and strongest feelings as to what their child had gained in 4-H. Their greatest area of satisfaction came from the information or the knowledge that their child gained in 4-H.

Marion County's 4-H Club Member Survey: The University of Florida's 4-H Evaluation Tool Kit (developed by Dr. Lisa A. Guion) was used for this survey. Seventeen 4-H Clubs were surveyed. Surveys were returned from 11 clubs (65% response) with a total of 78 youth responding.

Results

71% indicated that they spent time with their parents frequently or a great deal because of 4-H.

The following percentages indicated that their 4-H club experience has helped them:

Learn how to work independently-79%

Learn how to get along well with others in a group-88%

To expect good things from themselves-86%

Improve their ability to keep accurate records-69%

Improve their ability to plan/organize-75%

Improve their ability to set goals-79%
Improve their ability to solve problems-71%
Improve their ability to make decisions-77%
Improve their ability to serve my community or volunteer-68%
Improve their ability to lead a group-49%
Improve their ability to get ready for a job-58%
Improve their ability to plan my career-59%
Them improve their ability to speak publicly-58%
Improve their ability to write more clearly-50%

Jackson County: 78% of 106 community club members strongly agreed that 4-H has strengthened their social competency skills by being able to have a positive relationship with an adult, get along well with others in a group, and expect good things from themselves;

20% of 106 community club members reported that 4-H has helped them improve their ability to keep accurate records;

36% of 106 community club members reported that 4-H has helped them improve their ability to plan, organize, and set goals;

58% of 106 community club members reported that 4-H has helped them improve their ability to solve problems and make decisions; and

81% of 106 community club members reported that 4-H has helped them feel empowered through service to others in their community by participating in club and county service projects.

Volunteer Perceptions and Testimonies of 4-H Impact from Lake County Leader Survey: As part of the organizational leader survey (see CMP 14), respondents were asked to rate various components of the 4-H program as they perceived each contributed to the positive development of youth, with 1 being no contribution and 10 being a tremendous contribution. Averages are listed below.

Club Meetings: 9.0
Project Work: 9.4
Community Service: 9.4
Competitive Events : 8.0
Workshops and Clinics: 9.3
Recognition and Awards: 9.1
Trips and Conferences: 8.1
Camp: 7.2

"I have watched these children have opportunities to participate in community events and become better and more responsible people."

"Two students stayed in school to be able to continue 4-H."

"Have counseled youth from broken homes. I am a safe place for them to be themselves and look for guidance.

"Have seen children change negative attitudes to positive ones...helped children make better choices."

After School Club Programming:

In Broward County there are approximately 10,000 homeless people. Of this number, 730 or 14%, are children less than 18 years of age living with their homeless parents. These youth and their families are served through a Countywide homeless continuum of care that includes a variety of homeless service providers. Key providers include the North, Central and South

Homeless Assistance Centers. Although this continuum does an excellent job of meeting the needs of homeless adults, it does not always adequately address the holistic needs of homeless youth. By virtue of their transience, it is very difficult for homeless youth at an emergency homeless shelter to consistently engage in traditional 4-H/Youth Development programs that are, by design, linear in approach.

Children living in an emergency Homeless Assistance Center (HAC) were exposed to research-based 4-H Extension curricula that has been modified to meet their specific need. The number of children on any given day at an emergency Homeless Assistance Center varies. Consequently, all 4-H activities and programs directed to this population are conducted as "point in time" exercises that are evaluated at the end of each session. Modification of the 4-H curricula to address these children's needs in no way diminishes the effectiveness of the 4-H learning experience. It does, however, give the child an opportunity to experience a more immediate sense of accomplishment.

The significance of a 4-H program in a homeless assistance center is that it is a comprehensive way in which to educate and empower youth, giving them a momentary break from experiencing and being affected by their homelessness. The ultimate goal of 4-H is to give these children an increased sense of self worth and value, and to reinforce the idea that their homelessness does not define who they are but only reflects a temporary circumstance that will improve with time.

Seventeen children were served during FY 2003, with the following outcomes resulting from their experience with 4-H:

98% of the kids surveyed said they "have fun."

75% of the kids said they "felt like they were part of a group."

50% of the kids said they felt comfortable "speaking before a group."

30% of the kids said they "helped decide what projects to do in the club."

50% of kids said they "spent more time with parents because of 4-H."

50% of the kids say they felt "less stressed" because of their involvement in 4-H programming.

100% of the HAC staff reported positive behavioral changes in children who participated in 4-H programming.

In Jackson County, 4-H After school programs at two public schools are in the process of being organized. This development will make 4-H programs available to approximately 125 youth who are not currently being reached. Both after-school programs have agreed to form 4-H clubs as a part of the program.

In Holmes County's 4-H Science and Technology After School Program, Teen volunteers performed over 260 hours of "homework help" for youth in the program. They assisted with homework and with community service projects. Throughout the year parents commented on the positive impact ASTP had on their child. One mother credited ASTP with providing her son an alternative to the delinquent activities he was beginning to get involved with. She said through ASTP he made a new group of friends with whom to spend time and he is learning that he does not have to be destructive to be cool. Several parents who accompanied their children to the county fair and North Florida Fair said the experience were something of an awakening for both their children and themselves-both parents and children were surprised by and proud of the projects that their children were able to do.

-With daily homework help, ASTP students increased the number of homework assignments they completed and the quality of their work. With higher homework scores, 20 students raised at least one grade letter in at least one subject, with the average being a raise of a letter grade in three subjects. Parents and teachers reported that the students now show their completed work and their improved grades with pride. Two parents said the program improved their child's attitude about studying and opened discussions about going to college.

-ASTP was designed for youth who are not only economically and academically at risk, but also socially uninvolved. Most of the participants are not involved in any other extracurricular activities. In the program 12 youth assisted in the construction of the educational exhibit for the county and North Florida Fair, 5 youth went to summer camp for the first time; 2 youth went to Tallahassee for 4-H Legislative Day and spoke with legislators about the program. Through ASTP, the youth are involved with projects and people that extend beyond the school and community.

-Eight of the fifteen youth that participated in the summer program are now enrolled in the ASTP. Those youth's parents felt the summer program benefited their child and wanted them to continue to develop new experiences.

-The highlight of the summer program was the Water Quality Puppet Show. Youth researched information about Florida animals, their habitat, and how water quality affects them. They used the internet and other research materials provided in a kit from the water management district. The youth developed a script for their Florida animals and using two refrigerator boxes designed and painted a stage for the puppets. The youth then took the show on the road and performed for children at three day care facilities. They were then invited to perform the show at the summer principals meeting where they received a standing ovation.

-With a standing invitation to parents to drop in, ASTP provided opportunities for parents to interact with their children. Three parents came in regularly to help with homework and spend time with their children. When children were working on their electricity projects, one father who is an electrician took off early from work to come in and work with his daughter on the project.

-Other community service projects included collections for the food bank, preparing 20 Christmas boxes for Project Christmas Child and working to fill "Santa Bags" for Head Start children.

Success Stories:

The Teens in Action 4-H club of Seminole County began in August of 2002. This past year was their first year of existence for this countywide 4-H Club. During the year membership grew to 20 youth with two volunteers supporting the club efforts. The club performed monthly service projects from August 2002 to June 2003. Members wrote two grants that were funded last year (\$1800) with another submitted this year (October 2003 for \$2000). The adult partnership program has generated not only community support but was recognized as the Southern Region "Power of Youth" adult partnership program winner. An evaluation of club members at the end of the year indicated the one thing that this service learning experience provided the majority of youth in this club was that youth learned if there is a problem in their community, they could work together with others to solve it. Their largest project was the "Packaged with Care" project where they along with the Longwood Rotary club made, collected, and assembled 100 backpacks for youth from Child Protective services. This project generated a newspaper article and TV report as well as an opportunity for youth to speak about the project to others. They even worked in partnership with Rotary to submit a video for the morning program, The View, to produce a video about their community. This program was promoted to all youth and through minority newspapers. Teens in Action has made it possible for youth to help others and be recognized in their community as a strong force for community service.

In Jackson County, many citizens, educators, government and civic leaders are not aware of the wide range of educational programs available to youth through the 4-H program. An organized public relations plan is necessary to increase awareness of 4-H, its relationship to IFAS, opportunities for youth and adults, and funding needs. A public relations plan was put into effect

with help from the 4-H Advisory Committee, and included a plan for newsletters, websites, press releases, public presentations, and displays. As a result, 76,010 people were reached, and close to \$41,263.00 was raised through grants, monetary donations, in-kind donations, sponsorships, and auctions. This fundraising effort, combined with the monetary value of volunteer service hours, enabled the 4-H Program to offer \$59.89 on each of the 1,106 participants during the 2002-03 year. This economic impact is even more substantial for families with more than one 4-H member. A concentrated public relations plan not only increased awareness, but can result in significant savings for 4-H families.

Desoto County 4-H Program Contribute to Community through the Desoto County Relay for Life Desoto County 4-H raised approximately \$3,500 for the American Cancer Society and Cancer Patients in our community since 2001. The 20-team members were given a chance to participate in the overnight festivities while raising money for a cause that touches everyone's life. Following the 2001 experience it was decided by the youth that we would have a team participate each year. In 2001 we were able to raise \$700. Our goal was to exceed the previous years donation. With the assistance of giving citizens and volunteers in our community we were able to raise a pig, free of charge, for auction at the Desoto County Fair. The pig alone raised \$1,100 while the rest of the funds came from donations throughout the community. Desoto County 4-H was able to donate a total of \$1,600 to the cause in 2003. The participation in Relay for Life continues to be a countywide Community Service Activity. Over the past three years we have seen a steady increase in funds raised through our 4-H members by an average of 34% per year.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. *Desoto County 4-H* continues to serve the After-school Program at Memorial Elementary School. Through this collaboration we are able to reach many of the minorities, which do not have the opportunity to participate in the traditional 4-H programs. Traditionally this has been attributed to the lack of transportation or parent support. Fortunately, Desoto County 4-H has a working partnership with the after-school program so we will be able to reach the youth through various teaching methods and activities for the next year. However, with the emphasis on the FCAT test at many schools are making it more difficult to conduct supplemental programming during the school day and also in the after-school programs. Because of the success of the Summer Environmental Education Program the County Commissioners purchased a portable classroom to permanently house the 4-H Environmental Program, and joined it to the County Extension Office. This building is used year round for after school programs.

In Collier County, the Immokalee school population is primarily Hispanic and African American, with Caucasians being the minority. 4-H is now an integral part of the Kaleidoscope after-school programs at Pinecrest and Lake Trafford Elementary Schools, with Village Oaks added in 2002-2003. Collaboration with the YMCA-a training was held for three Hispanic and one African-American and three Caucasian young adult site supervisors to serve as 4H leaders at their sites at Lake Trafford, Highlands, and Shadowlawn Elementary schools. Special tours of the fair were arranged, when the fair was officially closed, to allow a total of 54 minority youth to visit 4-H Family Living and Livestock exhibits. A new club was formed in a location to attract a diverse group. Haitian, Mexican, and Caucasian teens are members. The club meets at the Golden Gate Community Center and is accessible by walking, biking from nearby apartments and homes. The Coordinating Committee secretary has 4-H promotional materials written in Spanish from another state to revise for us to use locally

Educational programs are conducted in accordance with the University of Florida's policy of equal opportunity/affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities through the use of mass media. Minorities are encouraged to participate in all extension programs. In some counties where a large number of the clientele is Hispanic, some programs and publications are done in Spanish. Agents sometimes do direct or personal contact with minority leaders, business owners, ministers, youth workers, or other individuals to promote programs. Agents report using Equal Opportunity and ADA statements on meeting announcements. Some counties report using minority newspapers when available. Meeting sites are selected where there is commonality and local support.

Source of Federal Funds: Smith Lever

FL-SMP-262

Title: Nutrition, Diet and Health in Florida, 1890

National Goals: 3

Key Themes: Human nutrition

Situation/Program Rationale:

The prevalence of overweight among Americans increased dramatically during the past decade. A recent report by the Centers for Disease Control and Prevention predicts that obesity will be the most urgent challenge related to nutrition during the 21st century. The increase in prevalence of overweight among American children and adolescents has mirrored that of adults. Data has shown that overweight continues to be a health problem that disproportionately affects poor adults, youth and children of color and carries with it many social and economic consequences. A major cause of concern over the increasing prevalence of obesity is the range of medical and psychological complications including hypertension, type 2 diabetes, sleep apnea and other hyperventilation disorders, body image disturbances, and lowered self-esteem. Intervention, through the introduction of consistent nutrition information and physical activity recommendations through multiple programs that are linked at the community level is seen as a way to combat obesity.

Food safety remains an important concern for consumers, processors, and retailers. Consumers, processors, and retailers (including restaurants) all play an important role in keeping foods safe. Food safety programs have been designed for consumers. However, the Centers for Disease Control and Prevention reports that traditional foodborne illness outbreaks often follow church suppers, family picnics, wedding receptions, or other social events that involve volunteer or occasional food handlers. Few Food safety programs have been designed for this group of food handlers – with their special needs (little time for training, lack of trained managers, etc.).

Program Objectives:

Nutrition, Diet and Health:

One extension faculty member and two program assistants will recommend the use of the Food Guide Pyramid and the dietary guidelines as a basis for personal meal plans.

One extension faculty member and two program assistants will recommend physical activity as a part of a healthful lifestyle.

Six hundred limited resource adults and two hundred limited resource children/youth will learn about the Food Guide Pyramid and the Dietary Guidelines as the basis for personal meal plans.

One hundred limited resource adults and one hundred limited resource children/youth will increase physical activity as a part of their more healthful lifestyles.

Food Safety:

Two hundred consumers will learn about the recommended food safety principles

Two hundred consumers will use at least two of the four recommended food safety principles.

Summary of Programs for Clientele:

Specialist conducted 10 nutrition seminars with over 400 individuals attending. Topics included low-fat cooking, using the Food Guide Pyramid and the Dietary Guidelines to plan healthy meals and snacks. 1890 program assistants had over 1700 educational contacts presenting information on the Food Guide Pyramid and the Dietary Guidelines as a means of planning healthy meals and snacks throughout the lifespan. Contacts included WIC participants, senior citizens, youth, and single parents. Seminar topics also included budgeting for food and food safety. Food safety was incorporated into to all nutrition seminars.

Summary of Impacts for Clientele:

One hundred eighty older adults presented with nutrition information reported that they would adopt the lower fat method of food preparation and would try to incorporate more fiber into their diets according to the information they received in the seminar. One hundred fifty individuals reported that they would use a shopping list when shopping. The same number said that they would incorporate more fruits and vegetables into their diets.

Success Stories:

In Gadsden, over 200 seniors continue to participate in the “Keeping Your Blood Pressure Down” program – taking the blood pressure frequently and noting the reading in a health record book they can take to their physicians.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Special efforts (low –literacy materials, materials in Spanish, having translators for Spanish speaking participants, holding seminars in neighbor hoods, etc.) were used to attract minorities to our programs.

Source of Federal Funds: Smith Lever

FL-SMP-265

Title: Improving profitability of Small-farm Agriculture

National Goals: 1

Key Themes: Adding Value to New and Old Agricultural products, Agricultural Profitability, Biofuels, Home Lawn and Gardening, Organic Agriculture, Ornamental/Green Agriculture, Plant Health, Plant production Efficiency, Precision Agriculture, Tropical Agriculture

Situation/Program Rationale:

Low market returns, enterprise competitiveness and high cost of production are among the profitability constraint facing the small-scale farmer. This realization has caused many to seek off farm sources of income. It is now quite clear that if the small farmer is to remain competitively in business, he/she will of necessity have to become engaged in niche enterprises, which can remove the competitiveness of the large-scale farmer thus making the enterprise of the small farmer more lucrative. Small-scale farm profitability may be improved through diversification in cropping systems and adoption of cost effective practice. Production of the selected enterprise should be guided by the potential to optimize yields while carrying out environmental stewardship.

Program Objectives:

To improve the profitability of small-scale farm enterprises and encourage farmers to carry out the practice of

agriculture in such a manner as to protect and sustain the natural resource base. To encourage and facilitate the adoption of alternative farming techniques by small scale farm enterprises. To investigate and disseminate new/alternative and adoptable crops to farmers.

Summary of Programs for Clientele:

Workshops were held in Gadsden and Jackson Counties to provide training in areas of production and marketing for farmers.

Summary of Impacts for Clientele:

Florida A&M University has impacted farmers both state and nationwide. Technical assistance has been rendered via telephone support and information from research bulletins. New farmers have been enrolling on a regular basis and previously enrolled farmers now possess the necessary skills to produce and manage their own crops successfully. Over the last two years, a total of 27 small farmers and 3 cooperatives have benefited from the program. Most of the farmers enrolled with the program have reported success this year. Currently, pepper prices range between \$1.30 and \$1.50, per pound, guaranteeing hot pepper farmers returns well above those realized by farmers engaged in the production of other vegetable crops such as tomatoes.

Success Stories:

One hot pepper farmer engaged in containerized production (a recently introduced techniques) realized gross returns in excess of \$15,000.00 from 3600 plants after only 9 weeks of harvesting. Emphasis on alternative enterprises will continue since they show much potential for paving the roads to future success for small farmers. Outreach To Minorities: To date over 63% of the farmers participating in this program falls within the minority category

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Source of Federal Funds: Smith Lever

FL-SMP-269

Title: Water Quality and Environmental Education For Limited Resource Clientele.

National Goals: 4

Key Themes: Global Change and Climate Change, Integrated Pest Management, Natural Resources Management, Nutrient Management, Riparian Management, Soil Erosion, Soil Quality, Water Quality

Situation/Program Rationale:

Florida's increasing population (now 13 million) continues to put a high demand on the state's water resources. In 1990, for example, some 7,530 million gallons of fresh water were withdrawn daily for domestic and other uses. Approximately 63% of this was groundwater (Florida Statistical Abstracts 1992). Simultaneously, due to poor soil fertility and high incidence of insects and pathogens, farmers, industrialists, and homeowners continue to apply pesticides and fertilizers to their crops, lawns, and gardens in order to guarantee high yields and enhance aesthetic quality. In fact, according the Florida Statistical Abstracts 1992, during this period of July 1990 to June 1991, over 1,976,734 tons of fertilizers (10% of which was nitrogen and phosphates) were applied to crops and landscapes in the state by large and small-scale farmers and homeowners. It is routine for small-scale farmers in north Florida, for example, to apply up to 1,000 lbs/acre of inorganic fertilizer to their corn.

The high seasonal rainfall occurring in Florida (average 55 inches annually), will readily facilitate leaching and/or runoff of these chemicals in the state's fragile soil-zone environment. It is

important that these fertilizers and other chemicals, ingredients of paramount importance to the state's agricultural industry, be used and applied in such a manner that they do not become polluting agents of the state's vulnerable water resources.

Program Objectives:

To provide information on the problems and harmful effects of water contaminated through practices carried out in agriculture practices, use of household chemicals, petroleum products and other anthropogenic induced activities. To educate landowners and rural residents about practices to enhance the quality of their drinking and domestic water supply and and to develop alternative methods to prevent further pollution.

Summary of Programs for Clientele:

Over 150 attendees participated in 2 composting workshop which were held in Quincy, North Florida and Immokalee, South Central Florida.

Summary of Impacts for Clientele:

The Mobile drinking water laboratory continued to serve the target group. Some 2000 residents in north Florida received 'on the spot' diagnosis, pertaining to their drinking water supply. This has brought increasing awareness from residents regarding the source of their drinking water. Workshops on composting provided training for approximately 150 persons including farmers and agency personnel.

Success Stories:

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. The program targeted limited resource and non-traditional groups

Source of Federal Funds: Smith Lever

FL-SMP-270

Title: Community Resource Development-1890

National Goals: 5

Key Themes: Community Development, Home-based Business Education, Promoting Business Programs

Situation/Program Rationale:

North and northwest Florida communities are changing. The rapid changing economic forces have created an urgent need for bolstering and diversifying local economies, increasing employment opportunities, promoting economic well being and increasing the productivity of public resources to meet the needs of the these communities.

Economically healthy rural communities are a key factor in maintaining and improving life for its residents. The development of economic and education programs can help rural communities and citizens improve their economic outlook and devise effective approaches to community and rural development. Dramatic demographic changes and recent innovations in agricultural practices and community development offer new challenges and opportunities. An aging population, the arrival of new immigrant populations, youth retention and workforce development are all having an impact on the rural economy. Rural communities need to understand these demographic forces and develop capacity to translate off-farm innovations into economic growth and community prosperity. New employment opportunities and education programs can help rural communities share more fully in economic opportunities, especially where they are part of holistic approaches to community development.

Presently the economic well-being of local communities in the Extension counties are being influenced by many factors. Small communities in these counties are generally not very diversified in terms of the sources of income for their citizens. In light of limited employment options, the possibility of individuals operating their own businesses appears to offer hope to many. These individuals have skills in providing specialized products and services. However, most of them have poor or no credit and limited tangible resources to start and maintain a small business.

In order for us to effectively assist these individuals in addressing small business issues, we will have to design programs to deliver information and education on such topics as Starting and Managing a Small Business, How to Write a Business Plan, How to Prepare a Small Business Loan Application, Basic Accounting and Bookkeeping Techniques for New Businesses that will assist these small business persons to be better able to understand and overcome various challenges that may effect their ability to contribute to the viability, sustainability and quality of life of rural communities. Increased awareness and knowledge are essential to the successfulness of these entrepreneurs.

Program Objectives:

1. Conduct informational programs that will stimulate business and economic development.
2. Collaborate with businesses and local government agencies to develop a program of business incubation and technical education to assist minority owned businesses.
3. Provide training, technical assistance and special support services for potential and existing business owners, including one-on-one consultations in expanding and/or developing start-up businesses.
4. Disseminate information to stimulate business and economic development.

Summary of Programs for Clientele:

The Community Resource Development (CRD) Program has provided technical assistance to individuals in the form of developing business plans, marketing plans, financial statements, and/or loan packaging as a means of promoting economic development. The program staff has worked with individuals to develop start-up businesses and expand existing businesses in Leon and surrounding counties. The CRD Program has also developed collaborative partnership and/or working relationship with entities to address the needs of minority and underserved clientele. The objective of these collaborations and partnerships are to assist community residents in establishing successful businesses in Leon and surrounding rural counties. Some activities of program staff included the following:

1. Identified potential clients interested in starting or expanding a new or existing business.
2. Provided appropriate training programs according to the identified needs of the participants.
3. Served on the Small Business Week Committee and participated in Small Business Week activities.
4. Planned/conducted training programs related to small business development.
5. Provided technical assistance to individuals interested in starting a small business as a means of promoting economic development in the form of developing business plans, marketing plans, and/or loan packages.
6. Distributed handouts on business planning to program participants.
7. Provided referral services for rural residents and community organizations interested business development.

Summary of Impacts for Clientele:

1. Eighty-four (84) persons attended workshops or conferences where they received information concerning starting and managing a small business, preparing a business plan, and small business loan opportunities.
2. Provided technical assistance to three (3) non-profit organizations, each with potential to create a significant number of jobs.
3. Seven (7) individuals requested and received one-on-one assistance with developing business plans, preparing financial statements and/or preparing loan packages.
4. Two individuals actually submitted loan packages for funding

of a new business. 5. At least six new jobs were created and five jobs were retained. 6. Created a sense of hope for rural residents who needed personalized attention to their business development goals. 7. Area Community Development Corporations and related organizations participated in a conference that facilitated partnership development and information sharing.

Success Stories:

1. Expressions of hope relayed by the (3) individuals representing non-profit organizations and (7) individuals who received personal attention in developing and implementing their business development goals. 2. The University Center maintained its focus to provide technical assistance to small businesses as a means of promoting economic development and collaborating with organizations in sponsoring small business development workshop. 3. Hosting of an area wide technical and information conference for local Community Development Corporations and related organizations received a resounding positive response and call for an annual event for organizations in North Florida.

As a result of attending the workshops or conferences on starting and managing a small business several new businesses were opened in the Leon County area of which at least fifteen jobs were created.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Provided services to under-served and under-represented ethnic minorities and limited resource clients in (10) rural counties. Outreach was conducted through Chamber of Commerce's, Community Development Corporations, Economic Development Councils, churches and other community based organizations.

Source of Federal Funds: Smith Lever

FL-SMP-271

Title: Adult and Child Health and Wellness Program

National Goals: 3

Key Themes: Human Health, Human Nutrition, Medicinal Plants

Situation/Program Rationale:

Traditionally minorities experience inequality in health care and underrepresentation in medical research. In the new millennium, the two most profound trends will be the graying of the baby boomers and the significant increase in the number of minority groups throughout America. According to the 2000 U.S. Bureau of Census, there was 15,606,063 minorities in Florida. Of that number approximately 2,335,505 are Black Americans. Of the total population of Floridians, 22.1 percent are minorities. The American Cancer Society predicted that by 2015 more African Americans will live in Florida than any other state in the United States resulting in major changes in the health status of minorities.

Aggregate demographic changes cause social, economic and political problems that have a direct impact on the health status of society. Despite advancement in technology and education, disparities in health care will continue among minorities and the underserved, until interpretations about illness, sickness and disease among these populations are examined and understood by the dominant systems. Interpretations and illness, sickness and disease have stereotyped minorities and the underserved as having a lack of knowledge about health or being noncompliant. Little consideration has been given to the perceptions and experiences certain populations have with the environment for good health (i.e., farming/agriculture/healing). Farmers traditionally rely on the environment for good health (nutrition, exercise, good mental health) as opposed to outside agents (biomedicine). Programs have to be developed to gain accurate knowledge about how

minorities, people in rural areas, farmers and the underserved interpret illness, sickness and disease. This requires research, collaboration and training to identify, evaluate and analyze health belief practices in order to decrease the high mortality rate for illness such as heart disease, strokes, diabetes, certain cancers, violent crimes and the overall quality of life in agricultural communities.

Program Objectives:

1. One hundred (100) adults will become aware of how cultural attitudes and beliefs about biomedicine act as barriers to health care, thereby improving upon access to care.
2. Twenty-five (25) providers will be informed about myths act as barriers to care for rural, farming, minority and poor families and the underserved thereby improving upon communication with these populations.
3. Two hundred (200) women will be contacted and encouraged to seek mammograms for breast health screening, thereby reducing late stage diagnosis among African American women.
4. One hundred fifty (150) persons will participate in workshops or health fairs to increase their awareness about the signs and symptoms of major illness such as heart disease, diabetes, strokes, prostate and breast cancer, thereby increasing the number of people participating in preventive care.
5. Coordination with at least one state major agency and local health departments will result in programs to educate at least one hundred fifty (150) women about health issues.
6. Fifty (50) youth will participate in programs to improve upon their confidence and social skills so they may better relate one another.

Summary of Programs for Clientele:

Summary of Impacts for Clientele:

As a result of the purple teas, a local church was able to provide free mammograms to 50 women. Providers were able to better communicate with their patients by better understanding beliefs women hold about breast cancer that act as barriers. Fifty two providers were trained this year. Two hundred tapes have been produced. Health fairs are another methodology used to educate the population and improve communication between doctors and patients. Over 1,000 persons were reached this year during health fairs. Panels were held with providers from different disciplines in order to allow clientele to ask questions and have their health concerns addressed. In Gadsden County a major health fair was conducted the results was 189 free screenings, for diabetes alone. Over 5,000 persons were reached in presentations on breast cancer and patient/provider communications this year. Hundreds of persons were reached abroad when breast cancer cards were translated into Creole and supplied to a local church for during their mission expedition to Haiti.

Success Stories:

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Partnerships were developed between the Lincoln Neighborhood Center Governor's Revitalization Committee, the Diabetes and You Project, Leon County Housing Department, Gadsden County Community Health and Bethel Missionary Baptist Church as the four major community organizations targeting outreach to minority populations. A partnership was also developed with the Institute for African American Health, Project H.E.A.L.T.H. and Cancer Information Services. Project H.E.A.L.T.H. will allow students to learn more about obesity. Working through the Diabetes and You project, Myth interpretations were instrumental in teaching physicians to consider their style of communication with patients. In another project, women were taught to openly discuss breast cancer. Through the Bethel Missionary Baptist Church women were taught to address breast cancer concerns with their

children. In addition, wallet-size breast cancer cards were translated into the Creole and forwarded to Haiti on a missionary trip with a local Church. Six papers were prepared and presented at major national meetings prove to be a way to communicate to physicians the need to understand cultural beliefs. Health fairs prove to be an efficacious way to provide information to a large number of women, however research shows women tend not to follow-up with preventive practices.

Quarterly mini-conferences for parents and in-service training for Head Start staff, on topics of food selection and preparation for children, feeding special needs children, and food safety for children preparing their own food. Monthly newsletters go to parents, in English and in

Spanish, on topics relating to diet, health, food safety and seasonal issues for children.

Food related activities or foods the parents can prepare with their children are included.

Newsletters go directly to centers of BOCC Head Start. School Board Head Start offices provide the copies sent to their parents. Both programs also use articles from the FCS newsletter for inclusion in their monthly newsletters to parents.

Six ServSafe classes were scheduled, but due to last minute cancellation or lack of registration, only two have been taught, one more is pending. All six participants passed the examination and were certified. In-service training on safe food handling in the classroom was conducted for 13 new Head Start classroom staff. A training on Safe Food Handling was taught to church members and volunteers at a church which runs a soup kitchen. The USDA FSIS Food Safety Mobile spent 4 days in the Tampa Bay area on its inaugural run, visiting the Jazz Festival for 3 days and spending one day at a local grocery store. TV announcements were aired for two weeks prior to the events, promoting safe food handling and the coming Mobile. Agent assisted at all events, making contacts with event attendees, distributing literature and food thermometers. One local TV station visited the mobile, and aired a brief news piece during its stay. Events were video filmed and participants were interviewed, with follow-up TV promotion of USDA and local phone numbers for food safety information. A video was developed and produced covering the safety and quality aspects of judging home canned foods for fairs.

Source of Federal Funds: Smith Lever

FL-SMP-272

Title: Herd Health and Food Safety

National Goals: 1, 2

Key Themes: Animal Health, Food Handling, Food Safety, Food Security, Foodborne Illness, Foodborne Pathogen Protection, HACCP

Situation/Program Rationale:

Herd Health and Food Safety are two of the most important areas in managing food animal products. They impact cost, efficiency, health, and consumer satisfaction. The Centers for Disease Control estimates that 35 to 76 million cases of foodborne illnesses are reported per year, resulting in 325,000 hospitalized cases and over 5,000 deaths. The cost to producers, consumers and society can reach into the billions of dollars. Farming and herd management practices play a major role in preventing and reducing the incidence of foodborne illness. The ill advised use of antibiotics for the treatment of diseased and parasitic conditions have added to the risk and cost of production. It is estimated that 15 to 20% of production cost is attributed to the cost of herd health. Producers can cut production costs and maintain a more disease free stock by following a science based approach to herd health. Prudent use of antibiotics, and other drugs, medicated feeds, use of good agricultural production practices, can greatly reduce the risk of illness, while maintaining a healthier herd and reducing the cost of production.

Program Objectives:

To develop and execute a comprehensive preventive based Health and Food Safety program aimed at targeted clientele in the state of Florida. To provide education, and learning opportunities leading to the prevention and control of herd health, public health and food safety hazards.

Summary of Programs for Clientele:**Summary of Impacts for Clientele:**

Presented 6 workshops on Bioterrorism Awareness Education: Zoonotic Diseases to various audiences that include Goat Producers (Florida Dairy Goat Association and Florida Meat Goat Association), Cattle Producers, Processors, Food Safety and Military Personnel, Educators, Extension Professionals, Faculty and Students in Leon, Escambia, Jackson, Alachua, and Suwannee counties in Florida. A total of 88 people including 5 County Extension agents were more aware of the potential impact that zoonotic disease-causing organisms can have on humans and animals and their respective roles and responsibility in response to bioterrorism on farms or in the general population.

Conducted a comparative study on the efficacy of Moxidectin and Ivermectin against naturally acquired nematodes using 135 meat goats at three farm locations (45 animals at each farm) in Jackson County, Florida from June 30-October 10, 2003. Body weights were taken and recorded monthly and a fecal sample was taken from each animal at one week and then every two weeks. Preliminary results from one meat goat farm showed that goats treated with Moxidectin gained more weight than those treated with Ivermectin and in the control group (no medication).

Collaborated with Dr. Mobley and Dr. Brooks-Walter on the evaluation of fecal samples collected from 165 meat goats at three farm locations in Jackson County, Florida from June 30-October 10, 2003, for the presence of *Salmonella*, *Listeria*, *Campylobacter* and *E. coli O157:H7*. Six students

received on farm experiential learning from farm and laboratory activities.

Visited 8 farms (5 goat and 3 cattle) in Escambia and Jackson counties and discussed on-farm management practices with the farmers. Discussed feeding growing different forages and the procurement of feed from out of state was a challenge to the farmers. Presented information on Herd Health Practices For Livestock Producers to the farmers.

Currently, conducting a comparative study on the efficacy of Moxidectin and Ivermectin against naturally acquired nematodes using 135 adult meat goats and 50 goat kids at three farm locations in Jackson and Washington Counties, Florida March to June 2004. Body weights are taken and recorded monthly and a fecal sample was taken from each animal at one week and then every two weeks until the end of the study.

Visited one meat goat and cattle producer in Calhoun County and discussed and provided on-farm management practices and herd health program. A follow-up visit will be done.

Success Stories:

Food safety workshop for processors led to twenty-one (21) processors, producers, and regulators becoming HACCP certified and able to implement a HACCP program in their establishments.

This certification allowed them to meet requirements of USDA. Workshop for producers led to fifteen (15) producers implementing a science based herd health program leading to individual animal identification, record keeping, and practicing sound antibiotic control. Twelve (12) producers were given on farm training which led to the implementation of year round-herd health management program. Information received from prevalence studies allowed for definitive training for preventive strategies for food borne disease control in goats. Biosecurity training provided knowledge on recognition and control of biohazard and chemical hazards that may be used on the farm.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Conducted training to fifty minority farmers in 8 counties on herd health and food safety, and biosecurity. Underserved population includes North Florida Cooperative, Florida Goat Associations, and producers of other meat producing animals. Underrepresented population includes small and limited minority and ethnic producers.

Source of Federal Funds: Smith Lever

FL-SMP-273

Title: Florida Agricultural and Mechanical University (1890) StateWide Small Farm Programs

National Goals: 1, 3, 4 and 5

Key Themes: Adding Value to New and Old Agricultural Products, Agricultural Competitiveness, Agricultural Profitability, Animal Health, Animal Production Efficiency, Diversified/Alternative Agriculture, Innovative Farming Techniques, Managing Change in Agriculture, Niche Market, Organic Agriculture, Rangeland/Pasture Management, Small Farm Viability, Urban Gardening, Human Health, Human Nutrition, Medicinal Plants, Integrated Pest Management, Natural Resources Management, Sustainable Agriculture, Agricultural Financial Management, Jobs/Employment, Literacy

Situation/Program Rationale:

The majority of farms in the United States are small farms. The preliminary results of the 2002 Census of Agriculture suggested that:

Ninety percent (90%) of America's agricultural operations are still run by individuals or families and most are still small farms. The majority of operations (59%) had less than \$10,000 in sales of agricultural products in 2002. Thirty nine percent of farms have less than \$2500 in sales.

2002 Census of Agriculture preliminary results indicate that:

27.2 percent of agricultural producers were women in 2002; the number of women who were principal operators increased 12.6 percent from 1997.

Principal operators of Spanish, Hispanic, or Latino origin increased by 50.8 percent from 1997 to 2002.

Black principal operators increased by 8.8 percent and American Indian principal operators increased by 19.4 percent from 1997 to 2002.

As we enter the 21st century, a key issue within global agricultural research and development is the need to positively focus on small farmers, resource poor farmers and their families. Though small and resource poor farmers make up approximately 90% of the worlds farmers, traditionally, they have not had equal access and participation in programs and training designed to assist large producers and agribusiness. Agricultural research and extension has often sought out medium and large farmers, thought more successful, innovative, and readily able to adopt technology and contribute to growth and development. However, in light the challenges of world hunger and community food insecurity on global and national levels, agricultural research and extension development are focusing on incorporating the agricultural efforts of underserved farming populations.

Program Objectives:

To provide access to knowledge and decision making tools, relevant education and training, enhance sustainable agricultural production and management strategies/ viability and profitability

of enterprises, to provide collaborator/partner linkages between underserved farming population – university-and community collaborators; and enhance the quality of life of underserved farming populations.

The Florida A&M University College of Engineering Sciences, Technology and Agriculture StateWide Small Farm Programs uses a holistic, participatory, multidisciplinary, systems approach to provide relevant education opportunities, technical information, and hands-on training to underserved farming populations.

Summary of Programs for Clientele:

Held farmer participatory meetings and farm assessments.

Provided participant-oriented educational and hands-on training programs in organics and sustainable living: affordable greenhouse building and maintenance, transitioning livestock, pastured poultry, alternative marketing strategies, eating right, nutrition; farm worker capacity building meetings, etc.

Provided assistance in bridging community learning opportunities through hand-on community gardens.

Participatory-Curricula Development and integration of agriculture, engineering, etc. into schools (teachers, students); providing resources, education, training, linkages with University, community, and student recruitment opportunities.

Provided educational programs on muscadine production and market, new plants to try in 2003, propagation techniques, soils and fertility, turf grass maintenance, pesticide safety, forestry maintenance, poisonous plants, grant writing, alternative methods for parasite control, composting and recycling.

Summary of Impacts for Clientele:

Clientele participated in the following:

Leadership, planning and decision making, capacity building

Participant-oriented education and hands-on training programs

Education and training programs

Collaboration and program development with University, Agencies, and Community partners

Several farmers and urban gardeners have attended the hands-on workshops and built the affordable greenhouse – one person published her success in a local newspaper, others have telephoned their success stories.

Success Stories:

435 people attended Pesticide Applicator Training Programs; 85% passed

Provided technical assistance to 15 new blueberry producers

Home Fire Safety course attended by 350 people

Introductory gardening information was taught to 956 students

Facilitated the Buy Local Campaign meeting for 23 farmers

150 people attended the Growing and Marketing Muscadine Grapes Seminar

Published 30 farms and products on link-website

Four small farmers received local grant to help market produce

Farmer obtained help on alternative de-worming strategy

More than 250 students have participated in the FAMU Small Farm Programs Integrated Curricula Approach

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Targeted Audience:

Underserved small farm populations, farm workers and their families:
Linking University and Collaborative Partners

Source of Federal Funds: Smith Lever

FL-SMP-315

Title: Coastal and Marine Recreation and Waterway Management

National Goals: 4, 5

Key Themes: Endangered Species, Land Use, Natural Resources Management, Water Quality, Wetlands Restoration and Protection, Character/Ethics Education, Community Development, Leadership Training and Development, and Promoting Business Programs, Tourism.

Situation/Program Rationale:

Inland coastal waterways of the United States since 1960 have been transformed by recreational boating and fishing, and by accompanying tourist and residential uses. This transformation has been driven by technologic changes combined with rising income, increasing leisure time, and population growth and migration. While coastal population over the period has increased slightly above the overall U.S. growth rate, Florida's has increased 169 percent, from 4.8 to 15.9 million. Furthermore, recreational boats in the U.S. have more than doubled since 1973; today there are over 13 million. During the same period, the number of boats in Florida grew by 176 percent; today (2004) there are an estimated 920,000 registered vessels in the state. Thousands of miles of channels and basins have been dredged in Florida as by-products of coastal land development and are used as navigable waterways by recreational vessels.

Increasing use of these waterways and adjoining waterfronts has created competing and conflicting pressures between bay water users and waterfront users. The rapid pace of development has stressed the water and shore environments of the state. Maintaining a quality waterway environment, in the face of these pressures, is a principal concern of residents, elected officials and state and federal agencies charged with managing Florida's environmental and recreational resources. This situation requires a pro-active, bottom-up approach public education and community outreach, with Florida Sea Grant working directly with the regulators and those who are regulated, to accomplish the goal of allowing marine recreation in an environmentally acceptable way, without the implementation of reactive, top-down regulations which are both limiting and costly to everyone involved.

Program Objectives:

To prepare educational materials and implement education programs that will help the marine recreation industries (i.e., bait & tackle, scuba, surfing, marinas, marine attractions) function in an economically and environmentally sustainable way.

To provide support to existing education programs that will improve boating safety and promote boat operation ethics on Florida waterways.

To develop and disseminate boating and bay management guidelines and educational materials which foster stewardship, nature-based tourism, and resource sustainability through user-driven, non-regulatory management of waterways and recreational anchorages.

To provide to state and local decision-makers, planning models and management methods that are based on science-based information and that will provide for the maximum use of Florida's waterways by the public while sustaining environmental resources.

Summary of Programs for Clientele:

Programs that prepare educational materials and implement education programs to help marine

recreation industries (i.e., bait & tackle, scuba, surfing, marinas, marine attractions) function in an economically and environmentally sustainable way.

The Clean Marina and Boatyard Program: A voluntary program—involving Florida Sea Grant, the Florida Department of Environmental Protection, Marine Industries Associations, and the U.S. Coast Guard Auxiliary—that is designed to improve the quality of Florida's waterways and benefit our marina and boating industry; an industry that generates \$4 billion dollars annually in Florida. A marina or boatyard may be designated as "Clean" after undergoing a rigorous process that begins with a Clean Marina Workshop to introduce the program, subsequent work sessions to address proper procedures and best management practices and lastly, assessing the facility to determine if certification standards are met. Once certification is achieved, a designation ceremony is held by the facility and attended by Clean Marina Program partners, media representatives, community leaders, elected officials, and other honored guests. The marina and boating industry, through the Clean Boating Partnership, is active in maintaining and improving the water quality of Florida's marine and coastal areas.

Programs that provide support to existing education programs to improve boating safety and promote boat operation ethics on Florida waterways.

"A Boaters' Guide to Charlotte Harbor" (SGEB-52) was produced that included newly sanctioned manatee protection speed zones. The guide also identifies the locations of sensitive habitats, such as seagrass and marsh grass. The guide serves to better enable boaters to avoid manatees and use coastal waterways without causing environmental damage. More than 50,000 copies of the publication were distributed to fishermen, boaters, divers and other marine resource users.

Creating an Environmentally Sustainable and Emergency Prepared Marine Industry: A Hurricane Manual for boaters was developed with financial assistance (\$30,000) from Office of Emergency Management. Volunteers assisted in the distribution of over 15,000 copies to marine related facilities. The manual will serve as the basis for the development of an Emergency Disaster Preparedness DVD for Florida.

Programs to develop and disseminate boating and bay management guidelines and educational materials which foster stewardship, nature-based tourism, and resource sustainability through user-driven, non-regulatory management of waterways and recreational anchorages.

The Southeast Florida Coral Reef Initiative: The U.S. Coral Reef Task Force is developing Local Action Strategy Plans (LAS) with states that manage coral reefs in order to strengthen government coordination and more fully engage partners at the state and local levels. In Florida, this partnership initiative is known as the Southeast Florida Action Strategy Team (SEFAST) and it is targeting its efforts on the reefs that extend up the southeast coast through Miami-Dade, Broward, Palm Beach, and Martin counties. Efforts will focus on: 1) land based sources of pollution; 2) physical impacts from maritime industry and coastal construction; 3) fishing, diving, and other uses; and 4) awareness and appreciation. Target audiences include boaters, fishers, divers and marine-related businesses.

Programs to provide to state and local decision-makers, planning models and management methods that are based on science-based information and that will provide for the maximum use of Florida's waterways by the public while sustaining environmental resources.

Improving the Utility of the Vessel Title Registration System to Characterize Florida's Boating Population: Efforts to characterize the boating population, boat-use patterns, and boat locations in Florida have relied on expensive, time-consuming survey methods that include aerial surveys, mail and telephone surveys, and on-the-water censuses by GPS-equipped field crews. Technological advances now allow for the integration of information contained in non-spatial databases (e.g., boat type, length, model, address) such as the state mandated Vessel Title Registration System (VTRS), with spatial data (e.g., parcel boundaries). The study determines the reliability of VTRS information to provide accurate boat locations and characteristics. Project outcomes include recommendations for optimizing data collection, so that the VTRS can be a

reliable and cost-effective source of spatially-based boating information that will enhance the ability to make wise waterway and resource management decisions.

A New State Rule: Noticed General Permit for Maintenance Dredging of Public Waterways—

Coastal counties face a planning dilemma: how to balance phenomenal growth of the boating population with conservation and management of estuarine resources. Demographic forecasters indicate that foreseeable population growth predictions for Florida remain high, while a preference for coastal living prevails in the state. Growth leads to a decline in the quality of natural environments and to marine resources that are used beyond their capacity for renewal. The Florida Sea Grant Regional Waterway Management System provides counties with a planning tool and decision options to prioritize and evaluate management alternatives on a regional scale, while balancing waterway use and resource conservation. The State of Florida, with the guidance of Florida Sea Grant, is developing a new administrative rule for dredging public waterways in Lee County under the authorization of a general permit. The rule will apply to traffiched with high priority maintenance dredging needs as identified in three Florida Sea Grant (FSG) applications of the Regional Waterway Management System.

A Coastal Data Server System For the Gulf Intracoastal Waterway and Adjoining Bay Waters of Southwest Florida: During more than a decade of projects involving southwest Florida coastal waters, the Florida Sea Grant (FSG) office for Boating and Waterway Management has created and acquired a substantial amount of spatial data. These data, which have been archived upon completion of each project, include historical and modern aerial photography; scanned historic hydrographic and topographic maps and bathymetry interpreted from them; and depths, sea grass extent, and bottom characteristics in 16 popular recreational vessel anchorages. Data are paper-based (e.g., the aerial photographs), digital (GIS files or imagery), or both. This project makes this coastal data available on-line, through the UF Map & Imagery Library, using standard documentation formats and search technologies.

A Recreational Boating Characterization for Tampa and Sarasota Bays: The preferences, activities, and use-patterns of Tampa Bay and Sarasota Bay boater populations were characterized based on a map-based questionnaire mailed to a random sample of 6800 area boaters. Over 2000 questionnaire recipients marked the start and end point of their last two recreational boating trips, traced their travel routes, identified their favorite boating destinations, and the primary activities that they engaged in while at a particular destination. Data collected from returned surveys was digitized into a geographic information system to be used for resource management and planning applications, and as the basis for developing map-based products intended to improve boating experiences and instill resource stewardship.

Using Archived Maps and Charts to Determine Historical Distribution of Oyster Reef Habitat:

The project was in response to a request by the Sarasota Bay National Estuary Program (SBNEP) Technical Advisory Committee for information to assist in development of an oyster reef habitat restoration plan. Archived cartographic resources and modern GIS technology were used to produce a 120 year historical picture of the evolution of oyster reef habitats in Little Sarasota Bay. Project results are to be used in planning oyster reef habitat restoration work in Little Sarasota Bay and to initiate regional waterway management activities in the Tampa Bay area. The UF/IFAS Marine Extension program is developing technical information and extension programming for Tampa Bay similar to the work conducted in southwest Florida.

Summary of Impacts for Clientele:

Clean Marina Program

43 workshops were conducted with over 400 contacts attending

20 marinas signed pledges to continue in the program

17 marinas and boatyards were designated as 'Clean'

600,000+ pounds of glass, 1.5 million pounds of paper, 3.7 million pounds of aluminum, 5.6 million gallons of oil, and over 1 million gallons of antifreeze were either recycled or properly handled, thus keeping this material from entering the waters of the state

An active bilge sock distribution project provides socks to individual boaters that pledge to do their part as a Clean Boater. Each sock absorbs 2.5 quarts of oil and grease resulting in over 13,500 gallons of material prevented from entering the waterway when all socks are distributed and deployed

Boating Guides and Boater Education

50,000+ copies of "A Boater's Guide to Charlotte Harbor" were distributed to fishermen, boaters, divers, and other marine resource users

15,000 copies of 17-page Hurricane Manual for Boaters distributed

Exhibits, presentations, and workshops informed boaters about clean boater habits, hurricane preparedness, and manatee avoidance

The Southeast Florida Coral Reef Initiative

The Southeast Florida Action Strategy Team (SEFAST) formed in May 2003, and then developed a Local Action Strategy for the state of Florida by October 2003; the plan was presented by Deputy Secretary of the State Bob Ballard at the annual United States Coral Reef Task Force meeting in Guam

The plan's implementation phase has begun and includes projects/programs to increase coral reef awareness and appreciation (i.e., education) over a 3-year time period

Regional cooperation has been established with agencies, organizations, and marine recreational industries in the U.S., Puerto Rico, and the Virgin Isles to address human dimensions of coral reef resource management and identify issues of concern

A New State Rule: Noticed General Permit for Maintenance Dredging of Public Waterways

Development of state policy based on "best available science", including a geographic analysis of boat access problems and waterway restrictions; and recommended solutions

Regional waterway management system/GIS training for the Environmental Administrator, Aquatic Preserve managers, environmental specialists, and biologists from the Florida Department of Environmental Protection (FDEP)

Delivered to the FDEP a geographic information system containing a comprehensive inventory of marine resources and boating infrastructure related to waterway management in southwest Florida

Better efficiency and effectiveness in dredging and waterway maintenance

Saving in real dollars and staff time.

Better public policy.

A Coastal Data Server System For the Gulf Intracoastal Waterway and Adjoining Bay Waters of Southwest Florida:

The following elements have been digitized and delivered to the UF Map & Imagery Library to be served on the Web:

661 historic aerial photographs of SW Florida were georeferenced and rectified; 444 of these to be used in a Geographic Information System (GIS);

66 hydrographic "smooth sheets"; 51 topographic "smooth sheets," were digitized, of which 18 were georeferenced and rectified;

22 US Army Corps of Engineers survey report maps

Using Archived Maps and Charts to Determine Historical Distribution of Oyster Reef Habitat

Produced technical information (GIS data layers) on historical oyster reef distribution that provides a basis for planning an oyster habitat restoration program for Little Sarasota Bay

Chaired meetings of the Sarasota Bay National Estuary Program (SBNEP) Habitat Restoration Subcommittee to develop oyster restoration plan for Little Sarasota Bay—Experimental oyster reefs targeted for construction in 2004

Presented results (presentations and poster exhibits) of historical analysis of oyster reef distribution at regional and local technical conferences and advisory committees—National Estuary Program Submerged Habitat Restoration Conference, Tampa Bay Area Scientific Information Symposium (BASIS), SBNEP Technical Advisory Committee, SBNEP Habitat Restoration Subcommittees, Manatee County Marine Extension Advisory Committee
350 scientists, resource managers, and agency staff increased their knowledge of cartographic and GIS resources that can be directly used in planning oyster reef habitat restoration projects and waterway management

Developed a workshop "Using Science to Manage Florida's Waterways," hosted by the Tampa Bay Estuary Program. Participants (22) included resource managers from local governments surrounding the bay (Pinellas, Hillsborough, Sarasota and Lee counties, Tampa, St. Petersburg, Tampa Port Authority, FDEP, and US Army Corps of Engineers)

Program activities led to discussions that indicate significant potential for the UF/IFAS Sea Grant Waterway Management Program to work with local governments in the Tampa Bay Area; work would include a comprehensive survey of waterways and boating traffic patterns

Success Stories:

Clean Marina Program: The Clean Boating Partnership received a first place Gulf Guardian Award in the Partnership category at the Southern States Environmental Conference and Exhibition in Mississippi. The Gulf Guardian Awards are presented to recognize businesses, community groups, individuals, and agencies that are taking positive steps to keep the Gulf healthy, beautiful, and productive. This national award recognizes the importance of the Clean Boating Partnership (CBP) and the Clean Marina/Clean Boatyard Programs in which several Florida Sea Grant Marine Agents are heavily involved. The Florida CBP has assisted more than 79 marinas and 12 boatyards to achieve the environmentally friendly designation of clean facilities. Another 130 facilities are currently working toward designation. The Florida Clean Boating Partnership is the original clean marina program in the nation, and has served as a model for other states that have since initiated similar programs.

Southeast Florida Coral Reef Initiative: The Florida Keys draws international interest and research as the home of the third largest coral reef tract in the world. Anecdotal evidence suggests that the health of the reef and its associated biological community in this area is declining. In response to this situation, the United States Coral Reef Task Force partnered with Florida Sea Grant and several interagency marine resource professionals (state, regional, local and federal) to develop local action strategies to address key threats to the reef. The Southeast Florida Action Strategy Team (SEFAST) was formed in May 2003 and by October 2003 it developed a draft of Local Action Strategy for the state of Florida, which was presented by Deputy Secretary of the State Bob Ballard at the annual United States Coral Reef Task Force meeting in Guam. The plan is in the implementation phase, with education as the primary, current focus.

A New State Rule: Noticed General Permit for Maintenance Dredging of Public Waterways: The Lee County Division of Natural Resources uses, on a daily basis, the Florida Sea Grant Regional Waterway Management System and the accompanying geographic information data sets to prioritize their management activities, the siting of waterway signs, and planning for maintenance dredging in an ecologically sensitive and cost-effective manner. The State of Florida, with the guidance of Florida Sea Grant, is developing a new administrative rule for dredging public waterways in Lee County under the authorization of a general permit. The rule will apply to trafficsheds with high priority maintenance dredging needs as identified in three Florida Sea Grant (FSG) applications of the Regional Waterway Management System. The rule will explicitly state that environmental restoration or enhancement projects must comply with the science-based procedures and methods of the FSG Regional Waterway Management System

(RWMS) outlined in the three FSG technical documents listed above. The general permit will result in savings in real dollars and staff time.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Use of mass media advertising, working with marine industries in minority neighborhoods, and attending special events leads to parity in the delivery of most programs.

Source of Federal Funds: Smith Lever

FL-SMP-316

Title: Florida's Coastal Environment and Water Quality

National Goals: 4

Key Themes: Recycling, Water Quality, and Wetlands Restoration and Protection

Situation/Program Rationale:

Florida's estuaries deserve our care and concern. They are among the most extensive, diverse and productive areas in the state, and the adjacent real estate is where most Floridians choose to live. If we want the benefits we derive from our coasts and estuaries to continue, then we all must act as knowledgeable and concerned stewards.

Florida has a longer coastline than all the other Atlantic states from Georgia to New England. Because the coast covers six degrees of latitude, Florida's coastal and estuarine systems are highly diverse. These bodies of water-where fresh water from the land meets the salt water of the sea-range from the temperate systems in Pensacola Bay and the lower St. Johns River to the subtropical systems in Biscayne Bay and Charlotte Harbor. These differences warrant targeted approaches to research, management, outreach, and communications that translate generic information to local applications.

Florida's estuaries and coasts produce millions of dollars in fisheries and wildlife resources, buffer coastal areas from storms, absorb pollutants, and provide amenities for coastal settlement, trade and tourism. Over 75% of Florida's population lives in its 35 coastal counties. Sea trout, redfish, oysters and blue crabs exemplify the 80-90% of commercial and recreational fishery species that spend at least part of their life cycle in estuaries or near the coast. Hundreds of thousands of acres of seagrass meadows, salt marsh grasses and mangrove forests are critical habitats for these and other species. The environmental quality that underpins all of this ecological and economic productivity is under increasing threat from a wide range of human activities.

Many of the obvious impacts on coasts and estuaries are being managed more effectively. For example, outright destruction by dredging and reclamation has largely stopped, and point source inputs, such as sewage and industrial discharges, are being reduced or eliminated. However, the sheer numbers of people living in Florida increase potentially damaging inputs that enter coastal waters via watersheds and non-point sources (e.g. runoff). These diffuse inputs are harder to manage, in part because they involve the actions of numerous, individual citizens including those that live far from the coast. For example, household pesticide use is one factor that leads to five of Florida's estuaries being among the ten U.S. estuaries most threatened by pesticides. In addition, historical losses of 50% of the salt marsh, 60% of the seagrass and 85% of the mangroves in some of Florida's estuaries need to be repaired.

Successful approaches to these issues will require both innovative work facilitated by the FL316 Design Team and improved coordination with other state major programs. Some key collaborations will be with FL412 Florida's Comprehensive Water Quality Program, FL114

Environmental Landscape Management in Florida, FL317 Florida's Sustainable Marine Fisheries, FL315 Coastal and Marine Recreation/Tourism and Waterway Management in Florida, and FL420 Conserving Natural Resources in Florida's Urban and Suburbanizing Landscape.

Program Objectives:

To sustain or enhance Florida coastal and estuarine water quality, habitat quality, sustainable commercial use and sustainable recreational use by increasing knowledge of coastal ecology and by motivating citizens, professionals, and agency personnel to take actions that reduce impacts on these valuable resources.

Summary of Programs for Clientele:

Marine debris

The objectives of this program are to raise awareness and understanding of damage from marine debris, and then involve volunteers in stewardship activities. Volunteers were recruited by giving information and presentations on the problems caused by marine debris, including monofilament fishing line. Along with county faculty, volunteers collected debris on clean-up days and created, placed and managed recycling bins for monofilament line.

In 2003, county faculty:

gave presentations to over 1,500 people

distributed or displayed information at 7 events that were attended by over 400,000 people

gave newspaper, radio and television interviews that could reach over 1,000,000 people

provided information directly to over 150 clients

Restoration

The objectives of this program are to raise awareness and understanding of the need for restoration of natural habitats, and then involve volunteers in stewardship activities. Volunteers were recruited by giving information and presentations. Along with county faculty, volunteers revegetated disturbed areas.

In 2003, county faculty:

gave presentations to community groups

gave radio interviews

trained volunteers

Invasive species

The objectives of this program are to raise awareness and understanding of the problems caused by non-native species. Interested clientele are trained to recognize likely non-native species in their area, and volunteers help remove non-native species.

In 2003, county faculty:

gave presentations to community groups

gave radio interviews

trained volunteers to recognize non-native species

Summary of Impacts for Clientele:

Debris

In 2003, extension faculty: recruited over 500 volunteers who collected over 8,000 pounds of trash distributed over 100 "Don't Splash Your Trash" buckets that area used by 77% of those who received them established dozens of monofilament recycling points and collected over 1,300 pounds of discarded fishing line, which equates to about 78 miles of line

Restoration

In 2003, extension faculty: gave presentations and training that increased the knowledge of clientele planted over 13,000 native plants during restoration efforts

Invasive species

In 2003, extension faculty: gave presentations and training that increased the knowledge of clientele by 20% promulgated information about invasive species on the radio removed acres of invasive plants

Success Stories:

Debris

Monofilament recycling spread rapidly throughout Florida in 2003. Recycling locations in nineteen counties are currently listed at www.fishinglinerecycling.org, and there are outdoor recycling stations in at least seven other counties. In September 2003, "New Florida," which airs on PBS television stations around the state, ran the segment on monofilament recycling, which was produced by IFAS in 2001. Florida's Clean Boating Partnership included monofilament recycling as one of the features that can earn marinas points towards the Clean Marina designation. Additionally, they budgeted money to have 100 monofilament recycling stations built and distributed to marinas participating in the program. The FFWCC included an article on monofilament recycling in its July 2003 Recreational Saltwater Fishing Regulations, and 820,000 copies of this publication were distributed. The recycling program continues to spread nationally, and even internationally, as groups in Bermuda, Puerto Rico and Portugal are starting monofilament recycling efforts.

Boca Grande Pass Clean-Up event removed 7500 pounds of debris from the bottom. This two-day event had 43 divers who amassed 121 dives without any injuries. This was a collaborative effort of Florida Marine Patrol, Lee County Sheriff's Office, Lee County Emergency Management Services, Miller's Marina, Florida Guides Association, Fantasea Scuba, Florida Marine Research Institute, Mote Marine Laboratory, Keep Lee County Beautiful Inc., and Florida Sea Grant. The Lee County Sheriff's Department Dive Team has made this a part of their mandatory training program. This effort received an award of accomplishment from Keep Florida Beautiful Inc. Eleven media outlets covered this clean-up event (7 newspapers and 4 television stations).

Restoration

The majority of one site in Project Greenshores was completed in Pensacola Bay. Oysters began to develop on the rock-based reef that provides wave attenuation for the coastal salt marsh. Emergent grasses planted during 2002 and 2003 continue to grow and provide new habitat. Bird diversity at the project site has more than doubled to 44 species of interest. Thousands of children and adults have visited the site on educational tours. This \$2 million public-private partnership to restore marine habitat in Pensacola Bay received national recognition via a Coastal America Partnership Award, which recognizes outstanding partnerships that restore and protect the nation's coastal environment.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Use of mass media advertising, working with marine industries in minority neighborhoods, and attending special events leads to parity in the delivery of most programs.

Source of Federal Funds: Smith Lever

FL-SMP-317

Title: Sustainable Marine Fisheries in Florida

National Goals: 1,4, 5

Key Themes: natural resources management

Situation/Program Rationale:

The commercial and recreational fishing industries represent important components of the Florida economy. The commercial fishery contributes about \$150 million in dockside value annually. Florida ranks sixth among all states in terms of the dockside value of commercial fishery landings. There are about 18,000 commercial fishermen in Florida who employ approximately 11,000 craft involved in commercial fishing in Florida. The commercial seafood processing industry generates products valued at about \$500 million annually. These products, which are comprised of imported and Florida-caught finfish and shellfish, are processed and directed into wholesale and retail markets located in Florida and elsewhere by approximately 450 processing and wholesale plants which employ about 5,000 people. There are also about 5,000 seafood retail establishments in Florida. Seafood is the single most valuable food commodity imported into Florida. The saltwater recreational fishery involves about 3 million anglers each year who expend up to \$1.2 billion annually. This industry creates total economic activities valued at approximately \$4 billion and provides jobs to 35,500 persons. More individual fish are caught recreationally in Florida than in any other state in the Gulf of Mexico and South Atlantic region. In addition, there are about 400 permitted artificial reef sites in Florida, which represents about 50 percent of the total number of permitted reefs in the nation. These artificial habitats further enhance the benefits associated with saltwater recreational fishing in Florida.

Numerous problematic issues confront fishery managers in Florida. Allocation of fishery resources by management agencies, including attempts at resolution of conflict, is an extremely contentious issue. Many of Florida's marine fishery resources are managed as common property resources. As the various user groups have increased in number, economic power, and political presence, disparate perceptions of highest and best use has resulted. Limited access management programs are possible tools for reducing and controlling excess fishing capacity which currently exists in the commercial fleets. In addition, methods to reduce release mortality are becoming more important as the recreational catch increases. The multispecies nature of both the commercial and recreational fisheries creates the need to depart from the traditional fishery management methods that focus on a single species. However, unintended effects must be anticipated. And, as management begins to achieve its stated objectives, methods to implement adaptive management strategies should be introduced to both commercial and recreational users. Effective management requires a better understanding of not only biological and economic factors, but social elements as well. The preference and acceptability of management options must be explored to provide the greatest likelihood of compliance. Thus, user group involvement in the management process is vitally important.

The Florida Sea Grant Program and the Food and Resource Economics Department at the University of Florida can play a role in addressing these and other issues related to the sustainable use of Florida's marine fishery resources by both commercial and recreational user groups, such as commercial fishermen, recreational fishermen, marine resource advocacy groups, seafood industry leaders, and regulatory agencies. Findings from applied research can be provided to interested user groups and regulatory agencies via a variety of educational programs.

Program Objectives:

To increase commercial and recreational user group awareness, understanding, and utilization of marine fisheries resource conservation and management principles and processes.
To increase user group participation and involvement in the formulation and development of effective marine fisheries management policies within the state and federal management process.
To increase state and federal regulatory agency awareness of the role of economics in the effective management of marine fishery resources.

Summary of Programs for Clientele:

With support from the design team and the Florida Sea Grant Marine Advisory Program, county faculty conducted educational activities in 36 coastal counties that addressed a wide range of topics including: fisheries management, the use of venting tools and other methods to reduce recreational release mortality of recreational caught fish, artificial reefs, stock enhancement of native finfish and shellfish species, recreational fishing tournaments, and participation in state and federal fisheries management advisory positions. Contact was achieved through numerous workshops, personal meetings, extension publications, county newsletters, radio/TV appearances, fishing club meetings, and telephone contact.

Summary of Impacts for Clientele:

Blue Crab Workshop Series: The FWC will utilize the findings of this workshop series to guide discussions during a late 2003 series of public hearings designed to produce an effective fishery management plan for the Florida blue crab fishery. FWC has already distributed excerpts from the project final report to industry participants in preparation for the public hearing process. The resulting blue crab management plan will replace a series of permit moratoria that expire in 2005. Design Team efforts will have made direct impact in helping focus the needs of management and ensuring that perspectives of industry participants are included in the management process

Scallop Re-Stocking Efforts: The seed stocking efforts have been recognized by FMRI as playing a key role in the recovery of the bay scallop stocks in the Crystal River / Homosassa region. The recreational season was restored in 2002. The Design Team, along with the Citrus County Tourism Development Council, will conduct a survey of local businesses following the current (2003) recreational season to determine the economic impact of the renewed harvest activities. Anecdotal evidence and unsolicited reports from local restaurants, hotels, marinas, and related businesses have already suggested that the impact to the Citrus County economy alone is in the millions of dollars. The Design Team's efforts have helped marine resource managers better manage the bay scallop resource such that community impacts are incorporated into future decisions regarding the utilization of the bay scallop resource.

Venting Tool Program: A 2002 survey conducted by the Design Team indicated over two-thirds of Floridians who were provided a venting tool have used it. And of those, almost 90% would be willing to purchase another tool if necessary. The survey provided additional important market-related information that will allow the Design Team to transfer the technology to a private tackle manufacturer for the future construction and marketing of the venting tool. The venting tool project and related efforts demonstrate the effectiveness of the Design Team concept in connecting research, educational programs, and clientele groups in a manner that better ensures the sustainable use of Florida's marine fisheries resources.

Artificial Reef Efforts: The highly successful workshop series has been attended by virtually every one of the county and state artificial reef coordinators in Florida. The partnership between the Design Team and state/local artificial reef managers has been extremely productive. For example, since 2000 the Design Team has assisted in the procurement of permits or assisted in construction of 17 new artificial reef sites, helped local program coordinators develop proposals that have been successful in obtaining \$169,000 in funds for the acquisition/staging/placement of reef materials, and assisted in the placement of approximately 3,500 reef modules and/or reef balls at near-shore reef sites. This effort is an example of success in actively transferring the science of artificial reef development to county and state agencies responsible for citing, placement, and monitoring of artificial reefs under the auspices of the Florida Artificial Reef Program.

Sponge Biomass Project: The findings of this on-going effort have been recognized by the FWC as the primary data currently being used to observe the recovery of the sponge population in the region for managing the commercial sponge fishery in a sustainable manner. This work has provided a basis for evaluating changes in hard-bottom communities resulting from the

deterioration of the Florida Bay ecosystem and has provided unprecedented quantitative data for modeling trophic pathways in the Florida Bay Ecosystem. Without these data it is highly likely that a traditional fishery, spanning 120 years and currently sustaining approximately 150 sponge harvesters, would have been eliminated in 2000 due to false perceptions which linked sponge scarcity with commercial harvest activities. This work is a powerful example of how the Design Team concept can deliver important science-based resource management information in a cost-effective and timely manner to local and statewide decision makers.

Fishery Management Interaction: Direct involvement with the GMFMC, SAFMC, and NMFS stock assessment activities was instrumental in determining that the king mackerel (2001), red grouper (2002), and yellowtail snapper (2003) fisheries in Florida are not over-fished. This was accomplished by leading educational efforts with the commercial fishing industry and fishery regulators to provide a non-transferable snapper and grouper permit for part-time fishermen. As a result, the Councils and NMFS were convinced to reopen the snapper and grouper limited access application process in 2000 to accommodate Hispanic fishermen that were procedurally excluded. The Councils were also convinced to allow commercial fishermen in the Florida Keys region to qualify for a limited access permit with either Gulf of Mexico or South Atlantic landings due to confusion associated with the landings reporting system. The Design Team also led educational efforts that were successful in establishing area sub-quotas for king mackerel to protect historical allocations during the stock recovery period. These sub-quotas prevented one user group from catching so much of the overall quota that another user group could be excluded from fishing that particular year. As a result, the Councils have invited a Design Team member to participate in several ad-hoc working groups to develop over-fishing criteria for several southeastern US fisheries stocks. These efforts are examples of how the Design Team has played established a strong working relationship with federal fishery management agencies in the region and provided direct assistance in the management process.

Spiny Lobster Management Effort: The 2001 Workshop led to the use of federal hurricane disaster funds to develop and implement a study of the social and economic impacts of the Florida Spiny Lobster Trap reduction program. This study, which is on-going, is assessing how individual spiny lobster-harvesting firms and families in the Florida Keys have been impacted by management. FWC has indicated that the findings of the study will be vital in the future implementation of the trap reduction program. The 2003 Workshop was regarded as a success by those attending. About 85 percent of the attendees who completed an evaluation rated the workshop highly and indicated similar workshops on other fishery issues should be held. Almost 75 percent of attending fishers said they learned information useful to their fishing business, while 80 percent of all attendees felt the workshop was useful in identifying future research needs. The workshop was successful in developing a discussion between researchers and fishers about the current state of knowledge about lobsters, identifying research data needs, and increasing collaboration between researchers and fishers. The information generated by the workshop will be a helpful guide to funding agencies in evaluating lobster research proposals. Increased collaborations derived from the workshop will lead to improved research and acceptability by industry. The findings of the marine reserve project suggest that the average size and abundance of lobsters within the reserve are consistently greater than the adjacent fished areas. Some evidence of spillover from the reserve to the adjacent fishery is also evident. This project had the direct involvement of local commercial spiny lobster fishers. These efforts show the effectiveness of the Design Team leadership in assisting in developing effective fishery management decisions at a very local level.

Success Stories:

The venting tool developed as a result of the FL317 program has now been accepted for commercial production by a fishing gear manufacturer in Florida. The University of Florida has officially allowed the transfer of the technology to this firm for commercial production purposes.

This will allow the use of venting tools to become even more widespread and visible, thereby assisting in the achievement of fishery management objectives.

The Gulf and Caribbean Institute (GCFI) is a uniquely diverse professional organization because it is comprised of fisheries scientists from academia, policy makers from government, and fishermen and other commercial interests. Additionally, these are individuals who are long-term members of the Institute, usually have a background in at least one of the areas described (i.e. academic research, fisheries management policy, private sector), and have an historical sense of trends in fisheries throughout the Caribbean region. Each year the Gulf and Caribbean Institute convenes a special session dedicated to high priority topics. This agent, in collaboration with colleagues of the Gulf and Caribbean Fisheries Institute, received over \$20,000 in grants and donations to support program development, publication of the GCFI Proceedings and other scientific publications, travel support for scientists from developing countries to attend the GCFI, and four student scholarships.

More than 6500 venting tools have been purchased with grant and Sea Grant dollars. Nearly 5000 have been distributed and the fishermen trained in their use through a brochure, video or personal instruction. Articles about the venting tool have appeared in Saltwater Sportsman Magazine, Florida Sportsman Magazine and was aired on the Wishin' I Was Fishin' television show. Recently, the marine agent completed an invention disclosure form with the UF Office of Technology Licensing and a potential manufacturer was located to manufacture produce the tool for distribution to fishermen. In addition to success with venting tools, fish mortality has been reduced in Charlotte County and SW Florida through a series of educational efforts that include teaching fishermen to use circle hooks, venting tools, recirculation tanks and numerous other techniques to release fish in the best condition possible condition.

The Keys National Marine Sanctuary Program urgently requested that the Florida Sea Grant Marine Extension Program present all relevant available information on the sponge fishery and results of past work so that the Sanctuary Program could make recommendations based on sound, unbiased technical information. As a result of

information provided to the Sanctuary Program, the Sanctuary Program recommended the following management measures to the Florida Wildlife Commission: 1) establish restricted species endorsement for sponge harvesters, and 2) modify the definition of minimum legal size. During the past year the Florida Wildlife Commission accepted

our management measures, presented to them by the Sanctuary Program: 1) FWC established a restricted species endorsement for sponge harvesters and, 2) set a 5" size limit for sponges-measured cross wise across the top of the sponge. During the past ten years the value of the sponge fishery has ranged from \$1,000,000 to \$4,000,000

dollars and has provided employment for 150-200 harvesters, many of which are Hispanic with few opportunities for alternative employment in the fisheries industry. Without sound technical information to have decisions on, it is highly likely that this traditional fishery (dating back to the 1850's) would have been eliminated based on false

perceptions.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. The demographic characteristics of the commercial fishing industry in South Florida indicates the most of the participants are of Anglo and Hispanic origin. Some of the materials and brochures developed under the auspices of FL317 are printed in both English and Spanish. These are particularly useful in South Florida, where a number of recent Cuban and Haitian immigrants are employed. Circle hook brochures are printed English and Spanish and were distributed to female anglers and minorities at boating shows, fishing tournament, and workshops. Parity has been reached by advertising programs through mass

media to reach potential minority recipients. The Gulf and Caribbean Fisheries Institute is a multi-national organization of fisheries professionals throughout the Caribbean, the US states bordering the Gulf of Mexico, and the Atlantic continental countries of Central and South America. The GCFI membership and the attendees to the annual Institutes reflect a broad range of ethnic backgrounds. Outreach to minorities, particularly to the hispanic fishermen which are the primary minority group in the local fisheries, included visits to hispanic docks for individual contact, meeting notices placed at the docks, use of intermediaries (such as bilingual fishermen and fish house employees), newspaper articles, and radio presentations. A special effort was made to accommodate Spanish speaking fishermen at the Keys Lobster Workshop by hiring a company to provide simultaneous translation of the workshop at a cost of \$3500. Although extensive pre-workshop efforts to advertise to and solicit interest from hispanic fishermen were made, only 4 hispanic fishermen attended. Outreach to Minorities: Outreach to minorities is limited in Charlotte County due to the low number of minority residents in the County and the nature of the marine habitat enhancement program. Most of the minority contact comes in the form of presentations to user groups, school programs and an occasional consultation with seasonal waterfront homeowners. Less than 5% of the Charlotte County population is minority (black 4% and 1% hispanic). Female contact percentages are higher and parity is achieved because of presentations, school programs, use of public media and group participation. Parity has been achieved and no special activities are needed.

Source of Federal Funds: Smith Lever

FL-SMP-411

Title: Florida Water Conservation

National Goals: 1, 4

Key Themes: Agricultural Profitability, Home Lawn and Gardening, Innovative Farming Techniques, Ornamental/Green Agriculture, Tropical Agriculture, Natural Resource Management, Drought Prevention and Mitigation, Water quality

Situation/Program Rationale:

The increase of water use efficiently in various sectors in Florida will assure more sustainable development of the state. The shifting of water use from one sector to the other may be necessary in the future. The efficient use can assure that agricultural sector can coexist with growing urban sector without destruction of wetlands and other natural ecosystems in Florida.

Program Objectives:

To increase water use efficiency and reduce water consumption while maintaining adequate and sustainable water supplies for urban and agricultural users in Florida. The emphasis of this major program is on promoting the most efficient water use in agriculture, landscape, and urban settings. The program is directed towards urban and agricultural audiences. The rationale is that efficient water use in one sector may increase water availability for other sectors without increasing the total amounts presently used.

Summary of Programs for Clientele:

WATER CONSERVATION IN AGRICULTURAL PRODUCTION

Water and Fertilizer Management in Vegetable Production

In Manatee County the agent made over 55 farm visits during which water or fertilization topics were discussed and/or educational material was distributed. Examples of topics discussed include irrigation run times, leaching and supplemental fertilization calculations, BMPs, drip irrigation water movement, fully enclosed irrigation design and scheduling, controlled release fertilizers,

foliar fertilization, etc.. Bi-monthly vegetable newsletters were published and distributed to 485 recipients in Manatee County. The agent conducted 72 soluble salt and/or pH tests on soil samples. Some samples were to confirm salt injury problems or to monitor salt levels in the bed as a way to fine-tune water and fertigation scheduling with growers attempting to reduce in bed fertilizer levels. Some were in response to leaching problems from heavy August rains. A survey of Manatee County seep irrigated fields/growers to gather background information in order to guide research/demonstrations on BMP related fertilization projects was conducted. Field days were organized throughout the state to demonstrate: the use of crop coefficients and PET data (FAWN system) in irrigation scheduling; use of 12 soil moisture measurement devices for irrigation scheduling, use of water and fertilizer management strategies. Dye tests were used to demonstrate the water movement under various drip irrigation management schemes. These dye tests are instrumental in improving the irrigation recommendations, especially in determining the greatest amount of water to be applied in a single irrigation event before leaching below the root zone may occur. In addition, side-by-side testing of different drip tapes was demonstrated. The optimal dripper spacing is 8 to 12 inches, with 12 inches preferred.

• Water Use and Conservation in So. Miami Dade agriculture

Following programs were conducted in South Florida in support of water conservation in agriculture. A Field day: alternative tomato production system to meet current challenges, Pine Island Farms, Miami (1.5 hrs), March 26, 2003.-"Better" Management Practices (BMP's) for water management, Miami-Dade Cooperative Extension Office (2 hrs), June 30, 2003.- Workshop: update in Soil Moisture Monitoring for Irrigation Scheduling in Tropical Fruit Groves, UF-IFAS TREC-Homestead (2 hrs.), July 8, 2003.-Workshop: Miami-Dade County Conserve Water: The Challenges Ahead: 2002 Water Conservation Survey Results, Miami-Dade Cooperative Extension Office (2 hrs), July 22, 2003.-The South Florida Drip Irrigation School: Managing Water and Nutrients in Vegetable Production, Miami-Dade Cooperative Extension Office (2 presentations, 1 hr.), August 21, 2003.-Several support educational materials have been produced: 5 UF/IFAS Extension fact-sheets (4 published/in review, 1 in preparation), newsletter articles, one refereed journal paper (in preparation), and conference proceedings.

Technology Adoption for Irrigation and Nutrient Management

The Second South Florida Drip Irrigation School in Miami-Dade County was again a great success. A 50 page handbook was reated, including a pre-and post-test. Each participant received a "Certificate of accomplishment". 4.5 CEUs

(Continuing Educational Units) for holders of the Pesticide Applicator Licenses were requested by the agent and granted by the Pesticide Certification Office. Total number of participants: 78 One acre field demonstration of performance of drip tapes in the calcareous soils was established by the agent at the UF TREC. The blue dye was injected die to demonstrate wetting patterns for different drip tapes. our tomato growers representing 80% of tomato acreage in Miami-Dade County were able to evaluate wetting atterns for different drip tapes. (8 participants, 8 teaching contact hours).

Servicing of tensiometers for growers provides cleaning and repair service , calibration with the vacuum calibration chamber and installation of tensiometers for vegetable, fruit and ornamental growers. Growers interested in testing tensiometers before purchasing them can borrow instruments from the agent for four weeks to become familiar with the use and interpretation of readings for scheduling irrigation. 51 tensiometers were tested, 40 cleaned, and 56 were installed in the tropical fruit groves and vegetable fields. This represents about 196 acres. 26 people received on-on one instructions on use, service, installation and interpretation of readings. (26 person/teaching hours).

Water Use Conservation Survey. The questionnaire was sent to about 600 ornamental nurseries, tropical fruit growers, vegetable growers and golf courses. Survey contained questions about water management and conservation practices, knowledge and competencies concerning irrigation practices and environmental attitudes. The results were tabulated and presented at grower meetings and scientific conferences.

- **Tropical Fruit Culture and Management**

Six programs addressing Fertilizer/irrigation management were delivered to 446 participants in Miami-Dade County and owners in the C139 basin) to discuss the water and nutrient BMPs needed for C139 basin vegetable growers.

- **Water and nutrient management for citrus production in Southwest Florida**

The water supply quantity educational activities for the 2003 consisted of visiting citrus and vegetable growers to discuss the current water management practices, organizing meetings with grove managers to discuss the scenarios for reducing the leakage from the reservoirs for storing water for irrigation and its impact on the citrus production, discussing the results with vegetable growers in SW Florida who have impoundments to obtain their feedback.

Best Water and Nutrient Management Practices for Foliage Plant Production

This program includes timely response to extension agents' and growers' needs for solutions to production problems related to water and nutrients in foliage plant production. A weekly plant diagnostic clinic activities, organized by Orange, Lake, and Seminole county agents and housed at the research center in Apopka (MREC), including the identification of water, nutrient, pH, and temperature-related growth disorders and proposed solutions to the problems (about 30 to 50 growers visit the clinic monthly) were conducted in 2003.

A bi-monthly newsletter, "Manatee Production Lines" with a circulation of 350 which contains information about nursery plant culture, water conservation, IPM and other grower news. The Manatee County extension agent conducted approximately 48 grower visits to observe

production methods, diagnose problems, monitor scouting and releases of beneficial organisms, survey irrigation effectiveness and suggest changes in culture or pest control.

Technical on site visits and consultations usually are a result of nurserymen having plants that are not growing as they should, because of a nutritional, water, pest, or growing media problem. Usually, the normal growth rate or at least a faster growth rate resumes after the problem has been solved. Costs are then decreased and profits increased by solving the plant growth problems. A common problem is overwatering.

Florida Automated Weather Network (FAWN) Prediction of irrigation requirements is based on the climatic data. Programs on the Florida Automated Weather Network (FAWN) were conducted with various groups across the state. Presentations were made to the Polk County Citrus Roundtable, Southwest Florida Water Management staff, Fern Growers, Volusia County Citrus Advisory Committee, Lake/Orange OJ meeting, Central Florida Citrus Production Managers Association, Farm Bureau Citrus Committee, Mid Florida Citrus Foundation and FNGA Action Chapter. The following Trade show and workshops were attended: Citrus Expo, Florida Agricultural Conference and Trade Show, Southwest Florida Water Management District Expo, Open House and Dedication of the research center at Baum, and Farm Bureau Legislative Day. The other educational efforts involved providing information to trade associations, individual growers,

WATER CONSERVATION IN SUSTAINABLE DEVELOPMENT AND LANDSCAPE

Landscape Plant Management

Master Gardeners (MG) programs contain a strong component of water conservation. Duval County hosted 4 MG training sessions, Nassau County hosted 2 sessions, and Clay County hosted

3 sessions in fall 2003. Evaluations were conducted monthly to determine satisfaction ratings of MG volunteers. Telephone callers are selected randomly to determine satisfaction ratings and groups were contacted to find out level of satisfaction/volunteer competency. 30 callers were surveyed monthly from December through July.

Two Environmental Landscape Management classes were offered to county parks and recreation staff in Citrus County. Classes covered soils and Fertilizers and fertilization, Turf grass selection, maintenance and diseases, Integrated Pest Management, beneficial insects, water management and Principles of FY&N and proper pruning. The entire 25 member staff of the maintenance department attended these classes. The same class was offered twice to local landscape maintenance companies. County regulations require completion of this class for any company that wants to bid on county landscape maintenance contracts.

The existing landscape at Coastal Region Library Demonstration Site, Crystal River, was reviewed and evaluated. A landscape plan was developed. Plants were ordered, delivered and installed. Mulch was ordered and installed. The irrigation system, its function, adjustment and maintenance was examined so it could be made to better meet the needs of the site. The planting beds were worked and fresh mulch was spread at the Citrus County Canning Center Demonstration Site, Lecanto. Additional signage for the site was ordered. Plans were set in motion to review and reevaluate the plantings and the irrigation system. At Central Ridge Library Demonstration Site, Beverly Hills existing landscape was also examined to assess the necessary maintenance, replacement/planting and signage needs. An evaluation plan is being developed. UF/IFAS Citrus County Extension Office Landscape Site, Inverness Weeds were removed and fresh mulch was added to all plant beds. The rain barrel set-up was examined for revision that will allow it to be better interfaced with and into the site. At the Lakes Region Library Demonstration Site, Inverness the existing landscape was evaluated to review what has been done and what needs to be done to maintain the viability of this site. Two new sites, Citrus Springs Community Center and the Citrus County Firehouse, were evaluated as possible future FY&N landscape sites.

A total of 8 separate new classes on Water Efficient Irrigation/Landscapes were developed and taught 26 times in Manatee County. Educational displays featuring water conservation in home landscapes were exhibited and staffed at 10 major public events for a total of 21 days at various sites including the county fair, a home and garden show at the civic center, a SWFWMD children's water emphasis event and others. Twenty county residents volunteered to have irrigation technician and horticulture program assistant bring our mobile irrigation laboratory to their residence and conduct a water efficiency audit. An additional ten evaluations were done for new water conservation rebate program participants. Each homeowner received a comprehensive follow-up report on specific recommendations for irrigation and landscape revisions for reduced water usage and/or rebate program qualification.

Florida Yards and Neighborhoods

In Miami-Dade County nine seminar presentations were delivered to 248 participants accounting for 10.35 teaching hours. Display Exhibits Display exhibits were mounted at two community events resulting in an estimated

169 face to face educational contacts and accounting for 6 hours of teachable moments Florida Yard Site. Two

Florida Yard site visits were made during which a total of 3 hours of instruction on FYN principles were conducted. One existing demonstration landscape was completed and officially opened with the help of 10 volunteers. 835 copies of FYN promotional and educational materials were distributed in Miami-Dade County.

In Duval County, 11 plant clinics were held in retail garden centers with FYN information. An FYN demonstration landscape was set up for the 10 day Greater Jacksonville Agricultural Fair. An estimated 480,420 people attended the Fair. Of those, 10% visited the display for an estimated 48,420 people.

Four Florida Yards and Neighborhoods Florida Friendly Landscape programs were conducted for commercial and home horticulturist in Volusia County. 172 people attended. A FYN table top display was set up at the Cassadaga Water Festival. 84 people viewed the display.

In Lee County 4 presentations were delivered and building plans were reviewed by extension agents to improve water conservation in the houses and in the landscape. Florida Yards and Neighborhoods Introductory Workshops (given twenty-one times at various locations throughout the Lee county.

In Broward County, educational programming in Environmental Landscape Management include 45 classes, workshops or public events reaching an audience of 5220 for a total of 11,606 instructional hours.

Title: Improving Urban Environmental Landscape Management

In Pinellas County following educational activities were reported under this topic with a total of 186 participants:

-6 rain barrel construction workshops

-4 micro-irrigation workshops

-128 rain barrels constructed

It was also reported that 60 micro-irrigation starter kits purchased for landscape irrigation- various television spots were also reported in this county.

Yard Work-a weekly (Friday) 3-minute live TV spot on WTSP TV TV, Channel 10 (localCBS) during Life Around the Bay- timely horticulture topics, water conservation issues and Florida Yards and Neighborhoods principles. February 28-October 31.

In Saint Johns County, 24 people learnt how to make rain barrels.

Two Rain Sensor and Home Irrigation programs for the City of Edgewater, Volusia County, with 63 people attending were also conducted. Each person who attended the workshop received a free mini click rain sensor valued at twenty dollars. The rain sensors were purchased by the St. Johns River Water Management District and member utilities of the Volusian Water Alliance.

In Miami-Dade County, there were 6 activities related to this program attended by 156 clients. Educating homeowners in environmental landscape management principles and practices will help reduce the potential impact of Hendry counties citizens on environmentally sensitive areas in southwest Florida. Three hundred twenty five area residents attended various environmental horticulture presentations in 2003 in Henry County.

WATER CONSERVATION EDUCATION

Watershed Education Program for Florida

An in-service training "Watershed Water Quality" for county extension faculty (total attendance = 40) in Florida was organized in 2003. A bus tour of a large Southeast watershed (Indian River) for the IFAS county agents to demonstrate the use of urban and agricultural BMPs in reducing the sediment and nutrient transport to the waterbodies was conducted. The areas toured ranged from uplands to the estuarine system. A unique "South Florida Watershed" training module to educate the county faculty about the hydrological processes was designed and delivered. A multimedia (presentation CD and a fact sheet on watershed function) was designed and distributed to 40 county faculty and made it available for the county faculty for the entire Florida.

Program Title: Natural Resource Education

A six-session course entitled, "Living at the Lake" was taught in Hillsborough County. The same course was presented four times in Polk County (Lakeland twice, Winter Haven, and Babson Park). Agent developed the curriculum and taught all sessions. The Florida Master Naturalist Program continued in both Polk and Hillsborough Counties during FY2003. The Freshwater Wetlands Module was taught in Polk County in the Winter of 2003 and in the Fall of 2003 the new Coastal Module was taught in Hillsborough County. In Palm Beach County, the following programs were developed and delivered by extension agent : "My Florida: A Look Through the Eyes of Henry Flagler"-January 8-Grassy Waters Preserve, West Palm Beach, 30 participants.

Everglades Coalition Conference-January 9-11-Delray Beach, Florida. Presentation on Florida Earth Project Courses and Programs. 350 participants.

An environmental fair, Earth Day celebration, Lecanto Primary school, Citrus County,-the presentation was entitled "Being Water Wise", it included video, music, charts along with oral information and interactions, each of the 17 teachers were given a packet of information with sheets to duplicate for students. There were 704 students and eight parents present.

- **Sustainable Development and Natural Resource Education**

A program was designed in Martin County to support this program. Information related to local environment including water quality and quantity was presented in this program. Extension was involved with curriculum development, speaker acquisition and preparation, and program delivery where IFAS was both branded and participated in information delivery. The four offerings of the program had 100 participants.

- **Housing and Construction Issues**

Programs related to water conservation in the housing industry have been conducted in many counties (Citrus (215 participants),

In Volusia County three water conservation programs were conducted at homeowners associations, garden clubs and civic groups. 71 people attended.

Buy Green and Save: Anatomy of a Home: 3.5 hour seminar was delivered in Hillsborough County to educate potential homebuyers about the benefits and types of features that will make a home energy and water efficient while also decreasing the cost of operating the home. The other program was Secrets of Successful Remodeling: 3.5 hour seminar to educate homeowners about how to start a remodeling project, how to upgrade their home's energy and water efficiency, and how to protect their homes from termites. Three classes were presented and 96 people attended. Two classes were also were on Build Green and Profit and 60 people attended. This program included fourteen hour continuing education program about sustainable building techniques and the building code for building contractors, building inspectors, and architects.

Summary of Impacts for Clientele:

WATER CONSERVATION IN AGRICULTURAL PRODUCTION

- **Water and Fertilizer Management in Vegetable Production**

Over 60 growers received information through one-on-one contact or formal meetings on various water management tools or methods which could be employed to increase efficiency and reduce runoff. Over 500 clientele received water use information via newsletter articles, educational materials distributed and faxed information. With extended cropping seasons due to newer varieties, etc., it is important for regulatory agencies to understand the various water needs that growers have to insure regulatory expectations that are realistic. The 18 participants of vegetable workshop completed the post-program survey indicated a 30% increase in knowledge of liming topics, 20% increase in knowledge of fertilization topics and 10% increase in knowledge of water management as it relates to fertilization. 50% indicated the workshop provided useful information and 44% indicated it was very useful, with 100% indicating interest in a "follow-up" program. A program is planned for 2004.

Based on feedback following grower meetings and informal surveys with growers, an additional 300 acres of microirrigation is currently being installed for use in Spring 2004 crop on one farm which will bring them close to 100% drip irrigated. One other packinghouse is considering converting at least part of next year's acreage from traditional seep to the fully enclosed subsurface and/or drip system, with a potential water savings of 40% or more. This farm has had

problems in the past with water management on very sandy blocks which are hard to seep irrigate. It is believed that installing these new systems would increase both yield and quality of tomatoes.

Fifty participants (growers, industry, and UF Faculty and Staff) in the Drip Irrigation School learned about drip irrigation and nutrient management in a day long session including field activities. 98% of the participants rated the school as excellent or very good. Participants were given a pre and post test. The average score on the pretest was 68% and on the post test was 85%, indicating an increase in knowledge of 17%.² The greatest impact of the on-farm irrigation scheduling demonstrations was an average reduction of early season water use by over 50%. The program also resulted in more accurate water scheduling during peak water demands.

- **Water Use and Conservation in So. Miami Dade**

Impacts:-Knowledge of existing water conservation practices obtained in the surveys is resulted in the identification of current and future research and extension needs that been have presented to the different commodity groups in Miami-Dade. Grower awareness and involvement in the conservation of water resources has increase with thisprograms.-Proper introduction and use of soil moisture devices is critical in the "rock-plowed" (gravelly loam) soils common to So. Miami Dade agriculture. These soils are usually characterized by a low moisture retention capacity. This has traditionally resulted in excessive irrigation being applied. The use of soil moisture devices brings a reduction in irrigation and excellent coupling between water application and plant needs. Reduced irrigation not only has proven by other researchers to increase yields and produce quality, but results in important reductions in potential chemicalleaching from agriculture. This is extremely important for the sustainability of agriculture in this environmentally sensitive area next to the Everglades, Biscayne and the Keys.

Technology Adoption for Irrigation and Nutrient Management

100 % of 46 who returned the post-survey rated presentations as very good to excellent. 100 % of respondents rated provided information as very good to excellent, 100% rated the usefulness of information as useful to very useful and they gained knowledge on the subject. 49 persons returned pre-and 46 returned a post-test. The average score of the post-test in comparison with the pre-test was 37% higher. (Knowledge increased).Fifteen new growers started to use tensiometers in 2003. Total acreage of tropical fruit groves, vegetablesand ornamental nurseries using tensiometers for scheduling irrigation is close to 750 acres. (196 new acres in 2003). 51 tensiometers were tested, 40 cleaned, and 56 were installed by the agent and County Extension Biologist in tropical fruit groves and vegetable fields. This represents about 196 acres monitored with tensiometers. 10 tensiometers were "leased" by the growers from the agent. Two ornamental nurseries (10 acres) were also using tensiometers in 2003. 30 people received one-on-one instructions on use, service, installation and interpretation of readings. (30 person/teaching hours). As reported by the growers, reduction in irrigation water use with tensiometers is between 30-50% and at the same time they report decrease in fertilizer use by about 30% (reduction in fertilizer leaching, reduction in the impact of agriculture on environment).From the personal communication with growers, we learned that the average irrigation for tropical fruits used to be about 3 inches of water per acre per week . With the use of tensiometers these growers are using only about 1.5 inches of water per acre per week. This allows them to save about 40,731 gallons of water per week per acre. Growers are reporting savings in water use up to 50% and savingsin fertilizer use up to 30%. Based on my feed back growers can potentially save about \$65.00 per acre/year infertilizer cost. With about 11,000 acres under tropical fruit production, potential savings may reach up to \$ 715,000. Four tomato growers who evaluated a field test of five different drip tapes and four irrigation durations were very impressed by study. They were able to visualize water and liquid nutrients wetting patterns in the soil and realized that the longer irrigation duration doesn't mean that all surface of the plant bed will get wet due to unique calcareous soil.

- **Tropical Fruit Culture and Management**

At least 15 new grove owners will install irrigation systems, 5 will install tensiometers and 50 will adopt good irrigation practices. There were 62 new grove owners all of which installed either a micro sprinkler or a high volume irrigation system. There were 56 new tensiometers installed by some of these growers covering 399 acres and saving 1.5 in/week for 5 months equivalent to 11970 in. of water saved (30 in/Ac x 399 ac = 11970 in). About 98% of the tropical fruit acreage (12740 acres) is irrigated. A survey revealed that 50% of the clientele (694/347) will change/adopt practices and techniques related to these programs. Growers were advised that tensiometers, if well maintained, are still the best economical and reliable way to monitor soil moisture in our soils but other devices are being tested. Also these growers were shown what other areas are doing to implement Better Management Practices related to irrigation.

- **Best Water and Nutrient Management Practices for Foliage Plant Production**

Application of N based on the optimal rate reduced fertilizer usage by at least 20%, consequently reducing nitrogen runoff or leaching and surface and ground water pollution and decreasing costs in foliage plant production. For example, the optimal N rate for philodendrons is 1.3 g N per 6" pot, which is equivalent to 1,272 lb per acre. Compared to the traditional recommended rate of 1,800 lbN per acre, using the optimal rate reduces N application by 29%. Our systematic evaluations of optimal N rates for major foliage plant genera and our education of growers on the use of the optimal rate will improve nutrient management practices in foliage plant production and minimize N leaching and/or runoff.

Reclaimed water in Manatee County was tested to assess the quality for use in nurseries, and the Advisory Committee requested continued testing to see how it varied over time. Reclaimed water was tested from two Manatee County Sewage treatment plants and one in Palmetto. One nursery used a sand filter, so it was tested before and after the sand filter. The results were that the salts varied from one testing to another, and they were always too high in one or more salts, based on irrigation water quality guidelines from, "Best Management Practices-Guide for Producing Container-Grown Plants". Also, the sand filter had little effect on salts or alkalinity. Three nurseries which were considering using reclaimed water decided not to use it. One which is using it has reduced its usage. Two others who use it will monitor it more closely, and adjust their fertilizer applications based on salts in water.

Florida Automated Weather Network (FAWN)

According to the members of the Ag Weather Task Force, FAWN has had a multi million dollar impact on agriculture through more informed production, harvesting and marketing decisions. There has been no major attempt to document the overall impact, but feedback from non agricultural users indicate substantial use and value. NWS has used the data when evaluating fire risks, developing mesoscale surface maps; emergency management has used the data when making decisions regarding potential risks from weather events; Division of Forestry relies on the information to deal with fires; the UF/IFAS DISC project uses the weather data for input for their models; media has incorporated the data in numerous articles and presentations (NBC station in Orlando is a frequent user for early morning reports). No doubt there are many more that we are not aware of and have no way of determining the impact.

WATER CONSERVATION IN SUSTAINABLE DEVELOPMENT AND LANDSCAPE

- **Florida Yards and Neighborhoods**

Of the 248 participants which attended nine seminar presentations: 84% of seminar participants indicated an average knowledge gain of 32%. 59% of seminar participants indicated that the seminars were 'very useful' 47% of seminar participants indicated that they would change 'some things' in their current landscape practices and 32% indicated that they would 'change a lot'.

In Citrus County the entire county parks and recreation department maintenance staff attended Environmental Landscape Management training. This totaled some 25 people and a total of 200 teaching hours. The head of the parks maintenance department is a strong believer in ELM and in Extension programs. He is working to ensure 100% compliance with ELM principles and practices. Ninety-five percent of class attendees have adopted proper landscape maintenance practices. This results in a major reduction in the amount of water, fertilizer and pesticides used in the county. Classes were also offered to business owners. Those who attended also learned the environmentally friendly ways to manage landscapes. This will be carried over into their contracts in the private sector as well in their dealings with the county. At least 50% of those attending the classes have changed their landscape practices to reduce the use of fertilizers, pesticides and water.

As a result of ongoing FY&N Introductory Workshop series in Lee County, approximately 68% of program participants increased their knowledge of FY&N principles by 33%. This was determined by pre/post test results. Also as a result of these workshops, program participants averaged three practice changes in their own yards. This was determined by follow-up phone calls made to program participants three months post-workshop. Twenty percent of program participants were polled for the purposes of this analysis.

In Manatee County Twenty-six classes were held with a total of 543 people attending. Eighty-nine percent of the attendees indicated they would change their practices to reduce landscapewater consumption based upon what they had learned. Public Displays/Exhibits: Face to face discussions were held with 3,081 people and 4,620 publications on water conservation in landscapes were distributed. Home Irrigation/Landscape Evaluations: A landscape/irrigation evaluation process was managed for auditing home landscapes and delivering the resulting findings and recommendations to homeowners at no cost. Thirty landscapes were evaluated and received detailed recommendations for landscape and irrigation improvements to reduce water consumption. If all recommendations were followed, an average weekly water savings of 1,390 gallons per landscape or a total of 40,230 gallons could be saved weekly.

• Improving Urban Environmental Landscape Management

A survey was mailed to participants of the micro-irrigation and rain barrel workshops in Pinellas County as well as special programs such as the Certified Yard Tours and the Eco Garden Conference. The purpose of this post-survey was to evaluate practice change in several categories from one to ten months after program participation. Sixty one surveys were returned for a 30% response rate. In the irrigation category, 31% of respondents recognize that they now use less water for irrigation, 31% now

check for inefficient usage from spraying on non-landscaped areas, and 53% now collect rainwater for watering plants. In the mulch category, 60% of respondents already use organic mulches, 10% have changed to using mulching landscape beds, and 23% no longer use cypress mulch. In the landscaping category, 52% of respondents now utilize drought tolerant plants, 48% group plants according to their water requirements. Additionally, 56% now properly water to establish plants and 53% choose plants according to site soil and climatic conditions.

In Martin County, 91% of the surveyed participants of the FYN programs were satisfied with the program content, handouts and presentation, 86% of the surveyed participants increased their overall knowledge of FYN principles and practices, 24% of the surveyed participants of the Schools (4hrs. or more of instruction) showed overall behavioral change through adoption of practices. FYN participants have demonstrated overall use of "Florida Friendly" landscape management practices by 73%.

In Volusia County, sixty three homes now have mini click rain sensors for use in reducing irrigation water use. The cost of the rain sensors, \$1,260 was donated by the St. Johns River

Water Management District and the utility members of the Volusia Water Alliance. Estimated 40 % water savings per household.

In Broward County, a telephone survey conducted in November indicated that 100% of the workshop participants had installed their rain gauges; 96% had adjusted their sprinkler systems to apply 3/4 to one inch of water per irrigation cycle; 100% adjusted their mulching practices to a provide 3-4 inch layer and clear mulch from base of trees; 100% indicated that they now consider water requirements of plants before placement in the landscape; and 90% indicated that they are now capable of maintaining their own irrigation system.² At the end of the Best Management Practices (BMP) training program, 75% of the attendees will have increased their knowledge in landscaping practices as they relate to improving water quality. Eighty three percent of the participants received a higher score on the post test than they did on the pre test. A total of 5 CEUs were available for this workshop.³ Fifty percent of the youths participating in water camps will increase their knowledge and adopt at least 3 measures to conserve water indoors and outdoors. A pre and post test evaluation was done and eighty five percent of the youths showed and increase in their scores. Follow up telephone surveys in May and September with the parents indicates that 57 percent of the youths were more conscious about the way they use water. They were taking shorter showers, turning off the water while brushing their teeth, and drinking more water. Fifty percent of residents participating in NatureScope Broward / Water Matters Lectures will increase their knowledge of 5 of the 9 Florida Yard and Neighborhoods (FYN) principles. Five percent of the participants will adopt 70% of the techniques taught and get their yards certified by scoring a minimum of 36 inches on the FYN Checklist. Evaluation done at end of program indicates that an average of 90% of the 177 participants increased their knowledge in at least 7 of the FYN principles. Twelve percent of the participants adopted 70% or more of the techniques taught and got their yards certified.

WATER CONSERVATION EDUCATION

- **Natural Resource Education for Polk and Hillsborough Counties**

A total of 235 individuals have completed the Living at the Lake course. Course evaluations indicated that participants have increased their knowledge and understanding of Florida lake systems by 40 percent. 70% of workshop participants indicated that they will change one or more lakefront management practices as a result of participating in the course. Lakes managers in Winter Haven and Lakeland have requested that sessions be taught annually to residents and course attendance has risen with each session due to word of mouth testimonials from course participants.

Twenty three individuals have completed and been certified as Florida Master Naturalists as a result of participating in Florida Master Naturalist Training offered by agent in Polk and Hillsborough Counties this year. The Freshwater Wetlands Module was taught in Polk County in Winter 2003 with 12 graduates and the Coastal Module was taught in Hillsborough County in Fall 2003 with 11 graduates. Post test scores improved by an average of 21 point over pre test scores. Lake Management Plan development proceeded for East Lake (complete), Lake Egypt, Lake Wilson and Little Lake Wilson in Hillsborough County and Lake Wailes (complete) in Polk County. Volunteer participation in annual LAKEWATCH meetings averaged 32 people attending per workshop. The number of lakes being monitored in Polk County is 79 and 125 lakes are monitored in Hillsborough County.

- **The Florida Earth Project**

A goal of 95% participants in the groups reached by this program learning (gaining knowledge) of natural resource issues and the science behind the issues in South Florida was established for the academic and extension products of the Project. This will be from a historic, on-going, and proposed perspective developed through the hands-on activities in the Earth Project curriculum.

Academic students will be tested for knowledge gained and given marks as this will be a credit worthy course for them. Extension students will be given voluntary exams with exit interviews for initial evaluation of this program. Impact: Eighteen University students took the academic course from May 20 through June 6. Very detailed evaluations were done by both students and instructors. All eighteen students reported gaining knowledge of the material covered in the course. As an unexpected benefit, many instructors expressed gaining knowledge by participating in the course. By feedback to the agent, each has in turn passed information gained in the course to those they come in contact with in that all twelve are active in some form of natural resource related educational activities. Of the 63 attending the Restoration Update forum, 100% expressed gained knowledge from the teaching activity through an evaluation instrument. Impact 2: 50% of those gaining knowledge will apply (change behavior) those taught concepts in order to promote productive, collaborative efforts between environmentalists, agriculturalists, and governments (social, economic and environmental impacts). A data base of Earth Project students, both academic and extension, is being kept to have some indication of their impact the social, economic and environmental aspects of natural resources issues they learned. This evaluation technique will be derived by periodic surveys sent to alumni of the Project. Impact: In the evaluation instrument, all eighteen students expressed a change of attitude and intent to change behavior on natural resource issues, especially as it applied to agricultural issues, primarily due to interaction with agricultural industry personnel during the Ag Module experience.

Housing and Construction Issues

In Citrus County, during the Build Green and Profit classes, a pre and post test was given to measure knowledge gain. According to the Build Green and Profit average test score by module the average increase was 23%. The average pretest score was 62% and the average post test score was 85%.

In Hillsborough County, fifteen people returned a post-post evaluation and reported that they had added at least one feature to their home to increase energy and water efficiency. The majority had added multiple features to increase efficiency.

Fifty-four (90%) completed a post evaluation of green remodeling class.

53 reported they increased their knowledge of features that can make their home more energy efficient.

50 reported they increased their knowledge of features that can make their home more water efficient.

51 reported they increased their knowledge of local utility programs that can make adding energy efficient features less expensive.

Eighteen post-post evaluations were mailed seven months after the class. Nine (50%) people reported they had added features to increase energy and water efficiency.

Success Stories:

Tropical Fruit Culture and Management

Success Stories:

The adoption of tensiometers and other soil moisture sensing devices continues to increase and there are now 399 acres being monitored by these devices resulting in 30 to 50% savings in water. Leaching of nutrients is also reduced. The agent's Advisory Committee with help from the tropical fruit Specialist obtained a \$630,000 grant to promote tropical fruits. The local weather system and the FAWN station at TREC are saving \$138,000 to growers (based on 1380 growers and \$100 for private weather service).

- **Water and Fertilizer Management in Vegetable Production**

Success Stories:

Growers are often reluctant to ask questions at educational meetings. In order to increase participation and stimulate discussion, Manatee County agent and specialist, Dr. Eric Simonne, tried a new technique for the Manatee/Ruskin fertilizer management workshop this year. As part of the meeting announcement/registration process, participants were asked to include 2-3 questions that they would like to have answered on topics related to fertilization and liming. As questions came in, agent condensed and grouped them according to topic and forwarded them to Dr. Simonne. This way, not only could the program be more tailored to meet the needs of the actual participants, but growers got their questions answered without having to ask questions openly in the meeting. Because the topics discussed were those requested by the participants, this resulted in increased interest and increased discussion. All participants indicated an increase in knowledge and an interest in a similar "followup"

Success Stories:

In Volusia County each of the 63 people who attended the workshops received a free mini click rain sensor valued at \$20.00. Estimated 40% savings of water per household as a result of installing rain sensors on the automatic irrigation systems. The program received the Florida Chapter of the American Water Works Association Water Conservation Excellence Award for outstanding water conservation programs.
Florida Automated Weather Network (FAWN)

Success Stories:

Budget cuts to the IFAS budget have resulted in a 10% reduction in the operation and maintenance budget. To compound the problems, FAWN added 12 sites with FEMA funds, thus increasing the maintenance requirement. Bottom line, FAWN needed to secure at least \$50,000 from outside sources in order to keep the high quality data available every 15 minutes. A sponsor program was initiated to encourage contributions to FAWN. A rotating icon on the web page thanks the sponsors. The sponsor program has generated \$13,000 in gifts. Southwest Water Management District and the Florida Department of Agriculture and Consumer Services has funded a 3 year Agricultural Irrigation Efficiency and Cold Protection Project for \$220,000. In addition Southwest Florida, South Florida and St. Johns River water management districts have funded 3 year projects at \$15,000 per year to support on going activities. This \$45,000 a year will allow FAWN to maintain the entire network, from towers to web site. The grant will allow additional personnel and development of management tools. It appears FAWN now has the outside dollars to

- allow for proper maintenance of the system and development of management tools.
- Water Use and Conservation in So. Miami Dade**

Success Stories:

A number of progressive farmers have purchased and installed different soil

- moisture sensors on vegetable fields and groves. Word-of-mouth is bringing interest on their use as water conservation practices. Water conservation survey had excellent response, close to 40%, from two commodity groups (Tropical Fruits and Ornamentals). There is interest in the community on results from the survey (phone calls, open comments to the survey, one-to-one at meetings).
- Technology Adoption for Irrigation and Nutrient Management

Success Stories:

The Second South Florida Drip Irrigation School organized by this agent was a great success. 78 people (growers and industry) participated in this all day educational session including classroom presentations on nutrient and water management, irrigation system design and maintenance and troubleshooting and field hands-on activities including: water and chemicals movement in the soil shown with blue dye, chlorination and injection of methyl bromide alternatives through the irrigation system and field determination of irrigation uniformity. Most of the participants graded this program as excellent and requested a similar program next year.

A 78 year old avocado grower who was using tensiometers since February 2002 wrote a letter to the agent indicating that he used tensiometers, recommended by the agent in the last growing season. He discovered how far off he had been in estimating water needs for his avocado grove. By using tensiometers for scheduling irrigation he was able to increase his yield by one third. About 23 of the growers using tensiometers are involved in the USDA EQUIP program which promotes sustainable farm management practices. By improving their irrigation practices these growers may receive the reimbursement up to 75% of their investment in installation of the more efficient irrigation systems and use of the soil moisture monitoring tools.

Success Stories:

Landscape Irrigation Evaluation Program: Our program's Irrigation Technician, Bob Wyatt, hired in May, 2002 with no training or experience in irrigation or landscaping is now competent and fully capable of performing landscape irrigation system performance inspections and recommendations. Thirty landscape evaluations were completed at no cost to the owners with the potential saving of over 2 million gallons of potable water annually. Following is a thank you note from a Manatee County resident on another subject: November 13, 2003 Dear Jack, Thank you for exceeding my expectations when I requested information on water conservation for Cub Scout Pack 191. All of the handouts from the coloring books to the water cycle wristbands helped to reinforce our program on "Water, Our Most Precious Resource". I'm sure many of our boys have new posters taped to their bedroom walls. The (water conservation stick-on) tattoos were just plain fun for our youngest members. Thank you! Betty Cuthbert

Success Stories:

Southwest Florida citrus growers and the State of Florida each saved over \$13 million. Through the programs on irrigation and fertilizer management, all attendees claimed that they gained new

information from the program, and that they would share the gained information with others. They estimated their average savings and/or their efficiency to be at 9.3 over the 7.5% for the previous year. The average yearly cost of fertilizer and irrigation programs in SW Florida commercial groves is around \$300/acre. The total citrus acreage in SW Florida is 170,457 acres. The positive financial impact can achieve a saving of about \$4.756 million (9.3% multiplied by \$300/acre multiplied by 170,457 acres) for citrus growers in SW Florida. Over 117 volunteers were recruited and/or trained. They spent more than 790 hours helping me with this program. Their "In Kind" contribution exceeded (790 hours x \$16.54/hr) \$13,066.60.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. In all the counties every effort is made to reach minorities, including:

For Home Building programs-utilizing mass media (newspapers, radio, TV), requesting brochures to be displayed from the building department (when people are coming in for a permit), requesting assistance for blast faxing members of the Citrus County Home Builders' Association, visiting and displaying promotional materials at various associations, festivals and exhibits, holding activities at convenient and accessible facilities, utilizing all county channels (cable access, media contact, reader board, etc.), contacting all DBPR licensees with literature through a mass mailing (program specific), displaying brochures at other activities and events (ie. county expo, at the mall), and offering training on-site (ie. not required to be held on county property).

Notices are sent to individuals in area churches. Programs will be offered to families at times to encourage participation by those with childcare needs. Program lengths will be held to prescribed short lengths to encourage such participation. Programs are offered in area community centers and libraries. Several counties are offering programs in Spanish. Some extension publications are being translated to Spanish.

Outreach to minorities has been accomplished by a variety of methods, including partner advertising. A specific partner, Florida A&M University, has taken a special focus on minority participation through their Center for Environmental Justice. In March, extension agent was appointed to the Outreach, Environmental and Economic Equity Coordination Team, a subgroup of the South Florida Ecosystem Restoration Task Force. OEEECT focuses on outreach to minorities and works with FEF in developing minority outreach techniques.

Source of Federal Funds: Smith Lever

FL-SMP-412

Title: Florida's Comprehensive Water Quality Program

National Goals: 4

Key Themes: Water Quality

Situation/Program Rationale:

Groundwater and surface water quality are of paramount importance to Florida citizens. About 2 million of Florida's 16 million residents have self-supplied domestic drinking water wells that withdraw about 300 million gallons per day. Water from these wells is used untreated by many residents. A total of 1.75 million septic tanks discharge about 236 million gallons of effluent per day into the soil beneath drainfields, and about 40,000 new septic tanks are installed each year. Widespread and frequent applications of agrichemicals to Florida's extremely sandy soils creates high leaching potential, especially considering the state's intense subtropical rains. The

combination of these factors increases risk to ground-and surface-water quality, and has led to growing consumer concerns about water quality deterioration.

While public fears often prove to be considerably overstated upon critical examination, groundwater pollution concerns must be continuously addressed, and at the same time the population must be continuously educated. Florida also has more than 7,700 natural lakes ranging from 1 to 450,000 acres in size. Nearly 7% of the state's land area consists of water, including important freshwater fisheries and recreation areas. According to the state's trophic-index system, 52% of the lakes in a recent survey were classified as mesotrophic, and 35% as eutrophic. Florida also has vast areas of wetlands that provide a buffer between human activities and water quality of lakes, streams, and groundwater. Recognition of wetland function in water quality protection is necessary for sustainable development in Florida.

Program Objectives:

Develop, organize, facilitate, and/or deliver water quality educational materials, training, and programs with measurable impacts and outcomes to key target audiences in Florida so that water resources are protected or enhanced.

Summary of Programs for Clientele:

Environmental Landscape Management

The most common county FL412 programs across Florida centered on educating homeowners and commercial landscape caretakers about improved irrigation, fertilization, and pest control techniques for urban and other landscapes including gardens, lawns, and other managed areas. The general goals are to reduce water, fertilizer, and pesticide use and to promote on-site recycling as ways to prevent water pollution. The Master Gardener program has a strong statewide presence. Following a comprehensive training program provided by county and state specialists, Master Gardeners were used as a conduit to reach individual homeowners who needed advice on efficient use of water, fertilizers, and chemicals to help protect water quality in developed areas. The nine principles of the Florida Yards and Neighborhoods (FYN) program (water efficiently, mulch, recycle, wildlife, yard pests, right plant-right place, fertilizing, stormwater runoff, and on the waterfront) were used as an information base to provide recommendations.

Best Management Practices Education for Production Agriculture, Commercial Nurseries, and Forestry Operations

Best management practices education for production agriculture, commercial nurseries, and forestry operations dominated Florida's rural county FL412 programs. The segments of production agriculture contacted included forage, tobacco, peanut, cattle (beef and dairy), citrus, and vegetable production. Florida's farmers and ranchers are under increasing pressure to manage their land and water resources in ways that will reduce the potential for pollution of surface and ground waters. State and federal agencies charged with water quality protection (Florida Dept. of Agriculture and Consumer Services, Florida Department of Environmental Protection, USEPA) have favored voluntary adoption of flexible improved production practices as opposed to imposition of rigid rules, so extension programs conducted for large-scale production agriculture have centered on instruction and evaluation of Best Management Practices (BMPs) for water, nutrients, and other agrichemicals including pesticides. Florida's Cooperative Extension Service is deeply involved in the BMP process because UF-IFAS fertilization recommendations and irrigation scheduling techniques are integrated into the final BMPs that are written by FDACS.

Pesticide Applicator Training

Pesticide applicator training is an important extension education program in both urban and rural counties in Florida due to the large amount of pesticides that are applied every year. Indiscriminate use of pesticides violates the spirit of BMPs and increases the potential for water

quality impairment, so most counties provide training in pesticide selection, use, and environmental stewardship (integrated pest management) for those individuals that require certification as a private, commercial, or public pesticide applicator. County extension programs also provide continuing education units (CEUs) to allow current applicators to maintain their licenses.

Florida LAKEWATCH Volunteer Monitoring Program

Florida has more than 7700 lakes larger than 10 acres and probably more than 100,000 smaller bodies of water. Florida LAKEWATCH is a statewide volunteer citizen lake-monitoring program that facilitates "hands-on" citizen participation in the management of Florida lakes through monthly monitoring activities. County extension agents across the state collaborated with LAKEWATCH program staff to identify priority water bodies for monitoring, and recruited and supported volunteers to perform screening-level monitoring of water quality. Priority was given to lakes surrounded by a suburban neighborhood where FYN principles could be taught and BMPs implemented.

Florida Home*A*Syst

Florida Home*A*Syst helps the state's non-farm, rural and suburban residents identify and reduce potential contamination risks that might pollute their drinking water. It is educational, voluntary and free, and is provided to clientele through several county programs. The program reached residents who have private wells and/or septic tanks. The Natural Resources Conservation Service (USDA-NRCS) cooperates closely with this program. The program educated homeowners who were unknowingly polluting their own wells and people who were increasingly concerned with the quality of their drinking water. Information provided by this program is helping to decrease water pollution in as landowners eliminate their own problems.

Summary of Impacts for Clientele:

<ul style="list-style-type: none"> • County or Region 	<ul style="list-style-type: none"> • Category 	<ul style="list-style-type: none"> • Impacts
<ul style="list-style-type: none"> • Highlands county 	<ul style="list-style-type: none"> • Pesticide applicator training 	<ul style="list-style-type: none"> • 365 individuals were trained for the pesticide exam; 435 people took the exam; 85% passed.
<ul style="list-style-type: none"> • Polk/Hillsborough counties 	<ul style="list-style-type: none"> • BMP education 	<ul style="list-style-type: none"> • 235 people completed “Living at the Lake” course; 70% will change lakefront mgt practices. <p>58 people attended Fla. Forest Stewardship Pond Mgt Workshop; knowledge gain about 50%; 82% will change pond mgt practices.</p>
<ul style="list-style-type: none"> • Polk/Hillsborough counties 	<ul style="list-style-type: none"> • Environmental landscape mgt. 	<ul style="list-style-type: none"> • Newly-implemented FYN program has reached 871 people with 1254 instructional hours; pre/post test knowledge gain about 25%.

<ul style="list-style-type: none"> • Polk/Hillsborough counties 	<ul style="list-style-type: none"> • Fla. LAKEWATCH 	<ul style="list-style-type: none"> • LAKEWATCH meetings average 32 volunteers each; 79 lakes in Polk and 125 lakes in Hillsborough are being monitored.
<ul style="list-style-type: none"> • Polk/Hillsborough counties 	<ul style="list-style-type: none"> • Pesticide applicator training 	<ul style="list-style-type: none"> • 76 people received special pesticide training to prepare for restricted-use licensing.
<ul style="list-style-type: none"> • Palm Beach county 	<ul style="list-style-type: none"> • BMP education 	<ul style="list-style-type: none"> • 63 people completed “Florida EARTH” course; 100% expressed knowledge gain; 50% will change behavior to improve the environment.

<ul style="list-style-type: none"> • Gulf county 	<ul style="list-style-type: none"> • Environmental landscape mgt. 	<ul style="list-style-type: none"> • 12 people completed the Master Gardener program.
<ul style="list-style-type: none"> • Duval county 	<ul style="list-style-type: none"> • Environmental landscape mgt. 	<ul style="list-style-type: none"> • 28 people completed the Master Gardener program; knowledge gain about 23%; 100% learned new information. <p>118 Master Gardeners spent 12,645 hours and attended 1,134 hours in training; estimated MG training value to county office was \$209,148. MGs processed 1204 soil samples for pH.</p>
<ul style="list-style-type: none"> • Duval county 	<ul style="list-style-type: none"> • BMP education 	<ul style="list-style-type: none"> • 1434 people attended BMP workshops; 68% learned new information; knowledge gain about 25%; 25% of attendees will adopt at least

		<p>two practice changes.</p> <p>120 people took a “Learn by Mail” BMP course; 100% passed, with a mean score of 90%.</p>
<ul style="list-style-type: none"> Okaloosa county 	<ul style="list-style-type: none"> Pesticide applicator training 	<ul style="list-style-type: none"> 40 people were educated, and then passed the pesticide licensing test. <p>16 pest control operators received required CEUs.</p>
<ul style="list-style-type: none"> Manatee county 	<ul style="list-style-type: none"> BMP education 	<ul style="list-style-type: none"> 60 growers educated about water management BMPs. <p>18 people attended a vegetable fertilization workshop; 94% learned new information; knowledge gain was about 20%. Growers educated about petiole sap testing reduced fertilizer use. 300 acres of vegetable micro-irrigation systems were installed, with water savings of 40%.</p>
<ul style="list-style-type: none"> Manatee county 	<ul style="list-style-type: none"> Environmental landscape mgt. 	<ul style="list-style-type: none"> 75% of 222 compost bins distributed to homeowners were used to save 3 bags of yard debris per month from landfill disposal (5,976

		bags per year).
<ul style="list-style-type: none"> • Orange county 	<ul style="list-style-type: none"> • Environmental landscape mgt. 	<ul style="list-style-type: none"> • “Waterwise” extension program increased water conservation and improved plant selection by landscape managers. <p>360 people attended a landscape design class; the vast majority of people now design low-maintenance landscapes; half have moved to as-needed irrigation scheduling. 90% of residents reached by FYN program have reduced water consumption.</p>
<ul style="list-style-type: none"> • Orange county 	<ul style="list-style-type: none"> • Fla. Home*A*Syst 	<ul style="list-style-type: none"> • 100% of Home*A*Syst participants shared information with others; 77% assessed their drinking water system; 100% gained knowledge about water pollution potential; 50% made system

		changes to improve their condition.
<ul style="list-style-type: none"> • Leon county 	<ul style="list-style-type: none"> • Environmental landscape mgt. 	<ul style="list-style-type: none"> • Retail garden centers are selling zero- and low-phosphorus fertilizers with slow-release nitrogen; sales of P-containing fertilizers have decreased. <p>50 people attending a Landscape BMP workshop learned to reduce P fertilization. Master Gardener knowledge about reduced P fertilization improved 25%. 45 new Master Gardeners were trained; MGs contributed 5,442 volunteer hours valued at about \$90,000.</p>
<ul style="list-style-type: none"> • Leon county 	<ul style="list-style-type: none"> • Pesticide applicator training 	<ul style="list-style-type: none"> • 309 pesticide applicators received required CEUs. <p>21 people were educated to take the pesticide licensing test.</p>
<ul style="list-style-type: none"> • Leon county 	<ul style="list-style-type: none"> • BMP education 	<ul style="list-style-type: none"> • 50 Master Gardeners were trained in FYN principles. <p>Homeowners implementing FYN principles represented 658 acres</p>

		within the county. GIS technology was used to map locations where BMPs were implemented.
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<ul style="list-style-type: none"> • Leon county 	<ul style="list-style-type: none"> • Fla. LAKEWATCH 	<ul style="list-style-type: none"> • 40+ citizens were educated; they sampled an additional 40 water bodies as LAKEWATCH volunteers.
<ul style="list-style-type: none"> • Okeechobee county 	<ul style="list-style-type: none"> • Environmental landscape mgt. 	<ul style="list-style-type: none"> • 100% of 34 participants in Master Gardener training improved knowledge about water quality issues.
<ul style="list-style-type: none"> • Broward county 	<ul style="list-style-type: none"> • Environmental landscape mgt. 	<ul style="list-style-type: none"> • 100% of participants in a water conservation workshop improved knowledge; more than 90% implemented improved water management practices at home. <p>83% of participants in a BMP</p>

		<p>training program improved their pre/post test score.</p> <p>85% of youths taking part in a “water camp” adopted at least three water-conserving measures at home.</p> <p>90% of 177 people taught FYN principles increased their knowledge of at least seven of them; 12% adopted 70% or more of the principles and had their yards certified as “Fla.-friendly.”</p>
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<ul style="list-style-type: none"> • Gilchrist county 	<ul style="list-style-type: none"> • BMP education 	<ul style="list-style-type: none"> • 80% of vegetable growers use sap testing to monitor their crops and save fertilizer as a result. <p>15% of growers use BMPs in their farming system.</p>
<ul style="list-style-type: none"> • Dade county 	<ul style="list-style-type: none"> • BMP education 	<ul style="list-style-type: none"> • 93% of participants in a lychee/longan workshop reported that they will reduce phosphorus fertilizer use in their production system.
<ul style="list-style-type: none"> • Central Florida 	<ul style="list-style-type: none"> • BMP education 	<ul style="list-style-type: none"> • As a result of nursery grower BMP education, application of N for foliage production reduced fertilizer use by

		at least 20%, reducing nitrogen runoff or leaching and surface and ground water pollution.
<ul style="list-style-type: none"> Statewide 	<ul style="list-style-type: none"> BMP education 	<ul style="list-style-type: none"> The UF-IFAS Watershed Education Team trained 25 county agents from a wide variety of backgrounds (agriculture, urban, natural resources, sea grant). Training materials transferred include publications, a workshop CD, and demonstration tools.

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Success Stories:

BMP education

<i>Program</i>	<i>Success Story</i>
“Living at the Lake” (Polk/Hillsborough)	This program has shown significant growth from the previous year. A total of 235 individuals have completed the course. Participants have increased their knowledge and understanding of Florida lake systems by 40%, and 70% of workshop participants indicated that they will change one or more lakefront management practices as a result of participating in the course. Lake managers in Winter Haven and Lakeland have requested that sessions be taught annually to residents and course attendance has risen with each session due to word-of-mouth testimonials from course participants.
Water for the New Century: A Water School for Polk County Decision Makers (Polk)	The county agent conducting this school received an award of excellence for outstanding achievement in water conservation education from the Southwest Florida Water Management District. Additionally, the agent presented a paper at the USDA Southern Region Extension Water Quality Conference to share information on the Water School with other Southern Region extension professionals conducting water quality and watershed education programs.
Water and Fertilizer Management in Vegetable Production (Manatee)	Growers are often reluctant to ask questions at educational meetings. In order to increase participation and stimulate discussion, the county agent conducting this program tried a new technique in a fertilizer management workshop. During meeting registration, participants were asked to include 2-3 questions they would like to have answered related to the program topic. As questions came in, the agent condensed and grouped them to tailor the program for participant needs. Growers got their questions answered without having to ask questions openly. Since topics discussed were those requested by the participants, interest in the meeting increased, with improved discussion. All participants indicated an increase in knowledge and requested this format for future meetings.
Soil and Nutrient Management: Training Programs (Statewide)	Nutrient management plans for 148,500 acres of agricultural land in the state were prepared by USDA-NRCS personnel that were trained by the UF-IFAS Technical Service Provider Training Program. A total of 53 candidates were trained in two sessions held in 2003.
Watershed Education Program (Statewide)	Self-evaluations following in-service training sessions indicated that agents gained new knowledge of water quality issues, and pre/post-tests measured an average knowledge gain of 30%. Agents used new knowledge to augment their own educational programs and to aid client decisions.
Environmental Landscape Management	
<i>Program</i>	<i>Success Story</i>
Drought-Proofing Orange County (Orange)	As a result of “Waterwise” education: 31% of participants adjusted their irrigation timer to reduce water use in the landscape; 38% repaired or replaced irrigation systems to make them more efficient; 50% worked on a water efficient landscape design; 56% improved water conservation in the home; 56% Selected drought tolerant plants for the landscape; 69% are now more conscious of the water quality in the home.
Hendry County	The establishment of the Hendry County horticulture web site has

Horticulture Website (Hendry)	greatly improved communication with clients within the county and beyond. In addition to providing an on-line resource for citizens, the web site has prompted an average of 2-3 e-mail requests for information per day from area citizens as well as people from around the state and the country. Maintaining an electronic presence has enhanced the visibility of horticulture programming and has made extension services more readily available to those who have difficulty taking advantage of the extension service and the information available due to inability to visit or call the office. Use of the web as a delivery tool has also increased this agent productivity, as many questions and requests for information can be answered promptly from remote locations and during times outside normal office hours.
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Outreach to Minorities:

County extension programs attempt to attain parity participation through direct contacts with minority groups and contacts with all private individuals, commercial companies and government agencies that function without regard to race color, age, sex, handicap or national origin.

Program	Outreach
Statewide FYN Residential Community Outreach	A small percentage of all publications kept on hand for distribution are in Spanish. 0.65% of all participants reached in group learning events were minorities
The "Florida EARTH" Program	Outreach to minorities has been accomplished by a variety of methods, including partner advertising. Florida A&M University has taken a special focus on minority participation through their Center for Environmental Justice. The extension agent responsible for this program is part of the Outreach, Environmental and Economic Equity Coordination Team that focuses on outreach to minorities and works to develop minority outreach techniques.
Duval county	County agent organizes landscape efforts for Paint the Town, an annual event to rehabilitate a blighted, primarily African-American neighborhood. The Junior Master Gardener program was established in six schools that have minority populations of 14-75%.
Orange county	Programs were promoted through all mass media and sent to grass roots organizations. The programs were also part of the Post Purchase Counseling program that works with many county minorities. Spanish speaking and Spanish-language materials made a great difference in reaching out to minorities. Youth classes were aimed specifically at minorities with great success.
Leon county	The Master Gardener program seeks to involve minorities. Several of our current MG volunteers are minorities. A significant portion of our commercial landscape industry personnel audience is minority. Pesticide applicator CEU program audiences always contain a higher percentage of minorities than the general population.
Manatee county	County faculty advertise extension programs in minority newspapers, at minority churches, at libraries, and on radio and television.
Broward county	Programs are advertised through direct mailings, internet, county newsletter, and brochures distributed to clients on site visits. All items used to advertise programs state that they are open to all

regardless of race, creed, religion, gender, or disability.

Source of Federal Funds: Smith Lever

FL-SMP-416

Title: Management and Ecology of Aquatic, Wetland, and Invasive Exotic Plants in Florida

National Goals: 1, 4

Key Themes: Biological Control, Pesticide Application, Integrated Pest Management

Situation/Program Rationale:

Most of Florida's population is in some way affected by aquatic plants, their management, or lack of management.

Unmanaged aquatic plants can detrimentally impact domestic water supplies, recreational water use, drainage, agricultural uses, and wildlife and fisheries. In contrast, aquatic plants can be managed to benefit wildlife habitat and the aesthetic value of waters. The number of surface water retention ponds and interest in aquascaping them is continually increasing in Florida, and the need for selective vegetation management in wetland mitigation is burgeoning. Invasive exotic plants continue to threaten native plant communities in natural areas. Because of the large number of new residents that enter the state each year, a large part of the population is uneducated as to the policies, methods, or need for aquatic, wetland, and invasive exotic plant management. Educational material should be kept up to date and always available for public information. An increasing number of individuals is directly involved with managing aquatic, wetland, and invasive exotic plants, either professionally or on private property. The continuing improvement of vegetation management technology and need for educational opportunities is also growing with the rising demands of new clients entering this area of invasive plant species and wetland ecosystems. Educational opportunities, and training and testing services for certification and re-certification of vegetation management professionals should be kept up to date and readily available.

Program Objectives:

Maintain public awareness of aquatic, wetland, and invasive exotic plant management practices and problems caused by unmanaged vegetation in aquatic, wetland, and natural areas. Provide source for factual information on relationships between aquatic, wetland, and invasive exotic plants, their management, and the environment. Ensure availability of state-of-the-art vegetation management and aquascaping technology. Maintain professionalism of vegetation managers.

Summary of Programs for Clientele:

2 curricula developed. 40 workshops, meeting, classes held. 6 newsletter issues distributed. 204 lakes monitored through Lakewatch Program.

Summary of Impacts for Clientele:

235 individuals completed the Living at the Lake course. Participants have increased their knowledge and understanding of Florida lake systems by 40 percent. 70% of participants will change one or more lakefront management practices as a result of participating in the course. Volunteer participation in annual LAKEWATCH meetings averaged 32 people attending per workshop. 82% of workshop participants intend to change one or more practices relating to management of their pond. Participants increased knowledge of pond management had increased by 50% over their knowledge prior to attending. 12 participants

attended one-day workshop. 47% of the participants were knowledgeable about TSA before the training session and 75% After the training session.

Six of 23 workshop participants increased their knowledge of biological control of aquatic weeds. 68% of workshop participants felt more confident in implementing a biological control program for aquatic plants.

Participants answered 99% of the questions correctly in Lygodium control workbook. 100% (9/9) of the course participants could describe Lygodium (Old World Climbing Fern) biology, invasive characteristics, and prescribe an effective control strategy based on the best science can offer. Upon completion of the Melaleuca Control Training program, 100% (20/20) of Melaleuca Control Training Program participants could identify melaleuca, describe its invasive characteristics, and prescribe an effective integrated pest management (IPM) program. 122 Invasive Plant Management Short Course participants received continuing education units (CEU's) which were applied toward their pesticide applicator license renewal. 100% of a sample (43/43) of Invasive Plant Management Short Course participants could correctly identify and prescribe effective control strategies for the top twenty category I & II invasive plant found in St. Lucie County, state the issues surrounding biological vs. natural control of invasive plant species, and identify ways the nursery industry can prevent invasive plants from establishing in Florida's landscape. Five program participants harvested *Oxyops vitiosa* for use as a partial biological control agent for melaleuca. 275 Aquatic Plant Management Training Program participants received continuing education units (CEU's) which were applied toward their pesticide license renewal. 100% of a sample (11/11) of Aquatic Plant Management Training Program participants could correctly identify 20 aquatic plants, prescribe an herbicide control recommendation and conduct arithmetic calculations. Participants earned an average score of 98% on the course workbook.

Success Stories:

Living at the Lake program grew like gang busters this year with five sessions taught in the Polk/Hillsborough County area. A total of 235 individuals have completed the Living at the Lake course. Course evaluations indicated that participants have increased their knowledge and understanding of Florida lake systems by 40 percent. 70% of workshop participants indicated that they will change one or more lakefront management practices as a result of participating in the course.

A total of 93 individuals participated in self-directed, online coursework generated through Gioeli's Pesticide Applicator Training Program. A growing number (14% (93/705)) of the participants chose this method of learning over traditional teaching methods because of factors such as convenience, low cost, and content. All participants surveyed indicated that they preferred this method of instruction and hope Gioeli continues to develop and offer them to the public. In addition, Gioeli's assessment of learning outcomes indicates a high level of achievement in traditionally difficult subject areas such as arithmetic.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Source of Federal Funds: Smith Lever

FL-SMP-420

Title: Conserving Natural Resources in Florida

National Goals: 4

Key Themes: Biodiversity, Biological Control, Endangered Species, Energy Conservation, Forest Crops, Forest Resource Management, Integrated Pest Management, Land Use, Natural Resources Management, Sustainable Agriculture, Water Quality, Wetlands Restoration and Protection, Wildfire Science and Management, Wildlife Management

Situation/Program Rationale:

Natural resources contribute significantly to the Florida economy and are important components of the quality of life for many residents and tourists. At least half of the respondents to a 1999 IFAS survey indicated that prevention of water pollution (72%), protecting the marine environment (64%), and conservation of wildlife habitat and endangered species (50%) were "high priority" educational program needs for their communities. And yet many issues threaten these valuable assets. Florida is third in the contiguous 48 states in the number of plants and animals federally listed as being in danger of becoming extinct. Half of all Florida's non-marine vertebrates are declining in number. Wildfire is also a major issue influencing conservation of natural resources and protection of personal property. During 1998, over a half million acres of Florida's forested lands were devastated by wild fires. Many homes were destroyed and thousands of people were evacuated from their communities. Extension activities and programs in this State Major Program are directed toward addressing these and other important natural resource issues in Florida.

Program Objectives:

To increase knowledge and appreciation of natural resource values and conservation concepts related to the management of freshwater aquatic and wetland ecosystems, forests and other terrestrial ecosystems, their biotic and abiotic components, and natural processes;
To maintain/promote environmentally-sensitive approaches to recreational and commercial uses of natural resources; To decrease environmentally-insensitive pesticide and nutrient uses; and
To increase participation in appropriate natural resources conservation activities.

Summary of Programs for Clientele:

During 2003, members of the FL420 design team developed programs to promote knowledge and sustainable living and conservation and management of natural resources:

Florida Master Naturalist Program (41 courses, 608 graduates)

Master Wildlifer Conservation Program

Master Wildlifer distance learning shortcourse (400 attendees at 18 locations in Florida)

Fire in the urban-wildland interface

Florida Forest Stewardship Program

Florida Earth Project (1 course, 23 participants)

Preserving and Protecting Urban Forests

Conservation easements and habitat improvement programs

Sustainable development

Sustainable living in lakeside communities

wildlife food plots

pond management

backyard landscaping for wildlife

exotic plant removal and control

Summary of Impacts for Clientele:

Florida Master Naturalist Program (FMNP):

FMNP Instructors increased from 135 to 159 Instructors (118% increase), which includes 30 County Extension/Sea Grant agents in 20 counties
FMNP Partner (Instructor) Organizations increased from 74 to 87 (118% increase) and from 37 to 43 counties (116% increase),
FMNP courses taught during 2003 = 41 (14 Wetlands and 27 Coastal),
FMNP graduate certificates issued during 2003 = 608 (168 Wetlands, 440 Coastal).
FMNP Graduates increased knowledge. Average short-term knowledge gain based on pre-and post-test results (all classes) was Wetlands:19.0% and Coastal:19.5%.
FMNP graduates reported 12,323 volunteer hours contributed to the state of Florida (ca. \$150,000 benefit); obtained new jobs (5%), obtained new volunteer positions (8%), obtained pay raises/promotions (4%), obtained increased responsibility in job/volunteer positions (32%), obtained continuing education credit (3%), added new information/programs to job/volunteer activities (62%), shared information about Florida's environment with others (99%),
FMNP training resulted in behavioral changes among FMNP graduates (results based on annual survey): motivated to continue learning (94%), participated in additional programs (55%), introduced others to outdoor recreation (87%), joined a volunteer group (36%), more closely evaluate environmental issues and political candidates (81%), increased attention to personal actions such as recycling, lawn care, etc. (78%)
FMNP graduates were used by other organizations to promote environmental education: recruitment of new volunteers (45% of FMNP Instructor organizations), training existing volunteers (55% of FMNP Instructor organizations)

Florida Master Wildlife Conservationist

1 course, 7 graduates in 2003

240 MWCs and citizens attended 8 continuing education lectures in the monthly series held Jan-May and Sept-Nov 2003.

80 persons attended MWC Tree ID Labs in 2003

MWC volunteer hours during 2003 = 1701 hours

MWC volunteer conservationists assisted with the St. Marks watershed education project, the newspaper supplement guides to 5 ecoregions in the St. Marks watershed, and the Killlearn Golf Course wildlife habitat improvement and demonstration project.

MWC volunteers the agent's supervision developed educational exhibits on invasive exotic plants, bird feathers, stormwater runoff, groundwater contamination, landscaping for wildlife, and the educational outreach of the MWC Program, for the multiple community events

A total of 1075 personal contacts were made by MWCs staffing exhibits at fairs and festivals in 1998 alone.

22 MWCs helped coordinate and staff the Wakulla Birding & Wildlife Festival

The MWC Backyard Wildlife Habitat Consultation Team provided 60 consultations

Fire in the urban-wildland interface

Union and Lee counties targeted four high-risk communities and provided public programs in each.

Osceola county conducted a media event for reporters to help the public understand vegetation returns after a well-managed fire.

Gulf County DOF knocked on doors to distribute brochures and alert residents to their risk of wildfire.

Santa Rosa county DOF worked with volunteer fire fighters, cub scouts, and members of a homeowners association to educate the public on wildfire.

Lakeside living and pond management:

Living at the Lake course: 70% of 235 individuals that completed the course indicated they will change one or more lakefront management practices as a result of participating in the course. Town of Harmony-placed shoreline property under conservation easements and are exploring an organizational and financial structure for a private trust to hold title to and manage other conservation properties.

82% of workshop participants in Polk county intend to change one or more practices relating to pond management.

Florida mosquito factsheets in English and Spanish and published on EDIS related to arthropod-borne disease were accessed 28,542 times during 2003.

Restoration and exotic plant removal:

Town of Harmony-11,000 acres-removed invasive plants from landscaped yards, expanded list of prohibited exotic invasive plants to include those on the Florida Exotic Pest Plant Council list, prepared a resident's guide to planting with natives.

278 requests for information in Polk county.

a CD Rom was produced to summarize Multi-species Recovery Plan information for use by target audiences

Wildlife monitoring and habitat management:

2003 annual statewide coyote survey conducted with cooperators (5 state, 3 federal, and 2 non-governmental organizations), monitored 545 baited track stations from 36 survey areas in 24 counties throughout Florida.

2003 citizen bird survey program-2,000 surveys, >150 bird species, in 20 counties.

2003 Forest Stewardship Program-218 new management plans developed.

Success Stories:

Florida Master Naturalist Program:

Instructors rated as "above average or excellent": Wetlands (93%), Coastal (97%), course rated as "above average or excellent": Wetlands (92%), Coastal (96%).

FMNP training used as a criteria for community education-The Conservancy of SW Florida uses Florida Master Naturalists to conduct weekly guided beach walks; Walton County is requiring FMNP training for individuals to obtain ecotour licenses; Sanibel-Captiva Island South Seas Resort requires ecotour operators to take FMNP training.

components of the FMNP incorporated into other programs (e.g., Florida Yards and Neighborhoods program)

Fire in the urban-wildland interface

program successfully enabled relevant agencies to work together writing, reviewing, editing, and improving the publications and planning three training sessions that have attracted 40 Extension Agents, 60 Division of Forestry personnel, 4 Fish and Wildlife Conservation Commission personnel, 3 National Forest staff, and 21 County Fire and Emergency Services staff to inservice training workshops that refined their ability to use existing program materials (Toolkit) with local audiences.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin.

Source of Federal Funds: Smith Lever

FL-SMP-510

Title: Housing and Built Environment in Florida

National Goals: 5

Key Themes: Home Safety, Promoting Housing Programs

Situation/Program Rationale:

Housing is the most costly item in the average family budget. Ideally, no more than a third of a family' combined income should be required for housing. However many families are spending much more, up to 40, even 50%! In other instances the dollars spent for housing provide poor quality and undesirable living conditions. Neglect by the landlord and/or poor care by the tenant sometimes contributes to the problems.

Home ownership is often more desirable and beneficial than renting for both the resident and the community because it tends to create stability, community pride, and greater financial security. Even though home ownership is often less costly than renting many families have difficulty buying a home because of low income, no savings, poor money management practices and/or abuse of credit. There are special programs that are designed to help low and moderate income families address some of these problems if they qualify. There are several types of "affordable homes" programs including the SHIP (State Housing Initiative Partnership) and Habitat For Humanity. Education is an important part of these programs. Although these programs are very beneficial, the needs are greater than available programs and resources.

Florida has one of the highest percentages of elderly in the nation, and that percentage is increasing! Aging brings physical changes that require modifications in housing if the elderly are to remain in their homes and continue to live independently, which is desirable for the individual and will also save tax dollars. Some changes, such as replacing locks and furnishings, are easy to make but others require structural alterations, such as widening doors and halls, and should be considered when building or remodeling.

With Florida's warm, humid climate, moisture, mold and mildew are problems. This situation creates both physical and financial concerns. Florida has a large population of retired residents who winter in the state and return north for the summer months. Closing their homes for a period of time without experiencing damage from mold and mildew is difficult. The mold and mildew problem also plagues year-round residents; it is unsightly and does damage to walls and furnishings. However, the risks to those with allergies and asthma are of even greater concern. Asthma can be triggered by such toxins-and respiratory problems are responsible for more school absences than any other cause. Recently several major lawsuits against insurance companies over payment for damage resulting from mold and mildew have received large awards. This has created a major problem for insurance companies, who have in-turn now revised their insurance coverage for homeowners. Insurance rates have increased and limitations have been written into policies. With Florida's experience with hurricanes the moisture issue and insurance are of concern.

Furnishings and equipment are necessary and well selected can contribute to the quality of life of the residents. But sometimes residents and especially new home owners get into problems by making poor decisions relating to furnishings and appliances. Poor decisions can be costly, time consuming and sometimes even unsafe.

Florida is not an energy producing state, thus energy conservation is important both financially and environmentally. The demand for fresh water is becoming an important issue in the state and waste disposal is another issue.

Extension design team members worked together to better understand the present situation and problems within the state, identify areas where needs are great and Extension has expertise and to support programs that address the needs. County Extension agents conduct educational programs within their counties teaching residents how to address their problems and take action to improve their lives.

Program Objectives:

To identify statewide needs in the area of housing and home environment, as well as, to provide leadership to the development and delivery of programs that will enable Floridians to:

Acquire housing that meets their needs and is affordable

Improve their potential for home ownership

Reduce mortgage delinquencies and increase financial security

Protect the environmental quality and safety of their homes

Summary of Programs for Clientele:

A total of 22 counties reported programs in FL510, Housing and Built Environment. Counties reported programs in:

Home buying, including teaching SHIP and Habitat for Humanity programs. They taught people who want to buy a home that only those who cleaned up their financial situation could qualify for a loan. Many who did not qualify now are working to qualify later. It also included the buying process.

Home environment. These classes addressed the problems of indoor air pollution and addressed the concerns over exposure to indoor toxins, such as lead, radon, dust mites, etc.

Furnishings and interior design, which included how to select affordable and well-constructed furnishings, avoiding scams and "rip-offs," and selecting energy efficient appliances.

Universal design. How to adapt a home to fit the needs of the elderly and those with special needs.

Agents used educational materials in English and in Spanish. Videotapes were also used in both languages. Radio, TV, newspaper articles and newsletters were also used extensively by almost all of the reporting counties.

Summary of Impacts for Clientele:

Of the 22 counties reporting:

4064 low-and medium-income families from 14 counties attended 6 to 8 hours of instruction on how to qualify for a home loan and how to shop for a home.

1482 of those attending could be certified as acceptable applicants for a home loan.

A total of 456 actually purchased and moved into a new home.

Some of those certified were able to find financing outside the program and also purchased homes. Many of those who were not certified indicated they were going to take steps to resolve their problem areas so they would be able to purchase a home at a later date. A very few realized they were not at the stage of maturity that they wanted the responsibilities of home ownership.

All of those attending agreed the experience would make them more responsible managers of their resources.

Eighteen counties used the Renter Power program with renters and also new homeowners. Four counties now require new applicants for subsidized rental units to go through the program, which teaches care of the residences, very simple home repairs, and, for tenants, how to understand the terms of a lease.

Success Stories:

Examples of the success of county programs are illustrated by the following stories:

At a meeting attended by the Lake County Extension agent, a young man approached and told the group, "Attending this lady's program was worth over \$1,000 to me. What she taught me enabled me to qualify for a loan and what I learned is still paying off!" The young man had her class on home ownership.

In Collier County, 410 non-homeowners were able to assess their financial readiness to purchase a home by using income/debt ratios and credit reports. Thirty-seven families closed on loans through the loan consortium program, totaling \$4.7 million, resulting in a conservative estimate

of \$85,000 in new or continued tax revenue for the county. Six banks have committed \$5 million in funds to be used for home loans. An additional 24 people were able to secure mortgage financing from another source after the benefit of our homebuyer's education and counseling.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. A special effort is made to reach minorities by making sure that they are represented on advisory committees, included on mailing lists and holding meetings in various communities. Many of the programs for low and medium income consumers have high minority participation. The media is used to notify the general public about programs.

Source of Federal Funds: Smith Lever

FL-SMP-511

Title: Food, Nutrition and Health in Florida

National Goals: 3

Key Themes: Birth Weight, Human Health, Human Nutrition, Infant Mortality, Nutraceuticals

Situation/Program Rationale:

Extension Food, Nutrition and Health education programs are designed to improve nutritional status and health of program participants. The impacts of these programs can extend to economic benefits for the state of Florida by improving health of Floridians and reducing skyrocketing health care costs. Floridians spend approximately \$71.5 billion annually on health care, representing over 16% of the total gross state product, the second highest in the nation (Agency for Health Care Administration, 2001). Many of these health care costs can be reduced if Floridians adopt healthier lifestyles and if they seek and receive care at the appropriate time. Extension Food, Nutrition and Health programs are designed to assist Floridians in making lifestyle decisions that can improve their quality of life while reducing health care costs to the state.

Chronic diseases such as cardiovascular diseases, cancer, and diabetes are related to lifestyle choices such as diet and physical activity. Although genetics plays a role in the etiology of all of the major chronic diseases, when people change their behaviors toward a healthier lifestyle, they can reduce their health risks.

Cardiovascular diseases are consistently the number one cause of death in the state, with 64,588 deaths occurring in 2000, including 50,016 from heart disease and 10,381 deaths due to strokes (Florida Vital Statistics, 2002). Risk factors for heart disease and stroke, including hypertension, elevated serum cholesterol, and obesity, are related to diet, exercise, and other lifestyle factors. Florida's citizens have the highest cancer rates in the country, related at least in part to a large elder population. Cancer is the second leading cause of death, with 38,622 deaths occurring in 2000 (Florida Vital Statistics, 2002). Smoking is associated with approximately 30% of cancers, and diet appears to play a role in the etiology of several types of cancer.

Overweight and obesity are growing health concerns in the U.S. Obesity increases risk for diabetes, and risk of death from cardiovascular disease and cancer. Lifestyles associated with obesity, including poor diet and physical inactivity, are estimated to be responsible for approximately 300,000 deaths each year in the U.S. Although health risks of obesity are a concern, so too are inappropriate approaches to weight management which can create adverse physical and psychological effects.

Diabetes is one of the most expensive of the chronic diseases, costing an estimated \$98 billion each year. An estimated 11.1 million people have diabetes and another 5.9 million people are believed to have undiagnosed diabetes. More than 20% of persons 65 years or older have

diabetes (NIDDK/NIH, 2002). Lifestyle changes can reduce or eliminate the need for insulin in many persons with type 2 diabetes, and have recently been found to reduce risk of diabetes in persons at high risk for the disease.

Nutrition plays a significant role at all stages of the life cycle. Appropriate food and nutrient intake is especially critical during pregnancy, for young children who are developing physically and socially, and for elders who are at high risk for poor nutritional status related to physiological, social, and economic changes. Main target audiences for programs in Nutrition in the Life Cycle are pregnant teens, parents and caregivers of young children, and older adults.

Pregnant and Parenting Teens: Inadequate prenatal care and high infant mortality rates have been a concern in Florida, although in recent years there have been positive trends toward low infant mortality rates. Pregnant teens, especially younger teens and preteens, are more likely than more mature women to experience health problems during pregnancy and to have low birth weight babies. They are also less likely to choose to breast feed their babies than older mothers.

Parents and Caregivers of Young Children: Teaching children positive food intake behaviors can promote lifelong nutritional health and reduce both short-term and long-term health risks. By helping parents and caregivers establish positive feeding relationships with young children, Extension can promote healthy eating patterns in the young people and their parents/caregivers.

Older Adults: The percentage of the U.S. population that is age 65 years and older is growing, and with the aging of the "baby boom" population, elders are expected to be 20% of the population by the year 2030 (U.S. Census Bureau, 1996). Currently, Florida ranks number one in the nation in the percentage of the population that is 65 years and older. The Bureau of Economic and Business Research at the University of Florida projects that by the year 2005, there will be over three million persons (17.6% of the population) 65 years of age and older in the state and almost 5 million (22.5%) by 2020 (Bureau of Economic and Business Research, 2001). Older adults are at risk for malnutrition. It is estimated that, nationally, 67 to 88% of participants in the Elderly Nutrition Program are at moderate to high nutritional risk (The American Dietetic Association, 1996; Weimer, 1997). For this age group, heart disease, stroke, cancer, and diabetes mellitus, which are four of the eight leading causes of death, including the top three causes, are influenced by nutritional status (Bureau of Economic and Business Research, 1997). Those who have limited resources are particularly vulnerable to poor nutritional status and associated health problems, and in some Florida counties up to 33% of people 65 years and over have incomes below the poverty level (1990 Census Handbook).

In the midst of an abundant food supply, a significant proportion of the population continues to experience hunger or food insecurity, lacking food in sufficient quantity and quality for adequate nutrition. In 1999-2001, an estimated 12.2% of households in Florida were food insecure, with or without hunger and 4% were food insecure with hunger (ERS/USDA, 2001). Hunger and food insecurity issues may be addressed through public policy education, through use of federal food assistance programs, and through nutrition education to increase effective use of limited food resources. The EFNEP and FNP programs help persons with limited resources make better use of their food resources and make healthful food choices to improve nutritional status and health.

Situation/Program Rationale:

As a result of this program, at least 50% of Floridians who participate will live healthier lifestyles by improving their lifestyle choices, reducing risk behaviors, engaging in the early detection of disease, making better use of food resources, and/or making appropriate use of the health care system.

Significance of Change: The incidence of premature heart disease, some cancers, diabetes, and obesity will decrease as people who participate in Food, Nutrition and Health programs adapt healthier lifestyles. In addition to the obvious human cost of malnutrition and disease among those most vulnerable, including elders and those with limited resources, are skyrocketing health

care costs. By improving the nutritional status and overall health of those at high risk Food, Nutrition and Health programs will contribute to reduced health care costs for the state.

Program Objectives:

Number of participants who:

- improved eating practices (such as decreased fat, increased fruits/vegetables, increased whole grain foods, increased folic acid sources, increase calcium sources).
- increased physical activity.
- adopted safe food handling practices that reduce the risk of foodborne illness.
- improved blood sugar control, as recommended.
- decreased blood cholesterol, as recommended.
- decreased blood pressure, as recommended.
- performed self-exams, as recommended.
- used over-the-counter and prescription medication appropriately.
- decreased non-preventive or emergency visits to health care providers.

Number of limited resource participants, specifically EFNEP and FNP participants, who:

- improved eating practices (such as decreased fat, increased fruits/vegetables, increased whole grain foods, increased folic acid sources, increase calcium sources.)
- increased physical activity.
- adopted safe food handling practices that reduce the risk of foodborne illness.
- were able to provide food for the family during the entire month.
- reported running out of food less often.
- reported using emergency food assistance programs less often.

Summary of Programs for Clientele:

Forty-eight counties in five districts reported outcomes of programs in food, nutrition and health in 2003, including chronic disease risk reduction programs, lifecycle nutrition programs, and programs specifically targeting limited resource clientele including the Expanded Food and Nutrition Education (EFNEP) program and the Family Nutrition Program (FNP). Programs ranged from basic nutrition and health such as the Food Guide Pyramid, managing food resources, label reading, lifecycle nutrition programs, and the Dietary Guidelines for Americans, to educational programs focused on reducing risk for, or complications from, specific health conditions such as obesity, hypertension, hypercholesterolemia, and diabetes. Programs conducted included the statewide heart health programs *Keeping the Pressure Down* and *Cholesterol Control* as well as heart health programs adapted for individual counties using statewide materials, county developed materials, and other research-based educational materials. Other in-depth statewide programs used by county faculty include *Toward Permanent Weight Management*, *Take Control to Reduce Your Cancer Risk*, and the *Elder Nutrition and Food Safety (ENAFS)* program. Several counties implemented diabetes education programs targeted to persons with type 2 diabetes, and three counties participated in the pilot test of an in-depth, collaborative diabetes education program, *Take Charge of Your Diabetes*, with grant support from the Agricultural Experiment Station.

counties conducted in-depth programming in food, nutrition and health (not including EFNEP or FNP) and reported outcome data. In these counties people participated in educational programs designed to promote healthy lifestyles, reduce disease risk, and/or reduce health complications of chronic diseases. In addition, during fiscal year 2002-2003, the EFNEP conducted in-depth educational programs with 9,364 youth and adults in nine counties, and FNP made a total of 528,375 direct contacts in 38 counties. FNP generated an additional 4,161,823 indirect contacts

through articles in newsletters/newspapers and exhibits/displays at local fairs, Food Stamp offices, health departments, libraries, and schools.

Summary of Impacts for Clientele:

As a result of participating in Food, Nutrition and Health programs, persons at risk for health problems due to age, stage of life, socioeconomic status, family history, and/or lifestyle, increased their knowledge and improved lifestyle practices in ways that promote health and reduce risk for major chronic diseases. Written surveys measuring knowledge, planned behavior change, and/or actual behavior change, were used to collect impact data pre/post, pre/follow-up, pre/post/follow-up, post-program only, or follow-up only.

Behavior checklists were used to evaluate the EFNEP program. Among adult EFNEP participants, 638 of 651 evaluated (98%) showed improvement in one or more food resource management practices, 629 of 642 (98%) showed improvement in one or more nutrition practices, and 408 of 680 (60%) showed improvement in one or more food safety practices. As a result of participating in EFNEP, 168 of 271 youth (62%) now eat a variety of foods, 720 of 809 youth (89%) increased knowledge of nutrition, 59 of 106 youth (56%) increased ability to select low-cost, nutritious foods, and 26 of 54 youth (48%) improved practices in food preparation and safety.

In FNP, 25,031 participants enrolled in in-depth nutrition programs. Evaluation tools included behavior checklists, 24 hour food recalls, and other written assessment tools for adults; "skill a thons, behavior checklists, 24 hour food recalls, and other written assessments for children, youth, and teens. In addition, oral pre-and post-tests consisting of questions asked by instructors and answered by show of hands, surveys, and observations were used to evaluate programs. Program outcomes included:

Dietary Quality

11,399 (82%) of 13,861 participants improved or increased their dietary quality. This is a measure of actual behavior changes indicated on evaluation tools or observed by the instructors. 3,452 (75%) of 4,612 participants gained knowledge of dietary quality from participation in the Family Nutrition Program.

Food Resource Management and Shopping Behavior

8,764 (78%) of 11,238 participants improved their ability to select healthy foods. 1,152 (65%) of 8,764 participants improved their ability to budget food dollars to last through the month.

Food Safety

10,637 (82%) of 13,028 participants improved their food safety behavior or increased knowledge related to food safety.

The potential for health care savings to the state related to the reported behavior changes by Extension Food, Nutrition and Health program clientele is substantial. When people make lifestyle changes, they can potentially prevent the need for expensive treatment. The American Dietetic Association (ADA) has projected cost savings for a variety of conditions that can be affected by individual nutrition counseling. Several of these are relevant to Extension education programs designed to reduce risk for chronic health problems. For example, ADA estimates that for every person at high risk for heart disease who reduces his/her need for drugs and other artery-clearing procedures, or surgery, an estimated \$10,930 is saved. If even a very small percent of people who report behavior changes following participation in one of the Extension heart health programs being conducted in Florida reduce their need for such procedures, there is the potential to save hundreds of thousands of dollars in health care costs annually in Florida. Additional savings in health care costs can occur as a result of behavior changes made by participants in other Extension Food, Nutrition and Health education programs.

Success Stories:

Pilot of Diabetes Curriculum. Forty-three persons with type 2 diabetes participated in a pilot test of an in-depth, collaborative, Extension-based diabetes education program in three Florida counties. The impacts were significant in all three counties, with hemoglobin A_{1c} values significantly lowered at post-test and again at the three-month follow-up. For the three counties combined, hemoglobin A_{1c} values decreased from 7.2% pre-education to 6.7% at post-education, and 6.2 at the three-month follow-up. One person began the program with an A_{1c} of 12.4%, which placed him at very high risk for health complications. At the end of the program his A_{1c} was down to 7.4%, very close to the American Diabetes Association goal for persons with diabetes of less than 7%. The major change in lifestyle that he attained as a result of participating in the program was changing his erratic eating pattern to a healthful and regular pattern. Due to the high cost of diabetes and associated health complications, this type of change in blood glucose control and reduced risk for severe health complications, when duplicated in other counties, can significantly reduce health care costs in Florida.

Hillsborough County. The nutrition and exercise project at Bryan Elementary School is accomplishing one of its objectives – to get the children interested in eating a variety of healthy foods. Only children whose parents signed consent forms may participate, but children have been trying to sneak into the class without parental permission! In the class on 'eating different vegetables' for 5th graders, after taste testing raw potato, rutabaga, parsnip, turnip, jicama and boniato, teams of children competed to identify these vegetables by taste alone. After 10 rounds of tasting, the children begged to not stop the game! At the end of class, the children asked to take the samples home or to eat the rest of them in class!

Leon County. Coronary heart disease is the number one cause of death in America and the second leading cause of death in Leon County. Risk factors for heart disease are related to diet, exercise and other lifestyle factors. Educational programs conducted at the Florida Department of Education taught strategies for making lifestyle changes. One participant reported that her husband's elevated fasting triglyceride level of 596 mg/dl dropped by 61% three months after participating in Cholesterol Control and implementing healthy choices into the family's lifestyle. An EFNEP graduate who completed a series of nutrition classes returned to visit her WAGES class and reported that as a result of EFNEP she dramatically changed her eating and exercise habits and those of her family. Since beginning her lifestyle changes she has lost 51 pounds (196 pounds to 145) and has dropped from a size 22/24 to size 8.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Educational programs developed by state specialists and used by county faculty are designed to appeal to a wide variety of audiences, and can be adapted for use with persons of different ethnic backgrounds. Many educational materials are provided to county faculty in Spanish and some are available in other languages such as Haitian Creole and Vietnamese. ENAFS educational materials are designed for use at congregate nutrition sites and for home-delivered meal recipients throughout the state of Florida. These Older Americans Act programs are available to all older persons, but are targeted to limited resource clientele. Ethnic minorities make up a significant proportion of the clientele at many congregate nutrition sites. The ENAFS Daily Food Guide Pyramid for Elders was designed to appeal to ethnic minorities through the use of a variety of ethnic foods in the various food groups. The EFNEP and FNP programs specifically target individuals and/or families with limited resources. As appropriate, county faculty target specific educational programs to ethnic minorities and advertise their programs in ways that will reach the targeted group.

Source of Federal Funds: Smith Lever

FL-SMP-512**Title:** Family Economic Stability in Florida**National Goals:** 5**Key Themes:** Consumer management/education, Estate Planning, Family Resource Management, Retirement Planning, Youth Development/4 H,**Situation/Program Rationale:**

The purpose of this program is to empower Floridians to become competent consumers and to develop sound financial management programs for themselves and their families based on their goals and available resources. The program areas include changes occurring in the marketplace, consumer rights, and responsibilities, budgeting, savings, investing, and the responsible selection of goods and services. It focuses on programs that enable the consumer to make sound financial and consumer decisions.

Technology is generating rapid changes in the marketplace, outpacing the competence of consumers to function efficiently in the purchase of goods and services. Online shopping offers an impersonal worldwide market, which has few laws that govern the quality, distribution and security of purchases. Internet shopping increased more than 300% from 1999 to 2000. It provides new products and wider markets, but it also brings challenging problems such as identity theft, which increased threefold in 2000, creating major problems for its victims.

Despite a thriving economy, personal bankruptcies continue to increase, up about 23% in Florida since 1999. A Princeton Survey (2000) found that on a national average about 64% of households with an income of \$20,000 to \$50,000 live pay check to pay check. For families with an income under \$20,000, 79% live pay check to pay check. Furthermore, savings dropped to an average of negative .2%, indicating families are spending more than they earn. Another study found that over half of all households paid credit card bills late one or more times during the past year.

Americans are spending 14.3% of their take-home pay on consumer debts.

Electronic banking and funds transfer are simplifying financial transactions but creating a greater need for accurate record keeping. The number of people using credit cards is increasing and so are fees. Also there is an increase in non-bank "banking," for example payday loans, title loans, and rent-to-own.

Reports of personal credit use and repayment records are becoming increasingly important in all consumer transactions. In addition to impacting the availability and cost of credit, a consumer credit report can determine whether a bank account may be opened. At the same time, more and more employers are demanding salaries and wages be electronically deposited to employees' accounts.

Individuals and families need educational programs in consumer education and family economics to teach them to become competent financial managers and consumers. Washington University reports a study (2001) with 2,378 people in 14 groups, which documents substantial performance improvement per hour of instruction. Unfortunately, many Florida residents have very little if any training in the important areas of consumer education and family economics.

Program Objectives:

Floridians participating in the Family Economic Stability programs will reduce debts, increase savings (or investments), comparison shop, increase knowledge, develop financial plans, become informed about financial institutions and services, and/or do preplanning for the end of life.

Summary of Programs for Clientele:

In 2003 Family Economic Stability programs in Florida consisted of four programs for youth: Money Camps, Money Wise, Consumer Choices and the High School Financial Planning Program.

Programs for adults included: Consumer Education, Seat Belt Education, Family Financial Management, and SHIP

Forty-six of Florida's 67 counties reported some programming in Family Economic Stability. County faculty reported 1,534 learning events that reached 49,501 Floridians and average of 32 participants per event. An average of 50 days were spent on FL 512 for the 19 counties reporting days spent. This reflects about 8 FTE's in Florida dedicated to FL 512. County faculty answered 398 telephone calls related to FL 512 concerns. The county faculty responded to program request with an average of 76 clients visits per county. County faculty answered on average 815 letters pertaining to FL 512. 1500 pieces of direct mail was sent per county (average). 3,355 pieces of educational materials distributed per county, 389 media pieces were delivered in 28 counties reaching 8,927,655 households or about 318,845 per county. 13 counties reported 21,144 hits to websites or an average of 1,626 hits per county with questions related to 512 programming.

Summary of Impacts for Clientele:

Seventeen counties reported volunteer data. An average was determined then applied to the 46 counties reporting programming in FL 512. The FL 512 program area received assistance from 1,886 volunteers. These volunteers gave 3,858 hours (1.9 FTEs) and reached 97,566 individuals with FL 512 program materials.

Youth Programs:

Money Wise Program – County faculty used school enrichment programs to reach and teach large numbers of students. Classroom teachers sometimes assisted by the county Extension faculty provided the instruction within the school. Each participating teacher used an age-specific workbook provided by the county Extension faculty. Thirty counties used over 40,000 Money Wise workbooks to teach money and consumer skills to school age children.

Money Camps – In 2003 four “money day camps” were planned and conducted as a pilot project in Florida. Outside funding was received to support this effort. Three programs were conducted in three days and one was a five-day camp. Eighty at risk youth were selected to participate in the camps. The participants learned in a classroom setting; then participated in 3 or more field trips to reinforce the learning. Pre and posttest were given to evaluate the project. Data show that few participants had had previous experience with a bank. Participants learned about banking and how to write a check. They learned about credit and how to compute credit costs. They learned about shopping for the best buy. They learned about selecting an automobile and its cost, i.e. insurance, gasoline, payments, and liability. They also learned about the cost of consumer fraud, shoplifting and pilfering.

Consumer Choices Program – Consumer Choices program materials were used in 40 counties. Extension faculty taught classes for 4-Hers and other young people within their counties. Judging events were held at 11 county and regional fairs. Most of the participation numbers were reported under FL 715 (4 H) although program materials were developed and distributed by program area FL 512. Prof Harrison wrote 120 judging situations for 3 major regional fairs (Orlando, Tallahassee, and Jacksonville) and 8 county fairs. Some youth competed in judging events in more than one fair.

County data report:

2240 youth were involved in Consumer Education programs.

99% demonstrated knowledge gained.

54% learned how to calculate interest payments and differences between lease and purchase prices.

47% could recognize 6 or more warning signs of consumer fraud and could list at least 2 consumer laws.

75% could figure sales tax and discounts, determine unit pricing and prepare a family budget.

High School Financial Planning Program (HSFPP) – The HSFPP co-sponsored with the National Endowment for Financial Education and Cooperative Extension Service provides

educational materials free to each teacher and each student enrolled. Research data show that there is a critical need for financial education. High school seniors are not making a passing grade on financial test. Those with financial education fare much better on exams. In 2003 the HSFPP was implemented by extension in 29 counties. Two hundred and twenty schools throughout Florida taught the program reaching 26,260 students with financial information in budgeting, credit, savings, employment & taxes, insurance and goal setting-financial planning. 91% of young people surveyed (727) indicated that they had set financial goals, 25% reported that they had opened a savings account and 54% saved some money each month.

Adult Programs:

Consumer Education programs helped Floridians learn how to protect themselves from fraud and identify theft. Programs also helped consumer's comparison shop for best buys and to save money. Consumers learned about pre-paid funerals and other options for dealing with the cost of dying. A multi-county, multi-state program Consumer Be Aware was presented. Results from pre and post test and follow up questionnaires from one county showed that:

275 participants learned about funerals and options, they plan ahead for funerals, investigate prepaid contracts, and develop a plan for funerals.

205 learned strategies for dealing with telemarketers and how to protect self against fraud

189 report they will investigate charities before giving

174 report they will be more cautious when conducting business on the telephone.

155 will report to police potential fraud scams

116 learned how to protect themselves against identify theft and the need to report immediately.

92% of participants learned to shop more wisely to get best buy and to save money.

Seat Belt – The Seat Belt Safety Program includes educational programs for adults and young people as well as checking booster seats for correct installation. Four counties reported programs on Seat Belt Safety. 5,098 received information on seat belt safety from workshops, county fairs, or printed material. 310 infant booster seats were checked. (Data indicate that only one in five child seats are correctly installed.) On pre post test 80% of participants knew it was the law to buckle up, yet fewer than half of Florida's passengers and drivers buckle up. 57% of program participants were using seat belts and 49% of them were making sure that occupants of their vehicles also buckled up. In one county all 1,628 participants promised to buckle-up and 50% of those promised to ask at least one other person to buckle-up.

Money Management-Forty-six counties reported reaching 49,501 Floridians with Family Financial Management programs. Evaluation of these programs showed that as a result of participating in these programs:

Budgeting –

5428 learned how to develop spending plans

2342 developed spending plans to control spending, to avoid having to take out loans to pay bills, to pay bills on time, to improve ability to manage debt, and to control spending

42 reported using the budget box as a method of control

791 developed other strategies to prevent over spending

10 persons were required by law to attend budgeting classes

325 participants reported they improved ability to stretch income to meet family needs.

204 participants said that they would develop a spending plan

245 reported they learned how to use a bank account (according to the US Department of Treasury over 25% of Florida's adult population is un-banked.)

2 opened a bank account

43 parents gained knowledge on financing child's education

68 learned how to choose a bank

72% of participants took steps to improve the family's finances

90% improved budgeting skills

Credit-

724 reported that they gained credit knowledge
387 reported they learned ways to reduce debt
386 learned how to evaluate credit cards
386 learned how much credit cost and how it ties up future spending
95 reported they plan to change credit behavior
383 learned why they should review credit report
156 requested their credit report, 85 plan to request report
16 added his/her comments to the credit report
215 learned how to build a good credit rating
5 sought credit counseling
10 closed out one or more lines of credit
38 made plans to pay off loans early
88% of program participants learned to use credit wisely
11 people reduced debt by \$33,500 or average of \$3,045 each
9 people reported reducing debt by \$1,500 each

Employment-

11 people developed employability skills

Estate Planning-

672 increased knowledge about estate planning and property transfer
9 prepared a durable power of attorney to provide some assistance to family members who may need to handle estate matters.
35 wrote a will and/or established a trust
199 reported that they had established a plan (other than will or trust) to transfer non-titled property
7 began tax planning
57% of participants talked with family members about transferring property
30% of program participants reported they had developed a will, trust or other plan for transferring assets to the next generation

Insurance-

1/3 of program participants reviewed insurance policies.

Record Keeping-

333 participants learned steps to keep track of household records
100% of all participants reported that they had gained knowledge from programs on record keeping
64% of participants developed a household record keeping system
51% of participants developed a cash flow statement
62% of participants developed a net worth statement
53% of participants began a household inventory

Retirement-

48 participants determined retirement goals
60 participants calculated amount of money needed to fund retirement
80% began saving for retirement
64% began to make plans for retirement

Savings & Investments-

900 learned the importance of savings
580 developed plans to save, 2 specifically stated they planned to save for children
14 reported saving \$75 or more by doing projects
159 increased savings
2 Florida counties are involved in America Saves (Gadsden and Okaloosa)
120 signed up to begin savings

156 attended workshops
20 coaches trained
59 pledged to save \$14,376 an average of \$270 each
57 saved \$1500 – none had been withdrawn after 3 months
9 saved \$100 each per month
15 saved \$13,195 (\$880 each)
4 inmates are saving \$20 per month and another inmate is saving \$10 per month
(If the 900 who learned the importance of savings saved \$100 per month, savings would increase by more than \$1 million next year.)

SHIP

County faculty in 15 counties reported participating in the SHIP program in 2003. They reached 1,534 potential homeowners with educational programs designed to help them repair credit and save money in order to qualify for the special funds to purchase a home. Of that number 390 participants closed on new homes and 113 received funds to repair older homes. About 32% of participants received funds to improve their housing situation. This program had an economic impact in excess of \$17.3 million or about \$1.2 million for each participating county. Other impacts of this program are reported under FL 510.

Success Stories:

Money Camps. In the “5 day money camp,” the 25 participants set up a cookie factory. They organized the company with the mission to bake and sell cookies. They learned about selecting employees for particular positions, i.e. bakers, salespersons, bookkeepers, etc. After the 5 days the cookie business dissolved and profits were distributed to participants. The participants made approximately 5 cents per cookie.

Financial Management Program for inmates.—In Pinellas County 1263 inmates were involved in a financial management program. Twenty-three individuals were tracked. Only one had returned to prison 22 were gainfully employed. (Salary ranged from minimum wages to \$50,000 annually). Cost to house a prisoner is \$63 per day or \$23,000 annually. If the success of the sample tracked could be applied to all 1263 inmates involved in the program. The county could save (1263 x 96% [rate not returning to prison] x \$23,000) approximately \$28 million per year in reduced incarceration costs. If one considers the wages earned by these 1212 inmates (estimated average of \$18,000 per year) another \$22 million per year can be added to the economic benefit (Benefit to the county is approximately \$40 million per year).

Home Study Course— In Collier County a home study course has been running for the 4-year planning cycle. 658 participants have enrolled in the program. Survey data show that:

579 have adopted at least one financial management practice change
519 have established financial goals
210 developed and are using a spending plan
383 have reduced debt
288 have increased savings

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. In order to ensure that minorities are reached, educational events are advertised in all local newspapers, direct mailing, churches, grocery stores, work sites and local agencies. Class sessions are held in clients' location. County faculty make use of bilingual volunteer counselors to work with non-English speaking clients.

Source of Federal Funds: Smith Lever

FL-SMP-513**Title:** Community Development**National Goals:** 5**Key Themes:** Communications Skills, Community Development, Conflict Management, Home-based Business Education, Impact of Change on Rural Communities, Jobs/Employment, Leadership Training and Development, Promoting Business Programs, Supplemental Income Strategies, Tourism, and Workforce Preparation**Situation/Program Rationale:**

The vitality of a community stems from an interrelationship of many factors that can enhance or impede development. Some of these factors that impede development are the same ones that describe the uniqueness of the community, how it developed and what the future prospects might be. In each case, there is both a positive and a negative aspect to each factor. The challenge is to utilize the uniqueness to enhance the community vitality while, at the same time maintaining those factors that enhance development. In the case of rural communities these factors include: (1) remoteness from metropolitan areas which limits access to health care, technology and industry jobs; (2) sparse population which may inhibit efficiencies that depend on economies of scale; and (3) dependence on a single industry which can reduce a community's ability to withstand the effects of a downturn in that industry. These characteristics, typically tied to a natural resource or to low skill manufacturing, are often the root of the economic problems of the area. They are also the reason why many people choose to remain in a particular area because these characteristics describe the culture, the quality or way of life, of a particular community.

Other factors affecting a community include the adequacy of infrastructure for transportation, water and sewer, and communications; a favorable business climate in terms of credit availability and local business expertise; an adequate tax base and a favorable tax structure for social needs as well as development; employment opportunities and the availability and the availability of skilled workers.

Although rural and urban areas cannot change the characteristics that describe their area or the conditions that may impede economic development, they can exert influence on other factors that are critical to economic success. These efforts can spell the difference between a vibrant community and one that continues to lose population and business. Some needs are clearly evident when describing Florida communities:

There is a need to expand the pool of qualified leaders and to enhance the leadership skills of organization officeholders and local government workers. Local leaders need skills to work with boards, commissions, government agencies and community organizations. Currently in Florida, leadership skills are lacking among staff in some local government offices and among members in civic and community organizations. Officers and members of community organizations frequently do not have the basic leadership skills that are needed to work in harmony with other members in pursuit of group goals. Organizations and boards frequently cannot find officers and committee members to provide continuity for the group. The result is the interests of a prominent few dominate the interests of the community. Citizens become disenfranchised and critical of local government and organizations that should serve the overall needs of the community. The availability of local leaders is a prerequisite to economic development. Effective leadership can spur economic development by facilitating plans and projects for county, business, and financial institutions and others. In contrast, inadequate local leadership can contribute significantly to a lack of economic development. Leadership is inadequate when leaders do not have the perspective that is necessary to see opportunities for business development. Extension has experienced in developing community leaders. Education and assistance in planning, conducting and evaluating local leadership programs are available. Curriculum modules for

various facets of leadership training, including non-profit organizational development and volunteer management are available.

There is a need to assist local leaders and citizens in obtaining and analyzing information about their community and its relationship with the larger society. Though much demographic and socioeconomic information is available, many people in small communities have limited experience in retrieving such information and applying it to decision making. In short, local leaders are making decisions based on limited information, sometimes acting ineffectively and reaping unintended consequences. Extension faculty have experience using U.S. Census information, as well as data from other sources, to help local leaders better understand their community. Extension can help people obtain appropriate data, assist with analysis, develop presentation materials, and prepare reports.

In some cases, needed information, such as residents' opinions about local needs and priorities or customers' views about the local business district, cannot be obtained from secondary sources but must be collected directly. Extension faculty have experience in assisting community leaders and local volunteers, including high school students, to develop a partnership for conducting community surveys. Extension can help people plan the survey process, develop a questionnaire, select a sample, collect and analyze the data, communicate the results to community organizations, and identify ways to use the results.

There is a need to increase the number of and the success rate of present and potential owners of small business enterprises and to increase the number of Floridians who are working in unsubsidized employment. The economic growth in Florida and elsewhere in the United States is in small business development. Many small business enterprises are started each year and although some are still in operation after five years, most are not. These local entrepreneurs can provide economic growth and employment in communities throughout Florida. As a significant and growing part of the economy, small business owners need to be encouraged through education and training available in their community. Extension can provide appropriate training to help potential business owners understand the steps in starting and maintaining a business. Many communities have adults with limited educational attainment and who lack the skills needed to compete for the newer type of technology-oriented jobs being created in the marketplace. Many of these individuals are transitioning from welfare to unsubsidized employment due to federal and state legislation aimed at decreasing the welfare population. Extension has many disciplines, educational programs, and resources that can provide appropriate educational experiences to assist these individuals find and keep employment.

Program Objectives:

To improve the well-being of Floridians by: (1) enhancing community economic vitality through developing a cadre of local leaders who will focus on community uniqueness, resources and potential; (2) analyzing demographic, social and economic attributes of communities to help leaders and residents better understand their strengths and weaknesses and opportunities for economic development; (3) building human capacity of urban and rural residents for participation in labor force and entrepreneurial activities; and (4) improving the ability of local leaders to conduct the process of establishing informed public policy through issues education.

Summary of Programs for Clientele:

Number of counties reporting: 16 (Brevard, Broward, Calhoun, Collier, Franklin, Gadsden, Hardee, Hillsborough, Jefferson, Manatee, Nassau, Orange, Pasco, Suwannee, Taylor, and Wakulla)

Counties reporting information relevant to the community development state major program: Broward, Calhoun, Collier, Gadsden, Hardee, Hillsborough, Manatee, Orange and Taylor

Summary of Educational Activities for Clientele:

Programmatic efforts were focused on five content areas: 1) Business retention and expansion, 2) New business development, 3) Leadership development, and 4) Economic impact analysis. The first two contribute directly to development of the local economy, while latter two help community leaders make more informed decisions on locally-relevant issues. In each content area, only a few counties participated and the impact of these efforts is described elsewhere in this report. Community development activities also included ones that were unique to a county, such as enterprise zone designation, clam farming leases and business recruitment.

Summary of Impacts for Clientele:

Business Retention and Expansion

Studies have shown that 40 to 90 percent of new job growth comes from existing businesses. Enterprise Florida says that 80 % of instate job growth comes from existing businesses. Recognizing this, Business Retention & Expansion (BR&E) programs seek to promote a healthy local economy by focusing on existing businesses. The program promotes job growth by helping communities identify concerns and barriers to the survival and growth of local businesses. The Cooperative Extension BR&E program is designed to provide specific technical assistance to a local community. State specialists, certified in the BR&E process, assist a community with all aspects of a BR&E program including survey design, data analysis, report writing and preparation of recommendations to support existing business development. Hank Cothran provided information on the establishment of BRE programs to St. Lucie County. St. Lucie County established a BRE position in its Economic Development Office. He also provided information to Enterprise Florida on the establishment of a state-wide BRE program. Enterprise Florida is considering various models for providing assistance to existing businesses.

County Extension Directors in District 1 and 5 were trained on opportunities for BRE and Community Economic Development programs. Team member Hank Cothran was approved as an instructor in the Business Retention and Expansion Certification Curriculum and he taught the BRE Consultant Certification class in Bismarck, North Dakota and Galesburg, Illinois. A total of 37 people were certified as BRE consultants as a result of the training. Hank Cothran also continue to serve on the Board of Directors for BRE International.

Initiated a BRE program in Citrus County. This program is currently in the recommendation implementation phase. As a part of this program, a local leadership team (5 people) and task force (30 people) as well as 55 individuals who served as volunteer visitors to local businesses were trained. Together these people visited 104 businesses in Citrus County. Based on the business visitations, a final report was prepared. Community leaders implemented 17 recommendations. A total of 360 requests for information and assistance were received and 30 companies requested specific follow-up assistance. The community calculated that 55 jobs were immediately retained as a result of local action and that direct assistance led to the creation of 100 new jobs. and are implementing the recommendations in a priority order. The Citrus County BRE program was selected by Business Retention and Expansion International as the best multi-community program in the nation in 2003.

Initiated a BRE program in Sumter County. Trained a local leadership team and task force in their responsibilities in carrying out a BRE Visitation program. Trained 25 local volunteers to conduct business visits and 24 business visits have been completed. Some 20 recommendations were presented to the Economic Development Council (EDC). The EDC is currently considering what recommendations it will seek to implement in 2004.

As a result of completed BR&E visitation programs in 2002-2003, approximately 100 persons completed training for the local leadership team (Table 1). Many also were trained to conduct face-to-face interviews of firm owners or managers and they collected information from over 128 businesses employing over 9,000 workers.

Table 1. Business Retention & Expansion Program Outcomes, 2002-2003.

County	Number trained for BR&E leadership team	Number trained for business visitation	Number of businesses visited	Number of employees at visited firms	Number of issues for follow-up
Citrus	5	55	104	9,000	25
Sumter	5	25	24	--	--
Total	10	80	128	9,000	25

Contact: Hank Cothran, Department of Food and Resource Economics

New Business Development (Fast Track)

Much of economic growth in Florida is based on small business start-ups or expansion. Many small business enterprises are started each year but only about 40 percent are still in operation after five years. As a significant and growing part of the economy, many small business owners need technical assistance and training. Extension can provide appropriate training to help potential business owners understand the steps in starting and maintaining a business. The objective of the entrepreneurship education program is to increase the number and success rate of present and potential owners of small business enterprises. The FastTrac curriculum, developed by the Kauffman Center for Entrepreneurial Education, is used in programs in Broward, Collier, and Marion Counties. FastTrac data indicate that 74 percent of its program graduates are still operating profitably after six years. For current business operators seeking to sustain, expand, or improve their business operation, FastTrac Planning is used. The emphasis is on developing a business plan unique to their particular business operation. For persons who are not currently engaged in a small business but want to start one, there is FastTrac New Venture. The emphasis here is on developing a feasibility study.

In Collier County, 10 FastTrac Planning and four FastTrac New Venture recognition programs were held. A total of 121 participants graduated from FastTrac Planning classes and 63 completed a feasibility study during FastTrac New Venture classes in 2003. Along with the FastTrac courses, the agent also conducted one-on-one consultations with 148 graduating businesses and six graduation recognitions (with a required 30 second description of the essentials of their business plan). A contracted FastTrac certified national trainer provided no cost training to certify five South Florida area facilitators including a new Broward County Agent using state SBDC funding. This increased the number of certified facilitators from six to eleven. FastTrac graduates left the program with a strong business plan, a clear understanding of risk management and business continuation, which assist them with the dynamics of the business environment, competition and changing customer needs.

The Extension agent in Broward County coordinated and completed 2 FastTrac New Venture programs (35 enrolled) and a Planning program (7 enrolled). Another 16 persons enrolled in a New Venture program in December, 2003. He also conducted one-on-one consultations with 26 FastTrac clients and conducted 3 Business Planning Workshops to help 18 FastTrac participants and others develop their individual business concepts and business plans. As a result, 6 businesses expanded or started during 2003.

Extension faculty in Broward and Collier Counties also launched collaboration with Veterans Corporation, a 501(c) 3 corporation chartered by Congress in 1999. The Corporation subsidized tuition and helped with marketing to enroll veterans. Major Charles Henry sited Collier County Extension as the Veterans Corporation's premier collaboration. Veterans Corporation partnered with Gateway Computers, which provided computer equipment for graduated veterans. Kauffman Foundation supports the partnership with a well-monitored curriculum certification of facilitators and marketing support. Officials from FastTrac, the Veterans Corporation and Gateway Computers made presentations at a special recognition program. The national economic

development program leader, Sally Maggard, has selected this project for inclusion in the national convention to be held by regional rural development centers.

Contact: Denise Blanton, Collier County Cooperative Extension Service, and Henry Tarquine, Broward County Cooperative Extension Service
Leadership Development & Public Issues Education

Local leaders need skills to work with boards, commissions, government agencies and community organizations. Currently in Florida, leadership skills are lacking among staff in some local government offices and among members in civic and community organizations. Officers and members of community organizations frequently do not have the basic leadership skills that are needed to work with others in pursuit of group goals. Organizations and boards frequently cannot find officers and committee members to provide continuity for the group. The result is the interests of a prominent few dominate the interests of the community. Citizens become disenfranchised and critical of local government and organizations that should serve the overall needs of the community. There is a need to expand the pool of qualified leaders and to enhance the leadership skills of organization officeholders and local government. Programs in Collier and Hardee Counties are highlighted below.

Extension faculty in Collier conducted a structured leadership program in 2003. The program graduated 12 community members and county employees identified as emerging leaders in a fall, nine session, two-hour course covering personal leadership style, team building, communication skills, conflict resolution strategies, and problem solving analysis. These skills were then practically applied by two team projects and, upon completion, were presented to county leaders: 1) Transportation Alternatives to Road Building, and 2) Community of Character Education. As a result of the 2002 Learn to Lead program, 26 Collier County participants reported the following skills to be improved:

Used communication skills such as: writing letters: 31%; making contacts with other departments or organizations: 46%; speaking on behalf of a program, project, cause: 54%; listening for understanding: 69%; and, giving and receiving critical feedback: 69%.

Used group skills such as: conducting business or other organizational meetings: 31%; working with others on projects or programs: 69%; managing conflict creatively: 38%; involving others who were not previously involved: 54%; delegating: 54%; and, understanding your leadership style: 85%.

Used goal setting skills such as: setting specific goals for self, organization, or project: 46%; identifying or assembling resources to reach a goal: 38%; attaining set goals or evaluating results: 31%, and exploring various alternatives for solving problems 92%.

Estimate of number of hours spent in leadership activities: Number of hours spent in leadership activities over the last year: 6157; number of other people you have recruited to become involved: 378; and, number of hours these other people contributed: 3290.

Extension faculty in Hardee County and state specialists conducted a three eight-hour session leadership program with 24 participants. All of the participants indicated that "their time and money was well spent in attending this leadership school". Ninety-six percent also indicated they "would attend more advanced leadership training if provided locally." In addition, two businesses represented in this year's Leadership School have asked this agent to conduct leadership training at their place of employment. Although it is too early to determine impacts, several graduates of

this years' Hardee Leadership School have volunteered to assist this agent in developing a Youth Leadership School for Hardee County.

Leadership Rural North Florida

This project was initiated in Fall, 2002 by North Florida Community College to provide leadership education for a targeted group of persons in the six counties served by the College. IFAS faculty participated in planning the leadership development program. Subsequently, Glenn Israel conducted two modules in 2003: *Community Asset Mapping* and *Creating a Community Socio-demographic Profile*. Twenty-two community leaders attended the workshop on asset mapping and 20 attended one on community demographics. Participants were actively engaged in the learning process and several made positive comments at the end of each workshop. The program coordinators also indicated a high level of satisfaction with the quality of the workshops. Elizabeth Bolton conducted one module: *Developing Community Partnerships*. Approximately 20 participated in this module and a 50 page handout was prepared and given to the participants.

Contact: Elizabeth Bolton, Department of Family, Youth and Community Sciences, and Glenn Israel, Department of Agricultural Education and Communication

Civic Engagement: the Martin County Multi-Stakeholder Consensus Committee (MSCC)

A proposal for a county initiative to authorize a county-funded program to acquire agricultural land for conservation purposes had become a contentious issue, and community leaders decided to solicit the assistance of an "impartial, objective third party facilitator" to lead a community consensus-building process regarding land use policy in Martin County. At the request of the "Stakeholder Steering Committee"--through Martin County Extension Director, Carol Bailey, Dave Mulkey, Hank Cothran, and Roy Carriker have served as process design consultants and as facilitators for several meetings of the MSCC. The first was a meeting with the Steering Committee and about 20 community leaders representing a cross-section of stakeholder interests in the county. This group sponsored an open meeting that drew 165 people to an exhibit hall at the county fairgrounds to hear presentations on growth management and land use control topics. A consensus decision of this assemblage was that they wanted to meet again for the purpose of developing a vision statement for Martin County with respect to growth issues. A third meeting, in December, involved 65 individuals in facilitated breakout groups and produced proposed vision statements. Through a series of facilitated meetings, a large group of people, representing divergent positions on land use issues, worked together to discover areas of common interest around which they might build cooperative efforts to address otherwise divisive county growth management issues

Contacts: Roy Carriker, Department of Food and Resource Economics

Economic Impact Analysis

The project began in 2000 as a special Florida First Initiative to assess the economic role of Florida's agricultural and natural resource industries. It was started with special funding from the UF/IFAS Office of Vice President. A statewide publication was completed and presentations made to Governor's Budget Staff, the Florida Agricultural Council and to staff members of the Florida Congressional Delegation. Team members developed and maintained an Economic Impact Website to serve as a contact point and to provide for electronic distribution of economic impact data, publications, related information, and links to other sites. In addition to publications the website contains information on current projects, faculty contacts, agricultural census data for all Florida counties and economic and demographic profiles for Florida counties. A number of short-term economic impact efforts were completed at the request of county extension faculty or other clientele groups. Projects are listed below:

Worked to assist Marion County Extension in measuring the impact of an Ag Expo facility in Ocala

Information to assist IFAS faculty at Ft. Pierce in measuring the impact of agriculture in St. Lucie County

Information to assist faculty at Immokalee and in Hendry County in measuring the impact of agriculture in a five-county area of SW Florida

Information to assist Dairy Science Faculty in assessing the impact of potential changes in dairy regulations in Okeechobee County

Information for local officials related to the economic impact of rural hospitals in Taylor County and in Madison County

At the request of staff of Senator Bob Graham, provided advice on impacts of dredging and navigation project on the Apalachicola River (with VanSickle, Kiker, and Evans)

Met with officials with the Gambling Boat Industry in Florida to discuss economic impact study for their industry. As a result of this meeting, a study of the industry is being done by the Department of Recreation and Tourism at UF. We will add the economic impact assessment once the other study is completed with details on participation and expenditures.

Team members also wrote a number of technical papers and popular articles on economic impacts of various agricultural industries, activities and natural resources used in Florida.

As a result of these analyses, clients are better informed about the structure of the Florida economy, the role of agricultural and natural resource-based industries, and the impacts of specific activities and events.

Contacts: David Mulkey and Alan Hodges, Department of Food and Resource Economics

Success Stories:

Although Entrepreneurial Education programming has only been implemented this year, at least 2 individuals have actually started a business while a third decided against starting one. One individual started an automotive repair business that specializes in brake repairs. The unique feature of this business is that he has set up a complete workshop in a step-van, and actually goes to the customer's location. The truck is a complete garage on wheels that also include equipment to actually turn and resurface brake drums. Approximately 95% of all brake repairs can be performed by this operation. Another individual started a Martial-Arts training business. Specialized training programs are designed for police forces, corporations, and individuals. This individual has recently obtained a contract with the City of Miramar, Florida, to provide training to residents at the City's community center. Additionally, another participant has indicated that as results of taking the FastTrac program, he has decided not to pursue starting a business. Upon researching his business concept which was to provide specialized corporate training to businesses in the South Florida area, he has determined that the concept was not economically feasible. He has since thanked us profusely for the money that we have saved him. Prior to taking the program, he was all set to "blindly" expend his funds. He is now working to develop other business ideas and will apply what he has learned to make more informed business decisions.

Contact: Henry Tarquine, Broward County Cooperative Extension Service

Community Development Initiative's objective was to establish a coalition of people and agencies to pursue rural economic opportunities. This county has one of the lowest per capita incomes in Florida and we continue to have a serious infrastructure, leadership, and organizational structure needs to address. The local Extension office worked to bring state and federal agencies, as well as community leaders together to address selected problems and pursue economic opportunities. The local extension agent conducted three educational classes to teach about ways and means to accomplish local goals and objectives. After several meetings with companies, the Governor, area Representatives, bankers, we collectively meet with three established companies about locating in this county. One company is locating here, with the

other two possibly expanding their operations to this county. All persons associated with this effort have expressed their pleasure with this unique effort by Extension.

Contact: Logan Barbee, Calhoun County Cooperative Extension Service

Taylor County's success in receiving enterprise zone incentives is due to the extension's involvement in the program. Of the six net ban enterprise zones designated in 1997, only Taylor County has any significant activity in refunding incentive to business owners in net ban designated zones. The enterprise zone educational program has generated \$195,000 for businesses in the Taylor County enterprise zone. This includes credits taken against Florida Corporate Tax and actual refunds of tax paid on building materials and business equipment. Recently, Senate Aides from the Senate Commerce Committee have visited with the Extension agent conducting the educational programs in Taylor County and with business owners to discuss their reasons for participating in the zone incentive program. Owners reported that one-on-one education provided by the Extension service has been the difference in their involvement with the incentive program.

Contact: Clay Olson, Taylor County Cooperative Extension Service

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Educational programs are conducted in accordance with the University of Florida's policy of equal opportunity/affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities and encourage participation. Extension Educational programs also are advertised to the public through local media, posters and flyers are placed in community centers, and targeted letters are sent to agency and recognized minority community leaders. In Taylor County, for example, the agent worked with the Board of County Commissioners to appoint minorities to the Enterprise Development Agency, an important partner for community development. Extension agents sometimes work closely with minority communities to plan, explore, develop programs, and initiate opportunities for improvements within the minority communities. Programs are conducted at locations in minority communities to increase access for their residents. Some Extension agents also provide transportation and written literature for meeting and functions within the minority communities.

Source of Federal Funds: Smith Lever

FL-SMP-515

Title: Successful Parenting and Family Development

National Goals: 5

Key Themes: Aging, Character/Ethics Education, Child Care, Children, Youth, and Families at Risk, Communications Skills, Community Development, Conflict Management, Consumer Management

Situation/Program Rationale:

Program Objectives:

Summary of Programs for Clientele:

With support from the design team, in 2003, thirty-six counties have consistently conducted programs under the state major program FL-515. County faculty have reported reaching 59,151 participants through 5,627 learning events. They have offered a number of parenting programs targeted to different audiences, including single parents, teen parents, working parents,

grandparents, divorced parents, incarcerated parents, and parents court-ordered to attend because of child abuse and neglect.

Parent education programs have been offered at different sites such as community centers, public schools, Head start sites, childcare centers, places of worship, health department sites, juvenile detention centers, and prisons. Outreach has been further enhanced with the assistance of trained volunteers and through media such as newsletters and articles in local newspapers. Most often, programs have been delivered face-to-face in a series of workshops ranging from three to twelve lessons.

Though adapted to the needs of the different audiences, every program helped parents develop skills to better care for and guide their children. Participants learned how to enhance their relationships and improve their communication skills with their families. They also acquired knowledge about child and teen development. In addition, they were taught how to determine age-appropriate expectations, to manage their children's behavior, to enhance their children's self-esteem, and to control their anger and manage stress.

Summary of Impacts for Clientele:

To measure program objectives, Design team FL515 will report on the following impacts
Increase in use of positive stress management techniques by parents.

Increase in parents' and caregivers' knowledge of their child's behavior and age appropriate expectations. Increase in use of communication techniques with all family members.

Improvement in the quality of child-care and after-school programs.

County faculty utilized various evaluation instruments consisting of pre/post evaluations, post/pre evaluations, observations, and 3 to 6 month follow-up evaluations. In addition, design team FL515 developed a series of evaluation tools based on the National Extension Parent Education Model, Alabama Children's Trust Fund Evaluation Manual, and the Parenting Evaluation Decisions Framework (on the Children, Youth, and Families At Risk website).

For example, 15 counties reporting under FL-515 (FAS system, statistical section) report 7,141 participants increased knowledge (91.3% of respondents) while 6,051 participants (82.9% of respondents) reported behavior change in relation to family communication, reducing stress, managing their anger, understanding age-appropriate expectations for their children's behavior, alternatives to discipline, and doing better in building their children's self-esteem.

In addition, various County faculty reported program impact for their parent education programs utilizing the various statewide evaluation tools developed by this design team. A total of ten counties reported results utilizing one or more of the following tools:

Parenting Survey

Success and the Single Parent Survey

Child Care Questionnaire

Train the Trainer Evaluation

Before You Tie the Knot Survey

Grandparents Raising Grandchildren Survey

Parenting Survey- In the parenting survey, scores ranged from 5.0-3.6 under the different domains of stress management, age appropriate behavior, discipline, communication, self esteem and anger management. A five point likert scale was used (5 = much better, 1 = much worse) using the following question, " Compared to before you started this parenting class, how are you doing at? " The number of participants answering the questions ranged from 953 to 429 depending on the specific questions they were answering from the different domains.

Examples of additional comments reported in the parenting survey follows:

-Identify situations outside of my control and adjust my attitude and how I respond to them (children).

-I am spending more quality time with my children.

-Our family feels more calm now.

-Learned what to expect at what ages.

-I will think more before disciplining.

Success and the Single Parent: In the Success and the Single Parent Survey, scores ranged from 4.3- 3.2 (n= 6) under the different domains of money crunch, a flash of time, communication, understanding children's behavior and taking care of self. A five point likert scale was used (5 = much better, 1 = much worse) using the following question, "Compared to before you started this parenting class, how are you doing at? "

Child Care Questionnaire: Scores ranged from 4.9–3.6, 5 point likert scale, (n = 81) under the different domains of safe healthy learning environment, physical and intellectual development, social and emotional development, relationships with families, program management, professionalism and child observation.

Examples of additional comments reported in the child care survey follows:

-A lot more hands on activities.

-I give children more time to express their own feelings.

-A lot more interacting, group activities and listening time.

-I encourage the parents to participate in their child's school functions, parent meetings, and field trips.

Before You Tie The Knot - Marriage Preparation: This past year 25 engaged couples completed the class and became eligible to receive a discount of \$32.50 when applying for the marriage license. On the evaluation survey, 100% of the couples indicated that they are doing "better" or "much better" in relationship skills. All of the couples signed a commitment statement to each other to use specific skills taught in the classes.

Train the Trainer Survey: A total of 125 professionals participated in train the trainer workshops on a number of different topics including working with teens, anger management, time management, and parent involvement. As a result of the trainings participants strongly agreed or agreed (78%) that they were more knowledgeable and more confident in teaching the information to others.

Success Stories:

In Baker County, after teaching a series of parenting classes to 4 court mandated parents, three of the four parents were granted parental custody and their children were returned to them.

The Grandparents Raising Grandchildren curriculum was taught to a number of grandparents in collaboration with the Palm River Adult Education program. These classes focused on building positive relationships with the child's parents to achieve the best possible outcomes for the children. According to one grandparent who completed the classes, "This class has helped me keep my family together and my grandchild out of foster care."

In St. Johns County, a Family Fun Nights program sponsored by a USDA State Strengthening grant has been very successful. The administrators at Crookshank Elementary School, the main collaborators in the project, were so pleased with the program they decided to provide funding for the 2003-2004 school year. So far this year, 71 parents and children have attended the first Family Fun Night, with two more events planned for later in the year. The principal has reported that these educational activities are among the best attended of any provided by the school. In addition, parents report trying some of the educational activities at home with their children. Ten child care directors in Madison County and two in Jefferson County have completed the requirements for Director's credentials. The tri-county licensing director received a call from Tallahassee asking how she had succeeded in getting all of the directors credentialed. She gave credit to UF/IFAS Extension in each county due to the class offered through UF continuing education.

After a series of classes targeted to divorced parents, a father commented on a six-month follow up form, "Hello again, I would just like to express my feelings. This class really helped me a lot. If people will go there with their heart and mind open, it will help them feel better about the

whole deal. Discussing my divorce with others like we were allowed to do, really made me feel good and helped me be there for when my kids need to talk. And believe me they do.” The overall success of the CYFAR (Children, Youth and Families at Risk) grant’s 4-H After School Program was demonstrated when the Holmes County School Board received the 21st Century Learning Centers Grant to continue and expand the after school program in all four of the county schools. The objectives and outcome indicators were key elements of the grant proposal.

Outreach to minorities:

Extension programs conducted by the design team were offered to all interested parties without regard to race, gender or national origin. Educational programs are conducted in accordance with the University of Florida’s policy of equal opportunity/affirmative action. Efforts are undertaken to inform minority clientele about educational opportunities through the use of mass media. Minorities are encouraged to participate in all extension programs. In some counties where a large number of families are Hispanic, programs are conducted in Spanish and publications are also distributed in Spanish. In many cases an interpreter is used to assist with the program. Agents report using Equal Opportunity and ADA statements on meeting announcements. Some counties report using minority newspapers to advertise their programs when they are available. Meeting sites are varied. Many programs are held at Head Start centers, juvenile centers, health department sites, community-based centers, day care centers and schools.

Source of Federal Funds: Smith Lever

~ **STAKEHOLDER INPUT PROCESS**

Florida's Plan for Stakeholder Input Requirements for Recipients of Agricultural Research, Education, and Extension Formula Funds

Stakeholders
Guidelines
For
The University of Florida and Florida A&M University

Actions taken to encourage stakeholder input:

The University of Florida and Florida A&M University have established a process for “receiving input from persons who conduct or use agriculture research, extension, or education.” These stakeholder processes include, but are not limited to, the following:

- UF/IFAS Extension 4 year Strategic Plan (completed in March 2004)
- FAMU/CESTA long-term strategic Plan (completed in 2004)
- Florida County Extension Advisory Committees
- Florida Ag Council, Inc.
- Departmental Advisory Committee and the Research and Education Center Advisory Committee
- Commodity Advisory Committees
- Florida Agricultural Industry Review
- Industry Ag Summits

Brief description and process used to identify individuals and collect input

UF/IFAS Extension's strategic, long range planning process for FY 2004-2008 was a year long endeavor to evaluate, review and determine future direction to better carry out Extension's mission in support of Florida food, agricultural, natural and human resources. This initial process was accomplished through a grass roots approach in which advisory groups, representatives for the underrepresented and underserved populations, local government officials, commodity interests (both private and public), and the general citizenry were invited to attend local meetings in all 67 counties. Participants were asked to provide suggestions and make needs assessments. These county assessments were presented to Extension administrators at regional meetings conducted around the state.

Scientists and experts at UF/IFAS who research trends and major determinants of change in Florida's agricultural, human and natural resource subsectors were also asked for input into the process as well as some state and national commodity organizations. A total of 800 needs were identified state-wide (some were duplications and helped to identify trends). Information was then compiled and analyzed. Results were shared with teaching and research faculty as part of a close collaboration among the three units as a resource for determining UF/IFAS research and extension imperatives for the future including immediate, short-term, and long term critical need areas.

Based on stakeholder input and an external review (Appendix F) held in February 2003, seven state goals (Appendix G)(six of which are included in the AREERA) were identified and announced by interim Extension Dean, Larry Arrington. The state goals are:

- 0. To Enhance and Maintain Agriculture.
- 0. To Maintain and Enhance Florida's Environment
- 0. To Develop Responsible and Productive Youth Through 4-H and Other Youth Programs
- 0. To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow
- 0.** To Assist Individuals and Families Achieve Economic Well-Being and Life Quality
- 0. To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities
- 0. To Promote Professional Development Activities Designed to Enhance Organizational Efficiency and Effectiveness

For additional information on the Florida long range planning process and the Goal and Focus reorganizational structure go to <http://pdec.ifas.ufl.edu>.

FAMU/CESTA initiated a long-term strategic planning project. Over 125 internal and external stakeholders provided their input through structured questionnaires. The survey revealed FAMU is on target in their 1890 programs and suggested several new areas that need attention:

- 0. Biomass/Biofuels
- 0. Nanotechnology in Agriculture
- 0. Obesity
- 0. Product development

These will be reported in AREERA as action teams under the state-wide focus areas presently under development by Florida Extension (1862/1890)

The Florida County Extension Advisory Committees provides direction for Extension education programs for both the University of Florida and Florida A & M University on a continual basis. Active advisory committees exist in all of Florida's 67 counties, usually at both the overall and program area levels. The committees serve as a vehicle for local citizens to participate in, influence and provide support to the planning, implementation and evaluation of Extension education programs, and the accountability for those programs. The composition of the committees consists primarily of positional and reputational leaders representing the areas of agriculture, agribusiness, natural resources, family and consumer sciences, 4-H youth, and community development. Special attention is given to the representatives of the target populations, including race and socio-economic level. Extension advisory committees are strongly believed to result in increased accuracy in identification of clientele-perceived needs, more effective decisions on program priorities and methods, and more rapid and accurate communication of program efforts and clientele feedback on both program impact and need for education and research. This committee format serves as a vehicle for local residents to participate in, influence and provide support to the planning and implementation of the Extension Education Programs.

Departmental Advisory Committee and the Research and Education Center Advisory Committee are developed in the same manner and have the same function as the county Extension Advisory committees.

Florida Ag Council, Inc. is a self-nominating body comprised of over 100 organizations. A 12-member board directs it. Its purpose is to increase the accuracy in the identification of clientele-perceived needs and to assist in the decision making process relating to research, teaching and Extension priorities.

Commodity Advisory Committees are various advisory groups with special emphasis on important program areas such as Florida A&M Universities program FL 261 Small Animal and Small-scale Farm Profitability and Sustainability in Florida- 1890. Of primary importance in identifying critical need areas is their Goat Program Advisory Council. Although commodity oriented, this type of advisory committee is still developed and functions using the same standards as the county advisory committees.

Florida Agricultural Industry Review (FAIR) a report on the University of Florida Institute of Food and Agricultural Sciences to the Florida Farm Bureau Federation . The purpose of this report was to provide input from agricultural industry to the University of Florida, Institute of Food and Agricultural Sciences (IFAS) and state policy makers on the structure and future of UF/IFAS. The recommendations and timelines given in this report center primarily in the agricultural area and was designed “to move IFAS into the top five agriculturally focused land grant institutions nationally.

Ag Industry Summits Report is presently being prepared from four industry led meetings held across the state (2004) which identified AG industry needs for IFAS research, teaching and extension. The final report is presently being compiled for release.

~ PEER AND MERIT REVIEW GUIDELINES

Scientific Peer and Merit Review Guidelines for Research Project and Extension Program Proposals at The University Of Florida and Florida A&M University

Intention: This document sets out performance standards and operational guidelines for the Florida Land Grant Universities. The intention of the document is to facilitate both Universities and all integrated, multi-institutional, and multi-state activities in complying with the provisions of the federal Agricultural Research, Extension, and Education Reform Act of 1998. Adoption of these standards and guidelines will be primarily accomplished by adoption-by-reference in the Florida Plan of Work.

Definitions: *Scientific Peer Review* of an individual research project is defined as the evaluation of the conceptual and technical soundness of the intended activity by individuals qualified by their status in the same discipline, or closely related field to judge the worthiness of the proposal. Merit review process of an Extension focus team area is defined as the evaluation of the quality and relevance to program goals and the focus team's level of success in meeting the intended objectives and the anticipated outcomes. Merit Reviewers will also be qualified by their status in the same discipline, or closely related field to judge the worthiness of the program.

The topics covered by this document pertain to research projects and extension programs (focus areas) that are to be sanctioned and funded as part of the federal-state partnership in agriculture research and extension. These standards and guidelines do not apply to proposed research projects and extension programs that are subject to peer review by competitive grant agencies, peer review of extension and research publications. Thus, all research projects and extension programs sponsored by Florida Land Grant Colleges will have been formally merit and peer reviewed, before the expenditure of any federal funds.

Process: Prior to the initiation of any research project or extension program that will be wholly, or in part, funded by federal formula funding, the designated review coordinator (or, in the case of some multi-institutional, regional or multi-state projects, the administrative advisor) will call for a peer review of the proposed research or extension project. A minimum of three peer scientists (i.e., individuals qualified by their status in the same discipline, or a closely related field of science) will be selected to read and provide written comments to the appropriate administrator on the proposed project. The focus goal team made up of focus team leaders will read and provide written comments to the appropriate administrator on proposed programs (focus areas)..

Terms of Reference: The terms of reference for the reviewers will focus their attention on questions of the quality of the proposed science, technical feasibility of the research or extension program, the validity of the approach, and the likelihood for completing the stated objectives. Other equally important comments will include relevance to the state's priorities, the degree of integration between extension and research (as appropriate), responsiveness to stakeholders identified critical need areas, and the accuracy of any claims for multi-disciplinary, multi-institutional and multi-state collaboration.

Responsibility: All Merit Review activities for proposed Extension programs will be the responsibility of the Dean of Extension or his/her designee. All Peer Review activities for proposed research are the responsibility of the Dean for Research or his/her designee.

Appointment of Reviewers: Peer and Merit reviewers may be selected from the same campus or from another institution or organization at the discretion of the research and/or Extension dean(s), or by their delegated authority. Consideration will be given to the expenses associated with the reviewing individual proposal in the selection of reviewers. Additional consideration will be given to appointing reviewers who are without any apparent conflicts of interest and who are without personal or professional bias. Consideration may also be given in selecting reviewers that can protect confidential business information. The anonymity of the reviewers will not be preserved except in very special circumstances.

Documentation: Reviewers will be asked to present their findings in either paper or electronic format, and records of the reviewers comments will be preserved for the life of the project, or for a period of three years in the event that a project is not initiated. Document storage of all materials related to the Peer and Merit Review will be paper and/or electronic.

Research and Extension projects and programs not covered: Projects and Programs funded by competitively awarded grants, federal contract research projects, and federal cooperative agreements are not subject to these provisions, as they would be peer reviewed under other authorities.

Performance Standards: Peer review of proposed projects, and merit review of Extension programs is expected to provide the following performance outcomes:

Research

- Increase the quality of science funded by the federal-state partnership
- better assure relevance to institutional priorities and mission
- provide more responsiveness to stakeholder needs including the underserved and under-represented populations,
- and identify more opportunities to partner with other states, regions, federal research agencies, and Extension counterparts.

Extension

- Provide more responsiveness to stakeholder (including the underserved and under-represented) identified critical need issues
- Better assure relevance to institutional priorities and mission
- Increase the quality of programs, events and activities funded by the federal-state partnership, and
- Identify more opportunities to partner with other institutions, regions, states, and research counterparts

Performance outcomes from Merit and Peer Review

Performance outcomes from the merit reviews will be monitored by the Programs Development and Evaluation Center (PDEC) through the annual accountability process. Scientific peer reviews will be monitored by the Research Administration Office.

Adjustments to this merit and scientific peer review process will be made as needed.

• Evaluation Form for Merit Review

Extension Merit Review of Florida Goal Teams	
Goal Number:	
Goal Title:	
Goal Leaders:	
Focus Team Title:	
Focus Teams members	
Reviewer(s):	
	<p><input type="checkbox"/> Accept</p> <p><input type="checkbox"/> Accept with minor revision(s) (Explain required revisions)</p> <p><input type="checkbox"/> Accept with major revision(s)(Explain required revisions)</p> <p><input type="checkbox"/> Reject (Explain your reasons for rejection).</p>

For each statement below, please indicate your rating of how well the following statements have been written by the Focus Team (check one column for each statement)

Likert Scale

The Situational Statement and Rationale...	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Articulates the importance to agriculture, human and natural resources, rural and urban life, consumer concerns and science						
Relates to current priorities as identified by Florida stakeholders (long range planning, advisory committees, surveys etc.)						
Describes the situation						
Describes the potential impacts of this program						
Demonstrates the need for integration with research (and Teaching as appropriate)						
Explains the benefits of a multi-state, multi-institutional approach (if appropriate)						

Objectives: The Focus Team...	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
States clear, concise, measurable and focused clientele objectives						
Relates objectives to expressed preferred situations						

Audience: The Focus Team...	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Clearly identifies the audience(s) that need(s) to be targeted						

Includes underserved and underrepresented individuals and population segments						
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Educational Activities and Impacts: The Focus Team...	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Explains educational programs for each objective						
Describes the methods adequately to reasonably expect attainment of the objectives						
Describes potential impacts for each objective						

Evaluation: The Focus Team...	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Includes planned evaluations of itself to determine if each of its objective is achieved						
Clearly states its tools and approaches to be used (e.g., pre- and post- tests, survey 10% of the audience, etc.) and the expected results (e.g., increase knowledge, modified behavior, impact, etc.)						
Includes the best accountability indicators (e.g., percent of people promising to use knowledge, percent of people modifying behavior, etc.)						

Duties: The Focus Team...	Not Applicable (N/A) 0	Very Poorly Written 1	Below average 2	Average 3	Above Average 4	Very Well Written 5
Clearly states the responsibilities and work assignments of each focus team member						

Includes inservice training activities						
Includes the development of educational products that facilitate delivery of programs by county faculty						

• Evaluation Form for Peer Review

Dr. William F. Brown
FAES\CRIS Project Review Chair

December 12, 2003

Dear ____

Thank you for agreeing to review the enclosed FAES/CRIS Project proposal by: _____

Your complete and thorough review of this proposal is of fundamental importance to the research efforts of IFAS and insures the continuation of the high-quality IFAS statewide research program.

Please evaluate the proposal, considering the following points:

- 0) Does the project outline follow the format delineated in IMM 6C1-6.120-3 "IFAS: Research Planning" (excerpt enclosed; document located at: <http://research.ifas.ufl.edu/projects/prepinstructions.html>)
- 0) Is the work relevant to critical emerging issues in agriculture, rural life, consumers, and science?
- 0) Does the proposal clearly state the anticipated outcomes of the work, and do these outcomes benefit the scientific, extension, and educational components of IFAS?
- 0) Do the experimental design and methodology clearly address the stated objectives of the study?
- 0) In your view, does the project show evidence of high scientific quality? Does this project duplicate research being done through other projects?
- 0) Does the proposal provide opportunities for collaborative interactions with other individuals or units to maximize efforts and resources?

Please make your comments on a separate sheet, and provide an over-all summary of the primary changes you believe should be made before final approval. You may also mark appropriate changes in the body of the proposal. If you choose, you may sign your name to the review or remain anonymous.

Please return the copy of the proposal and an original and 2 copies of your written review and comments to me. Again, I would appreciate the return of your review by: **January 16, 2004**. Thank you for your assistance in this important matter.

Sincerely,

William F. Brown

***! Office of the Dean for Research !P. O. Box 110200 ! Gainesville, FL 32611
! Phone: (352) 392-1784 ! FAX: (325) 392-4965 ! e-mail: wfbrown@mail.ifas.ufl.edu***

**Excerpt From “Instructions For The Preparation Of Project Statements”
UF/IFAS Internal Management Memorandum 6C1_6.120_3**

The Project Statement should contain the following components:

Objectives: A clear, complete and logically arranged statement(s) of the specific objectives of the research to be conducted. The objective(s) should adequately cover all the work outlined in the procedures.

Justification: A short statement of the problem giving its importance in science, agriculture, environment, rural life and consumer concerns. The following questions should be addressed:

What is the importance of the problem to agriculture and natural resources and urban or rural life of the state or region? This should insofar as possible be answered in terms of acres, tons, people, cattle, plants, dollars, or other specific items. When possible, mention the dollar value of the industry. References in support of these items should be cited.

What are the benefits which may result from the proposed research? Express this in terms of new varieties, reduced labor costs, increased production, larger net returns, or other appropriate specific results.

What will be the dollar value of losses caused by the problem? Acres, tons, or other measures may be used if a dollar evaluation cannot be made. The above information is important whether the research in question is applied or basic in nature. The question may be more difficult to answer for basic research, but the importance of the problem and the reasons for undertaking the work should be clearly pointed out in either case.

Related Current and Previous Work

0. What has been done? (Literature Review) Should be a brief summary covering pertinent research on the problem. References should be included indicating what was found and its significance.
0. What needs to be done? (Hypothesis, rationale) Should be a summary statement placing emphasis on the research currently needed in this area of work. This paragraph should also contain an outlook statement, i.e., the PIs appraisal of what may be accomplished by this project.

Procedures: A statement of the essential working plans and methods to be used in attaining each of the stated objectives. There should be a numbered statement of procedures to correspond with each numbered objective and follow the same order. Whenever possible it should be presented in enough detail to serve as a guide for project PIs and to enable the reviewer and other readers to obtain a clear concept of the research to be done. For each objective, one or more experiments, or examples of the types of experiments) should be described that will seek to fulfill that objective.

Literature Cited: Literature references within the text should be given by author and year. Full citation of these references should be included in a “Literature Cited” section at the end of the Statement with the format: author(s), year, title, publication, volume, and pages.

~ **MULTI-STATE AND INTEGRATED ACTIVITIES SUMMARY**

Even with severe, state cut backs and a sluggish economy over the past three years, UF/IFAS Extension and Research have worked hard to increase both multi-state and integrated activities that reflect the use of Smith-Lever and Hatch funds. Florida has historically had a close working relationship between Research and Extension— many faculty have joint research/extension appointments that insure this process—but until 2000 no statistics had been required to reflect these two types of activities or a formal integration. Since 2000 we have been working on tools that allow us to collect this information in a formal manner and there has been an increase in auditable numbers each year.

Improvements continue to occur. This year, research had 53.9% (\$1,163,226) of Hatch money reportable as integrated activities. Although there is a much higher percentage of integration between research and extension, Florida is still working on better ways to report this information. Research continues to be more easily accountable as Hatch funding is tied to projects rather than directly to salaries as is the case in Extension.

Extension integrated activities are still being under-reported at 12.8% (\$492,559), again hampered partially by a fiscal system that does not easily reflect extension funds to the specificity of multi-state and integrated levels. Prior to 2000, Florida had not captured fiscal information specifically related to this level. Smith-Lever funds tied to salary instead of programs has also made reporting of time expended difficult and has required changes within the fiscal and faculty accountability process to capture this information (a waiver request for Extension integrated is included in this report). Some changes are occurring at this time related to organizational structure that will enable us to more clearly account for multi-state and integrated activities for both research and extension in the near future. Because of this it is expected that beginning in the 2004 ROA we will reach and/or exceed the required 25% accountability of extension integrated activities—the only area that still remains below our goal.

Extension multi-state activities increased this year to 26.7% (\$1,026,886). This again does not reflect so much the amount of multi-state activity we have as it does our ability to better capture these numbers. Florida has not historically collected this information and is improving reporting procedures in order to capture all Smith-Lever funds used for multi-state activities in an auditable form. The fact that we reached 25% this year attests to our working hard to meet the requirements of the AREERA Act:

- In 2000 an online accountability system complete with database was first implemented for use by all IFAS faculty. A final web-based phase of this system (fas2) to help us better capture extension activities will be completed the summer of 2004. (This enhancement was delayed because of budget reductions over the past two years.) The Faculty Accomplishment System (FAS) was originally developed primarily to capture individual teaching, research and extension activities for individual evaluations but is now being modified to meet growing demands for organizational accountability. Enhancements will also tie the system closer to fiscal accountability. The new enhancements will be completed by the fall of 2004.
- The Florida public university system has just been privatized through legislation. A new fiscal system is being implemented by the university in July 2004. This system will

allow a better accountability of Smith-Lever funds tied to multi-state and integrated activities. The present system makes it difficult to reach the level of specificity now required for extension audit purposes.

- Long range planning for 2004-2008 has been completed by Florida extension (UF/IFAS as well as for FAMU/CESTA. An extension external review was held in February 2003 as part of the UF/IFAS process. Suggestions relating to structure and process made through the review are being used to improve accountability and have been implemented into the fas2 system. These changes will significantly improve the reporting process for AREERA which will be reflected in the 2004 AREERA Plan of Work (turned in to you April 1, 2004) as well as the 2004 ROA which will be completed April 1, 2005.
- Part of the Extension Long Range Planning Process and AG summits for research included county and regional (state-wide) listening sessions with Florida stakeholders who will provide extension and research with additional suggestions to integrate programs and projects and to improve the reporting of multi-state and integrated activities.

In summary: Florida Extension and Research continues to examine ways that will allow us to more clearly report multi-state and integrated activities. We believe we have strong multi-state and integrated projects/programs at this time, however, our ability to report them in a manner that is clearly auditable must be improved to show these activities to full advantage. IFAS is committed to reaching this goal. Each year we move closer to meeting this goal.

~ MULTI-STATE ACTIVITIES

U.S. Department of Agriculture
Cooperative Research, Education, and Extension Service
Multi-State Extension Activities

U.S. Department of Agriculture Cooperative Research, Education, and Extension Service Multi-State
Extension Activities

Extension Personnel Arthington, John
Department: Range Cattle REC-Ona
Percent Extension Time 10 **Smith-Lever Funds** \$7,072
Title Management considerations to optimize cattle productivity and well-being in a sub-tropical environment

Extension Activities

A multistate effort has been established to compliment the existing program JDA-RCREC-01. Expertise in animal behavior and well-being as well as applied technologies in bovine reproduction have been incorporated from USDA-ARS (Purdue University) and the University of Minnesota. Additionally, I am a member of W-173, USDA multistate research project. Several results from these research efforts are used in educational activities within

Multi-State Partners:

Organization	State
University of Minnesota	Minnesota

SMPs:

FL102
FL103

Extension Personnel Atkins, John
Department: Santa Rosa
Percent Extension Time 1 **Smith-Lever Funds** \$0
Title Deep South Weed Tour

Extension Activities

Agriculture Extension Agents in the four western counties of Northwest Florida, WFREC specialist and this agent planned and conducted the 11th Annual Hay Day. Topics included Boom Sprayer Calibration, Vegetable Production on Plastic Mulch, Equipment Discussions, Tropic Soda Apple Management / Control and Field Demonstrations of Haying Equipment. There were approximately 40 pieces of equipment on display and for

Multi-State Partners:

Organization	State
Alabama Cooperative Extension	Alabama

SMPs:

FL101

Multi-State Partners:

Organization	State
Florida Game and Fish Commission	Florida

SMPs:

FL101

Multi-State Partners:

Organization Hendrix Tractor Company **State** Alabama

SMPs:

FL102

FL103

Multi-State Partners:

Organization Texas A&M University **State** Texas

SMPs:

FL420

Multi-State Partners:

Organization USDA, Farm Service Agency **State** Florida

SMPs:

FL101

Extension Personnel Bennett, Dale

Department: Wakulla

Percent Extension Time 2 **Smith-Lever Funds** \$846

Title Agriculture, Livestock & Forages in the Tri-State

Extension Activities

Each year the National 4-H Shooting Sports Program Committee conducts a Regional 4-H Shooting Sports Leader Training Workshop in either the north, south, central, east, or west portion of the country. Approximately 15-20 states may enroll two individuals in each 4-H Shooting Sports discipline area: archery, pistol, rifle, shotgun, black powder, hunting, reloading, or coordinator. The instruction and teaching practice offered at the workshops prepare participants to become part of the instructional team that provides training to adult 4-H Shooting Sports volunteers in their home state. This year the regional workshop was conducted in Raton, New Mexico. This agent was an instructor for the archery discipline along with another agent from Ohio. There were 18 adult 4-H volunteers from 12 states that participated in the archery training. The next training will be in May of 2004 in

Multi-State Partners:

Organization Extension **State** Florida

SMPs:

FL113

FL114

FL121

FL214

FL261

FL420

FL714

FL718

Multi-State Partners:

Organization Extension 4-H **State** North Dakota

SMPs:

FL113

FL214

FL420

FL714

FL718

Extension Personnel Bennett, Jan
Department: Collier
Percent Extension Time 1 **Smith-Lever Funds** \$0
Title Review of Draft Core Competencies for County Extension Faculty in the Area of Food Safety

Extension Activities

Agent reviewed the core competencies (3 levels) in the area of Food Safety, one of six domains in the area of Food, Nutrition, and Food Safety. This was part of a larger project that was initiated by the Southern Region State Leaders in Family and Consumer Sciences to develop basic competencies needed by county Extension faculty to conduct educational programs. The Agent's critical review was helpful to the committee as they finalized the core competencies for their final report to the State Leaders.

Multi-State Partners:

Organization **State**
North Carolina State University North Carolina

SMPs:
FL109

Extension Personnel Blount, Ann
Department: North Florida REC-Marianna
Percent Extension Time 5 **Smith-Lever Funds** \$3,212
Title Multi-state in-service forage training

Extension Activities

Development of a multi-state in-service training, alternating between Auburn, University of Georgia and University of Florida as annual meeting locations. It is designed to train tri-state county faculty on current topics in forage research and extension pertinent to the southern Coastal Plain Region.

Multi-State Partners:

Organization **State**
University of Florida FL

SMPs:
FL101
FL102
FL103

Extension Personnel Bobroff, Linda
Department: Family Youth and Community Science
Percent Extension Time 5 **Smith-Lever Funds** \$3,842
Title Nationwide distribution of ENAFS program

Extension Activities

The first five modules of the ENAFS program were prepared for sale on CDs by IFAS Communications Services. I worked closely with the editors to get the program ready for sale. As of December 2003, the CDs have been purchased by professionals in 30 states, with persons in 11 states purchasing all of the modules. The ENAFS modules were highlighted as Resource of the Month on the USDA-NAL-ARS Food and Nutrition Information Center website, Fall 2003. ENAFS Module 2, Healthy Living for Elders, was favorably reviewed in the Journal of Nutrition Education and Behavior, 2003;35(6):343-4.

Multi-State Partners:

Organization **State**
CES Oklahoma

SMPs:
FL511

Multi-State Partners:

Organization **State**

NAL/USDA

Washington DC

SMPs:

FL511

Extension Personnel Bolques, Alejandro
Department: Gadsden
Percent Extension Time 5 **Smith-Lever Funds** \$0
Title 2003 Green Industry Updates for Nursery, Greenhouse, and Landscape Organizations

Extension Activities

The Georgia/Florida Green Industry Update target's nurserymen, bedding plant growers, landscape contractors, maintenance personnel, landscape architects, landscape designers, pest control personnel and garden center managers with up to date information on new production practices, new products and new plants of importance to the Green Industry. Another important aspect of the program is that it offers pesticide re-certification credits to licensed pesticide applicators. My involvements with this year's update centered on the Landscape Installation and Maintenance Organization Program, October 22, 2003 and the Nursery and Greenhouse Growers Program, November 4, 2003 as follow: Green Industry Planning Meeting, February 14, 2003 This meeting was held to review the previous year program evaluations and begin the planning process for this year's Update. Extension agents and specialists attending the meeting provided input regarding topics of concern to the industry for topic presentation consideration. In general, we make suggestions based on current trends, hot topics, or an obvious need for more information. Suggestions brought forward by this agent that were included in this year program agenda were: Turf and the Environment: Managing Turf to Reduce Environmental Impact Fire Ant-Free Nursery Stock Certification Irrigation Uniformity Landscape Installation and Maintenance Organization Program, October 22, 2003 Morning session moderator Nursery and Greenhouse Growers Program, November 4, 2003 Program presentation: Eighty-five nursery and greenhouse growers attended the November 4, 2003 Florida/Georgia Green Industry Update. During the "New Tools for Nursery and Greenhouse Production" segment of the daylong program, I introduced a grower oriented web-base approach concept entitled, Monitoring for the Occurrence of Arthropod Pest in Ornamental Plant Nurseries. This grower oriented insect management approach takes advantage of individual nursery insect scout reports. Nursery scout reports would be submitted online each week and stored in a database. The database will be use to generate a summary of arthropod pests in ornamental plant nurseries detailing current conditions on a weekly bases. It is anticipated that host plant and/or pest groups would also be used to generate other summary reports such as insect pest seasonal occurrence. This project is in collaborations with Palm Beach Extension, Gadsden County Extension, Miami-Dade Extension, NFREC-Quincy, and Tropical-REC. Program workshop: Eighty-five nursery and greenhouse growers participated in hands-on breakout sessions on Irrigation Uniformity. Growers learned first hand how to test an overhead sprinkler and drip irrigation system for distribution uniformity and how to maximize the efficiency of water use in the nursery to save water.

Multi-State Partners:

Organization	State
UGA/CAES	Georgia

SMPs:

FL105

FL112

FL122

FL269

Extension Personnel Bolton, Elizabeth
Department: Family Youth and Community Science
Percent Extension Time 1 **Smith-Lever Funds** \$858

Title Strengthening Extension Advisory Leaders: Effective Meetings

Extension Activities

The curriculum has been tested and published. It is a multistate project which I was invited by Lisa Guion to become a participant in developing one of the modules., Effective Meetings. Lisa worked with the development group and tested it. We made some minor revisions after the testing. It has been delivered in North Carolina, Mississippi, Kentucky, Virginia, South Carolina, Florida and Alabama. Lisa Guion is the first author.

Multi-State Partners:

Organization	State
University of Florida	Florida

SMPs:
FL513

Extension Personnel	Brasher, Charles		
Department:	Jackson		
Percent Extension Time	10	Smith-Lever Funds	\$0
Title	Panhandle and Tri-State Watermelon/Cucurbit Workshop		

Extension Activities

Conducted Watermelon/ cucurbit planning meeting, then coordinated with the neighboring Alabama and Georgia Extension Agents to help publicize the workshop. Workshop was conducted on January 214th, 2003 in Chipley. Topics covered were representative of the problems encountered by watermelon and cucurbit farmers in the area. Attendees were from Florida and Alabama. Distribution of Vegetable Crops Newsletters--individual copies were sent to 20 farmers in the neighboring counties, and six County Extension Offices in Alabama and Georgia. These growers and agribusiness personnel requested to be on the mailing list. Two separate mailings of newsletters were sent in 2003. This office receives newsletters from two of the counties in Alabama and Georgia. Extension specialists from Alabama and Georgia participated in small-scale farm information sources to the growers. Multi-state coordination meetings was held at Chipley and Marianna in June and November, 2003, hosted by Northwest District and our staff, in which two counties from Alabama and Georgia were represented. Extension programming and coordination of program efforts were discussed.

Multi-State Partners:

Organization	State
Clay County Extension Office	Georgia

SMPs:
FL107
FL109
FL131

Multi-State Partners:

Organization	State
Nebraska Rural Health and Safety Coalition	Nebraska

SMPs:
FL124
FL715

Extension Personnel	Brinkley, Monica		
Department:	Liberty		
Percent Extension Time	5	Smith-Lever Funds	\$0
Title	Teaching Basic Health And Safety		

Extension Activities

Attended training taught by agents from University of Georgia. This agent taught the curriculum to early childhood professionals from Liberty and Calhoun Counties. Agents in Florida and Alabama that

received the training have written news letters that are to be sent home by the children in centers that implement the curriculum.

Multi-State Partners:

Organization University of Florida **State** Florida

SMPs:

FL511
FL512
FL515

Extension Personnel Brown, Kay
Department: Escambia
Percent Extension Time 1 **Smith-Lever Funds** \$348
Title Volunteer Leader Training

Extension Activities

Multi-state summer camping and International "Around the World" Day Camp programs with Environmental Agent form Baldwin County, Alabama

Multi-State Partners:

Organization Alabama Extension Service **State** Alabama

SMPs:

FL718
FL801

Extension Personnel Campbell, Kevin
Department: Madison
Percent Extension Time 5 **Smith-Lever Funds** \$0
Title Perennial Peanut Field Day

Extension Activities

Held Field Day in Moultrie GA with demonstrations, equipment, and lectures on production and marketing of perennial peanuts

Multi-State Partners:

Organization UGA **State** Georgia

SMPs:

NONE

Extension Personnel Chambliss, Carrol
Department: Agronomy
Percent Extension Time 2 **Smith-Lever Funds** \$1,260
Title Forage Production 2001

Extension Activities

In-Service Training for County Faculty

Multi-State Partners:

Organization Auburn Univ **State** Al.

SMPs:

FL101
FL103
FL106
FL115

FL130
FL412

Extension Personnel Chernesky, Mary
Department: Hillsborough
Percent Extension Time 2 **Smith-Lever Funds** \$985
Title National Urban Task Force

Extension Activities

This agent represents Florida on the National Urban Task Force and serves as Secretary of the overall group. This is a sub-committee of ECOP and representatives from 24 states are appointed. The focus is to gain recognition and coordination for Extension Urban programming. This committee was disbanded in late December 2002 by ECOP in their re-organization.

Multi-State Partners:

Organization **State**
Extension Service Florida

SMPs:

NONE

Extension Personnel Corbus, Judith
Department: Washington
Percent Extension Time 3 **Smith-Lever Funds** \$0
Title Promoting Financial Security

Extension Activities

FCS Agents from Florida, Georgia, and Alabama met in Thomasville, Georgia to develop goals, a rationale statement, objectives, and outcome indicators for multi-state FCS programs to be implemented in the three states.

Multi-State Partners:

Organization **State**
University of Florida/IFAS Extension Florida

SMPs:

FL510

FL512

FL715

Extension Personnel Cothran, Henry
Department: Food and Resource Economics
Percent Extension Time 1 **Smith-Lever Funds** \$0
Title BRE Rewrite Project

Extension Activities

Developing a "bundled" economic diversity training to include business retention and expansion, tourism development, eCommerce, agri-tourism, industry attraction, small business development, etc.

Multi-State Partners:

Organization **State**
Louisiana State University Louisiana

SMPs:

FL513

Multi-State Partners:

Organization **State**
Pennsylvania State University Pennsylvania

SMPs:

FL513

Multi-State Partners:

Organization	State
USDA CSREES	Washington, DC
SMPs:	
FL513	

Extension Personnel	Courtney, Elaine
Department:	Okaloosa
Percent Extension Time	1
Title	Smith-Lever Funds \$367
	AL/FL Baby Boomers in Changing Time

Extension Activities

Agents from Escambia, Santa Rosa, Okaloosa and Walton counties in Florida and Baldwin, Mobile, and Escambia counties in Alabama developed a curriculum for a multi-disciplinary curriculum, "Baby Boomers in Changing Times" to help baby boomers deal with current issues and future challenges. The topics covered were: Challenges of Change; Delicious Decisions; and Financial Freedom. The agents worked in teams to develop teaching materials, visuals, handouts, marketing materials and evaluation instrument. Each agent taught part of the program. Two seminars were planned for 2003. The one in Baldwin County, AL was cancelled due to low registration. One seminar was held in Escambia County, FL with 16 persons attending. 14 participants rated the program as very good and excellent. IMPACT: As a result of the workshop, the participants reported they would make the following changes: 16 identify ways to reduce personal debt. 16 determine retirement goals. 15 calculate estimated retirement income needed and savings required to produce that income. 16 plan to increase amount saved for the future. 14 will use the seven steps they learned to resolve conflict. 14 will use nonverbal communication skills. 13 will use communication helpers. 13 Identified ways to help cope with stress. 11 will include 30 minutes of physical activity daily. 15 build a healthy base and choose sensible for good health. 13 would eat more fruits, vegetables and grains with little added fat or sugar.

Multi-State Partners:

Organization	State
Alabama Extension/Baldwin County	AL
SMPs:	
FL512	

Multi-State Partners:

Organization	State
Escambia Co. Extension	AL
SMPs:	
FL109	
FL511	

Extension Personnel	Crane, Jonathan
Department:	Tropical REC-Homestead
Percent Extension Time	15
Title	Smith-Lever Funds \$12,142
	IR-4 Minor Use Pesticide Registration Project

Extension Activities

1. Execution of pesticide residue field trials under Good Laboratory Practices and Standard Operating Procedures. 2. Identical trials on the pesticide/pest combination are conducted in Hawaii, Puerto Rico, and

Multi-State Partners:

Organization	State
USDA, State Universities	Numersous
SMPs:	
FL111	

Extension Personnel Davis, Paula
Department: Bay
Percent Extension Time 2 **Smith-Lever Funds** \$0
Title 4-H Aquatic Adventure Camp

Extension Activities

-- 4-H Camp for youth ages 8 - 14 centered on watershed activities and involved planning and participation from Alabama Extension.

Multi-State Partners:

Organization **State**
ACES AL

SMPs:

NONE

Multi-State Partners:

Organization **State**
UF/IFAS FL

SMPs:

NONE

Multi-State Partners:

Organization **State**
UF/IFAS Extension Florida

SMPs:

NONE

Extension Personnel de Vries, Albert
Department: Animal Sciences
Percent Extension Time 20 **Smith-Lever Funds** \$12,671
Title Dairy Business Analysis Project

Extension Activities

Annual financial survey of dairy producers in primarily Florida and Georgia. Once data is collected from enough dairy producers, benchmark reports are created and the dairy producers are visited again to discuss the strengths, weaknesses, and action plans for their dairy operations.

Multi-State Partners:

Organization **State**
Southeast DHIA Florida

SMPs:

FL128

Extension Personnel Diller, Andrew
Department: Escambia
Percent Extension Time 2 **Smith-Lever Funds** \$0
Title 4-H leadership training workshop

Extension Activities

Speaker at multi-state 4-H leadership training workshop at Weeks Bay National Estuarine Reserve in Alabama. With Santa Rosa County marine agent, presented marine educational programs and projects that could be utilized in Alabama to 4-H faculty and volunteers. Offered to conduct multi-state programs with AL staff.

Multi-State Partners:

Organization **State**
Alabama Cooperative Extension AL

SMPs:

FL315

FL316
FL714

Extension Personnel Donahoe, Michael
Department: Santa Rosa
Percent Extension Time 1 **Smith-Lever Funds** \$368
Title 2nd Annual Farm Day

Extension Activities

GCFAA, the Gulf Coast Farm Analysis Association, is implemented through the Alabama Extension Service and is offered to farmers in both Alabama and Northwest Florida. The program collects and analyzes business, financial, and production data from farmers. At present, no Santa Rosa County farmers are enrolled in the Association. However, farmers not enrolled gain general knowledge about the business side of their production activities through grower meetings and newsletter articles.

Multi-State Partners:

Organization	State
Alabama Cooperative Extension	Alabama

SMPs:

FL101

FL120

Multi-State Partners:

Organization	State
Florida Cooperative Extension	Florida

SMPs:

FL101

FL120

Multi-State Partners:

Organization	State
Florida Game and Fish Commission	Florida

SMPs:

FL101

FL120

Extension Personnel Douglas, Diann
Department: Madison
Percent Extension Time 5 **Smith-Lever Funds** \$0
Title Family Economic Stability

Extension Activities

Multi-state planning meeting to share resource in family economic stability .

Multi-State Partners:

Organization	State
Extension	Georgia

SMPs:

FL512

Extension Personnel Edmondson, Gerald
Department: Okaloosa
Percent Extension Time 1 **Smith-Lever Funds** \$0
Title Alabama/Florida Finding Money in the Woods Forest Products Workshop

Extension Activities

This agent participated with specialist and agents to present a Deep South Weed Tour at WFREC.

Multi-State Partners:

Organization Alabama Historical Commission **State** Alabama

SMPs:
FL420

Multi-State Partners:

Organization Cooperative Extension **State** Alabama

SMPs:
FL101
FL102
FL103
FL420

Multi-State Partners:

Organization Extension Forester, Auburn University **State** Alabama

SMPs:
FL102
FL103

Multi-State Partners:

Organization Texas A&M University **State** Texas

SMPs:
FL420

Multi-State Partners:

Organization WFREC **State** Florida

SMPs:
FL101

Extension Personnel Elliott, Roger
Department: Escambia
Percent Extension Time 2 **Smith-Lever Funds** \$0
Title Agricultural Field -- Livestock and Forages -- Escambia County, Florida

Extension Activities

Developed, Reviewed, and Piloted three new 4-H Meat Goat Project Books and one Helper's Guide

Multi-State Partners:

Organization Escambia Co. (FL) Extension **State** FL

SMPs:
FL102
FL103
FL128
FL261
FL711

Extension Personnel Eubanks, Shepard
Department: Holmes
Percent Extension Time 3 **Smith-Lever Funds** \$0
Title Master Wildlife Program

Extension Activities

Seven week video conference hosted by Clemson University that was jointly sponsored by Southern region states including Florida. Topics covered various aspects of wildlife management including wetlands management, management of turkey, deer, quail, doves and ducks.

Multi-State Partners:

Organization	State
Auburn	Alabama

SMPs:

FL101
FL107
FL122

Extension Personnel

Funderburk, Joseph

Department:

North Florida REC-Quincy

Percent Extension Time

15

Smith-Lever Funds \$12,227

Title

Reduced-risk tactics for thrips and tospoviruses on solanaceous crops

Extension Activities

I am the principal investigator for a national project to implement for solanaceous crops a reduced-risk integrated pest management program for thrips and tospoviruses including biological control, cultural control, and biological insecticides. Project funded by a competitive grant from USDA CSREES and another competitive grant from a commodity group.

Multi-State Partners:

Organization	State
North Carolina State University	North Carolina

SMPs:

FL107

Extension Personnel

Goodchild, Michael

Department:

Walton

Percent Extension Time

1

Smith-Lever Funds \$0

Title

Finding Money in the Woods

Extension Activities

pine straw baling, sawmill demo, forestry herbicides, logging mathematics

Multi-State Partners:

Organization	State
Cooperative Extension	Florida

SMPs:

FL102
FL416
FL420
FL421

Multi-State Partners:

Organization	State
Covington Co. Extension	Alabama

SMPs:

FL102
FL416
FL420
FL421

Extension Personnel

Goode, Yolanda

Department:

Gadsden

Percent Extension Time 1 **Smith-Lever Funds** \$0
Title Multi-State 4H Planning Work Group

Extension Activities

Working together to plan, implement, and evaluate, professional and volunteer trainings in Florida, Georgia, and Alabama.

Multi-State Partners:

Organization **State**
Extension Alabama

SMPs:
FL718
FL801

Extension Personnel Gordon, Danielle
Department: Leon

Percent Extension Time 20 **Smith-Lever Funds** \$0
Title Chronic Disease Prevention

Extension Activities

A series of 12 Fit Families newsletters targeting limited resource families and emphasizing the importance of family in regards to food, nutrition and health issues was published and distributed to participants at the Family and Consumer Sciences Multi-State meeting held in May 2003. Additional newsletters to supplement the series are in progress. One Family and Consumer Sciences Multi-State meeting occurred with participation from Alabama, Florida, and Georgia. This Agent served as the chair for Florida. Taught 27 educational programs on chronic risk reduction. A total of 84 consumers participated. Evaluations of knowledge gained and behaviors changed were conducted. Three months after participating in an Extension program, 50% (N=14) of the participants reported an improvement in blood pressure. Likewise, of the seven participants reporting blood cholesterol levels over 240 mg/dL at the beginning of the program, 29% of participants reported a decrease in blood cholesterol levels.

Multi-State Partners:

Organization **State**
University of Alabama Extension Alabama

SMPs:
FL511

Extension Personnel Grant, Henry
Department: Gadsden

Percent Extension Time 1 **Smith-Lever Funds** \$649
Title Gadsden Tomato Forum

Extension Activities

To develop an annual report of research findings relevant to the problems of production and other regulations that influence the Gadsden County, FL and Decatur County, Ga. tomato industry.

Multi-State Partners:

Organization **State**
NFREC Georgia

SMPs:
FL102
FL103
FL121
FL261
FL265

Extension Personnel Hall, Mary

Department: Animal Sciences
Percent Extension Time 10 **Smith-Lever Funds** \$7,528
Title Improving Nutritional Management of Dairy Cattle

Extension Activities

Invited. "Feeding sugar to ruminants". 3rd National Alternative Feeds Symposium. Kansas City, MO, November 4, 2003. Presented information on the research results of supplementing sugar in cattle diets and its impact on digestion and production. ~150 attendees, feed industry personnel and nutritionists
Invited. "Feed analysis: sampling, deciphering, and applying", "Rumen function overview: how does the rumen work for the cow?", "Fiber in the diet", "Nonfiber carbohydrates", and "Diet evaluation: grain particle size and fecal evaluation". In the one day Introductory Nutrition Workshop, American Association of Bovine Practitioners 36th Annual Conference. Columbus, OH, September 17, 2003. In this workshop, veterinarians were introduced to the "how-tos" and "whys" of ruminant nutrition as they learn how nutrition can fit in keeping animals productive and healthy. 25 attendees, veterinarians
Invited. "Nonfiber carbohydrates: analysis, digestion, and effects on animal performance", "Value of by-product feeds as forage substitutes", "Evaluation of animal response to diets", and evening discussion on nutrition (with the entire group including Drs. Michael Allen (MSU), William Seglar (Pioneer Hi-Bred Int'l), and Dr. William Weiss (OSU). In the two day Advanced Nutrition Workshop, American Association of Bovine Practitioners 36th Annual Conference. Columbus, OH, September 15-16, 2003. In this advanced nutrition workshop, attendees were given indepth information on theory and practical application of cutting edge concepts in dairy cattle nutrition. 35 attendees, all veterinarians
Invited. Formulating for carbohydrates: from the ration to evaluation. California Animal Nutrition Conference, Fresno, CA, May 14, 2003. Presented information on the research results of supplementing nonfiber carbohydrates in cattle diets and its impact on digestion and production and how to evaluate cattle to understand their interaction with the diets. ~180 attendees, mostly nutritionists and veterinarians
Invited. By-product feedstuff evaluation for ruminants. California Animal Nutrition Conference Technical Symposium, Fresno, CA, May 13, 2003. Understanding where byproducts fit in diet formulation for cattle based on composition and variability. ~180 attendees, mostly nutritionists and veterinarians
Invited. Feeding and Reading Your Cows: Carbohydrates and Manure in Ration Evaluation. Proc. Tri-State Northwest Dairy Shortcourse, Pasco, WA, April 9, 2003. Presented information on the research results of supplementing nonfiber carbohydrates in cattle diets and its impact on digestion and production and how to evaluate cattle to understand their interaction with the diets. ~100 attendees, mostly nutritionists and veterinarians, some dairy farmers
Invited. Nonfiber Carbohydrates in Forages. 4-State Forage Conference, Baraboo, WI, March 26, 2003. Understanding where byproducts fit in diet formulation for cattle based on composition and variability. ~180 attendees, mostly nutritionists and veterinarians
Invited. The Cows Are Always Right!: Evaluating Rations. 6th Western Dairy Management Conference, Reno, NV, presented twice, March 12 and 14, 2003. How to practically evaluate dairy cattle response to diets and discover factors that may limit production based on observations of the animals, their feed, and environment. ~600 attendees, mostly dairy farmers, some nutritionists and agribusiness personnel
Invited. Categorizing and Analyzing Nonfiber Carbohydrates. NIRS Forage and Feed Testing Consortium Annual Conference. February 11, 2003, Madison, WI. Discussion on analysis of feeds and the significance of the carbohydrate fractions in animal production. 20 attendees, mostly feed analysis laboratory managers, some USDA researchers.
Invited. Measurement of Soluble Carbohydrates & Their Effects on Ruminant Fermentation, Seminar at USDA Dairy Forage Research Center, Madison, WI. February 12, 2003. Discussion on analysis of feeds and the significance of the carbohydrate fractions in animal production based on current research data. 30 attendees, USDA and University of Wisconsin faculty and staff
Invited. Balancing Starch and Fiber for Production and Health. Meetings for Pennfield Corporation in Cortland, NY, and in Troy, Prescott, and Lancaster, PA. February 25 - 28, 2003. Discussion of where carbohydrates fit in the promotion of dairy cattle production and health. ~350 attendees, mostly dairy farmers
Invited. What Can You Learn From the Tail End of Your Cows? Meetings for Pennfield Corporation in Cortland, NY, and in Troy, Prescott, and Lancaster, PA. February 25 - 28, 2003. Discussion of evaluation of the interaction of dairy cattle and their diets. ~350 attendees,

mostly dairy farmers Work with feed analysis laboratories on carbohydrate analysis. 54 contacts. Supply information, advice, and sometimes check samples to feed analysis laboratories to improve their ability to accurately analyze feed samples. This year, performed a sugar and starch check test with 14 laboratories as they strive to improve the accuracy of their results.

Multi-State Partners:

Organization	State
American Assoc. of Bovine Practitioners	Pennsylvania

SMPs:

FL128

Extension Personnel	Halsey, Lawrence		
Department:	Jefferson		
Percent Extension Time	4	Smith-Lever Funds	\$2,532
Title	Precision Irrigation		

Extension Activities

Wildlife Field Day - Precision Ag applications for Wildlife and Plantation Management (Arrowhead Plantation, Brooks Co, GA).

Multi-State Partners:

Organization	State
NESPAL, Coastal Plains Exp Station, Tifton	Georgia

SMPs:

FL124

FL131

Extension Personnel	Harrison, Mary		
Department:	Family Youth and Community Science		
Percent Extension Time	8	Smith-Lever Funds	\$8,608
Title	Indoor Air Quality		

Extension Activities

Jump Start is a national organization responsible for reviewing consumer education and resource management materials and making this information available to educators needing reliable information. The material must be reviewed and approved. The governing board consists of 15 representatives of major educational and financial organizations. The goal of the organization is to increase financial literacy among school age students. Florida's Money Wise series is included in Jump Start. To date, the information has been supplied to 42 states requesting the information. Florida now has established a state Jump Start organization and I am on executive board. We work with the Southern regional unit and the national organization in coordinating the website, planning programs and locating grants.

Multi-State Partners:

Organization	State
CRES	National

SMPs:

FL510

Extension Personnel	Heitmeyer, Lawrence		
Department:	Leon		
Percent Extension Time	1	Smith-Lever Funds	\$479
Title	District I Planning and Coordination Efforts for Agriculture		

Extension Activities

Two planning meetings led to location of live animal evaluators from Alabama and Georgia.

Multi-State Partners:

Organization	State
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Extension Alabama

SMPs:

FL102

FL103

FL711

Extension Personnel Hochmuth, Robert

Department: Suwannee

Percent Extension Time 2 **Smith-Lever Funds** \$2,695

Title Plasticsulture Technology

Extension Activities

This effort has provided educational programs and videos on greenhouse vegetable production and other plasticulture technologies. Sharing of research information, needs and technology adoption are all discussed. Only a few states have large programs in the area of greenhouse hydroponics, etc. Those states cooperate in providing educational opportunities for growers.

Multi-State Partners:

Organization	State
Penn State University	Pennsylvania

SMPs:

FL107

FL121

Extension Personnel Humphries, Deborah

Department: Taylor

Percent Extension Time 3 **Smith-Lever Funds** \$1,145

Title Parenting and Human Development

Extension Activities

Multi-State Partners:

Organization	State
Extension	Florida

SMPs:

FL515

Extension Personnel Hunsberger, Adrian

Department: Miami-Dade

Percent Extension Time 5 **Smith-Lever Funds** \$0

Title Phorid fly Release for Biological Control of Imported Fire Ants

Extension Activities

Release of biological control agents for the management of the imported fire ant. Monitoring establishment of the flies and impact on fire ant activity throughout the year. Contacted media outlets, which resulted in 2 interviews published Nationally. Also interviewed by National Geographic for a T.V. news special. Interviewed by a South Florida radio station for an update on the project. A cooperative project with USDA, Florida Dept of Agriculture- DPI, and UF. Research Entomologists and Extension Agents are part of this cooperative effort. This project is also multi-state (Alabama, Arkansas, Louisiana, Texas, Georgia, Mississippi, Oklahoma, South Carolina, North Carolina, Tennessee, FL).

Multi-State Partners:

Organization	State
PDACS-DPI Gainesville	FL

SMPs:

FL114

Extension Personnel Hutchinson, Chad
Department: Horticultural Sciences
Percent Extension Time 5 **Smith-Lever Funds** \$3,429
Title Regional NE184 Project

Extension Activities

This project is a multi-state potato variety evaluation program in which production and quality characteristics of new clones are compared to current commercially accepted varieties. Cooperative potato variety trials provide information on the production, adaptation, and performance stability of new potato clones under a wide range of geographic, climatic, soil, and cultural conditions. Twenty-four fresh market white-skinned, red-skinned, russet-skinned, and chip potato selections were evaluated as part of the program in Florida in 2003. The standard fresh market white-skinned variety, LaChipper, and red-skinned variety, Red LaSoda, for the region were not included in the trial. NY127 produced the highest total and marketable yields at was 74.6 and 67.2 MT/ha, respectively. NY127 is a buff colored tuber with cream flesh color. Marketable yield for Atlantic, the standard chipping potato for the region, was 53.3 MT/ha. Specific gravity of Atlantic tubers was 1.073. No other numbered clone tested produced as well as or had the quality of Atlantic. AF1753-16 and ATX84706-2Ru were highest producing russet-skinned selections with a marketable yields of 42.8 and 35.8 MT/ha, respectively. The russet varieties had 27 and 12% of total yield rated as misshapen tubers, respectively.

Multi-State Partners:

Organization North Carolina State University **State** North Carolina

SMPs:
FL107

Extension Personnel Jacoby, Charles
Department: Fisheries and Aquatic Science
Percent Extension Time 20 **Smith-Lever Funds** \$12,671
Title South Atlantic Regional Fish Extension

Extension Activities

Forge partnerships to improve management and outreach related to saltwater invasive species
Develop educational materials related to aquatic invasive species
Train formal and non-formal educators to help them incorporate material on aquatic invasive species into their efforts
Develop rapid response plans related to aquatic invasive species

Multi-State Partners:

Organization Georgia Sea Grant College Program **State** Georgia

SMPs:
FL317

Extension Personnel Jowers, Henry
Department: Jackson
Percent Extension Time 3 **Smith-Lever Funds** \$2,484
Title Panhandle Peanut Shortcourse

Extension Activities

Planng committee for the annual Panhandle Peanut Shortcourse
Speaker at Panhandle Peanut Shortcourse
Provide production information as related to peanut production throughout the year

Multi-State Partners:

Organization University of Georgia, Research Entomologist **State** Georgia

SMPs:
FL101

FL120
FL122
FL269
FL412

Extension Personnel Kent, Heather
Department: Jackson
Percent Extension Time 5 **Smith-Lever Funds** \$0
Title Developing Successful 4-H Volunteer Leadership

Extension Activities

4-H Volunteer Fact Sheets/ Newsletter Supplements - Written on a variety of "hot" volunteer topics - Shared on a multi-state web site so that they are readily accessible4-H Multi-state Volunteer Resource Web Site - A variety of volunteer resources (training materials, power point presentations, fact sheets, activities, etc.)

Multi-State Partners:

Organization Extension **State** Alabama

SMPs:

FL801

Extension Personnel Kersey, Alice
Department: Polk
Percent Extension Time 3 **Smith-Lever Funds** \$1,230
Title Southern Region 4-H Horse Championships

Extension Activities

4-H Horsemanship Contests and Shows for thirteen states including Florida.

Multi-State Partners:

Organization Texas Livestock **State** Texas

SMPs:

FL211

Extension Personnel Knox, Gary
Department: North Florida REC-Quincy
Percent Extension Time 15 **Smith-Lever Funds** \$10,857
Title Multi-state extension activities for the nursery and landscape industries

Extension Activities

Meetings Organized:Georgia/Florida Green Industry Update for Nursery and Landscape Professionals. Oct. 21, 2003. Jacksonville FL. Co-sponsored with University of Georgia. Attendance = 94. Georgia/Florida Green Industry Update for Landscape Professionals. Oct. 22, 2003. Quincy FL. Co-sponsored with University of Georgia. Attendance = 117. Georgia/Florida Green Industry Update for Nursery Professionals. Nov. 4, 2003. Quincy FL. Co-sponsored with University of Georgia. Attendance = 95.

Multi-State Partners:

Organization University of Georgia **State** Georgia

SMPs:

NONE

Extension Personnel Koehler, Philip
Department: Entomology and Nematology

Percent Extension Time 5 **Smith-Lever Funds** \$5,883
Title School and Daycare IPM

Extension Activities

Promotion and maintenance of IPM in School and Daycares with the goal of reducing unnecessary pesticide exposure while controlling pests.

Multi-State Partners:

Organization Alabama Department of Agriculture **State** Alabama

SMPs:
FL122

Extension Personnel Kucharek, Tom
Department: Plant Pathology

Percent Extension Time 1 **Smith-Lever Funds** \$947
Title Blue Mold Warning Service for tobacco

Extension Activities

I am the blue mold coordinator for Florida. Beginning in 1980, I proposed at a Symposium in Raleigh, NC, that we communicate among the tobacco-growing states as to the occurrences of blue mold, a fast developing fungal disease on the foliage of the tobacco leaves. I provide the information over the internet to our central system at North Carolina State University about the blue mold situation in Florida. This allows the states north of Florida to know about the location of blue mold and so that growers can initiate control tactics before blue mold epidemics are beyond control. Simultaneously, I provide this same information via my electronic batch files to county Extension Agents who have responsibility for production of tobacco. There is a downside to this warning system. Some individuals assume that the inoculum for the blue mold fungus, *Peronospora tabacina*, that causes the disease in other states originates in Florida. Further, some presume that wind blown spores from Cuba serve as inoculum for Florida. At prior Symposia and during many conversations with faculty at various universities, I have demonstrated that their ideas about long distance transport of these fragile spores from Florida to North Carolina (for example) is not occurring. This is an on-going debate.

Multi-State Partners:

Organization North Carolina State University **State** North Carolina

SMPs:
FL101
FL107

Multi-State Partners:

Organization University of Georgia **State** Georgia

SMPs:
FL101
FL107

Extension Personnel Lamb, Elizabeth
Department: Indian River REC-Ft. Pierce

Percent Extension Time 5 **Smith-Lever Funds** \$0
Title National Organic Standards: What Do They Mean For You?

Extension Activities

Part of Florida Team

Multi-State Partners:

Organization Washington State University **State** Washington State

SMPs:

FL107

FL121

Extension Personnel Lee, Dorothy
Department: Escambia
Percent Extension Time 10 **Smith-Lever Funds** \$0
Title Baby Boomers In Changing Times

Extension Activities

The FCS agents in Mobile, Baldwin and Escambia counties in Alabama and Escambia, Santa Rosa and Okaloosa counties in Florida developed a multi-state seminar to help baby boomers deal with current issues and future challenges. The topics covered were as follows: 1) Challenges of Change; 2) Delicious Decisions; and 3) Financial Freedom. The agents worked in teams to develop teaching materials, visuals, and handouts for each session. Each agent taught a part of the program. Marketing materials and evaluation tools were also developed by the agents. Two seminars were planned for this year. The one in Baldwin County, Alabama had to be canceled due to low registrations but the one in Escambia County, FL, was held as scheduled.

Multi-State Partners:

Organization **State**
Alabama Cooperative Extension System - Baldwin County, Alabama

SMPs:

FL512

Extension Personnel Lehtola, Carol
Department: Agricultural and Biological Engineering
Percent Extension Time 2 **Smith-Lever Funds** \$1,471
Title Extension Disaster Education Network

Extension Activities

In 2003, complimentary copies of "Rhythm of the Seasons" were distributed to Florida counties and to state safety specialists throughout the U.S. The video was very well received in the safety community, and several hundred copies were sold. Instructional materials to support the video were posted on the Florida AgSafe Web site (www.flagsafe.ufl.edu). The entire video has been posted on the NASD Web site to enable individual viewing and professional evaluation.

Multi-State Partners:

Organization **State**
AEM Wisconsin

SMPs:

FL124

Multi-State Partners:

Organization **State**
National Farm Children's Center Wisconsin

SMPs:

FL124

Multi-State Partners:

Organization **State**
North Carolina State University North Carolina

SMPs:

FL124

Multi-State Partners:

Organization **State**
University of Wisconsin-Madison/Extension Wisconsin

SMPs:
FL124

Extension Personnel Lesmeister, Marilyn
Department: Family Youth and Community Science
Percent Extension Time 5 **Smith-Lever Funds** \$3,250
Title Helping Kids Learn through Exhibit Conference Judging

Extension Activities
1.5 Hr. workshop for volunteers in 12 states and 2 territories

Multi-State Partners:
Organization **State**
4-H AL; FL; GA; TN;

SMPs:
NONE

Multi-State Partners:
Organization **State**
Area Rural Community Asset Program FL; Ga; Al; Ak; Tn;

SMPs:
NONE

Extension Personnel Liburd, Oscar
Department: Entomology and Nematology
Percent Extension Time 3 **Smith-Lever Funds** \$1,976
Title A multifaceted approach for control of blueberry pests in southern United States

Extension Activities
This regional project is a blueberry IPM agreement with cooperators in Georgia, Mississippi, and Canada. Dr. Dan Horton is a fruit entomologist at the University of Georgia (Tifton). Dan will be working with Georgia blueberry growers and will be responsible for some of the monitoring protocols for blueberry maggot in Georgia. In Mississippi, Dr. Blair Sampson is a USDA-ARS Small Fruit Entomologist. Blair will be conducting host parasitoid interaction studies for blueberry gall midge. Dr. Kenna Mackenzie is a small fruit entomologist with Agriculture Canada. She will be investigating the relationship between thrips abundance and blueberry yield.

Multi-State Partners:
Organization **State**
Agriculture Canada Canada

SMPs:
FL101
FL121
FL123
FL265

Extension Personnel Long, Alan
Department: Forest Resources and Conservation
Percent Extension Time 5 **Smith-Lever Funds** \$3,601
Title Subtropical Agroforestry

Extension Activities
This Multi-State Program (#37) involved 12 southern states in a series of satellite broadcasts from Clemson University. MTF and MW are designed as an introduction for landowners to many different aspects of forest and wildlife management. Broadcasts were on 7 consecutive Tuesday evenings (3 hours each) in February and March. In 2003 the program reached 4000 people southwide, and just over 400 at

18 locations in Florida. I was responsible for overseeing the Florida state program, but the FSP Coordinator at SFRC served as statewide coordinator for the program and each of the 18 sites in Florida was organized by CES county offices, DOF and private foresters near each site. Substantial time in 2003 was devoted by the Forest Stewardship Program to organizing for MW as well as for the Master Tree Farmer program to be delivered in 2004 at 14 sites in Florida.

Multi-State Partners:

Organization	State
University of Virgin Islands	US Virgin Islands

SMPs:
FL420

Extension Personnel	Mahan, William
Department:	Franklin
Percent Extension Time	1 Smith-Lever Funds \$500
Title	Gulf Oyster Industry Technical Support

Extension Activities

ISSC Vibrio vulnificus Education Subcommittee: The Franklin County Agent and Dr. John Supan (LA Sea Grant - Seafood Specialist) are both appointed members of this ISSC committee. The members are charged with developing and overseeing the implementation of a national education program to educate at-risk individuals of the risk associated with the consumption of raw oysters due to a naturally occurring bacterium named Vibrio vulnificus.

Multi-State Partners:

Organization	State
UF/IFAS	FL

SMPs:
FL114
FL132
FL312
FL316
FL317

Multi-State Partners:

Organization	State
UF/IFAS & Sea Grant	FL

SMPs:
FL132
FL312
FL316
FL317

Extension Personnel	Main, Martin
Department:	Southwest Florida REC-Immokalee
Percent Extension Time	2 Smith-Lever Funds \$0
Title	Minnesota Master Naturalist Program

Extension Activities

Corresponded and met with University of Minnesota faculty and other educators to assist in the development of the Minnesota Master Naturalist Program. Assisted by - describing the Florida model in detail, - providing detailed written information on how to structure a similar program in Minnesota, - assisting with information need for writing an NSF proposal, - providing letters of support for the proposal

Multi-State Partners:

Organization	State
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University of Minnesota

Minnesota

SMPs:

FL420

Extension Personnel

Marshall, David

Department:

Leon

Percent Extension Time

3

Smith-Lever Funds \$1,500

Title

Georgia-Florida Green Industry Updates

Extension Activities

Horticulture agents in northwest Florida share our weekly gardening columns with one another. Because of this, we can often use a column from another agent rather than having to write a column every week. In Leon County, we also proactively plan newspaper topics for the column in the Sunday Homes section of the Tallahassee Democrat through our advisory committee. Keith Mickler, horticulture agent from Grady County, Georgia, participates in this process. Keith writes four to six columns a year which appear in the Tallahassee Democrat and then are shared with other agents across northwest Florida. This benefits Keith's Georgia clientele, because some of them receive the Tallahassee newspaper. But it also benefits the Florida clientele who benefit from Keith's

Multi-State Partners:

Organization

UF

State

Florida

SMPs:

FL114

FL116

FL412

FL416

FL712

Multi-State Partners:

Organization

UF Ext

State

Florida

SMPs:

FL114

FL116

FL122

FL412

Multi-State Partners:

Organization

UF Extension

State

Florida

SMPs:

FL114

FL116

FL412

FL416

FL712

Extension Personnel

Martinez, Carlos

Department:

Fisheries and Aquatic Science

Percent Extension Time

1

Smith-Lever Funds \$0

Title

Evaluate Southern Flounder for Florida fresh water culture.

Extension Activities

CONTINUED SPECIALIED ASSISTANCE2000 to 2001A team representing the University of Florida specializing in all aspects of aquaculture traveled to Alabama on August 13th through the 15th. The

group visited two sites, one with the fresh water culture of the marine shrimp *L. vannamei* owned/operated by Dr. H.R. Schmittou and the other, a catfish farm owned by Mr. Sunny Williamson with similar interests in shrimp production. During each visit there was much discussion and technology transfer with subsequent follow up calls and mailings. 2001 to 2002 On July 22nd thru 24th Craig Watson (Director of the Tropical Aquaculture Laboratory) and I revisited the Schmittou shrimp production facility to find all the shrimp production ponds to be fully stocked. In contrast to the first years production, the 2001/ 2002 production cycle had very favorable results turning out 98,000 pounds. The key to their successful production run was a constant vigilance of water quality and the addition of dissolved solids. We have planned a follow up visit for 2003 in order to continue the technology transfer. 2002 to 2003 Unfortunately, during the 2002/2003 grow out season, neither Craig nor I was able to take time off of our schedules to visit the Schmittou shrimp operation. Constant telephone and e-mail communication was and will continue to be maintained in order to insure the success of the operation. Production results for the 2002/2003 season were slightly over 148,000 pounds. Even though there were an additional 32 acres in production the target goal of 3,000 to 3,500 lbs/acre was achieved. Over all Dr. Schmittou was pleased with production and will restock for the 2004 growing season. We have planned to visit in 2004, time permitting.

Multi-State Partners:

Organization	State
N C State University	NORTH CAROLINA

SMPs:

FL112
 FL122
 FL132

Extension Personnel	Mattis, Pamela		
Department:	Duval		
Percent Extension Time	2	Smith-Lever Funds	\$0
Title	Georgia/Florida Green Industry Update		

Extension Activities

GA/FL Green Industry Update -October 21, 2003 Georgia-Florida Green Industry Update for landscape maintenance and landscape installation personnel. Topics covered included culture of palms in Florida landscapes, Turfgrass disease management, Calibration, Invasive species management, and plant pathology identification.> 74 attendees from both SE Georgia and NE Florida> Agent secured \$200 sponsorship to offset local expenses> Agent coordinated 6 other agents and the afternoon hands-on session> Agent co-presented 4 sessions on Alien Pests> Agent presented the Plant Disease session 100 % of participants responding to the program survey indicated they gained useful knowledge. The topics identified by participants as most useful for their work were:> 62.5% Palm culture and management> 67 % Turfgrass disease and management

Multi-State Partners:

Organization	State
University of Georgia Extension	Georgia

SMPs:

FL112
 FL114
 FL116
 FL122

Extension Personnel	Mayfield, Joshua		
Department:	Gadsden		
Percent Extension Time	2	Smith-Lever Funds	\$0
Title	Tri-State Agriculture Program Implementation Team (PIT)		

Extension Activities

The Gadsden Tomato Forum is the annual meeting of tomato growers in S. Alabama, S. Georgia, and N. Florida to discuss policy changes, production, harvesting, and marketing advancements in the tomato industry pertinent to the Alabama/Georgia/Florida Tri-State area. It is well-attended by growers, extension personnel, and industry representatives. This event is held the first Thursday of every December.

Multi-State Partners:

Organization	State
University of Georgia	Georgia

SMPs:

FL411
FL416
FL421
NONE

Extension Personnel

Mayo, Douglas

Department:

Jackson

Percent Extension Time

5

Smith-Lever Funds \$0**Title**

Northwest Florida Beef Conference

Extension Activities

Northwest Florida Beef Conference planning and presentations on pasture management, use of legumes, insect and weed control and grazing management.

Multi-State Partners:

Organization	State
Berry College	Georgia

SMPs:

FL102
FL103
FL128
FL132
FL261

Extension Personnel

McAvoy, Eugene

Department:

Hendry

Percent Extension Time

1

Smith-Lever Funds \$0**Title**

North Carolina County Agricultural Extension Agents Florida
Agriculture In-service

Extension Activities

Provide North Carolina extension educators and farmers with an overview of alternative vegetable crop production in Florida to help prepare them for a transition from a tobacco based farm economy.

Multi-State Partners:

Organization	State
Cooperative Extension Service	North Carolina

SMPs:

FL106
FL107
FL109
FL110
FL115
FL120
FL121

FL122
FL130
FL131

Extension Personnel Middleton, Lynne
Department: Putnam
Percent Extension Time 100 **Smith-Lever Funds** \$0
Title Putnam County, USA

Extension Activities

Putnam County 4-H (Florida) participated in a national exchange program with Indiana's Putnam County 4-H. Four 4-H members from Indiana spent seven days with four Florida 4-H members and their families in June 2003. In December 2003, the eight 4-H members will participate in a "half-way trip" meeting in Putnam County, Tennessee. In June 2004, the four Florida 4-H members will travel to Indiana to participate in the second half of the exchange program.

Multi-State Partners:

Organization Perdue Extension Service **State** Indiana

SMPs:

FL716

Extension Personnel Miller, Betty
Department: Leon
Percent Extension Time 7 **Smith-Lever Funds** \$0
Title Parenting and Human Development

Extension Activities

The Extension faculty from University of Georgia, Auburn University and UF/IFAS are working together to develop a multistate evaluation instrument which would enable the three states to measure multi-state impact. This discussion will be continued at the next multi-state meeting scheduled for 2004. The multi-state program plan to address parenting and human development, including goals, objectives, target audiences, and outcomes indicators was reviewed at the multistate meeting in 2003. Child Care Training was identified as the primary focus of the multi-state team. I attended the multi-state in-service training on "Teaching Basic Health and Safety in the Early Childhood Classroom" held August 8, 2003 in Bainbridge, GA. Florida FCS agents are writing parent newsletters to expand the UGA curriculum. I have written the parent newsletter entitled, "My Healthy Body." The multi-state initiative will expanded as child care training is expected to be a major focus in the Leon County Long

Multi-State Partners:

Organization UF/IFAS **State** FL

SMPs:

FL515

Extension Personnel Miller, Oliver
Department: Okeechobee
Percent Extension Time 100 **Smith-Lever Funds** \$59,432
Title South Florida Fair Open Dairy Show

Extension Activities

Open dairy show for dair cattle breeders

Multi-State Partners:

Organization Isely Farm **State** N.Carolina

SMPs:

FL106
FL115
FL128

Extension Personnel Momol, Timur
Department: North Florida REC-Quincy
Percent Extension Time 10 **Smith-Lever Funds** \$6,599
Title Reduced-risk Tactics for Thrips and Tospoviruses on Solanaceous Crops

Extension Activities

This project examines the environmental and economical benefits of newly developed reduced-risk tactics for managing thrips and tospoviruses on tomato, pepper and other solanaceous crops. Activities include replicated field experiments, on-farm demonstrations, multi-state in-service trainings, and production of educational materials, including a CD rom, a web site and extension publications. This project is also a CRIS project # QUN-03903.

Multi-State Partners:

Organization UGA **State** Georgia

SMPs:
FL107
FL112

Extension Personnel Monroe, Martha
Department: Forest Resources and Conservation
Percent Extension Time 10 **Smith-Lever Funds** \$0
Title Community Preparedness

Extension Activities

Interviewing residents in Florida and Minnesota with parallel interview guides. Analyzing data jointly.

Multi-State Partners:

Organization Southern Region of USDA FS **State** TX, AL, MS, AR,

SMPs:
FL420
FL421

Multi-State Partners:

Organization Texas Fire Service **State** TX

SMPs:
FL420
FL421

Multi-State Partners:

Organization USFS **State** WA

SMPs:
FL420
FL421

Extension Personnel Moore, Marjorie
Department: Bay
Percent Extension Time 4 **Smith-Lever Funds** \$1,724
Title Chronic Disease Prevention

Extension Activities

Attended multi-state meeting and shared nutrition programs and resources. Wrote diabetes newsletter for FIT Families newsletter series. Newsletter is still in press.

Multi-State Partners:

Organization UF-Ext. **State** FL

SMPs:
FL109
FL511

Extension Personnel Mullins, Daniel
Department: Santa Rosa
Percent Extension Time 1 **Smith-Lever Funds** \$0
Title Emerald Coast Flower and Garden Festival

Extension Activities

Provided a 4 hour gardening clinic and provided Master Gardener volunteers to perform other duties and prepare exhibits.

Multi-State Partners:

Organization Alabama Extension **State** Alabama

SMPs:
FL114

Multi-State Partners:

Organization Extension Service **State** Alabama, Georgia

SMPs:
FL114

Multi-State Partners:

Organization Master Gardener Association **State** Alabama

SMPs:
FL121

Extension Personnel Mullins, Vickie
Department: Santa Rosa
Percent Extension Time 1 **Smith-Lever Funds** \$0
Title Alabama/Florida 4-H Volunteer Leader Training

Extension Activities

Coordinated with Escambia County Florida and Escambia, Baldwin and Mobile Alabama counties in conducting 4- H Volunteer Leader Training.

Multi-State Partners:

Organization Extension **State** Georgia

SMPs:
FL715
FL716
FL717

Multi-State Partners:

Organization Extension Service **State** Alabama

SMPs:
FL718

FL801

Extension Personnel Munn, Jessica
Department: Leon
Percent Extension Time 1 **Smith-Lever Funds** \$0
Title Fit Families

Extension Activities

Completed one newsletter to be published as part of a series called Fit for the Future. Topic was "The Health Benefits of Soy"

Multi-State Partners:

Organization University of Florida/IFAS Extension **State** Florida

SMPs:

FL511

Extension Personnel Nesheim, Olaf
Department: Food Science and Human Nutrition
Percent Extension Time 22 **Smith-Lever Funds** \$22,829
Title Southern Region Pest Management Center

Extension Activities

I serve as a Co-director of the USDA-CSREES Southern Region Pest Management Center. The Center is a three year competitive grant award to UF-IFAS. The Center links with other states in the Southern Region by state pest management information programs that were established by the Center with individuals at Land Grant universities in the Southern USDA Region. These states include, Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, and Virginia. The Center Directors at UF-IFAS administer the grants program and provide leadership on issues related to the pest management information network in the region. Programs and Meetings. 1. April 25-27, 2002. Southern Region Experiment Station Directors Meeting, Savannah, Georgia. Presented a report on the SR-Pest Management Center and a report on the establishment of an IPM facilitator for the Southern Region. 30 minutes. 40 people. 2. May 14-16, 2002. Southern Region Pest Management Center Advisory Committee, Steering Committee and Project Leaders Meeting, Orlando, FL. Meeting of regionally based advisory committee for the center. Reviewed Center objectives, mission and sought input from members. Met with steering committee so that Center Directors could get input and direction. Met with state project leaders for projects funded by Center. 35 people. 2 days. 3. November 12-13, 2002. Southern Region Pest Management Center Steering Committee. Orlando, FL. Meeting of Center Directors and Steering Committee to review progress reports for projects funded by the Center and and review work plans and budgets for continued funding of projects. 12 people. 1.5 days. 4. February 19-20, 2002, May 29-30, 2002, September 26-27, 2002. Pest Management Center Directors Meetings. Washington, DC. Meetings of the Center Directors for the 4 regional Pest Management Centers. Center Directors meeting with USDA, EPA and other agency staff on issues related to the Centers. Center directors give reports on activities and issues in their regions. 20-30 Contacts each meeting. 5. August 29-30, 2002. Kentucky Pest Management Center Advisory Committee Meeting. Lexington, KY. As Center Director, I met with the Kentucky project's advisory committee and discussed the purpose of Pest Management Centers. 25 people. 6. February 21-22, 2002. USDA meeting to develop a Road Map IPM Programs. An invited meeting of a broad range of stakeholder/participants to develop a road map or plan for IPM in the USDA .

Multi-State Partners:

Organization Univeristy of Puerto Rico **State** Puerto Rico

SMPs:

FL101
FL102
FL103
FL107
FL108
FL111
FL112
FL116

Extension Personnel Norcini, Jeffrey
Department: North Florida REC-Quincy
Percent Extension Time 1 **Smith-Lever Funds** \$570
Title Introduction and Evaluation of Native Wildflowers and Grasses

Extension Activities

Tri-State Longleaf Pine Ecosystem Restoration Symposium Steering Committee (Logistic Working Group Chair)I assumed a leadership role in this activity because one of the major topics of this symposium, to be held November 2004, will be seed sources of regionally adapted herbaceous plant material for ground cover restoration.

Multi-State Partners:

Organization	State
Society for Ecol. Restor. Int.	Florida

SMPs:

FL114
FL121
FL134
FL420

Extension Personnel Obreza, Thomas
Department: Soil and Water Science
Percent Extension Time 40 **Smith-Lever Funds** \$28,057
Title USDA National Water Quality Program

Extension Activities

Coordinate water quality extension programs throughout the southern region (13 states)

Multi-State Partners:

Organization	State
OSU	OK

SMPs:

FL412

Extension Personnel Olczyk, Teresa
Department: Miami-Dade
Percent Extension Time 2 **Smith-Lever Funds** \$0
Title Biologically-Based sustainable vegetable production System without Use of Methyl Bromide

Extension Activities

The agent will interact with growers,conduct field days and write & distribute extension publications based on the results.

Multi-State Partners:

Organization	State
ARS USDA	MD

SMPs:

FL107
FL111

Extension Personnel Olson, Stephen
Department: North Florida REC-Quincy
Percent Extension Time 10 **Smith-Lever Funds** \$2,956
Title Reduced-Risk Tactics for Thrips and Tospovirus on Solanaceous Crops

Extension Activities

This project examines the environmental and economical benefits of newly developed reduced-risk tactics for managing thrips and tospoviruses on tomato, pepper and other solanaceous crops. Activities include replicated field experiments, on-farm demonstrations, multi-state in-service trainings, and production of educational materials, including a CD rom, a web site and extension publications.

Multi-State Partners:

Organization	State
LSU	Louisiana

SMPs:
FL107

Extension Personnel Osborne, Lance
Department: Central Florida REC-Apopka
Percent Extension Time 5 **Smith-Lever Funds** \$0
Title Pest Management

Extension Activities

Conduct Scout training programs in conjunction with Georgia and Florida Research and Extension.
Conduct Training programs on new and important pests.

Multi-State Partners:

Organization	State
Univeristy of Florida	Florida

SMPs:
FL105
FL112
FL114

Extension Personnel Rosenthal, Stanton
Department: Leon
Percent Extension Time 3 **Smith-Lever Funds** \$0
Title Horticulture/Urban Forestry Newspaper Columns

Extension Activities

Much of the wildlife habitat in Florida is owned by private landowners. Most of these lands are either in forest or agricultural production, with a smaller percentage in suburban or urban developments. Many of these landowners are interested in enhancing wildlife habitat on their property for aesthetic purposes, enhancing quality of life, or deriving additional income from fees paid for recreational access such as hunting, wildlife viewing, or other land-based recreation. To address this situation this year a Master Wildlifer class was given. This shortcourse is designed for landowners and land managers who are interested in integrating wildlife management considerations into current land use and management. Farmers, forestland owners, homeowners, and others who are interested in improving their property for wildlife found the Master Wildlifer class to be a wealth of practical information that serves as a guide to develop and improve wildlife habitat on their land. For practicing land managers, the course highlighted alternative management approaches for wildlife in forest, farm and urban settings. The Master Wildlifer Class course was broadcast from Clemson University every Tuesday evening and shown locally at the Gadsden County Extension Office. The seven week course offered twelve host sites across the state from

Pensacola to Ft. Myers, reaching many landowners. Florida joined eleven other states which extended the coverage to many landowners throughout the southeast. The course built on concepts on forest stewardship, best management practices for protecting the environment, planning for objectives, and services and assistance available for managing forest land. Each session was two-to-three hours long. Specific topics included Introduction to Wildlife Management, Leasing, Liability, Law & Economics, Quail/Rabbits/Dove, Deer Management, Turkey Management, Wetlands and Waterfowl, Nongame and Threatened & Endangered Species. Each registrant also received a comprehensive reference notebook that provided additional information on the topics covered in the shortcourse as well as additional topics of interest. Twenty-seven students attended this year. A certificate of completion was provided to each participant who attends 6 of the 7 Master Wildlifer sessions. This course was followed by a tour for both Master Wildlifer and Master Wildlife Conservation students on private property managed by Southern Forestry Consultants. During this 8-hour field class, students were able to see good examples of wildlife food plot placement and management, use of prescribed fire, silviculture prescriptions, controlling unwanted vegetation, forest health and management of understory vegetation for wildlife. These are all illustrated principles taught in Master Tree Farmer I and II & Master Wildlifer Classes. 19 Master Tree Farmer graduates and 5 collaborating instructors from UF/IFAS, the Florida Division of Forestry and the Florida Fish & Wildlife Conservation Commission participated.

Multi-State Partners:

Organization	State
State	South East

SMPs:

FL420
 FL421
 FL714

Multi-State Partners:

Organization	State
Universtiy Extension	Georga

SMPs:

FL420
 FL421
 FL714

Extension Personnel	Rutledge, Cynthia
Department:	Florida Medical Entomology Lab. - Vero Beach
Percent Extension Time	80 Smith-Lever Funds \$0
Title	Mosquito Control: IPM Techniques

Extension Activities

Presented lectures and discussion on mosquito-borne diseases in the Southeastern United States; presented information on tools available for IPM in mosquito control.

Multi-State Partners:

Organization	State
Alabama Cooperative Extension Service	AL

SMPs:

NONE

Extension Personnel	Sargent, Steven
Department:	Horticultural Sciences
Percent Extension Time	20 Smith-Lever Funds \$0
Title	Development of Training Materials and Programs for Safe Florida Produce

Extension Activities

Southeastern U.S. Regional Training Grant in Food Safety
 Obtaining this multi-state grant has resulted in the development of training materials for handlers of horticultural crops, and training of county faculty, statewide faculty and industry. (with J. Brecht, M. Ritenour)
 Presentations: I gave a presentation on food safety to blueberry growers from Florida and southern Georgia (Mar. 18) I responded to numerous phone, e-mail and written requests for information regarding handling of vegetables throughout the year.
 Resource materials: An extension bulletin detailing effective sanitation recommendations was reprinted in the 2003 Florida Vegetable Production Guide (with M. Ritenour, J.A. Bartz and J.K. Brecht). Several fact sheets were published for food safety guidelines for major crops - citrus, tomato, berries, root crops, beans, as part of the multi-state project. These received awards from the American Society for Horticultural Science for Best Extension Publication.

Multi-State Partners:

Organization	State
UF/IFAS	Florida

SMPs:

- FL107
- FL108
- FL109
- FL110
- FL111
- FL121

Extension Personnel

Schmidt, Ronald

Department:

Food Science and Human Nutrition

Percent Extension Time

1 **Smith-Lever Funds** \$837

Title

Consumer Food Safety and Food Irradiation Education Program

Extension Activities

Funded project between Texas A&M University, University of California-Davis, and University of Florida. The project primarily addresses microbiological methodology and assessment of pathogen levels in fresh produce commodities including citrus, tomato, and strawberries, and developing intervention strategies. The training component consists of developing educational programs for the fresh produce industry regarding good agricultural practices and microbiological issues.

Multi-State Partners:

Organization	State
Fight BAC	

SMPs:

- FL109
- FL128

Multi-State Partners:

Organization	State
Texas A&M University	Texas

SMPs:

- FL109
- FL110

Extension Personnel

Schneider, Keith

Department:

Food Science and Human Nutrition

Percent Extension Time

5 **Smith-Lever Funds** \$3,319

Title

Advisory for retail processing with proper controls and variances for product safety

Extension Activities

Performing statewide safety of four Florida produced commodities. Ultimately this information will be

used to teach farmers, processors, retailers, consumers and county agents proper produce handling procedures. To date, Phase I data collection has been completed for tomatoes in the State of Florida.

Multi-State Partners:

Organization	State
AFDO	NY

SMPs:
NONE

Multi-State Partners:

Organization	State
Texas A&M	TX

SMPs:
FL109
FL110

Multi-State Partners:

Organization	State
University of Georgia	GA

SMPs:
FL107
FL108
FL109
FL110

Extension Personnel	Sheftall, Jr., William		
Department:	Leon		
Percent Extension Time	2	Smith-Lever Funds	\$0
Title	Field Training Class for Master Tree Farmer Graduates		

Extension Activities

The agent provided leadership to the Tr-state NR PIT for planning a series of 3 multi-state pond management workshops for GA, FL and AL landowners, including Master Tree Farmers, Master Wildlifers, FL Forest Stewardship and AL Treasure Forest landowners, FL LakeWatch volunteers and FL Master Wildlife Conservationists interested and/or engaged in managing ponds and lakes. The classroom and field instruction for all 3 workshops to be conducted in 2004-05 will be taught by Extension Fisheries Specialists and Agents from

Multi-State Partners:

Organization	State
Auburn Extension/DED	AL

SMPs:
FL416
FL420
FL421
FL714
FL801

Multi-State Partners:

Organization	State
Southern Forestry Consultants/Bainbridge	GA

SMPs:
FL416
FL420
FL421
FL714
FL801

Multi-State Partners:

Organization	State
USFWS-Panama City	FL

SMPs:

FL114

FL412

FL714

Extension Personnel

Simonne, Amarat

Department:

Family Youth and Community Science

Percent Extension Time

2

Smith-Lever Funds \$1,283**Title**

Enhancing food safety for Floirdians.

Extension Activities

1) Organized the multi-state in-service training: 2003 Food Safety and Quality Update targeted to county extension faculty from FL and GA. 2) Developing Cost-effective Interactive Distance In-Service Training. A multi- state training program targeted to State Extension Faculty in FL, GA, and OK. (Co-organized with Drs. L. Bobroff and M. Ferrer). This is a conference call training with the use of internet and CD electronic media. (2)

Multi-State Partners:

Organization	State
University of Georgia	Georgia

SMPs:

FL107

FL109

FL110

FL135

FL511

Extension Personnel

Starling, Clifford

Department:

Suwannee

Percent Extension Time

5

Smith-Lever Funds \$0**Title**

Agronomic practices in Row Crop and Vegetable Crops

Extension Activities

Georgia - Florida Tobacco Tour

Multi-State Partners:

Organization	State
University of Georgia	Georgia

SMPs:

FL101

FL107

Extension Personnel

Stribling, Karen

Department:

Wakulla

Percent Extension Time

2

Smith-Lever Funds \$0**Title**

Joint Multistate Meeting of Family and Consumer Sciences Education

Extension Activities

Met in Panama City, FL on

September 16-17, 2003 for a Multistate Meeting. I collaborated with Georgia and Alabama Agents on the Organizational Development team to establish a partnership with Alabama in using facilities at Camp Timpoochee for 4-H Camp.

Multi-State Partners:

Organization Cooperative Extension
State Auburn University

SMPs:
FL511
FL512
FL718

Extension Personnel Sturmer, Leslie
Department: Levy
Percent Extension Time 2 **Smith-Lever Funds** \$0
Title Development and Implementation of Cultured Clam Crop Assistance Programs

Extension Activities

Although the grant concluded in 2002, additional educational activities occurred relating to dissemination of information resulting from the funded project. A technical report (TP-125) written by the co-investigators was published by Florida Sea Grant in June and distributed to clam seed suppliers in the state. Further, an article about the economics of remote setting was featured in the May issue of The Bivalve Bulletin. This program was a collaborative effort among researchers at the Office of Sea Grant Development at Louisiana State University and faculty with the UF Food and Resource Economics Department and Cooperative Extension Service. A letter of memorandum written by Dr. John Supan confirms LSU's commitment to the remote setting project.

Multi-State Partners:

Organization Louisiana State University
State Louisiana

SMPs:
FL132
FL312
FL316

Multi-State Partners:

Organization University of Georgia, Shellfish Aquaculture Laboratory
State Georgia

SMPs:
FL132
FL312
FL316

Multi-State Partners:

Organization USDA Risk Management Agency
State Missouri

SMPs:
FL132

Multi-State Partners:

Organization USDA Risk Management Agency Regional Services Office
State Georgia

SMPs:
FL132

Extension Personnel Sweat, Donald
Department: Pasco
Percent Extension Time 1 **Smith-Lever Funds** \$349
Title Southeast Coastal Ocean Observation System Planning Meeting
Extension Activities

Program Planning
Multi-State Partners:
Organization
Georgia Sea Grant
SMPs:
FL312
FL317

State
Georgia

Extension Personnel Swisher, Marilyn
Department: Family Youth and Community Science
Percent Extension Time 10 **Smith-Lever Funds** \$7,199
Title What Local Service Providers Need to Know about Organic Rules and Regulations

Extension Activities
Develop training materials about National Organic Standards. Conduct workshops in Kentucky, Florida and the Virgin Islands. Evaluate changes in practice by county Extension faculty as a result of training.

Multi-State Partners:
Organization University of the Virgin Islands **State** U.S. Virgin Islands
SMPs:
FL101
FL105
FL107
FL120
FL128
FL130

Extension Personnel Taylor, Meredith
Department: Suwannee
Percent Extension Time 1 **Smith-Lever Funds** \$517
Title Human Development, Parenting and Strengthening Families

Extension Activities
Parenting Program Development Team of Georgia- Florida-Alabama Multi-State MeetingProgram planning with Idaho agent for Grandparents Raising GrandchildrenWorked with Texas agents on programming for Hispanic audiences.

Multi-State Partners:
Organization Southeast Ag Coalition **State** Georgia
SMPs:
FL101

Multi-State Partners:
Organization University of Georgia **State** Georgia
SMPs:
FL512
FL513
FL515

Extension Personnel Tesdall, Tracy
Department: Volusia
Percent Extension Time 1 **Smith-Lever Funds** \$0

Title Creating a 4-H Fundraising Plan

Extension Activities

Exposed 4-H volunteers and Agents to concepts of fundraising and how to create a plan in their own county.

Multi-State Partners:

Organization	State
Southern Region Leaders Forum	Georgia

SMPs:
FL718

Extension Personnel Thomas, William

Department: Columbia

Percent Extension Time 2 **Smith-Lever Funds** \$933

Title Tobacco Farmers Partnering Program

Extension Activities

Extension Representative on educational Tobacco Quality Assurance Committee for Florida and Georgia tobacco growers.

Multi-State Partners:

Organization	State
Phillip Morris, USA	Virginia

SMPs:
FL101
FL115
FL121

Extension Personnel Tyree, Allen

Department: Hamilton

Percent Extension Time 1 **Smith-Lever Funds** \$0

Title Master Wildlifer 2003

Extension Activities

Seven 3-hour satellite broadcasts on Master Wildlifer every Tuesday night from Clemson University (from February through March 2003 at sites in Florida. Tyree was the agent in Hamilton County that assisted with classes presented at the Hamilton County High School site. Eight (8) persons received a Master Wildlifer

Multi-State Partners:

Organization	State
Land-Grant Universities and Other Educational Institutions	15 Sites in the

SMPs:
FL101
FL107
FL121
FL420

Multi-State Partners:

Organization	State
Southeastern Sand-Grant Universities	~10 Southern States

SMPs:
FL101
FL107
FL121
FL420

Extension Personnel Unruh, Joseph
Department: West Florida REC-Jay
Percent Extension Time 5 **Smith-Lever Funds** \$4,219
Title Gulf Coast Turfgrass Expo and Field Day

Extension Activities

The Gulf Coast region (Florida panhandle, southern Mississippi, Alabama, and Georgia) is unique; unlike any other region in the United States. Because of this uniqueness, special needs for growing turfgrass exist. A major function of the Turfgrass Program at the WFREC is to provide valuable information to turfgrass managers working in this region. In an effort to parlay this valuable information to the end user, The Gulf Coast Turfgrass Expo and Field Day was started in 1996. An annually event drawing nearly 350 people to the West Florida Research and Education Center, turfgrass managers come to learn about current research/extension activities pertaining to turfgrass management as presented by our multi-state partners.

Multi-State Partners:

Organization	State
USDA-ARS - Tifton, GA	Georgia

SMPs:

FL114
FL116

Extension Personnel van Blokland, P.J
Department: Food and Resource Economics
Percent Extension Time 10 **Smith-Lever Funds** \$10,340
Title Technical and Economic Efficiencies of Producing and marketing Environmental plants S 290

Extension Activities

Initiate, review and modify research on landscaping, recreation plantings and turf in both the public and private sectors. trees, plants and turf. Please see previous section and the web site references

Multi-State Partners:

Organization	State
Oregon State	Purdue

SMPs:

NONE

Extension Personnel VanSickle, John
Department: Food and Resource Economics
Percent Extension Time 12 **Smith-Lever Funds** \$13,398
Title Southern Extension Marketing Committee

Extension Activities

The SEMC meets once annually to discuss programs that can be shared within the region. The SEMC also plans the Southern Outlook Conference. I developed a presentation for the group on Risk Management and the use of Futures Markets. These efforts resulted in the Trading Game that has been used by the group for training purposes and as competition between members in the group.

Multi-State Partners:

Organization	State
Clemson University	South Carolina

SMPs:

FL101
FL102
FL103
FL107

FL108
FL111
FL115
FL119
FL128
FL129
FL130

Extension Personnel Verlinde, Christina
Department: Santa Rosa
Percent Extension Time 1 **Smith-Lever Funds** \$0
Title AL/ FL 4H
Marine/Environmental Education Program

Extension Activities

Coordinated stream restoration workshops for 45 participants from various sectors including: county planners, Northwest Florida Water Management District, Florida Department of Environmental Protection, Leon county Master Wildlife Conservationists, Florida Division of Forestry, Fl. Department of Transportation, 3 Rivers Research and Conservation District, Escambia Soil and Water Conservation district, private consulting companies, etc. Workshops were developed to promote natural stream restoration practices, subjects included stream processes and functions, importance of restoration, the Rosgen classification system, stream stability and channel evolution, watershed and stream assessment, hydraulic geometry regional curves, restoration options for incised streams, natural channel design techniques, in-stream structures and road crossings, floodplain and vegetation considerations, case studies and stream restoration needs in the Panhandle.

Multi-State Partners:

Organization Auburn University **State** AL

SMPs:

FL214
FL315
FL714

Multi-State Partners:

Organization Baldwin Co. Extension **State** AL

SMPs:

FL214
FL316
FL714

Multi-State Partners:

Organization UF/IFAS Extension **State** FL

SMPs:

FL214
FL316
FL714

Extension Personnel Ward, Bruce
Department: Walton
Percent Extension Time 1 **Smith-Lever Funds** \$0
Title Alabama/Florida Finding Money in the Woods Forest Products
Workshop

Extension Activities

A program was developed jointly with Alabama Extension to provide a training for beef cattle producers on Efficient Winter Supplementation of Beef Cows, Matching Your Genetics to the Market, and Managing Tropical

Multi-State Partners:

Organization	State
Auburn University	Alabama Extension

SMPs:

FL114

Multi-State Partners:

Organization	State
Cooperative Extension	Florida

SMPs:

FL114

Extension Personnel

Webb, Daniel

Department:

Animal Sciences

Percent Extension Time

4

Smith-Lever Funds \$3,381**Title**

Dairy Records Management System

Extension Activities

Annual meeting in October Board meetings in October and March Spring Workshop for all DHIA workers in 22- states participation Workshops for dairy farm consultants (veterinarians and nutritionists) Meetings of specific work groups/committees Pocket Dairy CTAP Dairy Metrics DHIA Billing system Telephone conferences Email communications for review of projects and exchange of ideas on details

Multi-State Partners:

Organization	State
Louisiana State Univ	LA

SMPs:

FL128

Multi-State Partners:

Organization	State
LSU	LA

SMPs:

FL128

Multi-State Partners:

Organization	State
U G	GA

SMPs:

FL128

Extension Personnel

Wilken, Carolyn

Department:

Family Youth and Community Science

Percent Extension Time

2

Smith-Lever Funds \$1,030**Title**

Re-starting an Aging Initiative

Extension Activities

Met at Extension Pre-conference for National Council for Family Relations. Identified key areas of shared interest. Exchanged initial emails related to planned activities.

Multi-State Partners:

Organization	State
Oregon State University	Oregon

SMPs:

NONE

Extension Personnel Williams, Larry
Department: Okaloosa
Percent Extension Time 4 **Smith-Lever Funds** \$1,674
Title Brown Recluse Spider Challenge

Extension Activities

The agent initiated a brown recluse spider study for Northwest Florida working with Rick Vetter, University of California Entomologist. Vetter is researching brown recluse spiders, their distribution, afflictions misdiagnosed as their bites and the misperception of their presence throughout the United States. This study was established because there are many misidentifications and many misdiagnoses, even by the medical community. Misdiagnosis is common. Approximately thirty medical afflictions of diverse origin have been identified as being misdiagnosed as brown recluse bites in the research literature. The literature states that the brown recluse spider is not an established species in Florida yet annual bite diagnoses number in the hundreds. As a result, the brown recluse is perceived to be commonplace. This study involves the collection, submission and identification of spiders thought to be brown recluse spiders by North Florida residents. Each specimen is sent to Vetter with the University of California for identification. A paper will be written after the study is complete.

Multi-State Partners:

Organization	State
University of California	California

SMPs:
FL114
FL116

Extension Personnel Williamson, Jeffrey
Department: Horticultural Sciences
Percent Extension Time 10 **Smith-Lever Funds** \$4,185
Title Effects of Growth Regulators and Growth and development of Blueberry

Extension Activities

Description of Activity: I co-coordinate the annual North Florida/South Georgia Peach Meeting for Florida and Georgia peach growers. We have speakers from the Universities of Florida, Georgia, Auburn and Clemson, as well as other state and federal employees from Florida and Georgia.

Multi-State Partners:

Organization	State
University of Georgia	Georgia

SMPs:
FL107
FL121

Extension Personnel Wilson, Suzanne
Department: Holmes
Percent Extension Time 2 **Smith-Lever Funds** \$0
Title Ag in the Classroom - Where's the Beef

Extension Activities

Introduce Alabama youth to the beef industry with hands-on activities, classroom activities, field trips and volunteer education.

Multi-State Partners:

Organization	State
Alabama Extension Service - Geneva County	Alabama

SMPs:

FL701
 FL711
 FL713
 FL714

Extension Personnel Wright, David
Department: North Florida REC-Quincy
Percent Extension Time 20 **Smith-Lever Funds** \$22,208
Title Livestock Integration into Conservation Cropping Systems

Extension Activities

Coordinate efforts of research and extension programs for Livestock Integration into Conservation Cropping Systems. This is a multi-state effort with cooperation from Auburn, Clemson, Georgia, and USDA.

Multi-State Partners:

Organization	State
Auburn U.	AL

SMPs:

FL101
 FL130

Extension Personnel Yeager, Thomas
Department: Environmental Horticulture
Percent Extension Time 5 **Smith-Lever Funds** \$4,605
Title Best Management Practices for producing container-grown plants

Extension Activities

Adoption of BMPs by container nursery operators so that plant production results in minimal impact on the natural environment

Multi-State Partners:

Organization	State
Clemson	South Carolina

SMPs:

NONE

Extension Personnel Zerba Jr., Raymond
Department: Clay
Percent Extension Time 1 **Smith-Lever Funds** \$451
Title Georgia/Florida Green Industries Update

Extension Activities

Served on Planning Committee for 2003 Georgia/Florida Green Industries Update Meeting in Northeast Florida (Duval County) and in addition presented (partnering with Georgia Extension Agent Dave Linvill) a 30 minute afternoon breakout session on Palm Problems - repeated 4 times reaching a total of 77 participants (38 instructional contact hours), as part of October 21, 2003 Program.

Multi-State Partners:

Organization	State
UGA Extension	Georgia

SMPs:

FL114

Total Smith-Lever Funds \$1,026,886.00

~ RESEARCH INTEGRATED ACTIVITIES

U.S. Department of Agriculture
Cooperataive State Researach, Education and Extension Service
Integrated Research Activities

Goal 1

Research Project #	ABE-03285
Research Title	Anaerobic Decomposition Of Energy Crops, Wastes, And Metals
Research Faculty	Chynoweth, D. P., ,
Hatch Funds	\$383
Research Project #	ABE-03492
Research Title	Microirrigation Of Horticultural Crops In Humid Regions
Research Faculty	Haman, D. Z., Zazueta, F. S., Dukes, M.
Hatch Funds	\$482
Research Project #	ABE-03824
Research Title	Systems for Controlling Air Pollutant Emissions and Indoor Environments of Poultry, Swine and Dairy Facilities
Research Faculty	Bucklin, R. A., Jones, P. H.,
Hatch Funds	\$365
Research Project #	ABE-03874
Research Title	Improvement of Thermal and Alternative Processes for Foods
Research Faculty	Teixeira, A. A., Smerage, G. H.,
Hatch Funds	\$5,842
Research Project #	AGR-03374
Research Title	Genetic Improvement Of Forage Grass Species
Research Faculty	Wofford, D. S., Prine, G. M., Quesenberry, K. H.
Hatch Funds	\$25
Research Project #	AGR-03427
Research Title	Recyclable Organic Solids In Conservation Tillage Multiple Cropping Systems
Research Faculty	Gallaher, R. N., ,
Hatch Funds	\$16
Research Project #	AGR-03594
Research Title	Formation, Sprouting And Longevity Of Hydrilla Tubers
Research Faculty	Haller, W. T., Fox, A. M., Langeland, K. A.
Hatch Funds	\$20,977
Research Project #	AGR-03854
Research Title	Selection and adaptation of grass and legume species for forage production in the southern

coastal plain and peninsular Florida

Research Faculty Quesenberry, K. H., ,
Hatch Funds \$29,308

Research Project # AGR-03983
Research Title Conservation Tillage Multiple Cropping Management Strategies for Greater Sustainability

Research Faculty Gallaher, R. N., ,
Hatch Funds \$2,033

Research Project # ANS-03572
Research Title Byproduct Feedstuffs: Rumen Degradability Of Carbohydrate And Fat Fractions And Effects On Feed Effi

Research Faculty Hall, M. B., Van Horn, H. H.,
Hatch Funds \$5,300

Research Project # ANS-03821
Research Title Synchronization of estrus in cattle of Bos indicus breeding

Research Faculty Yelich, J. V., ,
Hatch Funds \$10,234

Research Project # ANS-03859
Research Title Use of bst, shortening the dry period, and prepartum feeding of anionic salts to improve milk production and health of dairy cows.

Research Faculty Head, H. H., Bachman, K. C.,
Hatch Funds \$3,565

Research Project # ANS-03912
Research Title Enhancing Production and Reproductive Performance of Heat-stressed Dairy Cattle

Research Faculty Hansen, P. J., Staples, C. R.,
Hatch Funds \$34

Research Project # ANS-03956
Research Title Luteinizing Hormone (lh) Synthesis and Secretion Regulation in Horses

Research Faculty Sharp, D. C., ,
Hatch Funds \$0

Research Project # ANS-03980
Research Title Improving Efficiencies of In Vitro Embryo Production Technologies in Cattle.

Research Faculty Moore, K., ,
Hatch Funds \$0

Research Project # APO-03523
Research Title Management Of Diseases Of Tropical Foliage Plants

Research Faculty Norman, D. J., ,
Hatch Funds \$3,772

Research Project # APO-03609
Research Title Introduction And Evaluation Of Ornamental Plants

Research Faculty Hatch Funds	Henny, R. J., Stamps, R. H., \$8,692
Research Project #	APO-03875
Research Title	Development Of New Potato Clones For Environmental And Economical Sustainability In The Northeast
Research Faculty Hatch Funds	White, J. M., , \$1,713
Research Project #	APO-04012
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty Hatch Funds	Leibee, G. L., Nuessly, G. S., Schuster, D. J. \$10,318
Research Project #	BGL-03827
Research Title	Best Management Practices for Turf Systems in the East
Research Faculty Hatch Funds	Scully, B. T., , \$3,269
Research Project #	BGL-04012
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty Hatch Funds	Nuessly, G. S., Schuster, D. J., Funderburk, J. E. \$536
Research Project #	BRA-03364
Research Title	Biology And Management Of Arthropod Pests Of Vegetables
Research Faculty Hatch Funds	Schuster, D. J., , \$129
Research Project #	BRA-03524
Research Title	Identification, Management And Control Of Viruses Infecting Ornamental And Related
Research Faculty Hatch Funds	Polston, J. E., , \$26
Research Project #	BRA-03544
Research Title	Improved Nutrition And Irrigation Of Ornamental Plants
Research Faculty Hatch Funds	Harbaugh, B. K., , \$13
Research Project #	BRA-03554
Research Title	Flower Initiation And Development Of Floriculture Crops
Research Faculty Hatch Funds	Harbaugh, B. K., , \$8
Research Project #	BRA-03609
Research Title	Introduction And Evaluation Of Ornamental Plants
Research Faculty Hatch Funds	Harbaugh, B. K., , \$5,392
Research Project #	BRA-03832

Research Title	Microirrigation Technologies for Protection of Natural Resources and Optimum Production
Research Faculty	Stanley, C. D., Csizinszky, A. A.,
Hatch Funds	\$2,698
Research Project #	BRA-04012
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty	Schuster, D. J., Nuessly, G. S., Funderburk, J. E.
Hatch Funds	\$11,109
Research Project #	BRO-03651
Research Title	Breeding To Optimize Maternal Performance And Reproduction Of Beef Cows In The Southern Region
Research Faculty	Chase, C. C., Coleman, S. W.,
Hatch Funds	\$0
Research Project #	ENH-03544
Research Title	Improved Nutrition And Irrigation Of Ornamental Plants
Research Faculty	Yeager, T. H., ,
Hatch Funds	\$34
Research Project #	ENH-03564
Research Title	Micropropagation Protocol Development For Production Of Native Wetland, Aquarium And Water Garden Pl
Research Faculty	Kane, M. E., ,
Hatch Funds	\$25
Research Project #	ENH-03595
Research Title	Asexual Propagation Of Environmental Plants
Research Faculty	Dehgan, B., Kane, M. E.,
Hatch Funds	\$3,297
Research Project #	ENH-03600
Research Title	Morphological And Physiological Responses Of Chimeral Plants To Environmental Factors
Research Faculty	McConnell, D. B., ,
Hatch Funds	\$431
Research Project #	ENH-03602
Research Title	Taxonomy And Boisisystematics Of Cultivated Plants
Research Faculty	Dehgan, B., ,
Hatch Funds	\$666
Research Project #	ENH-03609
Research Title	Introduction And Evaluation Of Ornamental Plants
Research Faculty	Dudeck, A. E., Barrett, J. E., Dehgan, B.
Hatch Funds	\$9,059
Research Project #	ENY-03419
Research Title	Toxicology Of Agriculturally Important Insect Pests Of Florida
Research Faculty	Yu, S. J., ,

Hatch Funds	\$34
Research Project #	ENY-03592
Research Title	Integrated Management Of Arthropod Pests Of Livestock And Poultry
Research Faculty	Butler, J. F., ,
Hatch Funds	\$166
Research Project #	ENY-03934
Research Title	Biological Control of Arthropod Pests and Weeds
Research Faculty	Frank, J. H., Cuda, J. P., Hoy, M. A.
Hatch Funds	\$3,798
Research Project #	ENY-03942
Research Title	Toxicology of Agriculturally Important Insect Pests of Florida
Research Faculty	YU, S. J., ,
Hatch Funds	\$40,609
Research Project #	ENY-03961
Research Title	Selection of Honey Bees for Suppressed Reproduction of the Parasitic Varroa Mite and Mapping of the Quantitative Trait Loci (qtl) Invol
Research Faculty	Hall, H. G., Wu, R.,
Hatch Funds	\$544
Research Project #	ENY-04011
Research Title	A Comparative Analysis of Plant and Insect Parasitic Nematodes: a Novel Approach to Controlling Insect Pests and Plant Pathogens
Research Faculty	Adams, B. J., ,
Hatch Funds	\$953
Research Project #	ENY-04012-L
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty	Liburd, O. E., Nuessly, D. J., Schuster, D. J.
Hatch Funds	\$0
Research Project #	ENY-04012-W
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty	Webb, S. E., Nuessly, G. S., Schuster, D. J.
Hatch Funds	\$311
Research Project #	ENY-04025
Research Title	Chemical Ecology and Management of Insect Pests of Blueberry, <i>Vaccinium</i> spp., in Florida
Research Faculty	McAuslane, H. J., Liburd, O. E.,
Hatch Funds	\$372
Research Project #	ENY-04030
Research Title	Sources, Dispersal and Management of Stable Flies on Grazing Beef and Dairy Cattle
Research Faculty	Butler, J. F., ,
Hatch Funds	\$474

Research Project #	FME-03966
Research Title	Predicting mosquito-borne disease transmission in Florida
Research Faculty	Day, J. F., ,
Hatch Funds	\$503
Research Project #	FOS-03456
Research Title	Improvement Of Thermal Processes For Foods
Research Faculty	Balaban, M. O., ,
Hatch Funds	\$0
Research Project #	FOS-03846
Research Title	Postharvest quality and safety in fresh-cut vegetables and fruits
Research Faculty	Talcott, S. T., ,
Hatch Funds	\$459
Research Project #	FOS-03910
Research Title	Phytochemical and Quality Assessment of Fresh and Processed Fruits and Vegetables
Research Faculty	Talcott, S. T., ,
Hatch Funds	\$0
Research Project #	FRE-03497
Research Title	Agricultural Change In The Gulf Of Mexico: The Case Of Citrus And Sugarcane In Florida And Veracruz
Research Faculty	Andrew, C. O., Spreen, T. H.,
Hatch Funds	\$46
Research Project #	FRE-03599
Research Title	The Effect Of Farmland Boom/bust Cycles On The Rural Economy
Research Faculty	Schmitz, A., Moss, C. B., Mulkey, W. D.
Hatch Funds	\$6,493
Research Project #	FRE-03701
Research Title	Agricultural and Food Product Logistics: Implications for Florida and the U.s. in a World Market
Research Faculty	Beilock, R. P., ,
Hatch Funds	\$1,489
Research Project #	FRE-03769
Research Title	Financing Agriculture and Rural America: Issues fo Policy Structure and Technical Change
Research Faculty	Weldon, R. N., ,
Hatch Funds	\$376
Research Project #	FRE-03863
Research Title	The Efficiency of Alternative Natural Resource and Environmental Policies and Practices
Research Faculty	Larkin, S. L., ,
Hatch Funds	\$490
Research Project #	FRE-04005

Research Title	Consumer Attitudes and Preferences Regarding Florida Agricultural Products.
Research Faculty	House, L., Degner, R.,
Hatch Funds	\$0
Research Project #	FTL-03423
Research Title	Foraging Behavior And Control Of Subterranean Termites
Research Faculty	Su, N. Y., Scheffrahn, R. H.,
Hatch Funds	\$107
Research Project #	FTL-03539
Research Title	The Influence Of Edaphic Factors On Growth Of Torpedograss, Maidencane, And Hygrophila And Their Res
Research Faculty	Sutton, D. L., ,
Hatch Funds	\$2,418
Research Project #	FTL-03554
Research Title	Flower Initiation And Development Of Floriculture Crops
Research Faculty	Klock, K. A., Broschat, T. K.,
Hatch Funds	\$260
Research Project #	FTL-03602
Research Title	Taxonomy And Biosystematics Of Cultivated Plants
Research Faculty	Giblin-Davis, R. M., ,
Hatch Funds	\$118
Research Project #	FTL-03607
Research Title	Bionomics And Management Of Hemipterous Pests Of Woody Ornamental Plants And Turfgrasses In Florida
Research Faculty	Howard, F. W., ,
Hatch Funds	\$2,885
Research Project #	FTL-03609
Research Title	Introduction And Evaluation Of Ornamental Plants
Research Faculty	Broschat, T. K., ,
Hatch Funds	\$347
Research Project #	FTL-03620
Research Title	Weed Biology And Control For Turfgrass And The Landscape
Research Faculty	Busey, P., ,
Hatch Funds	\$2,547
Research Project #	FTL-03711
Research Title	Turfgrass Fertility Management and Environmental Impact
Research Faculty	Cisar, J. L., ,
Hatch Funds	\$7,119
Research Project #	FTL-04066
Research Title	Environmental Management of Weeds in Turfgrass
Research Faculty	Busey, P., ,
Hatch Funds	\$0

Research Project #	FYC-03960
Research Title	Enhancing Food Safety and Quality Through Technologies and Consumer Research
Research Faculty	Simonne, A. H., ,
Hatch Funds	\$790
Research Project #	HAS-03875
Research Title	Development Of New Potato Clones For Environmental And Economical Sustainability In The Northeast
Research Faculty	Hutchinson, C. M., Weingartner, D. P.,
Hatch Funds	\$346
Research Project #	HOM-03402
Research Title	Integrated Pest Management As An Alternative For Control Of Soilborne Pests Of Vegetable Crops
Research Faculty	Ploetz, R. C., Bryan, H. H.,
Hatch Funds	\$14,619
Research Project #	HOS-03402
Research Title	Integrated Pest Management As An Alternative For Control Of Soilborne Pests Of Vegetable Crops
Research Faculty	Stall, W. M., Locascio, S. J.,
Hatch Funds	\$80
Research Project #	HOS-03457
Research Title	Phenology, Population Dynamics And Interference: A Basis For Understanding Weed Biology And Ecology
Research Faculty	Stall, W. M., ,
Hatch Funds	\$91
Research Project #	HOS-03601
Research Title	Identification Of Genetic And Physiological Mechanisms Of Thermotolerance In Lettuce Seed
Research Faculty	Cantliffe, D. J., ,
Hatch Funds	\$19,070
Research Project #	HOS-03832
Research Title	Microirrigation Technologies For Protection Of Natural Resources And Optimum
Research Faculty	Locascio, S. J., Simonne, E. H.,
Hatch Funds	\$1,085
Research Project #	IMM-03924
Research Title	Development, evaluation and Safety of Entomopathogens For Control of Arthropod Pests
Research Faculty	Stansly, P. A., ,
Hatch Funds	\$3,528
Research Project #	JAY-03457
Research Title	Phenology, Population Dynamics, And Interference: A Basis For Understanding Weed Biology And Ecology
Research Faculty	Brecke, B. J., ,

Hatch Funds	\$674
Research Project #	JAY-03609
Research Title	Introduction And Evaluation Of Ornamental Plants
Research Faculty	Thetford, M., ,
Hatch Funds	\$5,579
Research Project #	JAY-03620
Research Title	Weed Biology And Control For Turfgrass And The Landscape
Research Faculty	Brecke, B. J., ,
Hatch Funds	\$17,258
Research Project #	LAL-03571
Research Title	Dynamic Economic Analysis Of The Florida Citrus Industry
Research Faculty	Muraro, R. P., ,
Hatch Funds	\$9,218
Research Project #	LAL-03770
Research Title	Environmental Effects on Vegetative and Reproductive Growth of Citrus
Research Faculty	Syvertsen, J. P., Albrigo, L. G.,
Hatch Funds	\$9,208
Research Project #	LAL-03896
Research Title	Natural Products Chemistry As A Resource For Biorational Methods Of Insect Control
Research Faculty	Nigg, H. N., ,
Hatch Funds	\$27,071
Research Project #	LAL-03897
Research Title	Soil Microbial Taxonomic And Functional Diversity As Affected By Land Use And Management
Research Faculty	Graham, J. H., ,
Hatch Funds	\$0
Research Project #	LAL-03924
Research Title	Development, Evaluation, and Safety of Entomopathogens for Control of Arthropod Pests
Research Faculty	Mc Coy, C. W., Duncan, L. W.,
Hatch Funds	\$15,155
Research Project #	MCS-03798
Research Title	Biologically Based Ipm Systems for Management of Plant-parasitic Nematods
Research Faculty	Preston, J. F., ,
Hatch Funds	\$9,924
Research Project #	MCS-03861
Research Title	Genetic Engineering of Zymomonas mobilis for Fuel Ethanol Production
Research Faculty	Davis, F. C., ,
Hatch Funds	\$12,344
Research Project #	ONA-04006

Research Title	Stress Factors Of Farm Animals And Their Effects On Performance
Research Faculty	Arthington, J. D., ,
Hatch Funds	\$175
Research Project #	PLP-03336
Research Title	Phylogenetic Relationships Of Pezizales (cup-fungi) And Tuberales (truffles)
Research Faculty	Kimbrough, J. W., ,
Hatch Funds	\$60
Research Project #	PLP-03524
Research Title	Identification, Management, And Control Of Viruses Infecting Ornamental And Related Crops
Research Faculty	Zettler, F. W., Hiebert, E.,
Hatch Funds	\$276
Research Project #	PLP-03588
Research Title	Sanitation In Post Harvest Handling Practices For Fresh Fruits And Vegetables
Research Faculty	Bartz, J. A., ,
Hatch Funds	\$5,727
Research Project #	PLP-03623
Research Title	Biology And Management Of Diseases Affecting Vegetable Crops In North Florida
Research Faculty	Weingartner, D. P., ,
Hatch Funds	\$2,231
Research Project #	PLP-03925
Research Title	Biological Control Of Soilborne Plant Pathogens For Sustainable Agriculture
Research Faculty	Charudattan, R., Datnoff, L. E.,
Hatch Funds	\$0
Research Project #	PLP-03934
Research Title	Biological Control of Arthropod Pests and Weeds
Research Faculty	Charudattan, R., ,
Hatch Funds	\$429
Research Project #	PLP-04031
Research Title	Development of Plant Pathogens as Bioherbicides for Weed Control
Research Faculty	Charudattan, R., ,
Hatch Funds	\$0
Research Project #	QUN-03609
Research Title	Introduction And Evaluation Of Ornamental Plants
Research Faculty	Norcini, J. G., Knox, G. W.,
Hatch Funds	\$2,947
Research Project #	QUN-03854
Research Title	Selection and Adaptation of Grass and Legume Species for Forage Production in the Southern Coastal Plain and Peninsular Florida
Research Faculty	Blount, A. R., Quesenberry, K. H., Myer, R. O.
Hatch Funds	\$30,264

Research Project # SWS-03834
Research Title Chemistry and Bioavailability of Waste Constituents in Soils
Research Faculty O'Connor, G. A., ,
Hatch Funds \$0
Hatch Funds Expended by \$769,573

Goal 2

Research Project # ABE-03491
Research Title Parameter Sensing And Control Systems For Drying Agricultural Commodities
Research Faculty Talbot, M. T., Baird, C. D., Chau, K. V.
Hatch Funds \$938

Research Project # FME-03477
Research Title Develop Methods For Predicting Human Epidemics Of Mosquito-borne Encephalitis Virus In Florida
Research Faculty Day, J. F., ,
Hatch Funds \$148

Research Project # FME-03966
Research Title Predicting mosquito-borne disease transmission in Florida
Research Faculty Day, J. F., ,
Hatch Funds \$503

Research Project # FOS-03846
Research Title Postharvest quality and safety in fresh-cut vegetables and fruits
Research Faculty Talcott, S. T., ,
Hatch Funds \$459

Research Project # FOS-03910
Research Title Phytochemical and Quality Assessment of Fresh and Processed Fruits and Vegetables
Research Faculty Talcott, S. T., ,
Hatch Funds \$0

Research Project # FRE-03571
Research Title Dynamic Economic Analysis Of The Florida Citrus Industry
Research Faculty Spreen, T. H., Moss, C. B.,
Hatch Funds \$35,755

Research Project # FRE-03597
Research Title Factors Affecting The Cost Of Capital In Rural Communities: Changing Competition And Regulations
Research Faculty Moss, C. B., Taylor, T. G.,
Hatch Funds \$12,532

Research Project # FTL-03896
Research Title Biorational Methods For Insect Pest Management (ipm): Bioorganic And Molecular Approaches
Research Faculty Cabrera, B. J., Lewis, L. R., Seybold, S. J.

Hatch Funds \$4,599

Research Project # FYC-03960
Research Title Enhancing Food Safety and Quality Through Technologies and Consumer Research
Research Faculty Simonne, A. H., ,
Hatch Funds \$790

Research Project # HOS-03559
Research Title Senescence Physiology And Deterioration In Harvested Tomato And Other Fruits
Research Faculty Huber, D. J., Sargent, S. A.,
Hatch Funds \$1,041

Research Project # LAL-03571
Research Title Dynamic Economic Analysis Of The Florida Citrus Industry
Research Faculty Muraro, R. P., ,
Hatch Funds \$9,218

Research Project # PLP-03588
Research Title Sanitation In Post Harvest Handling Practices For Fresh Fruits And Vegetables
Research Faculty Bartz, J. A., ,
Hatch Funds \$2,863
Hatch Funds Expended by \$108,003

Goal 3

Research Project # BGL-03917
Research Title Reducing the Potential for Environmental Contamination by Pesticides and Other Organic Chemicals
Research Faculty Snyder, G. H., ,
Hatch Funds \$294

Research Project # FME-03477
Research Title Develop Methods For Predicting Human Epidemics Of Mosquito-borne Encephalitis Virus In Florida
Research Faculty Day, J. F., ,
Hatch Funds \$148

Research Project # FME-03966
Research Title Predicting mosquito-borne disease transmission in Florida
Research Faculty Day, J. F., ,
Hatch Funds \$503

Research Project # FOS-03513
Research Title Controlled Dietary Folate Effect On Folate Status In Elderlywomen
Research Faculty Kauwell, G. P., Bailey, L. B.,
Hatch Funds \$5,429

Research Project # FOS-03515
Research Title Folate Requirements Of Pregnant Human Subjects

Research Faculty Bailey, L. B., ,
Hatch Funds \$15,293

Research Project # FOS-03840
Research Title Biotin Metabolism in a Rat Model of Sepsis
Research Faculty McMahon, R. J., ,
Hatch Funds \$162

Research Project # FYC-03960
Research Title Enhancing Food Safety and Quality Through Technologies and Consumer Research
Research Faculty Simonne, A. H., ,
Hatch Funds \$790
Hatch Funds Expended by \$24,244

Goal 4

Research Project # ABE-03285
Research Title Anaerobic Decomposition Of Energy Crops, Wastes, And Metals
Research Faculty Chynoweth, D. P., ,
Hatch Funds \$383

Research Project # ABE-03593
Research Title Development And Application Of Comprehensive Agricultural Ecosystems Models
Research Faculty Campbell, K. L., Graham, W. D., ,
Hatch Funds \$1,249

Research Project # ABE-03596
Research Title Animal Manure And Waste Utilization, Treatment And Nuisance Avoidance For A Sustainable Agriculture
Research Faculty Nordstedt, R. A., Chynoweth, D. P., ,
Hatch Funds \$9,149

Research Project # ABE-04016
Research Title Development and Evaluation of Tmdl Planning and Assessment Tools and Processes
Research Faculty Campbell, K. L., Graham, W. D., Dukes, M. D., ,
Hatch Funds \$0

Research Project # AGR-03427
Research Title Recyclable Organic Solids In Conservation Tillage Multiple Cropping Systems
Research Faculty Gallaher, R. N., ,
Hatch Funds \$16

Research Project # AGR-03594
Research Title Formation, Sprouting And Longevity Of Hydrilla Tubers
Research Faculty Haller, W. T., Fox, A. M., Langeland, K. A., ,
Hatch Funds \$20,977

Research Project #	AGR-03983
Research Title	Conservation Tillage Multiple Cropping Management Strategies for Greater Sustainability
Research Faculty	Gallaher, R. N., ,
Hatch Funds	\$2,033
Research Project #	ANS-03596
Research Title	Animal Manure And Waste Utilization, Treatment And Nuisance Avoidance For A Sustainable Agriculture
Research Faculty	Van Horn, H. H., Hall, M. B.,
Hatch Funds	\$576
Research Project #	APO-03924
Research Title	Development, Evaluation, And Safety Of Entomopathogens For Control Of Arthropod
Research Faculty	Osborne, L. S., ,
Hatch Funds	\$9,561
Research Project #	APO-04012
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty	Leibee, G. L., Nuessly, G. S., Schuster, D. J.
Hatch Funds	\$3,439
Research Project #	BGL-03496
Research Title	Polyphasic Analysis Of Xanthomonads Associated With Horticultural Crop Plants In
Research Faculty	Pernezny, K. L., ,
Hatch Funds	\$44
Research Project #	BGL-03917
Research Title	Reducing the Potential for Environmental Contamination by Pesticides and Other Organic Chemicals
Research Faculty	Snyder, G. H., ,
Hatch Funds	\$294
Research Project #	BGL-03925
Research Title	Biological Control of Soilborne Plant Pathogens for Sustainable Agriculture
Research Faculty	Datnoff, L. E., ,
Hatch Funds	\$6,874
Research Project #	BGL-04012
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty	Nuessly, G. S., Schuster, D. J., Funderburk, J. E.
Hatch Funds	\$805
Research Project #	BRA-03364
Research Title	Biology And Management Of Arthropod Pests Of Vegetables
Research Faculty	Schuster, D. J., ,
Hatch Funds	\$25
Research Project #	BRA-03524

Research Title	Identification, Management And Control Of Viruses Infecting Ornamental And Related
Research Faculty	Polston, J. E., ,
Hatch Funds	\$26
Research Project #	BRA-03544
Research Title	Improved Nutrition And Irrigation Of Ornamental Plants
Research Faculty	Harbaugh, B. K., ,
Hatch Funds	\$13
Research Project #	BRA-03832
Research Title	Microirrigation Technologies for Protection of Natural Resources and Optimum Production
Research Faculty	Stanley, C. D., Csizinszky, A. A.,
Hatch Funds	\$2,698
Research Project #	BRA-04012
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty	Schuster, D. J., Nuessly, G. S., Funderburk, J. E.
Hatch Funds	\$3,174
Research Project #	ENH-03543
Research Title	Establishing Trees In Urban Landscapes
Research Faculty	Gilman, E. F., ,
Hatch Funds	\$38
Research Project #	ENH-03564
Research Title	Micropropagation Protocol Development For Production Of Native Wetland, Aquarium And Water Garden Pl
Research Faculty	Kane, M. E., ,
Hatch Funds	\$8
Research Project #	ENY-03934
Research Title	Biological Control of Arthropod Pests and Weeds
Research Faculty	Frank, J. H., Cuda, J. P., Hoy, M. A.
Hatch Funds	\$3,798
Research Project #	ENY-04011
Research Title	A Comparative Analysis of Plant and Insect Parasitic Nematodes: a Novel Approach to Controlling Insect Pests and Plant Pathogens
Research Faculty	Adams, B. J., ,
Hatch Funds	\$953
Research Project #	ENY-04012-W
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty	Webb, S. E., Nuessly, G. S., Schuster, D. J.
Hatch Funds	\$311
Research Project #	ENY-04025
Research Title	Chemical Ecology and Management of Insect Pests of Blueberry, <i>Vaccinium</i> spp., in Florida

Research Faculty Hatch Funds	McAuslane, H. J., Liburd, O. E., \$372
Research Project # Research Title Research Faculty Hatch Funds	FME-03966 Predicting mosquito-borne disease transmission in Florida Day, J. F., , \$251
Research Project # Research Title Research Faculty Hatch Funds	FOS-03548 Solid-phase Extraction Techniques For Pesticides In Water Samples Moye, H. A., Marshall, M. R., \$847
Research Project # Research Title Research Faculty Hatch Funds	FRE-03769 Financing Agriculture and Rural America: Issues fo Policy Structure and Technical Change Weldon, R. N., , \$376
Research Project # Research Title Research Faculty Hatch Funds	FRE-03863 The Efficiency of Alternative Natural Resource and Environmental Policies and Practices Larkin, S. L., , \$1,308
Research Project # Research Title Research Faculty Hatch Funds	FTL-03539 The Influence Of Edaphic Factors On Growth Of Torpedograss, Maidencane, And Hygrophila And Their Res Sutton, D. L., , \$2,418
Research Project # Research Title Research Faculty Hatch Funds	FTL-03544 Improved Nutrition And Irrigation Of Ornamental Plants Broschat, T. K., Klock, K. A., \$162
Research Project # Research Title Research Faculty Hatch Funds	FTL-03711 Turfgrass Fertility Management and Environmental Impact Cisar, J. L., , \$7,119
Research Project # Research Title Research Faculty Hatch Funds	FTL-03925 Biological Control of Soilborne Plant Pathogens for Sustainable Agriculture Elliott, M. L., , \$2,373
Research Project # Research Title Research Faculty Hatch Funds	HOM-04016 Development and Evaluation of Tmdl Planning and Assessment Tools and Processes Munoz-Carpena, R., , \$0

Research Project #	HOS-03402
Research Title	Integrated Pest Management As An Alternative For Control Of Soilborne Pests Of Vegetable Crops
Research Faculty	Stall, W. M., Locascio, S. J.,
Hatch Funds	\$80
Research Project #	HOS-03457
Research Title	Phenology, Population Dynamics And Interference: A Basis For understanding Weed Biology And Ecology
Research Faculty	Stall, W. M., ,
Hatch Funds	\$91
Research Project #	JAY-03609
Research Title	Introduction And Evaluation Of Ornamental Plants
Research Faculty	Thetford, M., ,
Hatch Funds	\$3,719
Research Project #	LAL-03770
Research Title	Environmental Effects on Vegetative and Reproductive Growth of Citrus
Research Faculty	Syvertsen, J. P., Albrigo, L. G.,
Hatch Funds	\$3,069
Research Project #	LAL-03832
Research Title	Microirrigation Technologies for Protection of Natural Resources and Optimum Production
Research Faculty	Parsons, L. R., ,
Hatch Funds	\$1,644
Research Project #	LAL-03897
Research Title	Soil Microbial Taxonomic And Functional Diversity As Affected By Land Use And Management
Research Faculty	Graham, J. H., ,
Hatch Funds	\$0
Research Project #	PLP-03305
Research Title	Comparison Of Two Management Programs On The Growth And Incidence Of Decline (blight) Of Citrus
Research Faculty	Berger, R. D., ,
Hatch Funds	\$35
Research Project #	PLP-03623
Research Title	Biology And Management Of Diseases Affecting Vegetable Crops In North Florida
Research Faculty	Weingartner, D. P., ,
Hatch Funds	\$3,719
Research Project #	PLP-03925
Research Title	Biological Control Of Soilborne Plant Pathogens For Sustainable Agriculture
Research Faculty	Charudattan, R., Datnoff, L. E.,
Hatch Funds	\$0

Research Project #	PLP-03934
Research Title	Biological Control of Arthropod Pests and Weeds
Research Faculty	Charudattan, R., ,
Hatch Funds	\$429
Research Project #	PLP-04031
Research Title	Development of Plant Pathogens as Bioherbicides for Weed Control
Research Faculty	Charudattan, R., ,
Hatch Funds	\$0
Research Project #	QUN-03934
Research Title	Biological Control of Arthropod Pests and Weeds
Research Faculty	Mizell, R. F., ,
Hatch Funds	\$785
Research Project #	QUN-04012
Research Title	Biology and Management of Arthropod Pests of Vegetables
Research Faculty	Funderburk, J. E., Nuessly, G. S., Schuster, D. J.
Hatch Funds	\$777
Research Project #	SWS-03596
Research Title	Animal Manure And Waste Utilization, Treatment, And Nuisance Avoidance For A Sustainable Agriculture
Research Faculty	Wilkie, A. C., ,
Hatch Funds	\$583
Research Project #	SWS-03820
Research Title	Pedological Research in Florida
Research Faculty	Collins, M. E., ,
Hatch Funds	\$0
Research Project #	SWS-03897
Research Title	Soil Microbial Taxonomic and Functional Diversity as Affected by Land Use and Management
Research Faculty	Sylvia, D. M., ,
Hatch Funds	\$1,681
Research Project #	SWS-03917
Research Title	Reducing the Potential for Environmental Contamination by Pesticides and other Organic Chemicals
Research Faculty	Jawitz, J. W., Ogram, A. V., Ou, L. T.
Hatch Funds	\$0
Research Project #	SWS-03919
Research Title	Mechanisms and Mitigation of Agrochemical Impacts on Human and Environmental Health
Research Faculty	Ou, L. T., Ogram, A. V.,
Hatch Funds	\$3,246
Hatch Funds Expended by	\$236,089

Goal 5

Research Project #	BGL-03917
Research Title	Reducing the Potential for Environmental Contamination by Pesticides and Other Organic chemicals
Research Faculty	Snyder, G. H., ,
Hatch Funds	\$588
Research Project #	ENH-03543
Research Title	Establishing Trees In Urban Landscapes
Research Faculty	Gilman, E. F., ,
Hatch Funds	\$88
Research Project #	FRE-03584
Research Title	Private Strategies, Public Policies, And Food System Performance
Research Faculty	Kilmer, R. L., ,
Hatch Funds	\$1,018
Research Project #	FRE-03599
Research Title	The Effect Of Farmland Boom/bust Cycles On The Rural Economy
Research Faculty	Schmitz, A., Moss, C. B., Mulkey, W. D.
Hatch Funds	\$6,493
Research Project #	FRE-03660
Research Title	Food Demand, Nutrition And Consumer Behavior
Research Faculty	Moss, C. B., Brown, M. G., Lee, J. Y.
Hatch Funds	\$5,115
Research Project #	FRE-03863
Research Title	The Efficiency of Alternative Natural Resource and Environmental Policies and Practices
Research Faculty	Larkin, S. L., ,
Hatch Funds	\$490
Research Project #	FRE-04005
Research Title	Consumer Attitudes and Preferences Regarding Florida Agricultural Products.
Research Faculty	House, L., Degner, R.,
Hatch Funds	\$0
Research Project #	FTL-03423
Research Title	Foraging Behavior And Control Of Subterranean Termites
Research Faculty	Su, N. Y., Scheffrahn, R. H.,
Hatch Funds	\$107
Research Project #	FTL-03607
Research Title	Bionomics And Management Of Hemipterous Pests Of Woody Ornamental Plants And Turfgrasses In Florida
Research Faculty	Howard, F. W., ,
Hatch Funds	\$4,328
Research Project #	FYC-03923
Research Title	Evaluation Research in the Area of Youth Development and Youth Crime and Violence in Public Schools

Research Faculty	Barnett, R. V., ,	
Hatch Funds		\$0
Hatch Funds Expended by		\$25,317
Total Hatch Funds		\$1,163,226

~ EXTENSION INTEGRATED ACTIVITIES

U.S. Department of Agriculture
Cooperative State Research, Education and Extension Service
Integrated Extension Activities

Faculty Name: Adjei, Martin
Department: Range Cattle REC-Ona
Extension 70
Research 30
Extension ProgramNumber: RCREC-MBA-01
Extension Program Title: Florida State Mole Cricket Task Force
Research Project: Mole Cricket Project

Extension Integrated Activites:

Area-wide testing of beneficial nematodes for mole cricket control in Florida pastures and sod farms. Nematodes were applied in strips on 16 different ranches in 2001 and 6 sites in 2002. Pitfall traps were installed on sites treated in 2001 to monitor spread of nematodes in mole cricket population and evaluate pasture grass recovery. Monitoring will continue in 2003. Sound traps will be used to determine rate of infection in trapped mole crickets on sites treated in 2002. A technician and a part-time field aide are provided transportation to conduct all field related activities of this project. Data from all studies are entered in electronic files, analyzed and published by M.B. Adjei

Total Smith-Lever Funds Expended by Adjei, Martin \$0

Faculty Name: Alvarez, Jose
Department: Everglades REC-Belle Glade
Extension 50
Research 50
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided

Extension Integrated Activites:

Not Provided

Total Smith-Lever Funds Expended by Alvarez, Jose \$28,156

Faculty Name: Blount, Ann
Department: North Florida REC-Marianna
Extension 30
Research 65
Extension ProgramNumber: NFFP-E101
Extension Program Title: Multi-state in-service training on southeastern forages
Research Project: QUN 03854

Extension Integrated Activites:

Multi-state in-service training, alternating between Auburn, University of Georgia and University of Florida as annual meeting locations. It is designed to train tri-state county faculty on current topics in forage research and extension pertinent to the southern Coastal Plain Region.

Total Smith-Lever Funds Expended by Blount, Ann \$3,212

Faculty Name: Brecht, Jeffrey
Department: Horticultural Sciences
Extension 30
Research 60
Extension ProgramNumber: FL135
Extension Program Title: S-294 Multi-State Project, Postharvest Quality and Safety in Fresh- cut Vegetables and Fruits
Research Project: HOS03846
Extension Integrated Activites:
Extend research information on fresh-cut vegetables and fruit
Total Smith-Lever Funds Expended by Brecht, Jeffrey \$0

Faculty Name: Cabrera, Brian
Department: Ft. Lauderdale-REC
Extension 70
Research 25
Extension ProgramNumber: 0100
Extension Program Title: Household andStructural Insect Multimedia Database
Research Project:
Extension Integrated Activites:
Insect specimens and damage items are being collected, identified, catalogued, and photographed.
Total Smith-Lever Funds Expended by Cabrera, Brian \$0

Faculty Name: Chambliss, Carrol
Department: Agronomy
Extension 80
Research 20
Extension ProgramNumber: FL-102
Extension Program Title: Corn silage producton.
Research Project: PROJECT AGR-3726
Extension Integrated Activites:
Planting of various demonstrations and a variety test. Plan and Conduct field day for clietele.Develop and Mail out results of variety test.
Total Smith-Lever Funds Expended by Chambliss, Carrol \$9,448

Faculty Name: Chapman, Frank
Department: Fisheries and Aquatic Science
Extension 20
Research 60
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites:
Not Provided
Total Smith-Lever Funds Expended by Chapman, Frank \$6,016

Faculty Name: Chung, Kuang-Ren
Department: Citrus REC-Lake Alfred
Extension 30
Research 70
Extension ProgramNumber: PROGRAM-caker education

Extension Program Title: Development and Delivery of Canker Education to Diverse Audiences in Florida

Research Project: PROJECT-canker

Extension Integrated Activities:

A functional statewide team coordinated at a central point to develop and distribute many different educational programs is proposed. These educational programs are needed to conduct canker education, to identify the groups that require the information, to identify the desired behavior of the client groups, to assess the needs for canker education among these groups, to generate the most effective means to penetrate the resistant groups, and to utilize or develop tools, products and activities to achieve these educational goals.

Total Smith-Lever Funds Expended by Chung, Kuang-Ren \$0

Faculty Name: Crane, Jonathan

Department: Tropical REC-Homestead

Extension 70

Research 20

Extension ProgramNumber: 1) State Major Program, HOM-03517

Extension Program Title: FL111 Tropical Fruit Crop Management in Florida, Extension- Research Demonstrations

Research Project: HOM-03517

Extension Integrated Activities:

1. Extension research programs on nitrogen and boron applications on avocado crop production. 2. Extension-research demonstration on 'Tahiti' lime rootstock evaluation in cooperation with UF-Citrus Research and Education Center and USDA-ARS, Miami. 3. Extension-research demonstrations of the use of plant growth regulators to improve fruit set of avocado and lychee and flowering of lychee.

Extension ProgramNumber: 2) IR-4, Minor Use Pesticide Registration

Extension Program Title: IR-4 Minor Use Pesticide Registration Project No. 4

Research Project: IR-4 Project

Extension Integrated Activities:

Conduct field trials for collection of residue samples to establish residue tolerances. This information is then used to petition the U.S.-E.P.A. and chemical companies to register pest control products for use on tropical fruit crops in Florida.

Total Smith-Lever Funds Expended by Crane, Jonathan \$16,189

Faculty Name: Crow, William

Department: Entomology and Nematology

Extension 70

Research 25

Extension ProgramNumber: Not Provided

Extension Program Title: Not Provided

Research Project: Not Provided

Extension Integrated Activities:

Not Provided

Total Smith-Lever Funds Expended by Crow, William \$3,215

Faculty Name: Cuda, James

Department: Entomology and Nematology

Extension 30

Research 65

Extension ProgramNumber: Not Provided

Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites:
Not Provided
Total Smith-Lever Funds Expended by Cuda, James \$12,881

Faculty Name: de Vries, Albert
Department: Animal Sciences
Extension 40
Research 50
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites:
Not Provided
Total Smith-Lever Funds Expended by de Vries, Albert \$6,336

Faculty Name: Degner, Robert
Department: Food and Resource Economics
Extension 40
Research 60
Extension ProgramNumber: FL317
Extension Program Title: Market Development Strategies for Blood Ark and Ponderous Ark Clams Based Upon Shellfish Industry Surveys
Research Project: FLA-FRE-0001

Extension Integrated Activites:
In late 2002, a mail survey of approximately 1,900 certified shellfish wholesalers as identified by the Center for Food Safety and Applied Nutrition of the Food and Drug Administration was conducted. The certified dealers are found throughout the U.S., and are the only firms that are authorized to handle shellfish. Although all wholesalers were initially contacted by mail and provided with a hard copy of the questionnaire, all were given the option of responding to the questionnaire via the Internet. The survey found very little awareness of these two types of clams among shellfish wholesalers. Shellfish dealers expressing an interest in handling the two types of clams were sent product samples in late 2003. The resulting data will be analyzed in early 2004, and form the basis for educational programs and publications targeted at commercial clam farmers in

Extension ProgramNumber: FL317
Extension Program Title: Market Preferences, Wholesale Demand, and Breakeven Prices for Ornamental Fish Cultured and Collected in Florida
Research Project: FLA-FRE-0001

Extension Integrated Activites:
Data collected via an internet-based questionnaire were analyzed and two major publications written in conjunction with Dr. Sherry Larkin and graduate student Wendy Rubenstein. One publication was a book chapter and the other was a detailed staff paper.

Extension ProgramNumber: FL120
Extension Program Title: Consumer Attitudes and Preferences Regarding Florida Agricultural Products

Research Project: FLA-FRE-04005
Extension Integrated Activites:

The goal of this study was to improve the marketability of sweet corn grown in Florida. Although the research component of this work has been completed, the rich data set resulting from trade and consumer interviews has been analyzed in greater detail and has formed the basis for several educational programs and publications.

Extension ProgramNumber: FL111
Extension Program Title: Consumer Attitudes and Preferences Regarding Florida Agricultural Products: Market Potential for Perennial Peanut Hay in the Florida Horse Industry
Research Project: FLA-FRE-04005

Extension Integrated Activities:

The Florida Department of Agriculture and Consumer Services (FDACS) estimated that Florida horse owners purchase about \$200 million worth of high quality legume hay annually, primarily alfalfa produced in western and north central areas of the U.S. Feeding trials comparing perennial peanut hay with alfalfa have shown that PPH compares very favorably. The Florida Agricultural Market Research Center launched a study in 2002 to estimate the potential market for PPH. A mail survey of 3,800 Florida members of the U. S. Equine Association was conducted in the latter part of 2002. Analyses of the survey data were completed early in 2003. This research found that there is a significant unmet demand for PPH. A common complaint among horse owners was that there simply is not enough PPH to meet their needs.

Total Smith-Lever Funds Expended by Degner, Robert \$0

Faculty Name: Fasulo, Thomas
Department: Entomology and Nematology
Extension 90
Research 10
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided

Extension Integrated Activities:

Not Provided

Total Smith-Lever Funds Expended by Fasulo, Thomas \$2,682

Faculty Name: Ferguson, James
Department: Horticultural Sciences
Extension 70
Research 20
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided

Extension Integrated Activities:

Not Provided

Total Smith-Lever Funds Expended by Ferguson, James \$6,241

Faculty Name: Funderburk, Joseph
Department: North Florida REC-Quincy
Extension 20
Research 80
Extension ProgramNumber: QUN03903
Extension Program Title: Reduced-risk tactics for thrips and tospovirus on solanaceous crops
Research Project: QUN03903

Extension Integrated Activites:

I am the principal investigator for a national project to implement for solanaceous crops a reduced-risk integrated pest management program for thrips and tospoviruses including biological control, cultural control, and biological insecticides. Project funded by a competitive grant from USDA CSREES and another competitive grant from a commodity group.

Total Smith-Lever Funds Expended by Funderburk, Joseph \$16,303

Faculty Name: Gilreath, James
Department: Gulf Coast REC-Bradenton
Extension 30
Research 70
Extension ProgramNumber: FL 107
Extension Program Title: IR-4 Methyl bromide alternatives program for tomato and strawberry in Florida
Research Project: BRA 04087

Extension Integrated Activites:

See the section for extension projects as all of the work on this project is integrated with other disciplines.

Total Smith-Lever Funds Expended by Gilreath, James \$19,329

Faculty Name: Hall, Mary
Department: Animal Sciences
Extension 60
Research 40
Extension ProgramNumber: Dairy Nutr 1
Extension Program Title: Improving Nutritional Management of Dairy Cattle
Research Project: Dairy Nutrition 1

Extension Integrated Activites:

Research information developed on carbohydrate feeding and in product evaluation experiments performed in commercial herds are provided through meetings/conferences, extension publications (including newsletters), farm visits, and a website to nutritionists, dairy farmers, veterinarians and other agribusiness personnel for their application on farm.

Total Smith-Lever Funds Expended by Hall, Mary \$7,528

Faculty Name: Hewitt, Timothy
Department: North Florida REC-Marianna
Extension 90
Research 10
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided

Extension Integrated Activites:

Not Provided

Total Smith-Lever Funds Expended by Hewitt, Timothy \$7,951

Faculty Name: Hodges, Alan
Department: Food and Resource Economics
Extension 70
Research 30
Extension ProgramNumber:
Extension Program Title: Florida's Water Resources: An Extension Education

Initiative

Research Project: Drought

Extension Integrated Activities:

Evaluated economic impacts of drought in Florida on ornamental horticulture and forestry industries.

Total Smith-Lever Funds Expended by Hodges, Alan \$0

Faculty Name: Hutchinson, Chad

Department: Horticultural Sciences

Extension 40

Research 60

Extension ProgramNumber: HOS-CMH-2

Extension Program Title: Regional NE184 Project

Research Project: HAS-03875

Extension Integrated Activities:

This project is a multi-state potato variety evaluation program in which production and quality characteristics of new clones are compared to current commercially accepted varieties. Cooperative potato variety trials provide information on the production, adaptation, and performance stability of new potato clones under a wide range of geographic, climatic, soil, and cultural conditions. Twenty-four fresh market white-skinned, red-skinned, russet-skinned, and chip potato selections were evaluated as part of the program in Florida in 2003. The standard fresh market white-skinned variety, LaChipper, and red-skinned variety, Red LaSoda, for the region were not included in the trial. NY127 produced the highest total and marketable yields at was 74.6 and 67.2 MT/ha, respectively. NY127 is a buff colored tuber with cream flesh color. Marketable yield for Atlantic, the standard chipping potato for the region, was 53.3 MT/ha. Specific gravity of Atlantic tubers was 1.073. No other numbered clone tested produced as well as or had the quality of Atlantic. AF1753-16 and ATX84706-2Ru were highest producing russet-skinned selections with a marketable yields of 42.8 and 35.8 MT/ha, respectively. The russet varieties had 27 and 12% of total yield rated as misshapen tubers, respectively.

Total Smith-Lever Funds Expended by Hutchinson, Chad \$34,287

Faculty Name: Koehler, Philip

Department: Entomology and Nematology

Extension 55

Research 20

Extension ProgramNumber: Not Provided

Extension Program Title: Not Provided

Research Project: Not Provided

Extension Integrated Activities:

Not Provided

Total Smith-Lever Funds Expended by Koehler, Philip \$11,766

Faculty Name: Leppla, Norman

Department: Entomology and Nematology

Extension 45

Research 55

Extension ProgramNumber: Not Provided

Extension Program Title: Not Provided

Research Project: Not Provided

Extension Integrated Activities:

Not Provided

Total Smith-Lever Funds Expended by Leppla, Norman \$16,556

Faculty Name: Lesmeister, Marilyn
Department: Family Youth and Community Science
Extension 70
Research 30
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites:
Not Provided

Total Smith-Lever Funds Expended by Lesmeister, Marilyn \$3,250

Faculty Name: Li, Yuncong
Department: Tropical REC-Homestead
Extension 30
Research 70
Extension ProgramNumber: HOM-LI-01
Extension Program Title: Using soil organic amendment to improve lychee production in south Florida
Research Project: PROJECT
Extension Integrated Activites:
We are determine the application rate of biosolids for lychee trees.
Extension ProgramNumber: HOM-LI-01
Extension Program Title: Determining Application Rates and Mineralization Rates for Biosolids used for Crops Grown on Calcareous Soils
Research Project: PROJECT
Extension Integrated Activites:
Measuring mineralization rates of biosolids in the calcareous soils and sub-tropical climate of South Dade, determining appropriate application rates on agricultural crops and transferring information to growers.
Total Smith-Lever Funds Expended by Li, Yuncong \$0

Faculty Name: Liburd, Oscar
Department: Entomology and Nematology
Extension 30
Research 60
Extension ProgramNumber: ENY-04025
Extension Program Title: Chemical Ecology and Management of Insect Pests of Blueberries
Research Project: ENY-04025
Extension Integrated Activites:
In Florida, pest management information on southern highbush and rabbiteye blueberries is not readily available. As a result, growers do not have access to adequate extension bulletins and fact sheets discussing management tactics to alleviate specific pest problems in blueberries. This project will enable growers to have access to these types of information through the development of a comprehensive extension program involving the use of newsletter, fact sheets and bulletins. Also, the project aims to develop a comprehensive database of all the blueberry growers in the state of Florida by surveying growers, independent consultants and extension specialists.
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided

Research Project: Not Provided
Extension Integrated Activites:
Not Provided
Total Smith-Lever Funds Expended by Liburd, Oscar \$3,293

Faculty Name: Mannion, Catharine
Department: Tropical REC-Homestead
Extension 40
Research 60
Extension ProgramNumber: HOM-CMM01
Extension Program Title: Integrated Crop Management of Commercial Ornamental Plants
Research Project: HOM-00001
Extension Integrated Activites:
Increase the number of commercial nurseries using IPM practices; promote selection of pesticides for use in nurseries to minimize adverse effects; and increase the number of trained pest management scouts available for nurseries in Florida.
Total Smith-Lever Funds Expended by Mannion, Catharine \$0

Faculty Name: Mizell, III, Russell
Department: North Florida REC-Quincy
Extension 15
Research 35
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites:
Not Provided
Total Smith-Lever Funds Expended by Mizell, III, Russell \$4,132

Faculty Name: Momol, Timur
Department: North Florida REC-Quincy
Extension 60
Research 40
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites:
Not Provided
Total Smith-Lever Funds Expended by Momol, Timur \$6,599

Faculty Name: Munoz-Carpena, Rafael
Department: Tropical REC-Homestead
Extension 60
Research 40
Extension ProgramNumber: RMC-E-2 Water Conservation in So. Dade
Extension Program Title: Water Conservation in So. Dade - Soil moisture devices
Research Project: HOM-00001: Water
Extension Integrated Activites:
- Field day: alternative tomato production system to meet current challenges, Pine Island Farms, Miami (1.5 hrs), March 26, 2003.- "Better" Management Practices (BMP's) for water

management, Miami-Dade Cooperative Extension Office (2 hrs), June 30, 2003.- Workshop: update in Soil Moisture Monitoring for Irrigation Scheduling in Tropical Fruit Groves, UF- IFAS TREC-Homestead (2 hrs.), July 8, 2003.- Workshop: Miami-Dade County Conserve Water: The Challenges Ahead: 2002 Water Conservation Survey Results, Miami-Dade Cooperative Extension Office (2 hrs), July 22, 2003. - The South Florida Drip Irrigation School: Managing Water and Nutrients in Vegetable Production, Miami-Dade Cooperative Extension Office (2 presentations, 1 hr.), August 21, 2003.- Several support educational materials have been produced: 5 UF/IFAS Extension fact-sheets (4 published/in review, 1 in preparation), newsletter articles, one refereed journal paper (in preparation), and conference proceedings.

Extension ProgramNumber: RMC-E-1 Hydrology and Water Quality in So. Miami Agricultural region

Extension Program Title: Hydrology and Water Quality in So. Miami-Dade Agricultural

Research Project: HOM-00001:

Extension Integrated Activites:

- Workshop: Frog Pond area research highlights, UF-IFAS TREC-Homestead (1 hr), Feb. 25, 2003.- Field day: BMP to protect water quality in sweet corn production, UF-IFAS TREC-Homestead (1 hr), March 12, 2003.- Workshop: South Dade Hydrology Research Update, Miami-Dade Cooperative Extension Office (2 hrs), September 30, 2003. - Workshop: Farmer's review of hydrological and water quality trends at the Frog Pond Area, UF-IFAS TREC-Homestead (3 hrs.), Nov. 24, 2003.- In addition to a full report, several support educational materials have been produced: newsletter articles, one refereed journal paper (in preparation), and conference proceedings.

Total Smith-Lever Funds Expended by Munoz-Carpena, \$0

Faculty Name: Muraro, Ronald
Department: Citrus REC-Lake Alfred
Extension 90
Research 10
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided

Extension Integrated Activites:

Not Provided

Total Smith-Lever Funds Expended by Muraro, Ronald \$38,281

Faculty Name: Norcini, Jeffrey
Department: North Florida REC-Quincy
Extension 30
Research 70
Extension ProgramNumber: WF/G MON-JGN
Extension Program Title: Introduction and Evaluation of Ornamental Plants
Research Project: MON-03609

Extension Integrated Activites:

Native/Nonnative Grass Evaluation/Demo Gardens - Leon County CES; WFREC-Jay; SMPs: FL114, FL420Leon County MGs and Master Wildlife Conservationists, and Santa Rosa County MGs finished recorded data in early 2003. Their experience has allowed them to become better aware of the how well these species are adapted to our climate, and provided them insight into the growth and flowering of these species under north Florida conditions. The knowledge gained by the MGs and MWCs will directly benefit both County Extension programs because it will aid the MGs and MWCs in answering inquiries from nurserymen, landscapers, and consumers.Data

is currently being analyzed by Mack Thetford.

Extension ProgramNumber: WF/G MON-JGN
Extension Program Title: Introduction and Evaluation of Ornamental Plants
Research Project: MON-03609

Extension Integrated Activities:
Wildflower Advisory Council Project: Treatment and Germination of Florida Native Wildflower Seeds for Commercial Production and Natural Landscaping; SMPs 121, 420Field plots (weed mgmt. x fertilization) plots established in fall for Gaillardia pulchella at NFREC-Quincy demonstration site

Extension ProgramNumber: WF/G MON-JGN
Extension Program Title: Introduction and Evaluation of Ornamental Plants
Research Project: MON-03609

Extension Integrated Activities:
CCAP Project - Native Wildflower Seed Production: Effects of Chemical Weed Control and Fertilization on Seed Yield and Quality of Phlox; SMP 121Field plots (weed mgmt. x fertilization) established in fall at NFREC-Quincy demonstration site.

Extension ProgramNumber: WF/G MON-JGN
Extension Program Title: Introduction and Evaluation of Native Wildflowers and Grasses

Research Project: MON-03609

Extension Integrated Activities:
Native Wildflower Seed Production: An Alternative Commodity for Tobacco Growers; SMPs: 121, 420Role: PI (and all the administrative/leadership duties associated with that role)In-Service TrainingNative Wildflower Seed Production - May 28, NFREC-SV, Live OakTourWildflower Tobacco Education Project: Demonstration Sites Tour - May 29, Alachua CountyPublications1. Norcini, J.G. 2003. Seed production of goldenmane tickseed. Fla. Agric. Expt. Sta. Publ. ENH882. (EP139)In Progress:1. Norcini, J.G. and J.H. Aldrich. 2004. Establishment of native wildflower plantings by seed. Fla. Agric. Expt. Sta. Publ. ENH968. (EP227)2. Publication being cowritten with FDACS for potential producers of wildflower

Extension ProgramNumber: WF/G MON-JGN
Extension Program Title: Introduction and Evaluation of Native Wildflowers and Grasses

Research Project: MON-03609

Extension Integrated Activities:
FDOT Project; SMPs: 121, 420DemonstrationsWildflower demonstrations statewide1. Interstates2. NFRECa. Quincy - effect of seeding date on wildflower displayb. Suwannee Valley - Coreopsis basalis co-cropped with hay production3. Bradford County - approx. 3 acres at reclaimed landfill overseeded with Gaillardia pulchella, Phlox drummondii, and Coreopsis basalis; plots established to benefit those traveling on S.R. 1004. Seed production demonstration (landscape fabric-vacuum harvest system) established at Santa Rosa County Coop. Ext. Service OfficePublicationsEDIS1. Norcini, J.G. 2003. Native wildflowers on roadsides of central and south Florida. Fla. Agric. Expt. Sta. Publ. ENH 881. (EP138)2. Norcini, J.G. 2003. Seed production of goldenmane tickseed. Fla. Agric. Expt. Sta. Publ. ENH882. (EP139)NFREC E-Newsletter Articles - 4In Progress:1. Publication being cowritten with FDACS for potential producers of wildflower

Total Smith-Lever Funds Expended by Norcini, Jeffrey \$2,852

Faculty Name: Nowak, Jaroslaw
Department: North Florida REC-Quincy
Extension 70
Research 30

Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites:
Not Provided
Total Smith-Lever Funds Expended by Nowak, Jaroslaw \$3,212

Faculty Name: Obreza, Thomas
Department: Soil and Water Science
Extension 70
Research 30
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites:
Not Provided
Total Smith-Lever Funds Expended by Obreza, Thomas \$7,014

Faculty Name: Osborne, Lance
Department: Central Florida REC-Apopka
Extension 30
Research 45
Extension ProgramNumber: FL-112
Extension Program Title: Biological Control of Selected Arthropod Pests and Weeds
Research Project: APO-03934
Extension Integrated Activites:
We are developing extension tools that can be used by growers in many different regions. We digitized the book, "Insect and Related Pests of Flowers and Foliage Plants", by North Carolina State University (sites at <http://ifas.ufl.edu/~apkweb/ncstate/ncstate.htm> and http://ipmwww.ncsu.edu/INSECT_ID/AG136/ncstate.html). This book was produced by Hatch projects: Project Number: FLA-APO-03006, Project Title: Biological Control of Selected Arthropod Pests and Weeds Through Introduction of Natural Enemies (S-301) and Project Number: FLA-APO-02445, Project Title: Entomopathogens for Use in Pest Management Systems (S-267:it has been renewed and has a new number). We send natural enemies that we have collected and colonize to laboratories all over the United States. We sent a small beetle that eats mealybugs to the USDA laboratory in Delaware to be evaluated for the control of the Pink Hibiscus Mealybug. This mealybug is a MAJOR pest of many crops. It will even kill 100 year old trees. We have applied for 2 grants to support our efforts in developing IPM programs for pests of ornamental plants. We also conducted a multistate "Scout Training Program". Faculty for the University of Georgia and University of Florida participated.
Total Smith-Lever Funds Expended by Osborne, Lance \$0

Faculty Name: Sand, Robert
Department: Animal Sciences
Extension 80
Research 20
Extension ProgramNumber: FL 103
Extension Program Title: Effect of Single Trait Selection for Marbling on Productivity of a Cow Herd
Research Project: 03074
Extension Integrated Activites:

Examining the effects of single trait sire selection on the productivity of the cow herd in terms of the performance of the females in the herd and the steers on the rail.

Total Smith-Lever Funds Expended by Sand, Robert \$10,128

Faculty Name: Sargent, Steven
Department: Horticultural Sciences
Extension 70
Research 20
Extension ProgramNumber: FL 107-Vegetables
Extension Program Title: Techniques for Maintaining Postharvest Quality of Vegetables
Research Project: FLA-HOS-03559;

Extension Integrated Activites:

Continued investigation was made of the cause for sporadic outbreaks of soft rot in packed tomatoes in the Quincy and Palmetto areas in the 2003 fall growing season. Tomatoes were sampled in the field, packing line and from packed cartons and brought to the Postharvest Horticulture Laboratory in Gainesville or at the NFREC-Quincy to document decay and have organisms identified (J. Bartz, T. Momol, M. Mahovic, S.M. Olson, P. Gilreath, A.J. Fox, collaborators). A three-year grant from USDA-TSTAR program for \$150,000 was in the second year. Information regarding extension of postharvest quality and shelf-life was developed and disseminated.

Total Smith-Lever Funds Expended by Sargent, Steven \$0

Faculty Name: Schmidt, Ronald
Department: Food Science and Human Nutrition
Extension 60
Research 10
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided

Extension Integrated Activites:

Not Provided

Total Smith-Lever Funds Expended by Schmidt, Ronald \$8,368

Faculty Name: Schneider, Keith
Department: Food Science and Human Nutrition
Extension 80
Research 15
Extension ProgramNumber: FS-004-Combined FL-135
Extension Program Title: Improving the Safety of Fruits and Vegetables: A Tri-state
Research Project: FLA-FOS-04021

Extension Integrated Activites:

Performing statewide safety of four Florida produced commodities. Ultimately this information will be used to teach farmers, processors, retailers, consumers and county agents proper produce handling procedures. To date, Phase I data collection has been completed for tomatoes in the State of Florida.

Extension ProgramNumber: FS-003-Processing
Extension Program Title: Developing Guidance to Expedite Food Product Recalls to Mitigate or Contain a Purposeful Contamination of Commercially Distributed Food
Research Project: FSO-2002-003

Extension Integrated Activities:

Task 1: Collect all available training literature on food product recall procedures, collate, and extract unique features for incorporation in final manual. Task 2: Visit with FDA District Office, Maitland, FL and collect information and examples from Recall Coordinator. Task 3: Visit Office of Regulatory Affairs, FDA, Rockville, MD and collect information on multi-state recalls (examples, timelines, etc) from Federal Recall Coordinator. Task 4: Construct manual and convert to PFD format. Task 5: Design and conduct training sessions for Extension Agents in Florida, evaluate training and materials. Task 6: Post all materials on EDIS and EDEN if appropriate.

Extension Program Number: FS-003-Processing

Extension Program Title: Produce Safety and Biosecurity - A Multi-State Research, Education and Extension Initiative

Research Project: FOS-2002-002

Extension Integrated Activities:

Target commodities for this project will be fresh produce and fresh-cut produce. This project is multi-functional in that it will address objectives related to research, education, and Extension. Research Objectives: a. To assess current GAP plans on selected vegetable production farms in Georgia, South Carolina, and Florida and to identify points of vulnerability that do not adequately address biological and chemical security and food safety needs; b. To assess HACCP programs suitable for use in the fresh-cut industry and to identify points of vulnerability that do not adequately address biological and chemical security and food safety needs; and c. To evaluate retention of food-borne pathogens and bacterial toxins at identified points and to evaluate potential intervention methods to control or prevent problems related to biosecurity. Education Objectives: a. To develop a multi-university, college-level course linking food safety and security of foods against biological and chemical terrorism; b. To develop a distance learning course on developing and implementing food safety procedures in any phase of the fresh produce operation; and c. To assess the impact of the course that is offered. Extension Objectives: a. To design, implement and evaluate workshops and/or short courses for fresh and fresh-cut produce management personnel that provide step-by-step guidance on developing food safety plans which incorporate food security issues; b. To develop a curriculum package for use by County Extension Agents and/or program assistants to teach field workers how to avoid both unintentional and intentional contamination as well as other safe handling procedures and to train County Extension Agents to implement and evaluate the curriculum for field workers; c. To develop curriculum components, fact sheets and assessment checklists on produce handling and safety, to supplement existing training for the foodservice industry and to develop model criteria for certification in fruit and vegetable handling; and d. To develop a computer module and fact sheet dealing with consumer handling of produce for use at health fairs, points of purchase, as well as in classroom sessions; and to train County Extension and Family and Consumer Science agents to implement and evaluate the module.

Extension Program Number: FS-003-Processing

Extension Program Title: Two novel postharvest treatments for enhancing the safety of fresh fruits and vegetables produced in Florida

Research Project: FOS-2002-006

Extension Integrated Activities:

Two novel postharvest treatments for enhancing the safety of fresh fruits and vegetables produced in Florida

Extension Program Number: FS-002-Retail

Extension Program Title: Advisory For Retail Processing With Proper Controls & Variances For Product Safety

Research Project: FOS-2002-007

Extension Integrated Activities:

GOAL To initiate an Advisory for Retail Processing (ARP) for development of uniform retail

manufacturing guidelines using HACCP principles which integrate extension, research, industry, and regulatory programs to provide guidance to industry and regulators in recognition of appropriate controls and variances that assure food safety in retail processing. OBJECTIVES 1. In order to support the National Food Safety System, initiate a Advisory for Retail Processing (ARP) for high risk foods which includes national representatives from extension programs (academic advisors), federal agencies, regional state regulatory affiliates, retail industry, retail industry trade organizations, and AFDO leadership to provide information, guidance, regulatory support, and training for industry and regulatory officials who are involved in assuring retail food safety. 2. Complete a qualitative and quantitative baseline research assessment of the types of manufacturing currently being performed at retail. From the compiled data, identify and prioritize product/process pairs that present the major food safety concerns. 3. Develop an Advisory Compendium for Retail Processing of High Risk Foods that will provide guidance to industry and regulatory jurisdictions for uniform controls and variance for retail. Maintain the Compendium on the AFDO web site and advance notice and utility of this site. 4. Provide initial advisories in the Compendium for retail processing for Specialty Meats/Poultry, Fresh Juices, Fresh-Cut Produce, Reduced Oxygen Packaging, Smoked Fish, and Sushi. Provide this information to support and encourage training through established extension programs at the state and county levels. Protocol will be developed to provide AFDO certifications for future training.

Total Smith-Lever Funds Expended by Schneider, Keith \$16,594

Faculty Name: Shukla, Sanjay
Department: Southwest Florida REC-Immokalee
Extension 60
Research 40
Extension Program Number: IMOK-WAT-1
Extension Program Title: Development and evaluation of water and nutrient management strategies for vegetables in Southwest Florida
Research Project: IMM-00001

Extension Integrated Activities:
 1) Development of watermelon water use research/extension project 2) Development of irrigation scheduling research/extension project 3) Development and evaluation of irrigation and nutrient BMPs for Southwest Florida

Extension Program Number: IMOK-WAT-2
Extension Program Title: Evaluation and demonstration of cow-calf BMPs in South Florida
Research Project: IMM-00001

Extension Integrated Activities:
 Three research/extension projects were developed and funded by UF-IFAS and several state and federal agencies. Two visits were made to visit 10 ranches in the Lake Okeechobee area to select the watersheds for monitoring. The monitoring design is expected to be completed in 2002. First report is due in October, 2002.

Extension Program Number: IMOK-WAT-3
Extension Program Title: Evaluation of agricultural reservoirs for water storage in SW Florida
Research Project: IMM-00001

Extension Integrated Activities:
 1) Developed a research proposal for evaluating the reservoirs in the Caloosahatchi river watershed for supplemental irrigation for citrus and obtained funding (\$130,000). 2) Organized a workshop on citrus grove water management. 3) Pulished results of a ground water monitoring study in citrus grove in a trade magazine. 4) Developed two EDIS publication on citrus irrigation

and water management.

Extension ProgramNumber: IMOK-WAT-4
Extension Program Title: Watershed Education Program for Florida
Research Project: IMM-00001

Extension Integrated Activites:

1) Reviewed literature on watershed hydrology and land use impacts on watersheds2) Made two presentations to South Florida extension agents3) Developed In-service training on watershed water quality in conjunction with Drs Chuck Jacoby, Mike Spranger, and William DeBusk.

Total Smith-Lever Funds Expended by Shukla, Sanjay \$0

Faculty Name: Simonne, Amarat
Department: Family Youth and Community Science
Extension 70
Research 30
Extension ProgramNumber: FYCS-AHS3
Extension Program Title: Produce safety and biosecurity - A multi-state research, education and extension initiative.
Research Project: PROJECT

Extension Integrated Activites:

Develop educational materials related to food biosecurity as related to fruits and vegetables.

Total Smith-Lever Funds Expended by Simonne, Amarat \$3,209

Faculty Name: Stall, William
Department: Horticultural Sciences
Extension 70
Research 15
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites: Not Provided
Total Smith-Lever Funds Expended by Stall, William \$10,025

Faculty Name: Stansly, Philip
Department: Southwest Florida REC-Immokalee
Extension 60
Research 40
Extension ProgramNumber: Not Provided
Extension Program Title: Not Provided
Research Project: Not Provided
Extension Integrated Activites: Not Provided
Total Smith-Lever Funds Expended by Stansly, Philip \$7,442

Faculty Name: VanSickle, John
Department: Food and Resource Economics
Extension 70
Research 20
Extension ProgramNumber: FL120
Extension Program Title: Economics and Policy Within the Florida Tomato Industry
Research Project: FRE

Extension Integrated Activites:

Evaluations of industry organization and public policy are conducted and presented to the industry. The information generated by this project helps the industry organizations develop an agenda for public policy development. It also helps producers understand the impacts of policy and market structure on the industry.

Total Smith-Lever Funds Expended by VanSickle, John \$16,748

Faculty Name: Yeager, Thomas
Department: Environmental Horticulture
Extension 70
Research 30
Extension ProgramNumber: FL105
Extension Program Title: BMP Development
Research Project: Hatch 3544

Extension Integrated Activites:

Extension program is dependent on information developed by researchers both in and out of state. Personnel with research appointments serve on the design team and participate in inservice training.

Total Smith-Lever Funds Expended by Yeager, Thomas \$46,050

Total 2002 Smith-Lever Funds Expended on Extension Integrated
\$492,559

~ STATISTICAL TABLES

Total Formula Funds Expended by Goal

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 Extension	\$2,193,315	\$180,450	\$151,964	\$384,641	\$931,346	\$3,841,713
1862 Research	\$1,425,747	\$200,091	\$44,916	\$437,390	\$46,903	\$2,155,047
1890 Extension	\$493,789	\$155,819	\$192,543	\$118,024	\$258,417	\$1,218,592
*1890 Research						

*1890 Research will report separately

Multi-State Funds Expended by Goal

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 Extension	\$646,148	\$49,687	\$35,275	\$111,949	\$183,827	\$1,026,886
1862 Research	N/A	N/A	N/A	N/A	N/A	N/A

1862 Integrated Extension/Research Formula Funding

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 Extension	\$309,933	\$23,833	\$16,920	\$53,698	\$88,175	\$492,559
1862 Research	\$769,573	\$108,003	\$24,244	\$236,089	\$25,317	\$1,163,226
1890 Extension						
*1890 Research						

*1890 Research will report separately

1862 Extension Matching Funds / Smith-Lever

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
Federal Smith-Lever	\$2,193,315	\$180,450	\$151,964	\$384,641	\$931,346	\$3,841,713
State	\$15,081,660	\$1,278,127	\$1,076,366	\$2,724,175	\$7,112,154	\$27,272,483
County	\$16,024,224	\$1,358,007	\$1,143,636	\$2,894,429	\$7,556,645	\$28,976,941

1862 Research State Matching Funds

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
State	\$43,854,248	\$3,410,317	\$1,010,546	\$14,267,413	\$4,745,614	\$67,288,140

1890 State Matching Funds

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
State	\$261,104	\$97,914	\$110,969	\$52,221	\$130,552	\$652,760

FTEs and Sys

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 Extension (FTEs)	54	1	9	9	15	88
1862 Research (Sys)	44	3	1	15	4	67

XII ~ APPENDIX

• List of Hatch Projects

Project nbr	Title
ABE-03285	Anaerobic Decomposition Of Energy Crops, Wastes, And Metals
ABE-03491	Parameter Sensing And Control Systems For Drying Agricultural Commodities
ABE-03492	Microirrigation Of Horticultural Crops In Humid Regions
ABE-03593	Development And Application Of Comprehensive Agricultural Ecosystems Models
ABE-03596	Animal Manure And Waste Utilization, Treatment And Nuisance Avoidance For A Sustainable Agriculture
ABE-03824	Systems for Controlling Air Pollutant Emissions and Indoor Environments of Poultry, Swine and Dairy Facilities
ABE-03874	Improvement of Thermal and Alternative Processes for Foods
AGR-03374	Genetic Improvement Of Forage Grass Species
AGR-03427	Recyclable Organic Solids In Conservation Tillage Multiple Cropping Systems
AGR-03594	Formation, Sprouting And Longevity Of Hydrilla Tubers
AGR-03854	Selection and adaptation of grass and legume species for forage production in the southern coastal plain and peninsular Florida
AGR-03983	Conservation Tillage Multiple Cropping Management Strategies for Greater Sustainability
ANS-03572	Byproduct Feedstuffs: Rumen Degradability Of Carbohydrate And Fat Fractions And Effects On Feed Effi
ANS-03596	Animal Manure And Waste Utilization, Treatment And Nuisance Avoidance For A Sustainable Agriculture
ANS-03821	Synchronization of estrus in cattle of Bos indicus breeding
ANS-03859	Use of bst, shortening the dry period, and parturum feeding of anionic salts to improve milk production and health of dairy cows.
ANS-03912	Enhancing Production and Reproductive Performance of Heat-stressed Dairy Cattle
APO-03523	Management Of Diseases Of Tropical Foliage Plants
APO-03609	Introduction And Evaluation Of Ornamental Plants
APO-03875	Development Of New Potato Clones For Environmental And Economical Sustainability In The Northeast
APO-03924	Development, Evaluation, And Safety Of Entomopathogens For Control Of Arthropod Pests
APO-04012	Biology and Management of Arthropod Pests of Vegetables
BGL-03496	Polyphasic Analysis Of Xanthomonads Associated With Horticultural Crop Plants In Florida
BGL-03827	Best Management Practices for Turf Systems in the East
BGL-03917	Reducing the Potential for Environmental Contamination by Pesticides and Other Organic Chemicals
BGL-03925	Biological Control of Soilborne Plant Pathogens for Sustainable Agriculture
BGL-04012	Biology and Management of Arthropod Pests of Vegetables
BRA-03364	Biology And Management Of Arthropod Pests Of Vegetables
BRA-03524	Identification, Management And Control Of Viruses Infecting Ornamental And Related Crops
BRA-03544	Improved Nutrition And Irrigation Of Ornamental Plants
BRA-03554	Flower Initiation And Development Of Floriculture Crops
BRA-03609	Introduction And Evaluation Of Ornamental Plants

BRA-03832 Microirrigation Technologies for Protection of Natural Resources and Optimum Production

BRA-04012 Biology and Management of Arthropod Pests of Vegetables

ENH-03543 Establishing Trees In Urban Landscapes

ENH-03544 Improved Nutrition And Irrigation Of Ornamental Plants

ENH-03564 Micropropagation Protocol Development For Production Of Native Wetland, Aquarium And Water Garden Pl

ENH-03595 Asexual Propagation Of Environmental Plants

ENH-03600 Morphological And Physiological Responses Of Chimera Plants To Environmental Factors

ENH-03602 Taxonomy And Systematics Of Cultivated Plants

ENH-03609 Introduction And Evaluation Of Ornamental Plants

ENY-03419 Toxicology Of Agriculturally Important Insect Pests Of Florida

ENY-03592 Integrated Management Of Arthropod Pests Of Livestock And Poultry

ENY-03934 Biological Control of Arthropod Pests and Weeds

ENY-03942 Toxicology of Agriculturally Important Insect Pests of Florida

ENY-03961 Selection of Honey Bees for Suppressed Reproduction of the Parasitic Varroa Mite and Mapping of the Quantitative Trait Loci (qtl) Invol

ENY-04011 A Comparative Analysis of Plant and Insect Parasitic Nematodes: a Novel Approach to Controlling Insect Pests and Plant Pathogens

ENY-04012-W Biology and Management of Arthropod Pests of Vegetables

ENY-04025 Chemical Ecology and Management of Insect Pests of Blueberry, *Vaccinium* spp., in Florida

ENY-04030 Sources, Dispersal and Management of Stable Flies on Grazing Beef and Dairy Cattle

FME-03477 Develop Methods For Predicting Human Epidemics Of Mosquito-borne Encephalitis Virus In Florida

FME-03966 Predicting mosquito-borne disease transmission in Florida

FOS-03513 Controlled Dietary Folate Effect On Folate Status In Elderlywomen

FOS-03515 Folate Requirements Of Pregnant Human Subjects

FOS-03548 Solid-phase Extraction Techniques For Pesticides In Water Samples

FOS-03840 Biotin Metabolism in a Rat Model of Sepsis

FOS-03846 Postharvest quality and safety in fresh-cut vegetables and fruits

FRE-03497 Agricultural Change In The Gulf Of Mexico: The Case Of Citrus And Sugarcane In Florida And Veracruz

FRE-03571 Dynamic Economic Analysis Of The Florida Citrus Industry

FRE-03584 Private Strategies, Public Policies, And Food System Performance

FRE-03597 Factors Affecting The Cost Of Capital In Rural Communities: Changing Competition And Regulations

FRE-03599 The Effect Of Farmland Boom/bust Cycles On The Rural Economy

FRE-03660 Food Demand, Nutrition And Consumer Behavior

FRE-03701 Agricultural and Food Product Logistics: Implications for Florida and the U.s. in a World Market

FRE-03769 Financing Agriculture and Rural America: Issues fo Policy Structure and Technical Change

FRE-03863 The Efficiency of Alternative Natural Resource and Environmental Policies and Practices

FTL-03423 Foraging Behavior And Control Of Subterranean Termites

FTL-03539 The Influence Of Edaphic Factors On Growth Of Torpedograss, Maidencane, And *Hygrophila* And Their Res

FTL-03544 Improved Nutrition And Irrigation Of Ornamental Plants

FTL-03554 Flower Initiation And Development Of Floriculture Crops
 FTL-03602 Taxonomy And Biosystematics Of Cultivated Plants
 FTL-03607 Bionomics And Management Of Hemipterous Pests Of Woody Ornamental Plants And Turfgrasses In Florida
 FTL-03609 Introduction And Evaluation Of Ornamental Plants
 FTL-03620 Weed Biology And Control For Turfgrass And The Landscape
 FTL-03711 Turfgrass Fertility Management and Environmental Impact
 FTL-03896 Biorational Methods For Insect Pest Management (ipm): Bioorganic And Molecular Approaches
 FTL-03925 Biological Control of Soilborne Plant Pathogens for Sustainable Agriculture
 FYC-03960 Enhancing Food Safety and Quality Through Technologies and Consumer Research
 HAS-03875 Development Of New Potato Clones For Environmental And Economical Sustainability In The Northeast
 HOM-03402 Integrated Pest Management As An Alternative For Control Of Soilborne Pests Of Vegetable Crops
 HOS-03402 Integrated Pest Management As An Alternative For Control Of Soilborne Pests Of Vegetable Crops
 HOS-03457 Phenology, Population Dynamics And Interference: A Basis For Understanding Weed Biology And Ecology
 HOS-03559 Senescence Physiology And Deterioration In Harvested Tomato And Other Fruits
 HOS-03601 Identification Of Genetic And Physiological Mechanisms Of Thermotolerance In Lettuce Seed
 HOS-03832 Microirrigation Technologies For Protection Of Natural Resources And Optimum Production
 IMM-03924 Development, evaluation and Safety of Entomopathogens For Control of Arthropod Pests
 JAY-03457 Phenology, Population Dynamics, And Interference: A Basis For Understanding Weed Biology And Ecology
 JAY-03609 Introduction And Evaluation Of Ornamental Plants
 JAY-03620 Weed Biology And Control For Turfgrass And The Landscape
 LAL-03571 Dynamic Economic Analysis Of The Florida Citrus Industry
 LAL-03770 Environmental Effects on Vegetative and Reproductive Growth of Citrus
 LAL-03832 Microirrigation Technologies for Protection of Natural Resources and Optimum Production
 LAL-03896 Natural Products Chemistry As A Resource For Biorational Methods Of Insect Control
 LAL-03924 Development, Evaluation, and Safety of Entomopathogens for Control of Arthropod Pests
 MCS-03798 Biologically Based Ipm Systems for Management of Plant-parasitic Nematods
 MCS-03861 Genetic Engineering of Zymomonas mobilis for Fuel Ethanol Production
 ONA-04006 Stress Factors Of Farm Animals And Their Effects On Performance
 PLP-03305 Comparison Of Two Management Programs On The Growth And Incidence Of Decline (blight) Of Citrus
 PLP-03336 Phylogenetic Relationships Of Pezizales (cup-fungi) And Tuberales (truffles)
 PLP-03524 Identification, Management, And Control Of Viruses Infectingng Ornamental And Related Crops
 PLP-03588 Sanitation In Post Harvest Handling Practices For Fresh Fruits And Vegetables
 PLP-03623 Biology And Management Of Diseases Affecting Vegetable Crops In North Florida

PLP-03934 Biological Control of Arthropod Pests and Weeds
QUN-03609 Introduction And Evaluation Of Ornamental Plants
QUN-03854 Selection and Adaptation of Grass and Legume Species for Forage Production in
the Southern Coastal Plain and Penisular Florida
QUN-03934 Biological Control of Arthropod Pests and Weeds
QUN-04012 Biology and Management of Arthropod Pests of Vegetables
SWS-03596 Animal Manure And Waste Utilization, Treatment, And Nuisance Avoidance
For A Sustainable Agriculture
SWS-03897 Soil Microbial Taxonomic and Functional Diversity as Affected by Land Use
and Management
SWS-03919 Mechanisms and Mitigation of Agrochemical Impacts on Human and
Environmental Health

• List of SMPs by Title

FL101	Practices for Competitive Agronomic Crop Production in Florida
FL102	Florida Forage Production for Livestock and Dairy
FL103	Improving the Production, Efficiency and marketability of Beef Cattle in Florida
FL105	Management of Water and Nutrients in Florida's Nursery Industry
FL107	Vegetable Production, Harvesting and Handling Efficiencies in Florida
FL108	Citrus Management in Florida
FL109	Food Safety and Quality in Florida
FL110	Food Processing and Handling in Florida: Quality, Value-Added Concepts and Safety
FL111	Tropical Fruit Crops Management in Florida
FL112	Ornamental Plant Production and Integrated Pest Management in Florida
FL113	Sustainable Community Development and Enhancement of Natural Systems in Florida
FL114	Environmental Landscape Management in Florida
FL116	Florida Turfgrass Management
FL119	Business Management for Horticultural Enterprises in Florida
FL120	Managing Competitiveness in Agriculture Through Management, Finance, Marketing, and Policy
FL121	Small Farm Sustainable Agriculture Alternative Opportunities and Crops in Florida
FL122	Pesticide Applicator Training in Florida
FL124	Florida's Farm and Home Safety and Disaster Preparedness and Recovery
FL128	Sustaining the Economic Viability of the Florida Dairy Industry
FL129	Profitable and Sustainable Sugarcane Production in Florida
FL131	Quality and Management of Florida State Diagnostic Services
FL132	Florida Aquaculture
FL133	Weather and Climate
FL134	Development, Evaluation, and Production of Florida Ornamental Crops
FL135	Food Safety, Quality, and Technology in Florida NEW
FL261	Small Animal and Small-Scale Farm Profitability and Sustainability in Florida - 1890
FL262	Nutrition, Diet and Health in Florida - 1890
FL265	Improving Profitability of Small-Scale Crop Production in Florida
FL267	Financial Management and Decision-Making in Florida - 1890
FL269	Water Quality and Environmental Programs in North Florida
FL270	Community Resource Development
FL271	Adult and Child Health and Wellness Programs
FL272	Herd Health and Food Safety
FL273	Small Farms
FL312	Seafood and Aquaculture Product Quality and Safety in Florida
FL315	Coastal and Marine Recreation and Waterway Management
FL316	Florida's Coastal Environment and Water Quality
FL317	Florida's Sustainable Marine Fisheries
FL411	Florida Water Conservation
FL412	Florida's Comprehensive Water Quality Program
FL416	Management and Ecology of Aquatic, Wetland, and Invasive Exotic Plants in Florida

FL420	Conserving Natural Resources in Florida
FL510	Housing and Built Environment in Florida
FL511	Food, Nutrition, and Health in Florida
FL512	Family Economic Stability in Florida
FL513	Community Development
FL515	Successful Parenting/Family Development in Florida
FL201/FL701	Preparing Florida's Youth for the World of Work
FL203/FL703	4-H EFNEP in Florida
FL211/FL711	Animal Sciences Education
FL212/FL712	Plant Sciences
FL213/FL713	Science and Technology
FL214/FL714	Environmental Education
FL215/FL715	Individual and Family Resources Including Health and Safety
FL216/FL716	Citizenship/Leadership
FL217/FL717	Communication Arts and Sciences
FL218/FL718	Organizational Development
FL801	Volunteerism in Extension

• FAIR Report

Florida Farm Bureau Federation IFAS Task Force

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Executive Summary of the
Florida Agricultural Industry Review of the University of Florida/
Institute of Food and Agricultural Sciences
(The FAIR Report of IFAS)
to the Florida Farm Bureau Federation Board of Directors
December 2002

Prepared by Pat Cockrell formatted and edited by Linda Dixon

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II Executive Summary

The purpose of this report is to provide input from the agricultural industry to the University of Florida, Institute of Food and Agricultural Sciences (IFAS) and state policy makers on the structure and future of the UF/IFAS. In our view IFAS is at a crossroads. The question we are attempting to answer is:

"Will IFAS become one of the top five land grant agricultural institutions, or will it slide into mediocrity?"

The recommendations and timelines given in this report are designed to move IFAS into the top five agriculturally focused land grant institutions nationally.

The process used for this report includes personal interviews with farmers and IFAS faculty and administration, a written audit of IFAS by other agricultural groups through the Florida Agricultural Council, and a group of producers representing the Florida animal production industry.

As a general farm organization, Florida Farm Bureau chose to look only at the agricultural component of IFAS. While we recognize the varied clientele base for IFAS, our concern and focus is on the agricultural sector and in strengthening that sector.

This report looks back over one hundred forty years in the development of the land grant system. Originally, the Federal Government provided land to states to establish schools to teach agricultural sciences, mechanical arts, and military training. The intent was to extend public education to meet the needs of the agricultural and industrial population. This truly provided the opportunity for public education of the masses.

The University of Florida is a chartered land grant university with the Institute of Food and Agricultural Sciences (IFAS) serving the agricultural component of the land grant mission. Within IFAS, the College of Agriculture and Life Sciences meets the teaching role, the Florida Agricultural Experiment Stations are the research components, and finally, the Florida Cooperative Extension Service. These units interface to form a statewide and nationwide network of land grant institutions that provide agricultural knowledge and expertise.

The mission of IFAS is to develop knowledge in agriculture, human, and natural resources and to make that knowledge accessible to sustain and enhance the quality of human life.

The College of Agriculture and Life Sciences (CALs) is one of the nation's larger teaching programs within the land grant system. CALs has an undergraduate enrollment of about 2,900 and over 850 graduate students on the main campus and six off-campus sites. The teaching

program is formula-funded, the same as other teaching programs within the state university system.

The Florida Agricultural Experiment Station (FAES) fulfills the IFAS agricultural research mission. The Experiment Station is actually a network of 13 administrative centers with 20 sites across Florida. There are more than 700 active research projects across the state. There is no formula funding within the state university system for this research component.

The Florida Cooperative Extension Service (FCES) provides educational programs that are cooperatively administered with IFAS, USDA, Florida A&M University, the state's 67 counties, and the Seminole Tribe. Each of the state's counties is served by County extension agents who provide information and educational programs that extend the research conducted through the FAES to farmers, ranchers, and others. This provides the third leg of the land grant stool. The county faculty may be paid jointly by the state and county or totally by the county for specific programmatic needs. Often a particular program may have only federal or county dollars earmarked for it, and that funding can only be used for that specific program. There is no funding mechanism in the state university system to allocate funding to faculty with contact hours with non-enrolled or informal students.

As a land grant institution, UF/IFAS has several streams of funding and funding sources that are a complex mix of state, local, federal and private funds. The state provides the largest portion of the funding for IFAS. There is no apparent way of calculating what the Extension or Research budget will be in any given year. The IFAS budget, over the last ten years, appears flat to actually decreasing when inflation is considered. In 2001 and 2002 the Florida Legislature made cuts that, when coupled with the flat budget in the previous ten years, forced a major contraction. To fully implement the reduced funding, the administration, faculty and support positions and facilities have undergone consolidation with a downsizing of 325 positions.

Florida is a unique and diverse agricultural state. The Sunshine State, with over 280 different crops being produced, is second only to California in agricultural diversity. This diversity assures that agriculture provides stability to Florida's economy. We consistently rank in the top 10 states nationally with farm cash receipts. Our farmers by and large do not benefit from Federal Farm Programs that raise other states' farm cash receipts. Florida's 44,000 farms are primarily family farms that manage more than 10 million acres of land. This, combined with commercial forestland, accounts for about 75 percent of the state's 35 million acres that are managed as some form of agricultural and natural resource enterprise.

Farmers operate in a classic supply and demand market and are more price-takers than price-makers. Even though agriculture has a \$54 billion impact on Florida's economy, there are sectors that have not prospered. In general, Florida's farmers were not participants in the economic boom of the 1990's. The economic pressure on our farmers has caused them to turn to IFAS for help in building profitability back into the agricultural operations. IFAS serves as the research and development arm for this diverse and broad-based industry. Small, limited resources and new farmers just establishing a farm learn about and can utilize the same technology that larger farmers utilize. This access to research and technology transfer through the extension function is because of IFAS and its land grant mission.

The Task Force surfaced and identified twenty findings from growers. These findings were very specific and covered areas from the greater University of Florida policies and processes to industry perspectives and legislative actions and activities.

A list of recommendations were developed that addressed each of the findings. These recommendations are:

1. We recommend that several agricultural representatives participate with the External Review Team to provide input from the agricultural industry on the structure of the Florida Cooperative Extension Service (FCES).
The administration should consider designating those County extension agents with agricultural responsibility as "County agricultural extension agents".
We recommend that multi-county or regional agricultural agents be considered as options to County agricultural extension agents.
There should be a system of accountability established that allows the affected clientele to have input on the evaluation of these faculty members.
2. We recommend that the Florida Legislature support the IFAS 2003 proposed budget initiative for serving and protecting Florida's agricultural and natural resources economic value.
3. We recommend that the IFAS administration work with the greater University of Florida community to develop alternatives to or broader opportunities for publication for those faculty who have a pure technology transfer role to receive tenure and promotion.
We also recommend that the IFAS administration hold faculty accountable in their annual evaluations and assure they are productive members of the IFAS faculty. For those faculty members who share research appointments with extension or teaching, we recommend they receive the necessary help and guidance so their research is productive enough to provide them ample opportunity for publication and consequently promotion.
4. We recommend that a basic and applied research fund be established within IFAS that would provide faculty the opportunity to apply, through a competitive grant process, for funding to do basic and applied research that may impact Florida agriculture.
5. We recommend that the Florida Legislature approve and IFAS establish a quick response program (\$100,000 annually) to address new and emerging issues that affect the agricultural industry and the State.
6. We recommend that the agricultural grower groups that provide IFAS funding for research hold the researchers and IFAS accountable for the quality of research done.
We also recommend there not be any administrative fees levied against grower group grants.
7. We recommend that IFAS continue to administratively focus on the entire system as a consolidated statewide entity.
8. We recommend that the IFAS administration study possible incentives for non-tenure track faculty positions.
9. We recommend that IFAS prioritize the maintenance needs of their statewide facilities and develop a budget to meet those needs as well as their operational cost needs.
We also urge the University of Florida administration to include in the budget deferred maintenance and operation costs of the off-campus facilities either in the overall budget or in the IFAS budget.
10. We recommend the Florida Legislature approve the 2003 IFAS budget request of \$1.4 million to match the approximate \$1.6 million of county funding to hire county and multi-county faculty to fill vacancies of the county Extension faculty.
11. We recommend that UF, IFAS and the Legislature work in concert to restore funding necessary to reverse the downward trend.

We recommend that the IFAS administration assure that agricultural education, research and extension continue to be the focus of IFAS and restore the faith of the agricultural community in UF/IFAS as an effective agricultural knowledge resource for Florida. We recommend that over the long term the Legislature adequately fund IFAS.

12. We recommend that the Legislature restore faculty funding to the same levels they were prior to the DROP program.
We also recommend that the IFAS administration develop a process where the agricultural industry has input into and prioritization of those replacement and new positions.
13. We recommend that the Legislature identify and comprehensively study those impediments that restrict the management ability of the heads of the agencies and universities in Florida.
We also recommend that appropriate legislation be drafted and passed that would allow the UF/IFAS to act and respond in a similar manner to budget matters as private enterprise does.
14. We recommend that the University of Florida include all three entities (CALs, FCES, and FAES) of IFAS in a unified budget to the Legislature.
We recommend that the Legislature further clarify the statute to mean that the IFAS budget includes all three entities.
15. We recommend that IFAS develop a new strategic planning process with the agricultural community. This process should focus on production agriculture to ensure its place in the Florida landscape and economy.
16. We recommend that IFAS faculty speak out on the positive aspects of agriculture without becoming advocates.
17. We recommend that a formula be developed in conjunction with IFAS and the Legislature that would recognize and account for the Florida Cooperative Extension Service's (FCES) educational role to Florida agriculture and their service in the non-traditional classroom.
We recommend and urge the Legislature to mandate that this formula be implemented and used in the budgeting process for IFAS and the University of Florida.
We also need to develop a formula to fund knowledge development through research thereby stabilizing funding for the Florida experiment station.
18. We recommend that IFAS develop budgets for regional and statewide initiatives and provide them to the Legislature for funding approval.
The Legislature should provide for the agricultural industry's input and hold IFAS accountable through reports back to the Senate and House Agriculture Committees and other committees as deemed appropriate.
19. We recommend that a Florida Center for Agricultural Profitability and Sustainability (F-CAPS) be established within IFAS with the appropriate funding to be determined by IFAS and approved by the Legislature.
This funding could be a one-time grant to establish and maintain the Center, or it could be funded through the annual budget process.
20. We urge the UF/IFAS to continue developing educational partnerships with other educational institutions within Florida that will result in expanded agricultural degree programs being available to students across the state.

We recommend that the Florida Legislature fund the Teaching Partnerships Initiative for \$1.6 million in the 2003 UF/IFAS budget request for expanded teaching programs.

Legislative Recommendations:

Short-term legislative needs (1-2 years)

- Approve the 2003 budget request for IFAS as submitted by the University of Florida and the three initiatives: Serving and Protecting Florida's Agriculture and Natural Resources Economic Value - \$3.9 million, Local Extension Matching Initiative - \$1.4 million and Teaching Partnerships - \$1.6 million.
- Clarify existing law to mean that all three components of IFAS (teaching, research and extension) should be in the IFAS budget line for the University of Florida.
- Have a study done of the impediments to effectively implement budget cuts within the University system.
- Maintain Legislative oversight by having IFAS give an annual report to joint agriculture and education committees.

Mid-term legislative needs (3-6 years)

- Develop legislation that would allow a research fund of up to \$1 million to be established within IFAS. These dollars would fund research on critical and emerging issues in Florida. The IFAS vice-president, the three deans and three agricultural industry representatives would approve the competitive grants to the IFAS faculty.
- Develop legislation that would allow the IFAS administration to have a fund (\$100,000 annually) that they could use to redirect faculty to new and emerging issues and in effect buy back the faculty members' time from the grants that they are working on.
- Develop a funding formula for Extension that takes into consideration clientele contact, state population and other considerations.
- Assure that funds realized from the IFAS DROP program stays with IFAS.
- Develop a legislative package that will address the deferred maintenance at off-campus facilities.
- Take action on impediments study so that IFAS can function more like the private sector.

Long-Term Legislative Needs (7-10 years)

- Legislative oversight of funding to see that it follows the trend lines for other educational institutions.
- Provide funding for future educational partnerships.
- Funding will be needed for specific industry requested initiatives.

This report also developed a plan of action for IFAS to implement to show the Legislature, IFAS and the grower community not only what our plan is, but also the implementation of that plan.

FAIR's Short Term Plan for IFAS With a 1-2 Year Horizon

- The agricultural industry will participate with the IFAS Extension External Review scheduled for late 2002 or early 2003. The IFAS Vice-President and the Dean of

Extension should study the recommendations and implement those appropriate changes that modernize and update the Florida Cooperative Extension Service.

- The IFAS Vice-President and the Dean of Research will make an in-depth inventory of off-campus facilities that need maintenance. They will develop a multi-year plan to bring all facilities up to standard and present that plan to the Florida Legislature.
- The IFAS Vice-President will prepare a report to be presented to the President of the University of Florida, the University of Florida Board of Trustees and the Florida Legislature detailing the operational areas that are financially provided for on campus but not at the off-campus facilities.
- The Vice-President of IFAS and the Deans of Research, Extension and the College of Agriculture and Life Sciences will identify additional administrative areas that can be consolidated and begin that consolidation. They are urged to look past simply consolidating positions, but also look at job functions, educational needs and research needs.
- During this administrative consolidation all off-campus research and education centers will be maintained and research and extension activities will continue at those sites.
- The Vice-President of IFAS will establish a Florida Center for Agricultural Profitability and Sustainability (F-CAPS) that will serve all sectors of the Florida agricultural industry.
- The IFAS Vice-President will establish a statewide industry advisory committee that will provide input on the direction of IFAS and the implementation of this plan.
- In consultation with the newly formed advisory committee the IFAS administration will submit a complete budget for IFAS through the University of Florida to the Florida Legislature.
- The IFAS administration will fill faculty positions that county governments will cost-share with legislative approval.
- The educational partnership with Hillsborough Community College will be completed.

FAIR's Mid Term Plan for IFAS With a 3-6 Year Horizon

- The major vacancies created by the DROP program should be finalized and the IFAS administration, with industry input, should complete evaluations of those positions and fill those that are justified. Those positions that are not justified as necessary or critical should be considered as new positions that will meet industry demands for new research and extension areas.
- Other new and open positions that meet industry needs will be filled after legislative approval of the budget.
- The IFAS administration will implement their plan to address the deferred maintenance for the off-campus facilities. They will also develop a plan for new and needed remodeling to make them effective research and demonstration facilities and capable of using new technology.
- In an effort to provide guidance and certainty to the budgetary process for the IFAS administration, the IFAS faculty, and the Florida Legislature, a funding formula for the extension function will be developed. This formula should be based on contact hours,

state population growth and other areas that may be pertinent. A funding formula for research should also be considered.

- The IFAS vice-president will develop a plan to establish a dedicated fund of up to \$1 million to be used in a competitive grant process by the faculty. This process will address emerging and other issues within the state that the faculty might not get external funding for, or to enhance and leverage external funding.
- The IFAS Vice-President will develop a quick response mechanism or process that provides for and mandates that IFAS faculty be focused on new and emerging issues. This process will allow for up to \$100,000 annually to be used to buy the faculty time away from their grants and allow them to refocus on these new and emerging issues.
- The IFAS administration, with the greater university community, will have resolved the issues of tenure and promotion for extension faculty.
- The IFAS administration will provide a report to Florida Farm Bureau Federation and other interested agricultural organizations concerning the use of non-tenure tracks for faculty.
- The IFAS administration will develop a strategic plan that focuses on production agriculture.
- The IFAS administration, while responsible for an academic institution, will use the private sector as a model for making management decisions when possible.
- The IFAS administration will provide an annual report to the Florida Legislature that addresses their service to the State of Florida and its agricultural industry.
- The IFAS administration will maintain teaching facilities and experiences so students are prepared to work and succeed in the agricultural industry. Even if facilities or programs are consolidated or downsized, the quality of education will not be compromised.
- The IFAS Administration will develop an in-house training program for faculty interested in moving to administrative roles within IFAS.

FAIR's Long Term Plan for IFAS With a 7-10 Year Horizon

- While the faculty will still rely on external funding, there will be internal funding that will keep the faculty responsive to new and emerging issues as well as critical state issues.
- The administration for this statewide resource will be trained in administration and be responsible for multiple administrative tasks and roles. When evaluated against similar institutions the IFAS administration will be in the top 10 percent, both in effectiveness and with the lowest ratio of administrators to faculty.
- IFAS will be responsive to the agricultural industry and its clientele. This will be evidenced by its graduates, the quality of research, and the variety of educational programs provided to the clientele.
- The Extension model will be altered to more accurately reflect the changing population, the changing agricultural industry and the changing needs of the agricultural community.

- With a stable funding source the IFAS faculty must not only be accountable but also must be productive. The productivity of the faculty, whether it is published research, classroom contact hours or extension contacts, will lend to its accountability.

The IFAS administration will present an annual report to the Florida Legislature and the agricultural community.

- The IFAS administration will continue to evaluate open faculty positions and fill only those that are justified.
- Off-campus facilities will continue to be evaluated for their productivity. If that productivity declines substantially, or if the focus of the Center has changed because of shifts in the industry, the IFAS administration will consult with the agricultural community. If they reach agreement, then the Center may be consolidated or closed. Without that industry approval the Center will continue as a research farm and as a demonstration facility even without faculty housed on-site.
- Form additional teaching partnerships across the state and with other land grants as opportunities arise.
- Maintain teaching facilities.

The FAIR Report of IFAS Executive Summary

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The full report can be downloaded at <http://pdec.ifas.ufl.edu/FAIR.doc>

• Reply to the FAIR Report

**FLORIDA AGRICULTURAL INDUSTRY REPORT ON THE UNIVERSITY OF
FLORIDA INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES (IFAS)**
(The FAIR Report)

Introduction

The subject review and report was an effort led by the Florida Farm Bureau Board. Dr. Mike Martin, Vice President for Agriculture and Natural Resources, appointed an Internal Task Force¹ to review the findings and recommendations. The Task Force surfaced and identified twenty general findings from agricultural producers and other related industry groups. The final report was issued in December of 2002. The findings were specific and covered areas from the greater University of Florida policies and processes to industry perspectives and legislative actions and activities. IFAS greatly appreciates the effort and recommendations that were developed and established an internal task force to address the short- and long-term actions or changes which needed to occur in response to the FAIR report.

A list of general recommendations that addressed each of the findings was presented in the Executive Summary to the report (copy attached). These recommendations and the IFAS interim response to each are provided below.

Recommendations and response

0. We recommend that several agricultural representatives participate with the External Review Team to provide input from the agricultural industry on the structure of the Florida Cooperative Extension Service (FCES).

The administration should consider designating those County extension agents with agricultural responsibility as “County agricultural extension agents”.

We recommend that multi-county or regional agricultural agents be considered as options to County agricultural extension agents.

There should be a system of accountability established that allows the affected clientele to have input on the evaluation of these faculty members.

Response

This recommendation is basically complete. The review was conducted February 5-7, 2003. Numerous agriculture and natural resources industry representatives met with the Extension External Review team and also participated in a series of listening sessions conducted by the Dean for Extension.

¹ Members: J. C. Joyce, Task Force Chair, L.R. Arrington, W.F. Brown, R. Hochmuth, E.J. Luzar, T.A. Nell, J.E. Rechcigl, P. Vergot

As a result of these meetings and the other recommendations from the FAIR report, IFAS is implementing changes to the Extension staffing model to establish multi-county or regional county agent positions where appropriate and to strengthen the linkage with the research faculty at the Research and Education Centers (RECs) and campus-based faculty. Since the review, five new county positions have been advertised in a manner to attract more highly trained and experienced county faculty with regional responsibilities. Additionally, two existing multi-county faculty have been given more regional responsibilities and status. All current and future vacancies will be analyzed to determine which should be shifted to regional positions. Some county/state faculty positions may be converted to Extension Scientist positions with the expressed purpose of supporting variety trials, pesticide trials and on-farm demonstrations.

IFAS is developing a framework for clientele input into customer service for the entire organization.

- 0. We recommend that the Florida Legislature support the IFAS 2003 proposed budget initiative for serving and protecting Florida's agricultural and natural resources economic value.**

Response

The FAIR report was submitted to the Florida Legislative Education Appropriation committees by Mr. Pat Cockrell as a part of the IFAS budget presentation and was well received. Unfortunately, IFAS received an additional \$2.5 million base budget reduction, but this was much less than the \$8.4 million reduction proposed in the Governor's budget. For the 2004-05 IFAS Legislative Budget Request, the University of Florida Board of Trustees, Universities' Board of Governors, and the Florida Board of Education have recommended a \$4.24 million increase in the IFAS budget specifically for research and extension programs in programs related to water, sustaining and enhancing Florida's agricultural and natural resources industries, and food safety, security and nutrition. An additional \$500,000 was requested to enhance off-campus teaching programs located at seven of the IFAS RECs. The current priority is to ensure that the Governor includes the request in his 2004 budget submission to the Florida Legislature. IFAS and Farm Bureau clientele will play a major role in convincing legislative leaders to endorse this request.

- 0. We recommend that the IFAS administration work with the greater University of Florida community to develop alternatives to or broaden opportunities for publication for those faculty who have a pure technology transfer role to receive tenure and promotion.**

We also recommend that the IFAS administration hold faculty accountable in their annual evaluations and assure they are productive members of the IFAS faculty. For those faculty members who share research appointments with extension or teaching, we recommend they receive the necessary help and guidance so their research is productive enough to provide them ample opportunity for publication and consequently promotion.

Response

The UF/IFAS administration embraces high levels of academic achievement and scholarship in teaching, research and extension and promotes the establishment of faculty

programs that lead to local, national and international recognition. We agree that Tenure and Promotion criteria should reflect the importance and uniqueness of the service aspect of our mission and recognize related accomplishments as equitably as other areas of academic endeavor. At the same time, an emphasis on innovation and practicality should not be neglected. Criteria will be reviewed regularly to determine additional adjustments that should be made.

Faculty are recognized for publishing in popular magazines and trade journals. A new publication category "Reviewed Extension Publication" to the tenure and promotion document has been added to the University's tenure and promotion criteria to address this request. This should raise the stature and importance of these peer-reviewed documents and provide the proper faculty credit for this effort. Those faculty with formal extension programs must define their objectives in the "Plan of Work" with measurable accomplishments that reflect the impact of their programs on Florida citizens. Requirements for advancement vary considerably among the academic units at the University of Florida. The service mission of IFAS is frequently misunderstood by the University Tenure and Promotion Committee. Since the composition of the Committee changes frequently, there is a constant need for reinforcing the IFAS message. Consequently, we recommend that each division (Liberal Arts and Sciences, Medicine, Engineering and IFAS) be granted the obligation and right to develop their own tenure and promotion guidelines and that the decisions for tenure and promotion rest within the individual colleges.

The professional and academic productivity of IFAS faculty is of paramount importance to the IFAS Administration. Deficiencies in this area have been recognized and continually are being addressed. The UF/IFAS Faculty Evaluation Forms were revised in 2002 and include more emphasis on accountability, clientele interaction and service. In addition, IFAS has recently implemented the "Sustained Performance Review," which was developed specifically to address the issue of "non-productive faculty". This program provides frequent counseling and a framework of measurable goals to enhance faculty productivity. If however, the faculty member does not show measurable improvement, the program allows for dismissal regardless of tenure status of the faculty member, and that process has been implemented.

- 0. We recommend that a basic and applied research fund be established within IFAS that would provide faculty the opportunity to apply, through a competitive grant process, for funding to do basic and applied research that may impact Florida agriculture.**

Response

Florida Farm Bureau is currently working this issue with the Legislature and the Commissioner of Agriculture. We endorse this initiative and view it similarly to the Citrus Production Box Tax funds in the way that they are administered, i.e. priorities are set by a panel of agricultural and natural resource clientele and faculty respond to these priorities and report results back to the panel. Such a program will ensure that IFAS scientists are addressing priority issues and provide for accountability to stakeholders. The funds would provide operational funds to address industry identified priorities. IFAS would provide the faculty and staff support from existing funds.

- 0. We recommend that the Florida Legislature approve and IFAS establish a quick response program (\$100,000 annually) to address new and emerging issues that affect the agricultural industry and the State.**

Response

IFAS has established such a fund as a part of its 2003-04 and future operating budget. The funds will be used as issues arise. If funds allocated for this purpose are not spent by May of a given fiscal year, they will be directed to critical deferred maintenance needs.

- 0. We recommend that the agricultural grower groups that provide IFAS funding for research hold the researchers and IFAS accountable for the quality of research done.**

We also recommend there not be any administrative fees levied against grower group grants.

Response

Several commodity/clientele groups provide much needed and highly appreciated funds to help drive the operational needs of the faculty's teaching, research and extension programs. State and federal funding provide infrastructure support (i.e. faculty and technician salary and fringe benefits, basic infrastructure) but provide the faculty limited discretionary operational dollars. These commodity/clientele support programs provide an excellent leverage to state and federal support that provides the faculty with needed operational dollars to drive their teaching, research and extension programs in direct response to clientele needs. Examples of these commodity/clientele programs include the citrus production funding order, dairy milk check-off, peanut growers check-off, soybean grower's check-off, tobacco grower's check-off, Florida Nurserymen and Growers Association research fund, Florida Tomato Committee, Florida Turfgrass Association, Caladium growers and Florida Foundation Seed Producers, Inc. Commodity/clientele groups also aid UF/IFAS funding through interactions with state and federal legislators seeking funding for specific programs.

Most of these commodity/clientele support programs have a producer advisory board that solicits a formal request for proposals, evaluates and makes decisions on which proposals are funded and receives progress and final reports from participating faculty. Other programs are less formal, but all have a mechanism for obtaining clientele input for determining teaching, research and extension priorities. These programs not only provide much needed funding to help drive faculty programs but also provide a mechanism for clientele interaction and discussion of needs and priorities for the direction of UF/IFAS teaching, research and extension programs.

UF/IFAS will develop a summary of all commodity/clientele support programs including funding amounts over the past several years and make this available to Florida Farm Bureau, if desired.

The issue of indirect cost return warrants further discussion. Indirect costs returned from grant programs are used for infrastructure support including facility repair and maintenance and to provide faculty support services through IFAS-wide publications, business and grants offices. There may be an opportunity to return a larger portion of indirect costs to provide infrastructure support to the UF/IFAS facilities that are directly involved in the commodity/clientele support program.

- 0. We recommend that IFAS continue to administratively focus on the entire system as a consolidated statewide entity.**

Response

Over the past decade IFAS has consolidated and/or closed numerous RECs, academic departments and administrative offices. Most recently, plans and funding was secured to sell the Bradenton REC and consolidate it with the Dover REC at a new regional site at Balm, Florida. This will provide a state-of-the-art facility that will be both more efficient and effective at meeting regional and statewide research, teaching and extension needs of our clientele. IFAS has also consolidated administrative functions for several RECs or departments under a single administrator, notable examples include consolidation of three animal science departments under one departmental chair of Animal Sciences and consolidation under one REC director of the facilities of Live Oak, Marianna, and Quincy with the closure/divestiture of Chipley, Bountstown and Monticello facilities. IFAS will continue to look for and take advantage of consolidation and cost saving opportunities.

- 0. We recommend that the IFAS administration study possible incentives for non-tenure track faculty positions.**

Response

IFAS has studied this recommendation in light of recommendation number 3 above. IFAS is moving to hire non-tenure accruing faculty to fill certain positions that in the past have been reserved for tenured faculty. Numerous positions have recently been filled following this model by hiring faculty to non-tenured, multi-year contracts to fill appropriate research, teaching and extension program needs. Examples include hiring full- and part-time Lecturers, Doctors of Plant Medicine for plant pest diagnostic functions, Extension Scientists, and multi-county specialists for higher-level extension and research functions. IFAS will continue to look for appropriate opportunities.

- 0. We recommend that IFAS prioritize the maintenance needs of their statewide facilities and develop a budget to meet those needs as well as their operational cost needs.**

We also urge the University of Florida administration to include in the budget deferred maintenance and operation costs of the off-campus facilities either in the overall budget or in the IFAS budget.

Response

IFAS has prioritized its most severe deferred maintenance needs and is using available maintenance/renovation funds to address the most serious needs.

IFAS submitted a legislative budget request item to the UF administration to adjust the operation and maintenance for all IFAS buildings constructed prior to 1999. These buildings are currently funded at approximately 50% of similar space at other public state universities. This under funding requires IFAS to divert appropriately \$4.5 million annually from programs in order to meet operational and maintenance needs. IFAS is also working with the Florida Board of Governors (FBOG) to change the formula under

authority of the FBOG without specific legislative funding.

- 0. We recommend the Florida Legislature approve the 2003 IFAS budget request of \$1.4 million to match the approximate \$1.6 million of county funding to hire county and multi-county faculty to fill vacancies of the county Extension faculty.**

Response

This request was not funded by the Legislature. However, using funds generated from vacancies and prioritization of programs, IFAS did fill 22 of 48 vacant county faculty positions. The 26 remaining positions were requested and approved as part of the \$995,000 legislative budget request by the University of Florida Board of Trustees.

- 0. We recommend that UF, IFAS and the Legislature work in concert to restore funding necessary to reverse the downward trend.**

We recommend that the IFAS administration assure that agricultural education, research and extension continue to be the focus of IFAS and restore the faith of the agricultural community in UF/IFAS as an effective agricultural knowledge resource for Florida.

We recommend that over the long term the Legislature adequately fund IFAS.

Response

IFAS has lost \$12.1 million of its base General Revenue (sales tax revenue) over the past three legislative sessions. This has meant a loss of over 140 faculty positions and corresponding technical and programmatic support. IFAS cannot sustain productivity and customer service if this trend continues. The fact that we have survived this situation without any more draconian measures than were implemented is a credit to the resourcefulness of the faculty and unit level administrators.

Clientele must feel ownership in IFAS as a resource and key to their economic and mission success that should then turn into legislative pressure by clientele for funding trend reversal. Becoming more customer -service oriented is an absolute key to this. We must engage clientele who must engage their legislative leaders to reverse this trend in order to support programs that are essential to sustainability and enhancement of Florida's agricultural and natural resource industries. A marketing/customer service focus plan is being developed to enhance IFAS identity and service focus.

- 0. We recommend that the Legislature restore faculty funding to the same levels they were prior to the DROP program.**

We also recommend that the IFAS administration develop a process where the agricultural industry has input into and prioritization of those replacement and new positions.

Response

IFAS, of course, concurs. The \$2.5 million budget reduction last session resulted in the inability to fill 28 faculty positions and support funds vacant due to the DROP program. IFAS must depend upon its clientele to engage the legislative leaders to reverse this

trend.

As indicated in recommendation 11, IFAS is evaluating and implementing processes to increase clientele input into program priorities. Engagement of expanded regional and local advisory groups is one method being pursued as a source of input into this process. Given the current budget climate, it must be recognized that within a given year not all requests can be met and IFAS central administration must make some hard prioritization decisions.

- 0. We recommend that the Legislature identify and comprehensively study those impediments that restrict the management ability of the heads of the agencies and universities in Florida.**

We also recommend that appropriate legislation be drafted and passed that would allow the UF/IFAS to act and respond in a similar manner to budget matters as private enterprise does.

Response

The devolution of authority to the Board of Trustees of each state university and the corresponding change in status of the universities from state agency status to “body corporate” should allow some flexibility to address this recommendation.

IFAS is not a private enterprise and cannot make the same operating decisions that the private sector makes during economic down turns.

- 0. We recommend that the University of Florida include all three entities (CALs, FCES, and FAES) of IFAS in a unified budget to the Legislature.**

We recommend that the Legislature further clarify the statute to mean that the IFAS budget includes all three entities.

Response

This is a discussion that must occur between the UF and IFAS administration, with a common request to the legislature. There are numerous pros and cons to this issue and it must be carefully analyzed prior to pursuing.

IFAS feels that educational opportunities are needed with the legislature in an attempt to stress the point that IFAS is a unique entity within the state university system, with a specialized research, extension and teaching mission that has a direct impact on the economic development of Florida. Such opportunities and efforts will have benefit in addressing the underlying issue associated with this recommendation.

- 0. We recommend that IFAS develop a new strategic planning process with the agricultural community. This process should focus on production agriculture to ensure its place in the Florida landscape and economy.**

Over the past several years, IFAS has conducted a series of strategic planning, external and internal reviews, formal and informal listening sessions and is planning for a commercial agriculture leader forum to better focus our programs on the needs of our commercial agriculture clientele. The Extension long range planning effort has been reviewed and endorsed by agriculture and natural resource industry leaders.

0. **We recommend that IFAS faculty speak out on the positive aspects of agriculture without becoming advocates.**

Response

Various projects have begun to identify the value (qualitative and quantitative) of agricultural and natural resource industries to Florida. Faculty will be encouraged to use proper forums to present data on value of both segments and the entire industry to the state's social, economic and environmental health.

0. **We recommend that a formula be developed in conjunction with IFAS and the Legislature that would recognize and account for the Florida Cooperative Extension Service's (FCES) educational role to Florida agriculture and their service in the non-traditional classroom.**

We recommend and urge the Legislature to mandate that this formula be implemented and used in the budgeting process for IFAS and the University of Florida.

We also need to develop a formula to fund knowledge development through research thereby stabilizing funding for the Florida Experiment Station.

Response

Currently the IFAS teaching program under the College for Agricultural and Life Sciences is "formula funded" in that its funding is calculated based upon the number of undergraduate and graduate students taught per semester. Recent reductions to the teaching budgets have been offset by legislatively approved tuition increases. The IFAS research and extension budgets are not "formula funded" and, thus, do not benefit from tuition increases. Three other budget entities in the state university system have a similar problem and resolution of this inequity has been made a priority by all the other universities affected.

Clientele are encouraged to convince the legislature for the need for such an approach.

IFAS developed such a formula several years ago but it did not receive adequate support or understanding. We suspect that the reason was that the timing was not appropriate and the formula was too complicated. IFAS has formed a task force to develop a more easily understood and saleable formula. A legislative mandate to develop such a performance-based formula will greatly assist in acceptance of the resulting formula.

0. **We recommend that IFAS develop budgets for regional and statewide initiatives and provide them to the Legislature for funding approval.**

The Legislature should provide for the agricultural industry's input and hold IFAS accountable through reports back to the Senate and House Agriculture Committees and other committees as deemed appropriate.

Response

Based on input received from our clientele, the 2004-05-budget request was developed in such a manner. We are attempting to schedule as many presentations before the

appropriate legislative committees and individual legislators as possible. Florida Farm Bureau's participation in such presentations during the 2003 legislative session was greatly appreciated.

- 0. We recommend that a Florida Center for Agricultural Profitability and Sustainability (F-CAPS) be established within IFAS with the appropriate funding to be determined by IFAS and approved by the Legislature.**

This funding could be a one-time grant to establish and maintain the Center, or it could be funded through the annual budget process.

Response

IFAS is evaluating the feasibility and funding potential for such an initiative.

- 0. We urge the UF/IFAS to continue developing educational partnerships with other educational institutions within Florida that will result in expanded agricultural degree programs being available to students across the state.**

We recommend that the Florida Legislature fund the Teaching Partnerships Initiative for \$1.6 million in the 2003 UF/IFAS budget request for expanded teaching programs.

Response

IFAS is aggressively pursuing this approach and currently has seven (7) such partnerships through the state. This approach allows IFAS to extend teaching/certificate programs to non-traditional, place bound students. Sites include Apopka, Ft. Pierce, Ft. Lauderdale, Homestead, Ft. Myers, Jay/Milton, and most recently Hillsborough Community College, Plant City campus. IFAS is also studying the feasibility of regional detailed market surveys of both students and potential employers around our regional RECs to determine the best mix of curriculum (degree and non-degree producing.)

- **External Review**

**2003 Extension Comprehensive Review
Final Report
March, 2003**

This report is our response to your request for an outside review of IFAS Extension at the University of Florida. Each member of our review team wishes to congratulate and thank you and your entire IFAS organization for the outstanding preparation and extra effort it took to make this a meaningful endeavor. In addition, each of us thanks you for your warm and caring hospitality.

The University of Florida IFAS Extension is a quality organization with a history of exceptional educational programming. Today, you find yourself facing significant changes in a variety of areas:

- Financial challenges that may persist for an unknown period of time.
- Rapidly changing state demographics ---an increasing and diverse population that is bi-modal in nature --- retired part-time residents and young families.
- Gaps in the economic status of many diverse groups within the state.
- A high rate of poverty closely correlated to detrimental health and educational problems.
- A high school dropout rate as high as 50 percent, in some communities.
- A rapidly changing agricultural industry that has historically been your primary educational clientele and political support.
- Increasing political influence in the state shifting to South Florida.
- Environmental concerns related to land and water.
- An aging faculty with a large proportion retiring in the next 5 to 7 years, accelerated by a state incentive retirement program called DROP.
- Changes in both the governance of the State of Florida and the University of Florida.

Extension is at a crossroads. Over the next 10 years, you will need to make important decisions about where Extension wants to lead this exceptional jewel of the university. It is in this context that we offer our observations, judgement and advice. Please realize that our crystal ball is no better than yours, that we bring a perspective based on our wide range of experiences. In addition, our distance from the day to day situation you encounter locally are both an advantage and a disadvantage.

We have listed below some important values that we perceive to be implied by the IFAS administration. We know you are currently working on articulating your vision, mission and values, and we suggest you complete that process as soon as possible. Each of us has found that this process of “stepping back” and refining who we are and refining our goals has been a very helpful tool for making decisions within our institutions.

Implied values:

- To provide a flexible administrative platform to apply research and knowledge to address local issues and concerns, thus meeting the land grant educational mission in Florida.
- To establish successful partnerships with county, state, and federal governments and with non-profit organizations and private industry by sharing interests, responsibility, resources and recognition.
- To broaden programming and political and monetary support to reflect the changing demographics of the Florida population and your local, state and federal elected officials.
- To expand educational programs for urban and suburban clientele.
- To seek diversity of faculty and clientele and welcome differences in people, programs and partnerships.
- To demonstrate the highest standards for program quality and recognition.

The review team organized its report in response to the questions stated on page 7 of the review syllabus.

What are the strengths and weaknesses of the organizational structure of FCES for supporting clientele needs?

Some of the most predominant strengths are listed below:

- Very competent, innovative and dedicated faculty and staff at the state, district and county levels.
- Excellent network of Extension educators located at the campus, district, Research Education Centers (REC) and county level.
- A good working and programming relationship between 1890 Cooperative Extension program and the University of Florida Cooperative Extension.
- Good variety of subject matter specialists in agriculture --- however, several positions currently are vacant.
- A variety of educational models are either in place or being considered. The energy program and the Sea Grant extension programs are strong examples.
- Joint appointments between extension and research add to the success of both components of IFAS.

There are some weaknesses as well. The most predominant weaknesses are listed below:

- The structure appears to impede a natural course of communications between administration, campus specialists, district, Research and Education Centers (RECs) and county faculty. The expectations, rules, responsibilities and avenues of communication between these groups are not well defined or understood in the agency. This was also outlined in the external review of the IFAS REC's.
- The roles of middle management (program leaders, district directors, REC directors, and county directors) are not well defined or understood in the organization.
- The expectations and span of responsibility for district directors is too broad and unrealistic.

- The absence of a memorandum of understanding between IFAS Extension and the county government is not in place for all counties. This has liability issues and appears to be adding to confusion as to role, responsibility and accountability of county faculty.
- Specialist support for youth development, family and consumer science and natural resources are inadequate to sustain long term educational programming.
- A comprehensive long range staffing plan does not appear evident.
- Support for program planning and development, distance education, professional development and evaluation is not well defined. Considerable resources are available, but a clear focus and coordination on high priority educational programming and internal professional development was not evident.
- The quality of communications shared with a variety of “advisory groups” appears to be adding to the confusion and lack of clarity of information moving in each direction within IFAS concerning both research and extension programs.

The fact that IFAS has RECs is both positive and negative. With respect to agriculture, RECs seem to effectively move research closer to the clientele and are seen by the majority of agricultural agents and agricultural clientele as positive. However, with respect to specialists and agents working in program areas other than agriculture, RECs seem to play a neutral to negative role. The negative aspect usually arises over allocation of funding and staffing resources. RECs historically focus on agriculture. Broadening their mission seems highly unlikely. It appears that the relationship and expectations of RECs and county offices needs to be clarified and communicated both internally and externally.

2. Does IFAS Extension have the correct balance of faculty to support clientele needs?

Defining the “clientele” is a critical part of any response to this question. In general, clientele were defined by administration and faculty in a traditional manner for three of the program areas: agriculture, family consumer science and 4-H. Aquatic, coastal, aquaculture, natural resources and energy were much broader and diverse in nature. Horticulture was presented in a variety of ways, for example, commercial horticulture was defined by commodity groups, and urban horticulture included Master Gardeners and the Florida Yard and Neighborhoods program focused on a broad base of clientele. It was rare to hear administrators or specialists consider county elected and appointed officials as clientele. This was not true of the county faculty. They considered a wide range of county departments and county personnel as essential clientele.

Compared to the organizations represented by the review team, the commodity diversity and the dominance of commercial agriculture as clientele is very strong in Florida. We expect that the fact that Family Consumer Science origins are at Florida State University rather than the University of Florida has significant influence on the culture and current resource base of IFAS. However, it appears to us that the changing educational needs in your communities and the potential long term political support will require you to broaden your programming. Effective programming in all areas cannot occur unless you have a critical mass of specialists involved in research and faculty that have as their primary job, facilitating the educational process with clientele.

Defining who will be IFAS Extension clientele in the next 10 years will be an important decision for this organization. We agree with the often-stated comment that “We must continue to meet the needs of commercial agriculture.” It is an important economic sector in Florida. The obvious question you also raised was... “Will there be adequate political support for research and education from public funds as the population and political influence continues to move to a more urban base?” We agree with your consensus that the answer will be “No.” The administrative team must quickly address this challenge.

Assuming that you are not able to find a windfall of funds with your traditional support, are there other sources of both fiscal and political support? We believe that you are fortunate to have many potential partnerships that have not been developed to their full potential. Local government officials are one broad group that knows you through their contacts with the county offices, but has not been focused upon as a clientele in the same context that IFAS Extension considers commercial agriculture. The same is true with respect to family and consumer science, 4-H and a broad array of potential volunteer groups.

Addressing the question of balance of faculty in this context is relatively simple. If you decide that addressing the highest educational needs of a broader clientele will help you meet the land grant mission in Florida, you will need new resources and need to reallocate resources you already have. To accomplish this goal, you will also need to explore the pros and cons of alternative educational delivery methods.

This may seem a daunting and difficult task. And we acknowledge that it will offer many challenges. However, we were impressed with the professional attitude and realistic vision that existed with almost every clientele group you included in your review. They know the reality that you face. And to their credit, they indicated they are willing and able to join in whatever endeavor IFAS Extension chooses. They simply want their opportunity to participate in a meaningful way. This will require considerable leadership from the entire IFAS administrative team.

Should IFAS Extension move toward multi-county agents?

Each of the states represented on the review team uses multi-county agents in limited specific cases. One must consider the costs and benefits, and each decision seems to be very specific to the environment being considered. A good reference is the North Carolina web-site <http://www.ces.ncsu.edu/depts/personnel/vacancies/respons.htm> where you will find general position descriptions. The “Area Specialized Agents” position addresses this specific question.

Does IFAS have the correct balance of administration versus programs?

This is a difficult question to answer. It will depend on where you want this organization to be 10 years from now. However, listed below are some observations relative to this question:

- The Vice President, Deans, Associate Dean for Extension and Program Leaders appear to be a close knit group with good communication and camaraderie. This is an important element

as the group addresses the pressures brought about by diminishing budgets and impact this has on the future.

- The District Directors, by virtue of their job responsibilities, are physically located throughout the state. This is positive and efficient. However, it requires extra effort on the part of both the District Directors and the rest of the management team to facilitate effective communication as a group.
- The question, “Can REC directors substitute for district directors?” was raised several times. We strongly advise to not move in that direction. Managing a REC is a major responsibility and is focused primarily on agriculturally related research and educational programs. As noted earlier, the current workload of District Directors is too broad and unrealistic. It is also unrealistic to expect REC Directors to assume these additional duties.
- It appears a transition was started in 2000 to move county faculty evaluation to the County Extension Director. We assumed that the District Director’s responsibilities were also changed, but this change was not clearly articulated. Our collective experience and observation of states that eliminated district directors is that the outcome has been detrimental to the organization. However, in each of our institutions the role of the district directors has changed significantly in the last 10 years. U.W. Extension has defined the functions for their district directors as described in the following website <http://www.uwex.edu/ces/depthead/ddfunctions.html>
- The role, responsibilities and accountability of middle management in general needs to be clearly articulated and communicated across the entire organization. The old adage ..”Form should follow function”... seems appropriate here.

Assess the financial portfolio of IFAS/Extension.

The fiscal support from all resources that Extension receives is excellent, although recent and pending reductions in state support are both alarming and contribute to a general decline in morale among faculty. Several individuals relative to county fiscal support expressed a concern. The counties’ willingness to invest discretionary dollars in Extension, as well as the ‘in-kind’ investments in facilities, is a testament to the high value that county governments place on Extension programs. However, the question may arise in the future as to whom actually employ the county personnel – the University of Florida or county government. The review committee suggests that Extension immediately initiate a Memorandum of Understanding (MOU) with every county that addresses the responsibilities of each party (Extension and county government) and stipulate definitively who employ the field faculty.

The ratio of salary to operating dollars is also quite good. Many states across the nation are addressing the issues associated with high investments in faculty salaries and minimum to inadequate resources in operating. This ratio for IFAS Extension is approximately 80/20 overall, whereas in other states this ratio is often 90/10 or even higher. Extension is to be congratulated for maintaining this flexibility, but should pay close attention to maintaining their operating dollars in light of future budget cuts and restaffing. This will also help to minimize further salary compression in the future. It is of some concern that the state portion of the budget is 86 percent

salaries/14 percent operating expenses. We advise that efforts be made to move this toward 80/20 and preferably 75/25.

Where are there opportunities to enhance funding?

Extension and IFAS faculty in general are to be congratulated for their successful efforts in securing outside grants to support their programs. This activity seems to be prevalent at all levels of the organization – campus, RECs and county offices. The opportunity to increase contract work through MOU's appears available and should be encouraged where it legitimately supports faculty programs. In addition, new funding partnerships should be explored to leverage dollars to support programs in both traditional and non-traditional areas.

The committee witnessed almost unanimous support for Extension faculty and their programs throughout the week. Most groups expressed a desire to help IFAS Extension tell its story to county government, legislators, congressmen or others who potentially influence the resources it receives. Every effort should be made to cultivate, educate and train a volunteer network that can speak on IFAS Extension's behalf to those who can positively influence the revenue stream. The committee wants to stress that these individuals need supervision and training to be effective advocates for IFAS programs and thus some resources should be invested to ensure the success of their efforts.

The opportunity to generate 'investment capital' for Extension through your IFAS foundation needs to be examined. IFAS might want to consider establishing a separate 501C3 for Extension which would allow citizens across the state to celebrate the excellent local support they receive by establishing named scholarships, land trusts and/or enhancement gifts to support faculty and their programs.

Does Extension's balance of federal, state, county and grant funding influence our ability to meet industry needs?

The committee believes that Extension's ability to move into new program areas, and therefore realign its programs to meet industry needs, is more influenced by budget reductions than by the balance of the funding it receives. Moreover, with future budget reductions looming, it is critical that any current staffing plan be reevaluated immediately to minimize any negative impacts on high priority programs in Extension's statewide delivery system. It is imperative that Extension does all it can to retain maximum flexibility and an infrastructure that will allow it to pursue new program areas as opportunities arise.

What about 'fees for services'?

Extension should consider adopting a 'fees for service' policy that clearly defines the criteria it will use to decide whether or not a service is to be free, or for a fee. There appear to be excellent examples of 'fee for service' activities already in place that can be used as models to help shape this policy. One example that the committee felt strongly about reflects a successful 'fee for service' model is the Energy program, FEES. Other non-traditional programs, including urban

programs and certain for sale publications, represent opportunities to build an excellent 'fee for service' portfolio.

Is IFAS/Extension following a sound program planning/development and evaluation process? How could it be enhanced? Are delivery methods keeping up with needs of clientele?

The current program planning, development and evaluation process appears to be adequate for IFAS/Extension to this point. However, considerable attention should be given to launching a new program planning, development and evaluation system to address contemporary issues of the state and local communities. The new system should emphasize outcomes, impact, accomplishments and change. The review team recommends:

- Initiate strategic planning, implementation and evaluation process that establishes statewide vision, values, mission and priorities.
- Significantly expand the network of stakeholders and program participants.
- The current design team process should be reinvented. No more than five, issue focused statewide design teams should be created. Each team should have a comprehensive charge to be bold, innovative and entrepreneurial, and capitalize on the strengths of IFAS. The design teams should, in part, be self-selected and given funding to support the operation. The teams should be nimble and have a sunset.
- Review the status of information technology systems throughout IFAS/Extension and develop a visionary implementation plan that promotes application in programs.
- Focus on expanding programs to significantly increase volunteers.
- Strongly consider implementation of "train the trainers" program models.
- Expand "master programs" especially for clients who are seeking more learning opportunities.
- Implement a program advisory committee system to direct local and statewide priorities and programs. Be sure to be inclusive of the diverse population in Florida.
- Promote and implement regional programs with Georgia, Alabama and other states, as appropriate.

New agent training and professional development intertwine with program development. We recommend that IFAS Extension participate and use the concerted professional development efforts being made by the Southern Regional Extension Directors with Ron Brown's leadership. Two issues will require increased training of personnel: the anticipated turnover of personnel and moving Extension in new programmatic directions.

Assess the relationship of Extension, Research and Academic Programs within IFAS. How can we improve the feedback loop from extension faculty to influence our research agenda?

It is clear that the administrative leadership team of IFAS has an effective and productive relationship that yields program coordination and team leadership. However, there appears to be significant lack of understanding and appreciation of the roles and responsibilities of faculty with county, DED, REC and department chairs. Communication and coordination of programs and operations is inadequate to build quality programs.

The review team recommends:

- Use the work of Ernest Boyer to broaden vision and definition of scholarship, and to revitalize promotion and tenure expectations. There is considerable literature with specific reference to numerous other institutions.
- Implement an innovative grant system that promotes integrated Extension, Research and Academic programs.
- Use information technology to facilitate communication and to create integrated program development and coordination.

Assessment of Strengths and Weaknesses of UF/IFAS Extension Partnerships

UF/IFAS has a partnership with 67 counties. Effectiveness of this partnership is evident through the following: signed MOUs with approximately 50 percent of counties; increasing county cost share; renovation and construction of approximately 23 new county Extension office facilities; and 72 100 percent funded county agent positions. County government now represents the largest funding source for Extension.

Unfortunately, 50 percent of counties do not have a signed MOU. The failure to mobilize county government to support appropriate state funding of IFAS represents an unfulfilled potential. Additionally, the large urban counties - three with more than 32.3 percent of the state's total population and 23 counties with populations above 200,000 - may require a special negotiated MOU – creating a new partnership relationship. The needs and expectations of large urban counties are significantly different from needs of smaller more rural counties. In addition, in approximately 15 counties, county Extension directors do not have the ability to talk directly with county commissioners. This may be a disadvantage.

More than 37 federal, state and other agencies and organizations are Extension partners.

These partnerships include strong support from commodity groups. However, there is need to continue cultivating non-traditional audiences as partners. Also, IFAS needs to evaluate creating a diverse extension advisory council at the state level and providing advocacy training. Master volunteers, such as master gardeners and master naturalists, also represent a significant pool of

well trained and educated leaders. With appropriate advocacy training, these volunteers could be effectively mobilized.

Although information on the 1890 program was shared, not much evidence was presented to determine effectiveness of this partnership. Issues of funding may have prevented prompt filling of 1890 county and state positions. Since the new president of Florida A & M University is a University of Florida graduate, strengthening of this vital partnership is anticipated. UF needs to encourage and support implementation of the 1890 staffing plan.

Marketing Extension

Several of the IFAS Extension clients mentioned the fact that Extension in Florida is the best kept secret. They were referring to your marketing ... both as a logo and message. This is an important but tricky area to address. Vice-President Martin clearly articulated that any marketing plan for Extension must include IFAS. This is an area that we recommend IFAS obtain some outside assistance. Many large corporations and agricultural commodity groups in Florida have expertise on their national marketing staffs. They may be willing to help if you ask.

Related, and just as important, is having a strong advocacy plan for IFAS and Extension. Communicating with decision makers is just as important as having people recognize your logo. The emphasis should be on building partnerships to work on important public issues in Florida. The plan should be comprehensive, ongoing, and focused on education. This should be a total staff effort.

Washington State University has a detailed marketing plan which you can find at the following website <http://www.wsu.edu/IntegratedMarketing/process/index.html>

Respectfully submitted by,

Carl O'Connor
Michael Tate
Clyde Chesney
Chester Fehlis
Jon Ort

● **Extension Goal and Focus Areas**

UF/IFAS and FAMU/CESTA Extension Statewide Goals and Focus Areas for 2004-2007²

I. To Enhance and Maintain Agricultural and Food Systems

- O. Agricultural Profitability and the Sustainable Use of Environmental Resources (*Example topics include economic analysis, public policies, irrigation practices, varietal improvements, best management practices related to production and marketing, pest management, and fertility management*) Task forces will be created to address profitability as it impacts commodities.
- O. Awareness of Agriculture's Importance to an Economy That Ranges From Local to Global (*The agriculture and natural resources industries are major contributors to Florida's economy, generating billions of dollars of revenue and tax contributions and hundreds of thousands of jobs every year. In addition to these significant monetary impacts, these industries benefit the state by providing wildlife habitat, aquifer recharge areas and areas of open space*)
- O. Processing, Distribution, Safety and Security of Food Systems (*Example topics include safe food handling practices from farm to forks with emphasis on safe food handling techniques, new food technologies, and a better understanding of current food systems*)
- O. Plant, Animal, and Human Protection (*Example topics include IPM, diagnostics, pesticide and farm safety programs, veterinary medicine programs dealing with insects such as mosquitoes and ticks*)

Commodity Action Teams

- Agronomic Row Crops
- Sugarcane and Rice
- Vegetables (*includes tropical and small fruits*)
- Ornamentals and Turf
- Animal Sciences / Forages
- Citrus
- Small Farms
- Aquaculture
- Forestry

II. To Maintain and Enhance Florida's Environment

- O. Water Resources (*Example topics include conservation, non-point source pollution, education*)
- O. Conservation and Sustainable Use of Freshwater and Terrestrial Natural Resources and Ecosystems (*Example topics include recreation, marine, boating, wildlife, forests, exotics, wetlands, natural resource management*)
- O. Environmental Education (*Example topics include helping youth understand their interdependence with the environment, local ecosystem, energy and other natural resources*)

² April 13, 2004

- O. Conservation and Sustainable Use of Coastal and Marine Natural Resources and Ecosystems (*Example topics include energy focused housing, transportation, planning, water, economy, land use, pests, landscapes and wild fires, natural areas, public property*)

III. **To Develop Responsible and Productive Youth Through**

IV. **4-H and Other Youth Programs**

- O. Life Skills Developed in Youth Through Subject Matter Experiences (*Example topics include positive relationships, service and leadership and effective communication skills*)
- O. Organizational Strategies and Learning Environments to Support Youth Programs. (*Example topics include developing a sense of belonging in an inclusive environment through their participation in organized 4-H programs*)
- O. Volunteer Development and Systems to Support Youth (*Example topics include providing for physically and emotionally safety of youth through sustained relationships with positive, supportive adult mentor(s)*).

V. **To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow**

- O. Residential Landscapes
 - . Florida Yards and Neighborhoods (FYN) (*Example topics include integration of the landscape characteristics of site conditions, landscape design, plant selection and placement, lawn irrigation, fertilization, pest control, mowing, pruning and recycling*)
 - . Master Gardeners(*Example topics include preparing volunteers to work in an educational program designed to enhance public education in consumer horticulture, working with trained and supervised volunteer staffs to provide educational assistance to the public on lawns, fruits, vegetables, trees, and ornamentals*)
 - . Green Industries' BMPs Program (Example topics forthcoming)
- O. Commercial Horticultural/Urban Forestry Services (*Example topics include community gardens, golf courses, recreation areas, turfgrass and landscape management practices*)
 - . Green Industries' BMPs Program (Example topics forthcoming)
- O. The Importance of Diagnostic Tools (*Example topics include interpretation and application of diagnostic results related to plant diseases, soil analysis, plant identification and insect and nematode identification*)

VI. **To Assist Individuals and Families Achieve Economic Well-Being and Life Quality**

- O. Personal and Family Well-Being (*Example topics include appropriate nurturance and guidance to children and youth, high quality care programs, and support for families using care facilities*)
- O. Financial Management and Economic Well-Being (*Example topics include strengthening the capacity of families to establish and maintain economic security and build their future*)

- O. Nutrition, Food Safety, and Health (*Example topics include enhanced health status and vitality supported by high quality diets and food management practices; safe handling, preparation and storage of food healthy behaviors and lifestyles*)
- O. Housing and Environment (*Example topics include housing choices appropriate to their financial situation and needs, Consumer reduction of home energy use, improving indoor air quality environments, energy-focused housing*)

VII. To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities

- O. Economic Development and Community Services and Infrastructure (*Example topics include assisting local governments and communities to investigate and create viable options in job retention and creation, tourism development, workforce education*)
- O. Civic Engagement, Growth, Leadership Development, and Community Decision Making (*Example topics include community leadership, public policy education, and improving the ability of local leaders to conduct informed public policy discussions on land use issues, population growth, and other community-wide issues. Also CEDs working in county on behalf of university and county on issues such as staffing, funding, MOUs and other issues important to the county/state relationship*)
- O. Community Preparedness (*Example topics include assisting communities in "Beach safety and preparedness" by developing programs that address issues of rip currents, shark attacks, coastal storms, and hurricanes; Assisting communities in development of plans and procedures for natural disasters; developing better predictive models to enhance the decision-making process in natural disaster events; working with planning agencies to incorporate construction and design practices for both shorelines and buildings that reduce shoreline erosion; working with community leaders in development of plans and procedures in the area of homeland security*)

VIII. To Promote Professional Development Activities Designed to Enhance Organizational Efficiency and Effectiveness

- O. Advancing New Technologies and Skills (*Example topics include development of disciplinary and interdisciplinary knowledge, information technology skills*)
- O. Communications and Marketing (*Example topics include appropriate methods to improve communications with peers, target audiences, stakeholders, and administration*)
- O. Extension Foundation Skills (*Example topics include planning, implementation, and evaluation of Extension programs*)
- O. Personal and Organizational Health (*Example topics include management/leadership development, team skills, change management, organizational accountability*)
- O. Administration and Leadership (*Examples include CEDs working in county on behalf of university and county on issues such as staffing, funding, MOUs and other issues important to the county/state relationship*)

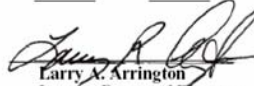
U.S. Department of Agriculture
 Cooperative State Research, Education, and Extension Service
 Supplement to the Annual Report of Accomplishments and Results
 Multistate Extension Activities and Integrated Activities
 (Attach Brief Summaries)

Institution University of Florida
 State Florida

Check one: Multistate Extension Activities
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Actual Expenditures

Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003
<u>See attached</u>	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Total	_____	_____	_____	_____ 26%


 Larry A. Arrington
 Interim Dean and Director
 Extension
 Date 04/01/20

Form CSREES-REPT (2/00)

U.S. Department of Agriculture
 Cooperative State Research, Education, and Extension Service
 Supplement to the Annual Report of Accomplishments and Results
 Multistate Extension Activities and Integrated Activities
 (Attach Brief Summaries)

Institution University of Florida
 State Florida

Check one: Multistate Extension Activities
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Actual Expenditures

Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
<u>See attached</u>	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total	_____	_____	_____	_____ 53.9%	_____


 Richard L. Jones
 Dean and Director
 Research
 Date 04/01/2004

Form CSREES-REPT (2/00)

U.S. Department of Agriculture
 Cooperative State Research, Education, and Extension Service
 Supplement to the Annual Report of Accomplishments and Results
 Multistate Extension Activities and Integrated Activities
 (Attach Brief Summaries)

Institution University of Florida
 State Florida

Check one: Multistate Extension Activities
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	Actual Expenditures				
	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
See attached					
Total				12.8%	


 Larry A. Arrington
 Interim Dean and Director
 Extension
 Date 04/01/2004

Form CSREES-REPT (2/00)

U.S. Department of Agriculture
 Cooperative State Research, Education, and Extension Service
 Request for Waiver from Target Percentage
 for Multistate Extension Activities and Integrated Activities

Institution University of Florida
 State Florida

Waiver for (circle one): Multistate Extension Activities
 Integrated Activities (Hatch Act Funds)
 XX Integrated Activities (Smith-Lever Act Funds)

Fiscal Year (circle one): FY 2000
 FY 2001
 FY 2002
 XX FY 2003
 FY 2004

Type of Waiver: Pre-waiver (Must be submitted prior to October 1)
 XX Post-waiver (Must be submitted with Annual Report of Accomplishments and Results)

Justification: With a loss of \$12.4 million in the past three years, UF/IFAS has strived hard to reach the required 25 % requirements in all areas. We also lost of 251 faculty positions along with the reduction of funds we continue to make necessary changes to reach required percentages. Extension has just completed a structural reorganization and will in the future be able to show integration with most research projects. Florida expects to reach the 25% goal during the 2004 Fiscal year.


 Larry A. Arrington
 Interim Dean and Director, Extension
 Date April 1, 2004

Note: All reports must be submitted regardless of request for waiver.
 Form CSREES-WAIVER (2/00)