AREERA PLAN OF WORK
University of Florida/IFAS
Florida A&M University/CESTA
Research (1862) and Extension (1862/1890)
Federal Fiscal Years
2004-2006

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 FY2004-2008 Plan of Work for AREERA. This report contains the following:

- UF/IFAS (1862) Research and Extension Plan of Work.
- FAMU/IFAS (1890) Extension Plan of Work.

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

Signatures:

Dr. Richard L. Jones 3/29/04
Dean and Director of Research

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Interim Dean and Director
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Dr. Larry Arrington 3/29/04
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II ~ EXECUTIVE SUMMARY

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 (Cockrell, 2003, Florida Farm Bureau, FAIR Report, Appendix i).

The Institute of Food and Agricultural Sciences

Florida's governing body for higher education created the Institute of Food and Agricultural Sciences in April 1964, by reorganizing UF's College of Agriculture, School of Forestry, Agricultural Experiment Station, and the Cooperative Extension Service into a single unit. Today, UF/IFAS includes Extension in each of the state's 67 counties, the Agriculture Experiment Station with 13 research and education centers and a total of 19 locations throughout Florida, the College of Agricultural and Life Sciences, the School of Forest Resources and Conservation, the Center for Tropical Agriculture, portions of the College of Veterinary Medicine, the Florida Sea Grant Program and the International Program for Food, Agriculture and Natural Resources.

UF/IFAS Research and the Florida Cooperative Extension (comprised of UF/IFAS Extension and FAMU/CESTA Extension) provide Floridians with science-based research and life-long learning programs in cooperation with county and state governments, and the United States Department of Agriculture.

Extension

From its inception, as intended, the Florida Cooperative Extension has extended research-based knowledge to communities across the state to solve problems. Extension continues to analyze and synthesize the results of university research and put that information in the hands of the public to improve the quality of life in Florida and does this through a variety of mechanisms and relationships. The most obvious of these is the continued partnership with county governments and the shared responsibility with counties to keep in place viable educational programs at the local level. Local needs often drive Extension's program and these needs frequently require resources from disciplines beyond those encompassed in Extension's university home in the Institute of Food and Agricultural Sciences.

Extension in Florida is defined by the cooperative efforts of Florida A&M University and the University of Florida. The universities operate under a memorandum of agreement which creates the "Center for Coordinated Agricultural Programs (CCAP). This agreement encompasses research, teaching and extension. The CCAP council meets annually to discuss project funding and other matters related to academic programs. Outside of this agreement FAMU extension and UF extension conduct programs in counties under the same parameters as outlined in the state statute 1004.37. There is no funding mechanism in the state university system to allocate funding to faculty with contact hours with non-

enrolled or informal students.

The organizational structure of Extension is complex but very effective in engendering support from its most important partners. The core of extension program remains as its original conception. It is based on the delivery of university based research to the citizens of the state of Florida. The responsibility of the Dean for Extension is to coordinate the activities of the Extension faculty to engage in the production and delivery of educational programs. In the past, Florida has done this through design teams that support "state major programs (SMPS)', in-service training, publications, collaborative programming and county operations. Following a long-range strategic planning effort in 2003-2004 and an external review of the Extension organizational structure, Florida Extension has moved towards a more focused structure composed of 6 major goals (appendix e) that more clearly identifies the formal ties between research and Extension and is based on prioritizing the needs of the stakeholders.

The administrative team that manages this effort consists of the State Extension Director, the 1890 Administrator, state program leaders, 5 district directors, County Extension Directors and other support personnel.

Extension has actively tried to serve the state by utilizing the resources of other colleges and schools on the campus as well as nationally and internationally to provide educational programs to the public. Faulty are encouraged to become involved in both multistate and integrated activities with research to improve programs while reducing the need for fiscal and human resources.

For additional information, see http://extadmin.ifas.ufl.edu/

Research

The UF/IFAS research mission is to invent, discover and develop knowledge to enhance the people and economy of Florida. Faculty members pursue fundamental and applied research that furthers understanding of natural and human systems. Research is supported by state and federal- appropriated funds and supplemented by grants and contracts. IFAS research expenditures in the 2002-2003 year exceeded $125 million.

The Florida Agricultural Experiment Station administers and supports research programs in UF/IFAS. The research program was created by federal legislation known as the Hatch Act, a follow-up to the Morrill Act that established US land-grant universities. The ultimate achievement of research is its contribution of new knowledge to the welfare of people. Within the UF/IFAS research organization the scope of research can be interpreted to include a broad range of activities that are related to agriculture and natural resources; the interrelationships among all people as suppliers of inputs and users of these products; the effects of agricultural and natural resource industries on people through environmental interfaces; and the social welfare of people as consumers.

The research programs support approximately 350 full-time equivalent faculty members in 19 academic departments on UF's Gainesville campus and at 13 research and education centers around the state many of them holding joint appointments in Extension and Teaching. There are more than 700 active IFAS research projects across the state. There is no formula funding within the state university system for this research component.

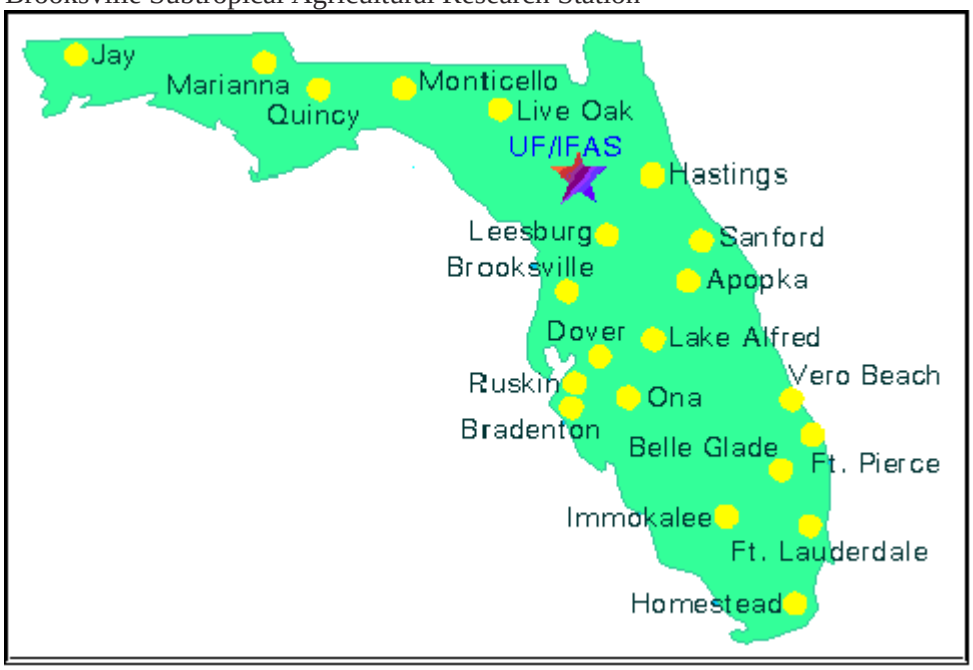
For additional information, see http://research.ifas.ufl.edu/

Research and Education Centers

There are 13 Research and Education Centers in the state. These are the facilities that house state faculty (research, teaching and extension) and some multi-county agents.

Everglades Research and Education Center
Gulf Coast Research and Education Center
Ft. Lauderdale Research and Education Center

Tropical Research and Education Center
Citrus Research and Education Center
North Florida Research and Education Center
Mid-Florida Research and Education Center
Southwest Florida Research and Education Center
Florida Medical Entomology Lab
Indian River Research and Education Center
West Florida Research and Education Center
Range Cattle Research and Education Center
Brooksville Subtropical Agricultural Research Station



Departments
There are 19 academic discipline departments based on the Gainesville campus.

Agricultural Education and Communication
Agricultural and Biological Engineering
Agronomy
Animal Sciences
Entomology and Nematology
Environmental Horticulture
Fisheries and Aquatic Sciences
Food and Resource Economics
Food Science and Human Nutrition
Family, Youth, and Community Sciences
Horticultural Sciences
Microbiology and Cell Science
Plant Pathology
Soil and Water Science
Statistics
Wildlife Ecology and Conservation

Interdisciplinary Centers

These centers draw on the faculty from departments or centers to conduct their missions.

Center for Aquatic and Invasive Plants
Center for Cooperative Agricultural Programs
Center for Natural Resources
Center for Nutritional Sciences
Center for Tropical Agriculture

County Operations
Florida Extension has divided the state into five geographic districts. A "District Extension Director, (DED)" is responsible for staffing, managing and programming for each respective district. They also assist with agency, commodity and government relations. Two of the DEDs are located on campus; three are housed at IFAS Research and Education Centers. The DED's immediate supervisor is the Associate Dean for Extension

The BOCCs, administrators, managers, coordinators and clerks are all critical partners with Florida Cooperative Extension as they make recommendations and decisions related to the local extension financial contribution. In fiscal year (FY) 2003, local finances to fund extension in Florida amounted to $29.2 million (excluding the value of office space and facilities) and show the importance Florida counties place on the existence of the Florida land-grant college at the grassroots level. FY 2002 represented the first time that county government provided the greatest share of operating revenue of the three (federal, state, local) financial partners. There are 379 county faculty positions in the state. Of these 302 are joint paid (state or grant) and 72 are 100% county paid. In many instances, county government has agreed to fully fund positions until such time that the University can provide the resources to pay its share. Roughly, 36 joint positions are vacant as of this writing. In Florida there is no state mandated relationship between county government and the University to operate an Extension program in the respective counties. The Florida Statute sets forth that each county must annually determine the extent of participation in Extension programs. There is also no mandated formula between the University and counties with regard to staffing levels in county offices, although over half of the counties operate under a formal memorandum of understanding The legislation does state that county agents who are jointly paid for by the state are officially employees of the university. Every other aspect of the relationship between the University and the counties is a matter of discussion and mutual agreement.

Program Areas

Agriculture and Horticulture
Commercial Agricultural and Horticultural Programs*:* Florida has 44,000 commercial farms, utilizing 10.2 million acres. Florida producers continue to provide a wide array of agricultural products that are safe and dependable. Due to Florida's diversity in climatic conditions, ranging from tropical in the South to temperate in the North, and soil types (7 soil types), more than 250 commodities are produced. In 2000, Florida ranked 9th in the nation with total cash receipts of over $6.9 billion. Florida ranks 1st in citrus (oranges, grapefruit, and tangerines), snap beans, cucumbers, sweet corn, radishes, sugarcane; 2nd in greenhouse and nursery products, tomatoes, bell peppers, watermelons, squash, avocados, and strawberries and 4th in aquaculture and honey.

Florida producers utilize a little more than 10 million or 30.3% of the state's 35 million acres for agriculture production. Commercial forests account for 37.2% of the states acreage, national and state forests account for about 10.0%, and urban/suburban/industrial account for the remaining 22.4%. Of the 44,000 commercial farms, 5000 had sales exceeding $100,000. The average farm size was a little less than 232 acres. Florida is the 4th leading state in net farm income.

Obviously as the population continues to increase there will be continued stress on natural resources. Demands for water in some counties may well exceed local water resource availabilities. Continued urban growth will force traditional agricultural and forestry lands to be rezoned for urban uses. Land-

extensive agriculture will be replaced in part by high-value specialty fruits, vegetables and nursery products. Agricultural sectors will continue to feel impacts of emerging product forms; shifting consumer preferences; heightened environmental, health and safety concerns; and changing lifestyles. Alternative crops, value-added products, global competition, new processing technologies, and biotechnology will stimulate change and increase opportunities for growth.

Most field crops in Florida are family owned and operated with the exception of sugarcane. The present value of field crops is in excess of $194 million (corn, cotton, peanut, soybean, tobacco, wheat, and hay). Sugarcane has a receipt value greater than $487 million.

As of January 1, 2000 there were 1.8 million head of cattle on farms and ranches in Florida, including 975,000 head of beef cows and 155,000 head of milk cows. There were 17,000 beef cow operations in Florida (79% of which have less than 50 head of beef cows). Florida ranked 12th nationwide in the number of chickens on farms in the year 2000. Florida's poultry farmers maintained an average of 10.5 million layers and produced almost 120 million broilers.

Florida leads the nation in gross wholesale sales of potted foliage for indoor use and foliage hanging baskets with sales of $361 million. Total sales by Florida nursery growers (nursery, sod, cut flowers and greens; $2,251 million), landscape firms ($3,110 million), retail ($3,643 million) and trade businesses ($904 million) in 2000 were $9.908 billion.

In addition, there are numerous small acreages of other minor crops.

Urban Horticultural Programs: The current population of Florida is 15,982,378 according to the 2000 Census. Florida ranks 4th in the U.S. in population and 1st in percent increase for the past 10 year period. Continued growth will alter and stress our natural resources. Demands for water in some counties may well exceed local water resource availability. As a result, UF/IFAS/Extension has a commitment to urban horticultural programs. The programs have a tremendous amount of diversity.

Master Gardener Programs: Since 1979, Cooperative Extension agents in Florida counties have maximized resources using a "learn and return" program developed in Washington: the Florida Master Gardener Program. By providing education-based instruction methods incorporated with the latest scientific research, the program capitalizes on the desire of Florida citizens to learn more about horticulture in exchange for a predetermined number of volunteer hours returned to the individual county.

Florida Master Gardeners are University of Florida-trained volunteer teachers. Master Gardeners provide research-based information to Floridians about gardening-America's most popular pastime. Their information about planning and maintaining urban, suburban, and rural landscapes emphasizes environmental stewardship.

The state does not require Florida counties to have the program. Rather, each individual county extension office determines the focus and structure of the program. The volunteers execute a variety of outreach tasks as determined by the program leader (usually the consumer horticultural agent). Duties include: answering horticultural questions over the phone, in person or through the media; participating in public service projects; giving educational programs; supporting youth activities, performing soil sample evaluations and assisting in field research. The ultimate end to all these activities is to extend the vision of the UF/IFAS - protecting and sustaining natural resources and environmental systems, enhancing the development of human resources, and improving the quality of human life through the development of knowledge in agriculture, human and natural resources and making that knowledge accessible.

During 2001, Florida Master Gardener Volunteers assisted horticulture agents in developing and promoting noncommercial horticulture ultimately increasing environmental action and awareness in 56 counties. Statewide more than 3,678 volunteers contributed 309,825 hours to local county horticulture extension educational programs providing $4,972,697 worth of services to citizens of Florida.

Florida Yard and Neighborhoods Program (FYN): The FYN Program was developed to address serious problems of pollution and disappearing habitats by enlisting homeowners in the battle to save our natural environment. This program provides special educational and outreach activities directed at the community to help residents reduce pollution and enhance their environment by improving home and landscape management and is funded by the UF/IFAS/ Extension, United State Department of Agriculture, the Water Management Districts, the National Estuary Program, Environmental Protection Agency, The Florida Department of Environmental Protection, Homeowner Associations, and city and county governments. The objectives of the of the program are to reduce storm water runoff, decrease non-point source pollution, conserve, water, enhance wildlife habitat, and create beautiful landscapes. Currently, 39 counties have active programs. These programs involve individual homeowners, homeowner associations, builders, landscapers, and condominium associations.

In addition to the above programs, urban horticultural agents are also involved with programs such as 'Build Green and Profit' (described in the Energy Extension Section), Hurricane Preparedness and Disaster Management, and Botanical Gardens.

Challenges for the Future:

- The tremendous diversity of clientele, commodities, size of operation, and sophistication of operations and producers within the state.
- Perception of 'us versus them' (ag. vs. urban) yet some if not all of the issues pertaining to the program area overlap: water quality, quantity, allocation; pest management (plant, animal, and human); urban rural interface and land-use issues; global competitiveness; food safety, quality and technologies; and public policy.
- What steps can be taken to increase effectiveness and impact of programs. How should we measure or monitor effectiveness. What steps can be taken to increase accountability to local, state, national entities.
- The real or perceived disconnect between research and extension particularly between the counties and the RECs and the state and county faculty. How do we improve the feedback loop from the county to influence the research agenda and where do we find the money.
- Support for programs comes from external sources that may or may not provide support for the programs of highest priority. How do we provide for strong connect from state faculty to county in designing, developing and delivering educational materials.
- Local, regional or state-wide programming. How do we effectively interface the expertise available at a specific locale or region to meet statewide needs and vice versa?

Family and Consumer Sciences

Family and Consumer Sciences Extension programs are designed to empower individuals, families and communities to solve problems and address issues related to quality of life in Florida and focus on a broad spectrum of issues affecting Floridians that can be addressed through educational programs.

Summary of the State and County Faculty Involved in the Program Area

The Family and Consumer County faculty represent 26% of all Florida county faculty. Currently there are 88 FTEs at the county level devoted to programming in FCS. At the state level the situation is quite different since state specialists with FCS background only represent seven percent of the state specialists. Currently there are 6.75 FTEs at the state level who provide leadership and support to the major programs in FCS.

Challenges for the Future

- Inadequate FTE allocation at the state and county level to lead and support program needs in each program area within FCS. Limited visibility for Family and Consumer Science Extension Programs.
- To meet the needs of Florida's diverse and rapidly growing population, FCS faculty target many of their programs to ethnically and culturally diverse persons, those with limited resources, and other vulnerable populations such as the elderly and very young children. These groups are under-represented when it comes to communicating with decision makers
- In difficult economic times there is a very limited budget to support programming. Program growth occurs by faculty being successful in obtaining grant funding to enhance development and implementation of FCS programs.
- Lack of understanding and support for FCS programs by both internal and external groups.

Florida Sea Grant Extension (MARINE & COASTAL PROGRAMS)

Florida is a coastal state full of opportunities and challenges. Florida has a longer linear coastline (1,350 miles) than all the other Atlantic states combined from Georgia to Maine. Within its over 8,000 miles of tidal shoreline, there is a wide diversity of living and non-living marine resources unmatched by any in the United States. It has both temperate and tropical ecosystems, and is the only state in North America with a shallow water marine ecosystem containing mangroves, sea grasses and coral reefs.

Florida's marine and coastal educational programs are delivered through Florida Sea Grant Extension (FSGE). Major funding is from the National Oceanic and Atmospheric Administration's National Sea Grant College Program. This funding is augmented by state and county support.

Challenges for the Future

- Key marine/coastal issues in Florida not being addressed due to fact we do not have state specialist coverage in these content areas or due to fact we do not have coverage by county faculty in key geographic areas
- Pressure to compete for more & more grant dollars to supplement base programs. (This competition is occurring more and more, even for Sea Grant funds that are supposed to come to the individual states). Faculties are also facing this issue; result is more time is being spent on grant development and management vs. program delivery.
- Population increases will continue to place stress on marine and coastal resources, critical habitat, and land/water interface.

Natural Resources

Florida's natural resource issues are covered through campus-based specialists and county faculty, most of whom have partial assignments in the natural resource area. Programmatic overview is through the Assistant Extension Dean for Environmental and Natural Resources Programs. Administratively, county-based agents report through their respective county extension directors and district extension directors. On-campus specialists report through their respective department chairs.

Challenges for the Future

- Population increases will continue to place stress on natural resources including the land, native plants and wildlife.
- Demands for water in some counties may well exceed water resource availabilities.
- Continued urban growth will force traditional agricultural and forestry lands to be rezoned for urban use.

Florida 4-H Youth Development Program

Florida 4-H Youth Development Program

The mission of the UF/IFAS Florida 4-H program is to create supportive environments for diverse youth and adults to reach their fullest potential.

The Florida 4-H program involved 241,487 young people ages 5-18 last year. 4-H community clubs involved 22,858 youth. Camping programs involved 3,816 youth. Special interest groups involved 38,276 youth, while school enrichment programs touched the lives of 251,245 youth. Individual 4-H project study enrolled 519 youth and 1,210 youth participated in school age child care and instructional television programs.

Thirty-three per cent of youth impacted by Florida 4-H programs last year were from minority racial or ethnic groups (19% African-American, 0.6% American Indian, 11% Hispanic, and 1.1% Asian). Slight increases in 4-H membership occurred in both farm and urban areas this past year. Youth in 4-H lived on farms (3.7%), in towns under 10,000 and in open country (27.4%), in towns and cities of 10,000-50,000 residents (38.6%), in suburbs (8%) and in central cities (22%). Nearly 85 per cent of young people impacted by 4-H in Florida last year were in grades K-6.

4-H programs remain strong at the county level in extension offices, particularly in those with retention of 4-H agents for three or more years. Nineteen 4-H agents are 100% county paid. One-third of 4-H agents in the field have less than 5 years of experience. Limited youth development staffing at the state level has minimized ability to provide in-service training and created gaps in program support for club, program and volunteer management systems. Faculty program support is available at the state level for environmental education, animal science, teen leadership and service learning, and individual and family resource programs.

Traditional 4-H program areas remain strong, although project areas have diversified substantially. UF specialists are instrumental in assisting the Florida State Fair with the popular Champion of Champions program, which has revitalized state fair activities and restructured recognition systems to reward youth for knowledge in animal science. Both 4-H and FFA members benefit from enhanced educational opportunities at the state fair. The annual state 4-H horse show in July involves more than 500 riders annually, and 4-H horse clubs are active throughout the year. Many counties conduct Ag in the Classroom programs as part of their special interest programming, working closely with the Ag In the Classroom organization. Judging teams are active in horticulture, wildlife ecology, forest ecology, meat science, dairy, land, hippology, livestock judging, poultry and other areas.

Citizenship and leadership programs for teens have seen increased popularity in recent years. Planned and organized by a committee of youth and adults, the Florida 4-H Legislature program remains a premier leadership and citizenship educational program. It drew record numbers of youth to the state capitol last summer to enact a mock legislature with youth carrying out the roles of legislators, lobbyists, justices, governor, and news reporters. Several counties provide preparatory programs for Florida 4-H Legislature, resulting in grassroots education of youth in how government functions. For example, in Clay County, Legislature attendees must observe school board and board of county commissioners meetings, and the 4-H members have also assisted with local elections. The Florida 4-H Congress continues to increase in size annually, with more than 550 youth attending a week of educational and competitive programs on campus at UF last summer.

Adult and youth volunteers this year numbered 15,995.

<u>Challenges for the Future</u>

Challenges for 4-H have been identified through focus groups, a program development committee, and through discussions with volunteers and staff. The priorities identified for Florida 4-H include the following areas of emphasis:

Providing state and district leadership and for key program leadership positions including organizational development, staff training and mentoring, leadership and citizenship education, etc.

Within the Land-Grant system, reconnect the 4-H youth development program with department chairs and discipline based specialists with emphasis on curriculum development and training for volunteer adults and youth.

Engaging all stakeholders in the 4-H movement at the state level as a unified body to guide the 4-H movement in Florida. As part of this effort, the creation of a structure to carry the tasks is an important component.

Expanding the use of quality indicators for evaluation and accountability

Marketing the 4-H Program within our land grant system and within IFAS, UF, and Florida.

Training county agents and volunteers in both program leadership & curriculum leadership utilizing current research in positive community-based youth programs such as essential elements and best practices.

Focusing on curriculum development and/or enhancement in four priority areas: healthy choices (in food, health decisions, etc.), financial literacy, agriculture awareness, and youth / adult partnerships (including civic engagement).

Energy

The Florida Energy Extension Service (FEES) is funded by registration fees, for sale publications, contracts and grants. It operates as an entrepreneurial group within CES producing, marketing and delivering high-quality, well targeted, and valuable information products primarily concerned with sustainable home construction. Educational programs and materials produced by FEES are all designed to promote understanding of the connection between building designs, construction processes, and materials as they relate to durability, resource efficiency and profitability.

The Florida Energy Extension Service has strong sponsorship ties to Fannie Mae, Home Depot, Florida Power, the Southwest Florida Water Management District, the St. Johns River Water Management District, the Efficient Windows Collaborative, and many others. In addition FEES conducts applied research studies for Certainteed Corporation, EPA, FEMA, and HUD.

<u>Challenges for the Future</u>

It is much more difficult to retrofit an existing home for energy efficiency than it is build efficiency into a home during construction. Over the last 10 years approximately 100,000 new homes have been built annually in Florida. Only a small fraction of these homes have been built to readily applicable resource efficiency standards like the EPA/DOE Energy Star home program. Homes stay in the environment for decades, so the benefit of resource efficient homes persists long into the future. In Florida the single greatest energy challenge is to substantially increase the baseline for acceptable efficiency standards.

Community Development

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 in one case, 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.

Challenges for the Future

1. Issues surrounding the rural-urban interface (Growth Management, Land Use Planning, Resource Conservation)

2. Economic development issues (rural-urban disparities, job quality)

3. Community capacity issues (Education, Leadership, Healthcare, Infrastructure)

Long Range Planning, Ag Summits, Multi-State Collaborations, Stakeholder Involvements, and Meeting the Needs of the Under-Served and Under-Represented.

Both FAMU and UF Extension completed a long range planning process in early 2004. Research is involved in a series of Ag Summits across the state which are nearing completion at this time. These grass roots processes provide valuable information for teaching, research and extension to disseminate into needed research projects, and for the development of teaching courses and Extension programs and activities. A formal process is 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 have the opportunity to provide input.

Florida has also initiated the development of multistate meetings between counties located along the Alabama, Georgia stateliness. These annual meetings have allowed faculty from the three states to increase multistate and multistate integrated programs in the areas of 4-H, Agriculture, Family and Consumer Sciences, and natural resources. Florida also continues to look for opportunities on the state, regional and national level to increase our multistate and multistate integrated activities in an effort to better utilize time and resources.

Meeting the Priority needs

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 some human resources in key critical areas. IFAS is presently reviewing all open positions and replacing those that are the most critically needed. In some cases this has resulted in a multi-county position replacing several county positions. Even within these severe restrictions UF/IFAS and FAMU/CESTA administrators and faculty, through carefully prepared reorganizational processes and prioritizing needs assessments are striving to provide the necessary research projects and Extension programs requested by Florida's citizens and at the same balance the needs of the remaining faculty who are being asked to accept additional responsibilities into already full schedules.

Through multiple stakeholder opportunities for input at the grassroots level, as well as through **business** and industry, 1862 research and Extension and 1890 Extension have identified needs for research projects and Extension programs that will be the focus for the Florida land-grant college through the next four years. Faculty will continue to increase integration between research and Extension and develop additional collaborations outside of Florida—regional, national, and international. Florida IFAS is also increasing its involvement in interdisciplinary and inter-county activities as we continue to strive for excellence, efficiency and an effective organization that meets the needs of our clientele.

> **Special Note**: Florida Extension and Research are in the process of undergoing structural and programmatic changes. For this reason Florida chose not to present a 15 page supplement to our original POW, but instead to create a new one that reflects the organization as it exists today. Since changes will still be occurring over the next several months, any additional corrections to this POW will be provided in a supplement in April 2005. The format used in this POW will allow us to generate our future ROA reports from Florida's accountability system (fas2) from which much of the information used in this report was obtained.

III ~ AREERA PLANNED 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

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages:

- Integrated
- Multistate
- Multidiscipline
- Multi-institutional

Target Audiences

Program Duration: intermediate to long term
Allocated Resources: Smith- Lever, Hatch
Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.
Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

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

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Outcome Impact

Key Program Components

Internal and External Linkages:

- Integrated
- Multistate
- Multidiscipline
- Multi-institutional

Target Audiences

Program Duration: intermediate to Long term
Allocated Resources: Smith-Lever, Hatch
Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.

Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

Florida's Performance Goal

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

Statement of Issue:

According the Centers for Disease Control and Prevention, 76 millions 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 behaviors 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

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages:

- Integrated
- Multistate

- Multidiscipline
- Multi-institutional

Target Audiences

Program Duration: Intermediate to Long Term
Allocated Resources: Smith-Lever, Hatch funds
Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.
Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

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

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages:

- Integrated
- Multistate
- Multidiscipline
- Multi-institutional

Target Audiences

Program Duration: Intermediate to Long Term
Allocated Resources: Smith-Lever, Hatch

Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.
Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

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:

1) develop policies that affect natural resources in Florida,
2) implement education, management, conservation, and restoration actions that influence natural resources and ecosystems in Florida, and
3) 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:

1) characterize the ‘wicked’ nature of the problem;
2) translate existing scientific findings into potential solutions for testing, with science broadly defined to include physical, chemical, biological, economic, social and political approaches;
3) highlight critical gaps in our knowledge and research efforts to fill them;
4) facilitate innovative decision-making processes; and
5) 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

Output Indicators - Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages:

- Integrated
- Multistate
- Multidiscipline
- Multi-institutional

Target Audiences

Program Duration: Intermediate and Long Range
Allocated Resources: Smith-Lever, Hatch
Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.
Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

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

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages:

- Integrated
- Multistate
- Multidiscipline
- Multi-institutional

Target Audiences

Program Duration: Intermediate to Long Range
Allocated Resources: Smith-Lever, Hatch
Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.
Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

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

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages:

- Integrated
- Multistate
- Multidiscipline
- Multi-institutional

Target Audiences

Program Duration: intermediate to Long Term
Allocated Resources: Smith-Lever, Hatch
Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.
Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

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 1stin 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

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages:

- Integrated
- Multistate
- Multidiscipline
- Multi-institutional

Target Audiences

Program Duration: Intermediate to Long Range
Allocated Resources: Smith-Lever, Hatch
Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.
Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

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 in one case, 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

Extension

- Economic Development and Community Services and Infrastructure
- Civic Engagement, Growth, Leadership Development, and Community Decision Making
- Community Preparedness
- Safety for Agricultural Operations and Equipment

Research

Performance Goals

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages:

- Integrated
- Multistate
- Multidiscipline
- Multi-institutional

Target Audiences

Program Duration: Intermediate and Long Range
Allocated Resources: Smith-Lever, Hatch
Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.
Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

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

Extension

- Advancing New Technologies and Skills
- Extension Foundation Skills
- Personal and Organizational Health
- Enhancing Effective Communication
- Administration and Leadership
- Test Focus Area

Research

Performance Goals:

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages

- **Integrated**
- **Multistate**
- **Multidiscipline**
- **Multi-institutional**

Target Audiences

Evaluation Framework

Allocated Resources

Educational and Out reach Programs

Goal 7

Budget and Performance Initiative

Statement of Issue:

Related Extension Programs and Research Projects

Extension
Research

Performance Goals:

Output Indicators: Still under development through long range planning process. These will be updated in next year's POW.

Extension
Research

Outcome Indicators

Key Program Components

Internal and External Linkages

- **Integrated**
- **Multistate**
- **Multidiscipline**
- **Multi-institutional**

Target Audiences: Faculty

Evaluation Framework

Allocated Resources

Educational and Out reach Programs: In the annual ROA Florida will provide examples and evidence that special attention has been taken to reach the underserved and underrepresented citizens of Florida.

Program Effectiveness and/or Efficiency: In the annual ROA Florida will provide measurable evidence of program effectiveness and/or Efficiency.

Outcome Indicators

Florida's Performance Goal

To Enhance and Maintain Agricultural and Food Systems

Agricultural Profitability and the Sustainable use of Environmental Resources **Profitability and the Sustainable Use of Environmental Resources**

- Accurate enterprise budgets and analysis
- Adoption of alternative enterprises for increased profit or improved sustainability
- Adoption of appropriate fertility programs
- Adoption of appropriate varieties/breeds/cultivars/rootstock
- Adoption of efficient irrigation systems and technologies
- Adoption of improved planting practices
- Attainment of advanced certification and/or license
- Greater understanding and compliance with laws and regulations
- Implementation of integrated pest management
- Implementation of sustainable rotation systems
- Improved efficiency and maintenance of agricultural machinery
- Improved management of animal health and welfare
- Improved processing systems for agricultural products
- Improved waste management practices
- Improved water management
- Increased accuracy of pest ID and control
- Increased adoption of BMPs
- Increased adoption of precision agriculture practices
- Increased application of management practices that enhance product yield and efficiency
- Increased communication and interaction with stakeholders
- Increased knowledge of effective marketing practices for agricultural products
- Increased knowledge of safe worker practices and improved labor safety
- Increased management practices for prevention of agroterrorism and food safety issues
- Increased public awareness of agricultural production practices
- Increased safety of handling fuel, fertilizers, and pesticides
- Increased use of record keeping systems
- Increased value added product development
- Increased wildlife habitat availability
- Reduced contamination of natural resource systems
- Understanding international competition and markets
- Understanding of domestic and international policies

Awareness of Agricultural Importance to an Economy that Ranges From Local to Global.

- Greater political support for agriculture and natural resources
- Increased awareness of economic impacts of agriculture and natural resources
- Increased awareness of environmental impacts of agriculture and natural resources
- Increased consumer confidence in Florida's agricultural products

Processing, Distribution, Safety and Security of Food Systems

- Better food handling practices
- Better food processing
- Improved food quality
- Understanding of food regulations

Plant, Animal and Human Protection

- Adoption of appropriate pest management tools

- Advance pesticide users' ability to parse and correctly interpret modern pesticide label statements
- Best pest management tactics used
- Elevate pesticide users' knowledge and understanding of relationships between pesticide chemicals and physical surroundings, including but not limited to: sunlight, air, soil texture, ground or surface water, non-target organisms, and sensitive areas.
- Enable Floridians seeking pesticide licensure/license renewal to demonstrate satisfactory competence in category-specific pesticide applicator knowledge and skills.
- Enhance pesticide users' familiarity with guiding principles of modern pest control, including but not limited to: pest identification, best management practices, chemical resistance management, and integrated pest management tactics.
- Enhance pesticide users' knowledge of behaviors, actions, procedures or articles of personal protective equipment (PPE) that enable, aid, augment, or sustain the personal health and safety of an applicator or other pesticide handler.
- Environmental protection
- Environmental stewardship
- Further pesticide users' knowledge of product-specific pesticide characteristics, including but not limited to: formulation, acute toxicity, corrosivity, ignitability, solubility, leaching potential, vaporization potential, mode of action, degradation rate, chemical classification, spray mix compatibilities, or target site specificity.
- Implementation of sustainable systems
- Improve pesticide users' knowledge or skill of pesticide application equipment selection, usage, maintenance, or calibration.
- Increase pesticide users' knowledge of handling practices, procedures, equipment, or facilities that promote safety and security of pesticide chemical purchase, transport, storage, mix/load, spray preparation, or other handling activities.
- Increase pesticide users' knowledge or awareness of Florida's pesticide laws and rules.
- Increase pesticide users' understanding of federal and state requirements of the Worker Protection Standard (WPS).
- Increased acreage in resistant cultivars
- Increased awareness of agrosecurity
- Increased knowledge of identification of pest species
- Increased knowledge of proper rates and materials for pest control
- Increased knowledge of sampling and monitoring procedures and pest thresholds
- Increased pesticide safety
- Increased sustainability
- Increased understanding of fate of pesticides in the environment
- Increased understanding of pest management practices on air quality
- Increased understanding of pesticides on water quality
- Increased usage of diagnostic services
- Increased yield
- Increases knowledge of proper rates and materials for pest control
- Maximize crop quality
- Reduced inputs
- Reduced pest levels
- Reduction in pest management costs
- Timely response to pest outbreaks
- Understanding effects of pest management practices on wildlife
- Understanding quarantine issues
- Understanding the effect of pests

Florida's Performance Goal

Processing, Distribution, Safety and Security of Food Systems

Better food handling practices

- Reduced foodborne illness
- Safer food supply Better food processing
- Better quality products
  - Improved food quality
- Reduced foodborne illness
- Safer food supply
- Better quality products
  - Understanding of food regulations
- More secure food supply
- Safer food supply

Florida's Performance Goal

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

Nutrition, Food Safety and Health

- Apply food safety principles to infant feeding practices
- Demonstrate increased knowledge of common types of food/drug and drug/nutrient interactions.
- Demonstrate increased knowledge of current food safety and quality issues.
- Demonstrate increased knowledge of food safety issues and recommended safe food handling practices.
- Demonstrate increased knowledge of healthy food preparation techniques.
- Demonstrate increased knowledge of potentially dangerous ergogenic aides.
- Demonstrate increased knowledge of recommended food preservation methods
- Demonstrate increased knowledge of risk factors for foodborne illnesses.
- Demonstrate increased knowledge of special nutrient needs of athletes.
- Demonstrate increased knowledge of techniques used by fraudulent practitioners/quacks.
- Identify key information on the food label.
- Identify solutions to common gastrointestinal discomforts during pregnancy
- Increase practice of ADA standards of care.
- Indicate intent to avoid potentially dangerous ergogenic aides.
- Indicate intent to request more healthful food preparation methods, as needed.
- Use food preparation techniques and/or ingredients that promote health
- Use good personal hygiene practices.
- Use recommended behavior modification techniques.
- Use recommended cleaning and sanitizing techniques.
- Use recommended food handling practices
- Use recommended infant feeding practices.
- Use thermometers as recommended to reduce risk of food borne illness.
- Use USDA recommended procedures when preserving foods.
- Wash fresh fruits and vegetables before consumption

Florida's Performance Goal:

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

Nutrition, Food safety and Health

- Accept physical size and choose to have a more positive body image
- Change high-risk lifestyle behaviors to reduce cancer risk
- Change high-risk lifestyle behaviors to reduce cardiovascular disease risk
- Demonstrate improved blood glucose control
- Demonstrate increased knowledge of basic nutrition.
- Demonstrate increased knowledge of cancer risk factors.
- Demonstrate increased knowledge of cardiovascular risk factors.
- Demonstrate increased knowledge of common types of food/drug and drug/nutrient interactions.
- Demonstrate increased knowledge of current nutrition and/or health issues.
- Demonstrate increased knowledge of healthy food preparation techniques.
- Demonstrate increased knowledge of healthy lifestyle practices.
- Demonstrate increased knowledge of nutrient needs throughout the lifecycle.
- Demonstrate increased knowledge of potential health complications of type 2 diabetes.
- Demonstrate increased knowledge of potentially dangerous ergogenic aides.
- Demonstrate increased knowledge of risk factors for foodborne illnesses.
- Demonstrate increased knowledge of special nutrient needs of athletes.
- Demonstrate increased knowledge of techniques used by fraudulent practitioners/quacks.
- Demonstrate increased knowledge of the USDA Food Guide Pyramid.
- Demonstrate increased knowledge of weight gain recommendations for pregnancy.
- Discard outdated medications
- Drink adequate fluids before, during, and following exercise.
- Eliminate potential fall hazards that are identified in the home
- Encourage physical activity in children.
- Evaluate nutrition information using recommended research-based approaches
- Exercise as recommended, to increase muscle strength, maintain balance and increase mobility
- Identify an exercise partner or other type of support system.
- Identify key information on the food label.
- Identify solutions to common gastrointestinal discomforts during pregnancy
- Increase practice of ADA standards of care.
- Indicate intent to avoid potentially dangerous ergogenic aides.
- Indicate intent to change high-risk lifestyle behaviors to reduce cancer risk.
- Indicate intent to change high-risk lifestyle behaviors to reduce cardiovascular disease risk
- Indicate intent to incorporate regular physical activity as needed, for a more healthful lifestyle.
- Indicate intent to request more healthful food preparation methods, as needed.
- Indicate intent to request nutrient information when eating out.
- Indicate intent to select a diet that meets recommended intake levels of key nutrients.
- Indicate intent to use Food Guide Pyramid to guide food choices.
- Inform health care provider of all medications taken
- Maintain or increase physical activity, as needed for a more healthful lifestyle
- Modify eating behaviors as recommended for managing calorie intake.
- Monitor blood glucose regularly
- Participate in recommended health screenings
- Pass certification exam
- Plan and eat regular meals and snacks
- Plan meals using an accepted food system.
- Practice self-examinations as recommended
- Reduce food costs
- Report change in condition to primary physician

- Review home for potential fall hazards
- Select a diet that meets recommended intake levels of key nutrients.
- Select more often menu items that contribute to a healthful diet
- Show improvement in meeting Food Guide Pyramid recommendations
- Take medications as prescribed
- Use available resources such as WIC, Food Stamps, and commodities
- Use cost effective strategies in planning and preparing meals and snacks.
- Use dietary supplements only as needed for adequate nutrient intake
- Use food labels to make healthy choices.
- Use food preparation techniques and/or ingredients that promote health
- Use good personal hygiene practices.
- Use recommendations of the Dietary Guidelines for Americans to guide food and activity choices.
- Use recommended behavior modification techniques.
- Use recommended cleaning and sanitizing techniques.
- Use recommended infant feeding practices.
- Use thermometers as recommended to reduce risk of food borne illness.
- Use USDA recommended procedures when preserving foods.

Florida's Performance Goal

To Maintain and Enhance Florida's Environment

Water Resources

- General - BMP endorsement by state and local agencies
- General - BMP implementation
- General - Continued support for education
- General - Greater compliance with laws and regulations
- General - Increase in active stewardship of land and water
- General - Increased communication and interaction between stakeholders
- General - Increased knowledge, awareness, and understanding of water issues
- General - Increased participation in certification programs
- General - Less pollutants entering surface and groundwater
- General - Planning and decision-making processes involve a wider range of stakeholders
- General - UF/IFAS training programs attract key people
- Improved planning processes - Increased participation by UF/IFAS
- Improved planning processes - Models to improve management
- Improved planning processes - Natural resource inventories
- Nutrients - Adoption of nutrient management plans by producers
- Nutrients - Appropriate fertilizer management (storage, handling, sources, rates, application)
- Nutrients - Increased use of soil testing
- Pesticides - Appropriate pesticide management (material selection and application)
- Pollution prevention - Adoption of filter strips
- Soil - Reduced ditch/canal maintenance
- Soil - Reduced erosion
- Waste - Appropriate disposal of non-recyclable waste
- Waste - Recycling/reuse of waste materials
- Water - Adoption of efficient irrigation systems
- Water - Adoption of new technologies for water management
- Water - Appropriate water management (source, volume, scheduling, system efficiency/maintenance/calibration)
- Water - Improved water use efficiency

- Water - Installation or retrofitting of water saving appliances and fixtures
- Water - Reduced outflows
- Watersheds - Science-based policy making
- Watersheds - Wider stakeholder group provides input to manage natural resources
-

Conservation and Sustainable Use of Freshwater and Terrestrial Natural Resources and Ecosystems

- Number of contact hours per participant in educational or training sessions
- Number of contact hours per volunteer
- Number of data points collected by volunteers
- Number of e-mail contacts from clientele
- Number of educational materials distributed
- Number of educational or training sessions
- Number of mail or fax contacts from clientele
- Number of newsletters distributed
- Number of office visits by clientele
- Number of participants in educational or training sessions
- Number of promotional materials distributed
- Number of telephone contacts from clientele
- Number of underserved or minority participants
- Number of uses of the mass media
- Number of visits to clientele
- Number of volunteer hours contributed
- Number of volunteer trainings
- Number of volunteers recruited
- Number of volunteers trained
- Number of web page hits
- Overall satisfaction with service - survey (1 to 5 ranking)
- Percentage increase in awareness or understanding - pre & post tests
- Percentage of participants indicating an increase in awareness or understanding - survey
- Potential number of mass media contacts

Environmental Education

- Extension agents will use Best Practices for designing and delivering EE programs
- Extension volunteers will support environmental education programs
- Media outlets will increase coverage of local environmental topics and issues
- Media will receive well-conceived and useful news releases on environmental topics and issues
- Participants will appreciate the complexity and intricacies of Florida's environment
- Participants will be able and motivated to engage in community environmental issues
- Participants will enhance their community through environmental service projects
- Participants will have research-based information on environmental issues
- Participants will understand multiple perspectives on environmental issues
- Participants will use critical thinking skills in environmental problem solving
- Participants will use technology-based programs to promote environmental education
- Partnering agencies and organizations will use Extension materials and programs
- Teachers will use environmental education programs to meet SSS and help prepare youth for FCAT

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

- Know status of sponge population
- Number of contact hours per participant in educational or training sessions
- Number of contact hours per volunteer

- Number of data points collected by volunteers
- Number of e-mail contacts from clientele
- Number of educational materials distributed
- Number of educational or training sessions
- Number of mail or fax contacts from clientele
- Number of newsletters distributed
- Number of office visits by clientele
- Number of participants in educational or training sessions
- Number of promotional materials distributed
- Number of telephone contacts from clientele
- Number of underserved or minority participants
- Number of uses of the mass media
- Number of visits to clientele
- Number of volunteer hours contributed
- Number of volunteer trainings
- Number of volunteers recruited
- Number of volunteers trained
- Number of web page hits
- Overall satisfaction with service - survey (1 to 5 ranking)
- Percentage increase in awareness or understanding - pre & post tests
- Percentage of participants indicating an increase in awareness or understanding - survey
- Potential number of mass media contacts

Florida's Performance Goal

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

Commercial Horticultural/Urban Forestry Services

- Actual use or adoption of practices gained as a result of educational effort (Example: follow-up survey)
- Intended use or adoption of practices gained as a result of educational effort (Example: post survey)
- Knowledge or certification gained as a result of educational effort (Example: pre and post survey)

The Importance of Diagnostic Tools

- Decreased landscape costs, pesticide usage, landscape call backs, disease problems, improper pesticide usage (industry, survey)
- Improved basic diagnostic/identification skills, diagnostic/identification services, landscape maintenance services provided, pesticide usage, Florida landscapes (measured through clientele testimony, comment, survey).
- Increase usage of diagnostic services, demand for professional services that utilize diagnostic services (measured by usage data from clinics, EDIS publications demand)
- Increased awareness of plant pest problems, available diagnostic services, biosecurity risks, control choices (measured with "before and after" questions or surveys)

Residential Landscapes: Under construction

Under construction

Florida's Performance Goal

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

Life Skills Developed in Youth Through Subject Matter Experiences

0 YOUTH DEVELOP POSITIVE PERSONAL COMPETENCIES
- a Youth demonstrate increased self-confidence.
- b Youth develop a positive attitude toward themselves and their future.
- c Youth demonstrate increased self-responsibility
- d Youth demonstrate character and adhere to a code of ethical principles
- e Youth will pursue safe and diverse recreational activities/hobbies.

1 YOUTH ENHANCE COMMUNICATION SKILLS
- a Youth organize thoughts into public presentations.
- b Youth enhance interpersonal communication skills(speaking, writing or listening)

2 YOUTH PROCESS INFORMATION TO MAKE EFFECTIVE DECISIONS AND CHOICES
- a Youth make informed decisions.
- b Youth demonstrate competencies in goal setting, planning or organizing.
- c Youth demonstrate wise use of resources.
- d Youth develop time management skills.

3 RELATIONSHIP SKILLS
- a Youth develop significant relationships with peers.
- b Youth develop significant relationships with adults.
- c Youth will show respect and consideration for others.
- d Youth and volunteers will value, respect, and practice an appreciation for diversity

4 YOUTH LEAD AND CONTRIBUTE TO OTHERS (peers, family, community)
- a Youth assume leadership roles as evidenced by helping/teaching others.
- b Youth are engaged in civic governance and community decision-making.
- c Youth contribute hours of volunteer service to communities.
- c Youth develop personal competencies of teamwork and cooperation.

5 YOUTH DEMONSTRATE MARKETABLE/PRODUCTIVE SKILLS FOR WORK OR FAMILY LIFE
- a Youth develop employability and workforce preparation skills.
- b Youth develop a positive attitude toward themselves and their future.
- c Youth demonstrate character and adhere to a code of ethical principles.
- d Youth will increase knowledge and skills related to clothing construction, care and selection.
- e Youth demonstrate increase knowledge, skills or improved practices for personal safety.
- f Youth will increase knowledge and skills related to financial stability.

6_a AGRICULTURAL /ENVIRONMENTAL SKILLS
- 1 Youth increase their knowledge of agricultural production and its importance for life.
- 2 Youth increase their knowledge and best practices for environmental stewardship and conservation of natural resources.
- 3 Youth will adopt conservation practices to sustain natural resources.

6_b YOUTH ENHANCE SKILLS IN ANIMAL SCIENCES
- 1 Youth demonstration ability to judge and select quality animals
- 2 Youth adopt best management practices for animal care
- 3 Youth adopt safe and ethical management practices for animal welfare.
- 4 Youth demonstrate ability to show and exhibit animals.

7 YOUTH DEMONSTRATE HEALTHY LIFESTYLE CHOICES
- a_1 Youth demonstrate the ability to make healthy food choices
- a_2 Youth increase knowledge and safe food handling practices.

b Youth will increase positive activities that promote physical health and well-being
c_1 Youth avoid situations or actions that would put them at risk.
c_2 Youth increase knowledge, skills and adopt best practices for firearm safety.

8 SCIENCE AND TECHNOLOGY SKILLS
a youth demonstrate ability to acquire, process and interpret data.
b Youth can demonstrate knowledge and application of scientific inquiry process.
c Youth demonstrate knowledge of biological principles of living organisms.

9_a LEADERSHIP SKILLS
1 Youth demonstrate attitudes, knowledge, and skills related to forming partnerships with adults.
2 Youth and adults will adopt best management practices for effective youth-adult partnerships.
3 Youth demonstrate involvement in community decision-making.
4 Youth assume leadership roles as evident by helping/teaching others
5 Youth exhibit leadership skills associated with serving as officers in clubs, committees, and councils.
6 Youth develop personal competencies of teamwork and cooperation

9_b CITIZENSHIP AND CIVIC ENGAGEMENT
1 Youth are engaged in civic governance and community decision-making
2 Youth demonstrate an understanding of the democratic process
3 Youth contribute hours of volunteer service to communities

9_Z-STAFF/VOLUNTEER TRAINING OUTCOMES
9Z1-Increased knowledge of events and opportunities
9Z2-Increased use of 4-H and youth development curriculum
9Z3-Developed curriculum to increase experiential learning opportunities
9Z4-Secure adequate, consistent financial resources to support programmatic efforts

Organizational Strategies and Learning Environments to Support Youth

- Adequate policies, procedures, and safeguards exist for all 4-H and youth activities
- Chartered 4-H Clubs
- Collaboration and partnerships in support of the 4-H program
- Developed curriculum to increase experiential learning opportunities
- Frequency of participation
- Knowledge of 4-H philosophy and mission
- Knowledge of events and opportunities
- Knowledge of UF/IFAS Extension philosophy and mission
- Participants contribute volunteer service to communities
- Participants demonstrate ability to acquire, process, and interpret data.
- Participants Demonstrate Citizenship And Civic Engagement.
- Participants demonstrate competencies in goal setting, planning, and organizing
- Participants Demonstrate Healthy Lifestyle Choices.
- Participants demonstrate increased self-responsibility
- Participants Demonstrate Leadership Skills.
- Participants Demonstrate Relationship Skills
- Participants Develop Positive Personal Competencies.
- Participants Enhance Communication Skills
- Participants Lead And Contribute To Others.
- Participants organize thoughts into public presentations.
- Participants Process Information To Make Effective Decisions And Choices.
- Participants report open and frequent communication and information flow
- Participation in 4-H and youth development programs
- Quality of youth programs
- Retention of in 4-H

- Secure adequate, consistent financial resources to support programmatic efforts
- Staff are trained to meet the needs of the 4-H and youth development program
- Use of 4-H and youth development curriculum

Volunteer Development and Systems to Support Youth

- Extension professionals will have competency in volunteer management.
- Extension Youth Development professionals will understand the needs of adults and youth volunteers.
- Volunteers actively recruit diverse participants
- Volunteers adopt best management practices for safety and wellbeing
- Volunteers and Extension staff will demonstrate effective and appropriate teaching/learning methods.
- Volunteers and Extension staff will develop curriculum to increase experiential learning opportunities
- Volunteers and Extension staff will increase their knowledge of events and opportunities
- Volunteers and Extension staff will secure adequate, consistent financial resources to support programmatic efforts
- Volunteers understand how to create a caring environment for youth
- Volunteers will adopt best management practices related to diversity.
- Volunteers will increase skills in leadership and teamwork.
- Volunteers will increase their knowledge and skill is specific areas of subject matter.
- Volunteers will increase their knowledge and understanding of risk management practices
- Volunteers will increase use of 4-H and youth development curriculum
- Volunteers will partner in the management of local and state programs, in new expanded roles.
- Youth and adults will adopt best management practices for youth and adult partnerships

Florida's Performance Goals

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

Personal and Family Well-Being

- Accepts child for who he/she is.
- Acknowledges the potential responses of family members (i.e. children, grandchildren, and others).
- Actively communicates with children/teens at their level.
- Advocates for children/teens.
- Allows child to express his/her feelings.
- Allows children to play and express their creative abilities.
- Allows teen to make harmless mistakes.
- Applies the Principles of Universal Design to home assessment.
- Appreciates differences and includes others.
- Asks for and accepts help from others.
- Asks for help when it is needed.
- Asks for help when it is needed.
- Asks for help when needed.
- Asks for what is needed with confidence.
- Assesses cash reserve needs.
- Assesses the impact of social isolation on clients/patients.
- Avoids arguing with child/teen.
- Avoids shouting and yelling at child/teen.
- Calls a break for child to calm down.
- Can identify techniques for working through a conflict.
- Can identify the difference in conflict resolution styles.

- Chooses appropriate meeting times and locations for older adults.
- Communicates at eye level with children.
- Communicates openly about negative/uncomfortable feelings.
- Communicates to community leaders the need for safe walking areas.
- Communicates with children's/teen's parents and guardians.
- Communicates with ex-partner about child's needs.
- Completes or updates legal documents.
- Considers children's input when making household rules.
- Considers grandchildren's input when making household rules.
- Copes with changes in relationships with family and friends.
- Copes with the changes in relationships with family and friends.
- Creates a plan to find community resources that match his/her needs.
- Creates a strong support network.
- Creates an environment that promotes good health and nutrition.
- Creates an environment where child/teen is safe and can grow and learn.
- Describes issues of dehydration with older clients/patients.
- Determines reasons for adolescent's behavior.
- Determines the best custody choices for his/her situation.
- Develops a plan for making home modifications.
- Develops a system for monitoring teen's whereabouts, activities, and safety.
- Develops plan to help provide social support.
- Develops plan to provide informational support.
- Develops plan to provide instrumental support.
- Discusses living trusts with a financial advisor.
- Does not compare one child/teen with another.
- Does not criticize child/teen.
- Does not feel guilty as a working parent.
- Does things together with family members to create happy memories of childhood.
- Encourages children/teens to use their curiosity, exploration, and problem-solving skills.
- Encourages parents to get involved in children's/teen's education.
- Enforces rules with appropriate consequences.
- Enforces rules with appropriate consequences.
- Engages in self-care.
- Enrolls someone with Alzheimer's disease in the Safe Return program.
- Establishes coalition before planning a program for older adults.
- Finds ways to build on the positive aspects of the relationship.
- Frequently encourages children to share their feelings.
- Gives help and encouragement to teammates to foster group success.
- Guides child's behavior.
- Guides children's behavior.
- Has a positive outlook.
- Has a positive outlook.
- Has a positive outlook.
- Has an increased sense of control over daily life.
- Helps child/teen feel better about herself/himself.
- Helps children/teens develop communication skills.
- Helps children/teens to get along with others.
- Helps others reach their goals.
- Holds a family conference to plan for caregiving needs.
- Identifies and discusses daily habits and behaviors with future spouse.
- Identifies and uses community resources.

- Identifies important issues that a couple should discuss about having and raising children.
- Identifies local legal resources.
- Identifies potential problems in spending habits as a couple.
- Identifies sources of stress.
- Identifies support services available to caregivers.
- Identifies the barriers that prevent good use of time.
- Identifies the major factors that affect one's use of time.
- Identifies ways to make the most of available time.
- Ignores misbehavior and praises positive behavior.
- Incorporates demographic trends in policy development.
- Informs local authorities about the Safe Return program.
- Involves child in making rules and consequences.
- Involves others in sharing leadership responsibilities.
- Is firm and kind.
- Is realistic about the number of activities that can be accomplished in a week.
- Keeps angry feelings under control.
- Knows how and when to pamper himself/herself.
- Knows the difference between fixed, periodic, and flexible expenses.
- Knows what behaviors to expect from a grandchild at his/her age.
- Knows what kinds of behaviors to observe.
- Knows what to expect from a child/teen at his/her age.
- Learns and practices empowering behaviors.
- Learns what to realistically expect from teens.
- Listens and acknowledges family member's feelings.
- Listens to and acknowledges family members' feelings.
- Listens to child's point of view.
- Listens to others without interrupting.
- Listens to the other person's point of view.
- Listens without blaming.
- Makes and sticks to a budget.
- Makes decisions based on their knowledge of child/teen development.
- Makes group plans.
- Manages stress associated with coordinating work and family roles.
- Meets with occupational therapist to identify needed adaptive devices.
- Monitors teen's friends closely.
- Monitors teen's whereabouts closely.
- Obtains information about Alzheimer's from the AlzOnLine website.
- Organizes and documents information necessary to locate resources.
- Organizes business with appropriate record-keeping tools.
- Plans and follows an effective daily activity schedule.
- Plans how time will be spent.
- Plans menu for clients based on the four key components of healthful eating.
- Plans menu for clients using Daily Food Guide Pyramid for Elders.
- Plans opportunities to meet children's/teen's different learning styles.
- Practices being more tolerant.
- Practices positive stress management techniques (diet, exercise, relaxation).
- Praises child's/teen's efforts.
- Praises children's/teen's efforts.
- Provides a safe environment for children/teens in their care.
- Provides a variety of activities to help child/teen experience success.
- Provides a variety of activities to help children/teens experience success.

- Provides age-appropriate opportunities that promote physical development.
- Provides an age appropriate environment for children/teens in their care.
- Provides grandchildren with choices and lets him/her choose.
- Provides opportunities for child to make choices.
- Provides regular time for family discussions and interactions.
- Recognizes and plans for the potential for later-life health issues.
- Recognizes signs and triggers of anger.
- Recognizes the benefits of providing care for older family members.
- Recognizes the differences between custody options.
- Redirects children when they misbehave.
- Redirects inappropriate behavior in positive ways.
- Relates the grief process to situations other than death.
- Respects teen's need for personal space.
- Responds to children's physical needs.
- Responds to children's/teen's positive behaviors.
- Responds to grandchildren's positive behavior.
- Responds to grieving friends and family appropriately.
- Reviews current insurance policies.
- Rules and consequences are consistent and age appropriate.
- Seeks child's/teen's input during problem solving.
- Selects affordable, quality child or self-care appropriate for child's needs.
- Selects an appropriate method for recording observations of children's behavior.
- Selects learning activities appropriate for child's/teen's age.
- Shares appropriate feelings clearly and respectfully.
- Shares appropriate feelings clearly and respectfully.
- Shares demographics of aging in Florida with program staff.
- Shares feelings clearly and respectfully.
- Shares information about physical changes related to falling.
- Shares own feelings respectfully.
- Spends "special time" with each child/teen.
- Spends one-on-one time with each child.
- Spends one-on-one time with each family member.
- Spends sufficient time talking with others without distraction.
- Spends time together as a family.
- Spends time together with the family.
- Spends time with child.
- Takes a break when needed.
- Takes a leadership role at home, at school and in the community.
- Takes advantage of personal and professional growth opportunities.
- Takes care of himself/herself (diet, exercise and stress management techniques).
- Takes care of himself/herself (diet, exercise and stress management techniques).
- Takes steps to reduce the risk of falling.
- Talks with teens about their physical changes.
- Tells other caregivers how to reduce the risk of wandering.
- Trainer is confident teaching the subject matter.
- Trainer is knowledgeable on the subject matter.
- Understands and accepts the choices and trade-offs necessary to find balance between work and family.
- Understands and addresses the financial issues related to later-life marriage.
- Understands and supports diverse families.
- Understands child's/teen's behavior.

- Understands cultural differences in expressions of grief.
- Understands different communication styles.
- Understands general process of grief.
- Understands how an individual's values relate to his/her spending habits.
- Understands how one's values relate to their use of time.
- Understands how the anger shown during conflict affects others.
- Understands normal grief behavior in self and others.
- Understands that conflicts can be both positive and negative.
- Understands the benefits of using time wisely.
- Understands the burdens of caregiving for older family members.
- Understands the causes of a child's misbehavior.
- Understands the causes of children's/teen's misbehavior.
- Understands the difference between conflict resolution and conflict management.
- Understands the importance of communication within the couple and between the couple and others.
- Understands the importance of controlling emotions during a conflict.
- Understands the importance of first building a strong relationship with each other.
- Understands the influence of peers on child's/teen's thoughts and actions.
- Understands the pros and cons of nursing home placement.
- Understands the reasons for a grandchild's misbehavior.
- Understands the role of a parent.
- Understands the role of emotions and the importance of controlling them during a conflict.
- Understands the roles and responsibilities of a babysitter.
- Understands the steps in developing a family spending plan.
- Uses a prioritized "to do" list.
- Uses AARP's home safety checklist for home assessment.
- Uses demographic data for program planning.
- Uses design principles for educational materials for older adults.
- Uses different strategies to advertise his/her childcare babysitting business.
- Uses Florida Injury Prevention Program for Seniors (FLIPS) information.
- Uses materials from the Alzheimer's Association.
- Uses media and informal marketing methods to publicize programs.
- Uses more "do's" than "don'ts" when communicating with children.
- Uses more do's than don'ts.
- Uses observations to plan developmentally appropriate activities, based on individual and/or group needs.
- Uses observations to positively direct problem behavior patterns.
- Uses positive methods to control personal emotions.
- Uses space to provide a secure environment that encourages play, exploration, and learning.
- Uses techniques other than spanking.
- Uses the available community resources effectively.
- Uses time savers to make the most of available time.
- Utilizes self-management skills, such as setting limits, delegating, organizing, developing routines, and managing time.
- With family, develops an acceptable division of labor at home.
- Works cooperatively with co-workers.
- Works toward short and long term goals.

Financial Management and Economic Well-Being

- Program participants will achieve an acceptable quality of life by managing available resources well enough to live within their incomes, by budgeting to achieve family goals, and by debt management.
- Program participants will become familiar with financial institutions and how to use them to protect their finances and/or assets to increase savings and reduce debt.
- Program participants will comparison shop to save money and increase satisfaction with purchases.
- Program participants will develop strategies for increasing wealth by using savings and investments.
- Program participants will learn how to evaluate insurance policies, including long-term health, auto, liability, homeowners, umbrella, and Medicare.
- Program participants will learn strategies for reducing death taxes.
- Program participants will learn what records to keep, where to store them and how to prepare a household inventory.
- Program participants will look for and use reliable information and practices relating to the purchase of goods and services.
- Program participants will maintain financial well-being and the orderly transfer of assets by estate planning, making a will, establishing a trust, and/or change in title.
- Program participants will manage credit and debt to achieve family goals.
- Program participants will prepare legal documents needed to maintain financial well-being in later life.
- Program participants will protect themselves, and reputable retailers, by using reliable information for purchases and by recognizing and avoiding fraud and deceptions.
- Program participants will save money and increase financial security by paying bills when they are due and using credit responsibly.
- Program participants will use safety practices, including being prepared for emergencies at home and on the road

Housing and Environment

- Builders and remodelers who participate in this program will increase knowledge about lead-based paint removal.
- Contractors who participate in the program will increase knowledge about skills necessary to build high quality, structurally durable housing.
- Participants will buy a home that fits the family's needs and finances.
- Program participants will carefully evaluate their needs versus risks and will recognize and avoid approaches used by con artists.
- Program participants will develop and follow a spending plan and pay their housing expenses for the purchase of their own home.
- Program participants will increase knowledge about energy efficient construction methods, materials, and equipment.
- Program participants will increase knowledge about environmentally sound home sites, landscape designs, water management, and related areas.
- Program participants will increase knowledge about finance, costs, loans, financial initiatives, and working with financial professionals.
- Program participants will increase knowledge about the Occupational Safety and Health Act.
- Program participants will increase knowledge about worker's compensation requirements and insurance needs.
- Program participants will increase knowledge of building codes and other related regulations.
- Program participants will inspect their homes and make changes needed to make them safer.
- Program participants will learn how to close their homes for extended periods without experiencing damage or financial loss.

- Program participants will learn to conserve and protect the quality of water.
- Program participants will learn to conserve energy by using it wisely.
- Program participants will learn to read and understand their leases and other documents.
- Program participants will learn to recognize environmental hazards and asthma triggers.
- Program participants will maintain their residences in condition for quality living.
- Program participants will select equipment, furnishings, and supplies that improve the quality of life, conserve energy, and save money.
- Remodelers and workers who participate in the program will learn about lead-based paint risks.

Florida's Performance Goals

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

Economic Development and Community Services and Infrastructure

- Community to develop in more efficient manner
- Implementation of smart business planning principles
- Implementation of smart financial principles
- Implementation of Smart Growth Principles
- Implementation of smart managerial principles
- Implementation of smart marketing principles
- number of business retention programs completed
- number of businesses successfully recruited
- number of communities initiating a strategic planning process
- number of communities initiating a visioning process
- number of employees added
- number of employees retained
- number of local businesses expanded
- number of local businesses retained
- number of local leaders trained
- number of people trained in new business start-ups
- number of small business owners trained
- number of small businesses started
- number of trained leaders joining alumni group
- number of volunteers trained to conduct a local business/community survey

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

- Community to develop in more efficient manner
- Implementation of smart business planning principles
- Implementation of smart growth principles
- Implementation of smart marketing principles
- Number of business retention programs completed
- Number of business successfully recruited
- Number of communities initiating a strategic planning process
- Number of communities initiating a visioning process
- Number of employees added
- Number of employees retained
- Number of entrepreneurship education programs completed
- Number of local businesses expanded
- Number of local businesses retained
- Number of local leaders trained
- Number of people trained in new business start-ups
- Number of small business owners trained
- Number of small businesses started

- Number of trained leaders joining alumni groups
- Number of volunteers trained to conduct a local business/community survey

Community Preparedness

- Adults aware of sources of post-disaster aid.
- Adults increase knowledge of appropriate behavior in the event of a general breakdown of municipal services.
- Boat owners aware of sources of post-disaster aid.
- Children understand the concept of a disaster supplies kit.
- Coastal residents aware of how to evaluate shelter in place vs. evacuation.
- Coastal residents develop a disaster plan for various disaster situations.
- Coastal residents develop a disaster plan for various disaster situations.
- Disabled develop a disaster plan adapted to special needs.
- Disabled understand how to evaluate shelter in place vs. evacuation.
- Elders understand how to evaluate shelter in place vs. evacuation.
- Extension agents aware of the mechanisms of governmental response to disaster.
- Large Animal Owners develop disaster plan for all animals, including plan for locating lost animals.
- Non-English speakers aware of sources for disaster preparedness information.
- Small Animal Owners develop disaster plan for all animals, including plan for locating lost animals.
- Workers aware of disaster/emergency situations that might isolate them at the workplace.
- Adults aware of evacuation routes.
- Adults aware of how to evaluate shelter in place vs. evacuation.
- Adults aware of how to live in a shelter.
- Adults aware of location of nuclear power plants.
- Adults aware of need for disaster supplies kit.
- Adults aware of potential mental health impact of various disaster events.
- Adults aware of potential misuse of agricultural chemicals and fertilizers.
- Adults aware of sources of appropriate disaster preparedness information.
- Adults aware of sources of mental health support in the event of disaster.
- Adults aware of sources of post-disaster self-recovery information
- Adults develop a disaster plan for various disaster situations.
- Adults develop disaster plan (shelter in place and evacuation) for pets and livestock.
- Adults identify items to take in case of evacuation.
- Adults prepared to shelter in place.
- Adults understand how to assemble a disaster supply kit.
- Adults understand how to respond to a radiological incident.
- Adults understand secure storage of agricultural chemicals and fertilizers.
- Agricultural Producers aware of agencies to notify in case of invasive pests.
- Agricultural Producers aware of potential impacts of invasive pests.
- Agricultural Producers aware of potential mental health impact of various disaster events.
- Agricultural Producers aware of potential misuses of agricultural chemicals and fertilizers.
- Agricultural Producers aware of role in preventing invasive pests.
- Agricultural Producers aware of sources of appropriate disaster preparedness information.
- Agricultural Producers aware of sources of mental health support in the event of disaster.
- Agricultural Producers aware of sources of post-disaster aid.
- Agricultural Producers aware of sources of post-disaster self-recovery information.
- Agricultural Producers develop a comprehensive disaster plan for their operation for various kinds of disasters
- Agricultural Producers develop an evacuation plan.

- Agricultural Producers develop disaster plan (shelter in place and evacuation) for pets and livestock.
- Agricultural Producers increase knowledge of appropriate behavior in the event of a general breakdown of municipal services.
- Agricultural Producers understand secure storage of agricultural chemicals and fertilizers.
- Boat owners aware of resources for post-disaster self-recovery.
- Boat owners aware of sources of accurate and up-to-date preparedness info.
- Boat owners develop contingency plans in case of various kinds of disasters (includes evacuation plans).
- Boat owners develop hurricane/storm surge disaster plan.
- Boat owners understand how to assemble a disaster supply kit.
- Boat owners understand how to shelter in place on their boat if necessary.
- Boat owners understand storm surge.
- Boat owners understand the potential impact of invasive pests (insect, animal, and plant).
- Boat owners understand the role they can play in port security
- Boat owners understand the sources, transmission and prevention of invasive pests.
- Children aware of how to live in a shelter.
- Children aware of the normal reactions to abnormal circumstances.
- Children aware that animals have needs in disasters.
- Children understand small animals' needs in disasters.
- Coastal residents aware of evacuation routes.
- Coastal residents aware of need for disaster supplies kit.
- Coastal residents aware of sources of information for disaster preparedness.
- Coastal residents aware of sources of post-disaster aid.
- Coastal residents aware of sources of post-disaster self-recovery information.
- Coastal residents develop hurricane/storm surge disaster plan.
- Coastal residents identify items to take in case of evacuation.
- Coastal residents prepared to shelter in place.
- Coastal residents understand how to assemble a disaster supply kit.
- Coastal residents understand storm surge.
- Disabled aware of sources of post-disaster aid.
- Disabled aware of sources of post-disaster self-recovery information.
- Disabled aware of sources of preparedness information.
- Disabled aware of special support services available to assist with evacuation.
- Disabled understand how to assemble a disaster kit adapted to special needs.
- Elders aware of sources of post-disaster aid.
- Elders aware of sources of post-disaster self-recovery information.
- Elders aware of sources of preparedness information.
- Elders aware of special support services available to assist with evacuation.
- Elders develop a disaster plan adapted to special needs.
- Elders understand how to assemble a disaster kit adapted to special needs.
- Extension Agents aware of Extension Disaster Education Network (EDEN).
- Extension agents aware of sources of post-disaster aid.
- Extension agents increase knowledge of Extension involvement in disaster preparedness, response and recovery.
- Large Animal Owners aware of carcass disposal protocols and agencies.
- Large Animal Owners aware of resources available to assist in case large animals must be evacuated.
- Large Animal Owners aware of sources of post-disaster aid.
- Large Animal Owners aware of sources of post-disaster self-recovery information.
- Large Animal Owners aware of sources of preparedness information.

- Large Animal Owners implement plan to prepare to shelter animals in place.
- Marina owners aware of agencies to contact in case of security issues.
- Marina owners aware of appropriate sources of disaster preparedness information.
- Marina owners aware of role to play in port security.
- Marina owners aware of sources of disaster recovery assistance.
- Marina owners develop hurricane/storm surge disaster plan.
- Marina owners understand storm surge.
- Marina owners understand the potential impact of invasive pests (insect, animal, and plant).
- Marina owners understand the sources, transmission and prevention of invasive pests.
- Marina owners use Panic file to develop disaster response plan.
- Non-English speakers aware of sources of post-disaster aid.
- Non-English speakers aware of sources of post-disaster self-recovery information.
- Small Animal Owners aware of changes in animal behavior under conditions of high stress.
- Small Animal Owners aware of how to live in a shelter with a small animal.
- Small Animal Owners aware of issues in evacuating small animals.
- Small Animal Owners aware of locations and requirements of pet-friendly shelters.
- Small Animal Owners aware of sources of post-disaster aid.
- Small Animal Owners aware of sources of post-disaster self-recovery information.
- Small Animal Owners aware of sources of preparedness information.
- Small Animal Owners understand how to assemble a disaster kit appropriate to each of their animals.
- Small Animal Owners understand needs of sheltering in place with small animals.
- Workers aware of potential mental health impact of various disaster events.
- Workers aware of sources of information for disaster preparedness.
- Workers aware of sources of mental health support in the event of disaster.
- Workers increase knowledge of appropriate behavior in the event of a general breakdown of municipal services.
- Workers understand how to assemble a disaster kit for the workplace.
- Workers understand how to shelter in place at the workplace.

Safety for Agricultural Operations and Equipment

- Children aware of basic emergency response procedures.
- Children aware of safe ATV use, including minimum age and safety equipment.
- Children aware of safe procedures for handling chemicals, including what they should not handle at all and proper safety equipment.
- Children aware of safe procedures for working with livestock, including minimum age and the danger of crush injuries.
- Children aware of the ‘no extra riders’ rule.
- Children aware of the minimum age for driving a tractor.
- Children aware of the risks associated with handling chemicals.
- Children aware that there are risks to their safety and health associated with farm work and farm environments.
- Children understand importance of helmet usage when horseback riding.
- Crop Producers aware of basic first-aid and emergency response procedures.
- Crop Producers aware of hazards of chemicals used in operations under their supervision.
- Crop Producers aware of resources to create safety training programs.
- Crop Producers aware of risks to worker health in operations under their supervision, including mental health, hearing, sight, zoonoses, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Crop Producers aware of their liability for worker safety.
- Crop Producers aware of training resources for chemical safety.

- Crop Producers aware of training resources for safety in confined spaces.
- Crop Producers aware of training resources for worker health issues.
- Crop Producers aware of what constitutes a confined space and hazards of working in confined spaces.
- Crop Producers understand appropriate safety measures for safe chemical handling.
- Crop Producers understand appropriate safety measures to protect worker health.
- Crop Producers understand appropriate safety procedures for working in confined spaces.
- Crop Producers understand gases that might be encountered in agricultural settings.
- Crop Producers understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Crop Producers understand the benefits of comprehensive and consistent safety training.
- Crop Producers understand the benefits of safer tractor operations.
- Crop Producers understand the risks of specific tasks carried out under their supervision.
- Crop Producers understand the risks of tractor operation and the means of prevention.
- Crop Producers understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment
- Emergency/ Rescue /Medical Workers aware of agricultural exposures.
- Emergency/ Rescue /Medical Workers aware of electrical hazards to which they may be exposed in an agricultural setting.
- Emergency/ Rescue /Medical Workers aware of hazards of chemicals used in agricultural operations.
- Emergency/ Rescue /Medical Workers aware of resources to create safety training programs.
- Emergency/ Rescue /Medical Workers aware of training resources for chemical safety.
- Emergency/ Rescue /Medical Workers aware of training resources for electrical safety.
- Emergency/ Rescue /Medical Workers aware of training resources for safety in confined spaces.
- Emergency/ Rescue /Medical Workers aware of types of agricultural confined spaces.
- Emergency/ Rescue /Medical Workers understand appropriate safety measures for safe handling of agricultural chemicals.
- Emergency/ Rescue /Medical Workers understand gases that might be encountered in agricultural settings.
- Emergency/ Rescue /Medical Workers understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Emergency/ Rescue /Medical Workers understand the benefits of safer tractor operations.
- Emergency/ Rescue /Medical Workers understand the benefits of safety training specific to the agricultural environment.
- Emergency/ Rescue /Medical Workers understand the risks of tractor operation and the means of prevention.
- Emergency/ Rescue /Medical Workers understand the special risks present in manipulating agricultural vehicles during rescue.
- Emergency/ Rescue /Medical Workers understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Employers/Managers aware of basic first-aid and emergency response procedures.
- Employers/Managers aware of electrical hazards to which workers may be exposed in operations under their supervision.
- Employers/Managers aware of hazards of chemicals used in operations under their supervision.
- Employers/Managers aware of hazards of handling livestock, including zoonotic diseases.
- Employers/Managers aware of OSHA standards, especially standards that directly impact operations under their supervision.
- Employers/Managers aware of resources related to OSHA standards.
- Employers/managers aware of resources to create safety training programs.

- Employers/Managers aware of risks to worker health in operations under their supervision, including mental health, hearing, sight, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Employers/Managers aware of their liability for worker safety.
- Employers/Managers aware of training resources for chemical safety.
- Employers/Managers aware of training resources for electrical safety.
- Employers/Managers aware of training resources for livestock safety.
- Employers/Managers aware of training resources for safety in confined spaces.
- Employers/managers aware of training resources for worker health.
- Employers/Managers aware of what constitutes a confined space and hazards of working in confined spaces.
- Employers/Managers understand appropriate safety measures for safe chemical handling.
- Employers/Managers understand appropriate safety measures for safe livestock handling.
- Employers/Managers understand appropriate safety measures for working with and around electricity.
- Employers/Managers understand appropriate safety measures to protect worker health.
- Employers/Managers understand appropriate safety measures to protect worker health.
- Employers/Managers understand appropriate safety procedures for working in confined spaces.
- Employers/Managers understand gases that might be encountered in agricultural settings.
- Employers/Managers understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Employers/Managers understand the benefits of comprehensive and consistent safety training.
- Employers/Managers understand the benefits of safer tractor operations.
- Employers/Managers understand the risks of specific tasks carried out under their supervision.
- Employers/Managers understand the risks of tractor operation and the means of prevention.
- Employers/Managers understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Farm Families aware of age- and capability-appropriate task assignment.
- Farm Families aware of basic first-aid and emergency response procedures.
- Farm Families aware of electrical hazards to which they may be exposed.
- Farm Families aware of hazards of chemicals used in operations on their farm.
- Farm Families aware of hazards of handling livestock, including zoonotic diseases and allergic reactions.
- Farm Families aware of health risks in operations they perform, including mental health, hearing, sight, infectious disease, allergic reactions and repetitive motion.
- Farm Families aware of how to create a safer environment for farm children.
- Farm Families aware of resources to create safety training programs.
- Farm Families aware of risks to child health in operations they are asked to perform, including mental health, hearing, sight, infectious disease, allergic reactions and repetitive motion.
- Farm Families aware of safety risks to children in operations under their supervision.
- Farm Families aware of training resources for chemical safety.
- Farm Families aware of training resources for child safety.
- Farm Families aware of training resources for electrical safety.
- Farm Families aware of training resources for livestock safety.
- Farm Families aware of training resources for safety in confined spaces.
- Farm Families aware of what constitutes a confined space and hazards of working in confined spaces.
- Farm Families understand appropriate safety measures for safe chemical handling.
- Farm Families understand appropriate safety measures for safe livestock handling.
- Farm Families understand appropriate safety measures for working with and around electricity.
- Farm Families understand appropriate safety measures to protect their health.

- Farm Families understand appropriate safety procedures for working in confined spaces.
- Farm Families understand gases that might be encountered in agricultural settings.
- Farm Families understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Farm Families understand the benefits of safer tractor operations.
- Farm Families understand the benefits of safety training.
- Farm Families understand the risks of specific tasks carried out on their farms
- Farm Families understand the risks of tractor operation and the means of prevention.
- Farm Families understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Home Owners aware of age- and capability-appropriate task assignment.
- Home Owners aware of basic first-aid and emergency response procedures.
- Home Owners aware of electrical hazards to which they may be exposed.
- Home Owners aware of hazards of chemicals used in operations on their property.
- Home Owners aware of how to create a safer environment.
- Home Owners aware of resources to create safety training programs.
- Home Owners aware of risks to child health in operations involving agricultural equipment and materials, including mental health, hearing, sight, infectious disease, allergic reactions and repetitive motion.
- Home Owners aware of safety risks to children in operations involving agricultural equipment and materials.
- Home Owners aware of training resources for chemical safety.
- Home Owners aware of training resources for child safety.
- Home Owners aware of training resources for electrical safety.
- Home Owners understand appropriate safety measures for safe chemical handling.
- Home Owners understand appropriate safety measures for working with and around electricity.
- Home Owners understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Home Owners understand the benefits of safer tractor operations.
- Home Owners understand the benefits of safety training.
- Home Owners understand the risks of tractor operation and the means of prevention.
- Home Owners understand the risks of using agricultural equipment and materials.
- Home Owners understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Livestock Producers understand the risks of specific tasks carried out under their supervision.
- Livestock Producers aware of basic first-aid and emergency response procedures.
- Livestock Producers aware of hazards of chemicals used in operations under their supervision.
- Livestock Producers aware of resources to create safety training programs.
- Livestock Producers aware of risks to worker health in operations under their supervision, including mental health, hearing, sight, zoonoses, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Livestock Producers aware of their liability for worker safety.
- Livestock Producers aware of training resources for chemical safety.
- Livestock Producers aware of training resources for worker health issues.
- Livestock Producers understand appropriate safety measures for safe chemical handling.
- Livestock Producers understand appropriate safety measures to protect worker health.
- Livestock Producers understand the benefits of comprehensive and consistent safety training.
- Medical Personnel aware of agricultural exposures.
- Ornamental Hort Producers aware of basic first-aid and emergency response procedures.
- Ornamental Hort Producers aware of hazards of chemicals used in operations under their supervision.

- Ornamental Hort Producers aware of resources to create safety training programs.
- Ornamental Hort Producers aware of their liability for worker safety.
- Ornamental Hort Producers aware of training resources for chemical safety.
- Ornamental Hort Producers aware of training resources for worker health issues.
- Ornamental Hort Producers aware of worker health risks in hort operations, including mental health, hearing, sight, infectious disease, allergic reactions, dust inhalation, and repetitive motion
- Ornamental Hort Producers understand appropriate safety measures for safe chemical handling.
- Ornamental Hort Producers understand appropriate safety measures to protect worker health.
- Ornamental Hort Producers understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Ornamental Hort Producers understand the benefits of comprehensive and consistent safety training.
- Ornamental Hort Producers understand the benefits of safer tractor operations.
- Ornamental Hort Producers understand the risks of specific tasks carried out under their supervision.
- Ornamental Hort Producers understand the risks of tractor operation and the means of prevention.
- Ornamental Hort Producers understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Poultry Producers aware of basic first-aid and emergency response procedures.
- Poultry Producers aware of hazards of chemicals used in operations under their supervision.
- Poultry Producers aware of resources to create safety training programs.
- Poultry Producers aware of risks to worker health in operations under their supervision, including mental health, hearing, sight, zoonoses, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Poultry Producers aware of their liability for worker safety.
- Poultry Producers aware of training resources for chemical safety.
- Poultry Producers aware of training resources for worker health issues.
- Poultry Producers understand appropriate safety measures for safe chemical handling.
- Poultry Producers understand appropriate safety measures to protect worker health.
- Poultry Producers understand the benefits of comprehensive and consistent safety training.
- Poultry Producers understand the risks of specific tasks carried out under their supervision.
- Small Farm Owners aware of age- and capability-appropriate task assignment.
- Small Farm Owners aware of basic first-aid and emergency response procedures.
- Small Farm Owners aware of electrical hazards to which they may be exposed.
- Small Farm Owners aware of hazards of chemicals used in operations on their farm.
- Small Farm Owners aware of hazards of handling livestock, including zoonotic diseases and allergic reactions.
- Small Farm Owners aware of health risks in operations they perform, including mental health, hearing, sight, infectious disease, allergic reactions and repetitive motion.
- Small Farm Owners aware of how to create a safe environment for farm children.
- Small Farm Owners aware of resources to create safety training programs.
- Small Farm Owners aware of risks to child health in operations they are asked to perform, including mental health, hearing, sight, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Small Farm Owners aware of safety risks to children in operations under their supervision.
- Small Farm Owners aware of training resources for chemical safety.
- Small Farm Owners aware of training resources for child safety.
- Small Farm Owners aware of training resources for electrical safety.
- Small Farm Owners aware of training resources for livestock safety.
- Small Farm Owners aware of training resources for safety in confined spaces.

- Small Farm Owners aware of what constitutes a confined space and hazards of working in confined spaces.
- Small Farm Owners understand appropriate safety measures for safe chemical handling.
- Small Farm Owners understand appropriate safety measures for safe livestock handling.
- Small Farm Owners understand appropriate safety measures for working with and around electricity.
- Small Farm Owners understand appropriate safety measures to protect their health.
- Small Farm Owners understand appropriate safety procedures for working in confined spaces.
- Small Farm Owners understand gases that might be encountered in agricultural settings.
- Small Farm Owners understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Small Farm Owners understand the benefits of safer tractor operations.
- Small Farm Owners understand the benefits of safety training.
- Small Farm Owners understand the risks of specific tasks carried out on their farms.
- Small Farm Owners understand the risks of tractor operation and the means of prevention.
- Small Farm Owners understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Workers aware of basic first-aid and emergency response procedures.
- Workers aware of electrical hazards to which they may be exposed.
- Workers aware of hazards and risks associated with livestock handling.
- Workers aware of hazards and risks associated with specific chemicals they may come into contact with.
- Workers aware of hazards and risks associated with Tractor/ Vehicle operation.
- Workers aware of hazards and risks associated with working in confined spaces.
- Workers aware of health precautions appropriate to working with livestock, including zoonotic diseases and allergic reactions.
- Workers aware of right-to-know and aware of specific chemicals that might be encountered in tasks they are asked to undertake.
- Workers aware of risks to worker health in operations they are asked to perform, including mental health, hearing, sight, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Workers aware of safety measures appropriate to chemical handling, including knowledge of safety equipment.
- Workers aware of safety measures appropriate to livestock handling.
- Workers aware of safety measures appropriate to Tractor/ Vehicle operation.
- Workers aware of safety procedures and equipment appropriate to working in confined spaces.
- Workers aware of their rights to adequate training and safety equipment.
- Workers aware of what constitutes a confined space.
- Workers understand appropriate safety measures for working with and around electricity.
- Workers understand appropriate safety measures to protect their health.
- Workers understand appropriate safety procedures for working in confined spaces.
- Workers understand gases that might be encountered in agricultural settings.
- Workers understand the safety and health risks of operations they are asked to perform and environments they are asked to work in.

Key Program Components

Florida's Performance Goal

To Enhance and Maintain Agricultural and Food Systems

Agricultural Profitability and Sustainable Use of Environmental Resources

- Production Management Practices
  - Crop/Animal Nutrition Management
  - Variety/Cultivar/Rootstock/Breed and Selection
  - Irrigation/Water Management (sources & quality)
  - Waste Management
  - Herd Health/Welfare
  - Precision Agriculture
  - Organic Agriculture
  - Grades/Standards
  - Conservation Tillage
  - Rotation
  - Best Management Practices
  - Reproduction
- Pest Management/Crop Protection
  - Insect Management
  - Disease Management
  - Weed Management
  - Nematode Management
  - Application Technologies
  - Rodent/Mammal/Bird Management
- Business Management
  - Human Resource Management
  - Budgeting/Financial Management
  - Risk management tools
  - Tax-Incentive Farming
  - Personnel Documentation
  - Worker Training
- Value Added Processes
  - New Processes/Products
  - By-product Utilization
- Policy/Trade
  - Exports/Imports
  - Product/Price Support Programs
- Marketing
  - Marketing Methods
  - Organic Packaging and Marketing
  - Niche Marketing
- Harvesting/Processing
  - Crop Maturity
  - Crop Quality Management
  - Harvesting Efficiency/Cost
  - Post-Harvest Handling Practices and Treatments
  - Packinghouse Equipment and Facilities
  - Processing Technology

- Environmental Stewardship
    - Water Quality/Quantity
    - Waste Management
    - Soil Conservation Practices
    - Air Quality
    - Habitat Preservation/Enhancement
- Regulatory
    - Land Management
    - Comprehensive Land Use Plan
    - Water Use Issues
    - Regulatory Compliance
    - Chemical Storage (Pesticides/Fertilizer/Fuel)
- Climate/Weather
    - FAWN / Weather Data
    - Irrigation
    - Cold Protection Implementation Incl. Water Use Decisions
    - Flowering/Fruit Set
    - Disease Models

Awareness of Agriculture's importance to an economy that ranges from local to global

- Role Of Agriculture In Local And Regional Economies
    - Concepts and uses of economic impact analyses
    - Economic impact of agriculture and natural resources
    - Employment and community development
    - Trade issues
    - Fiscal impacts
- Environmental Issues
    - Environmental amenities of agriculture and natural resources
      Impacts:
      on land, water and air resources
    - Ecotourism and recreational use of agricultural lands
- Consumer Education And Public Relations
    - Florida agricultural heritage
    - Role of science-based information in agriculture
    - Diversity of agricultural products
    - Access to a safe and affordable food supply
    - Natural resource educational programs

Processing, Distribution, Safety and Security of Food Systems

- Food Safety
    - Good Agricultural Practices (GAPs)
    - Good Retail Practices (GRPs)
    - Good Manufacturing Practices (GMPs)
    - HACCP
    - Consumer Food Safety
- Food Security
    - Food Security
- Food Quality and Technology
    - Processing
    - Product Development and Analysis
- Regulations
    - Regulations

Plant, Animal and Human Protection

- Integrated Pest Management (IPM)
  - IPM Procedures
  - Prevention in IPM
  - Cultural Practices
  - Biological Control
  - Chemical Control
  - Systems Integration
  - Scouting
- Diagnostics (FPDN)
  - Identification and Diagnosis
  - Monitoring and Sampling
  - Distance Diagnostics (DDIS)
  - Interpretation of Diagnostic Results and Recommendations
  - Rule-based Decision Aids and IT
  - Diagnostic Services
- Agrosecurity
  - Prevention in agrosecurity
  - Mitigation
  - Response
  - Recovery
  - Select Agents (exotic pests)
  - Impact on Trade
- Impact of Pest Management on Humans and Natural Resources
  - Impact of Pest Management on Humans and Natural Resources
- Pesticide Safety Education (PSE)
  - Pesticide Label Comprehension
  - Pesticide Product Characteristics
  - Chemical Safety and Security
  - Pesticide User Safety
  - Pesticides and Environmental Protection
  - Principles of Pest Control
  - Pesticide Application Methodology
  - Pesticide Law and Regulations
  - Agricultural Worker Protection
  - Category Specific Certification / Recertification
- Exotics and Invasives
  - Recognition
  - Distribution
  - Invasiveness
  - Prevention, Removal, Replacement
  - Human Contribution to the Problem
  - Economics and Impact

Florida's Performance Goal

Processing, Distribution, Safety and Security of Food Systems

Subject To be Taught Outcomes

Consumer Food Safety

- Better food handling practices

Food Security
- Understanding of food regulations

Good Agricultural Practices (GAPs)
- Better food handling practices
- Improved food quality

Good Manufacturing Practices (GMPs)
- Better food processing
- Improved food quality

Good Retail Practices (GRPs)
- Better food handling practices
- Improved food quality

HACCP
- Better food handling practices
- Understanding of food regulations

Processing
- Better food processing
- Improved food quality

Product Development and Analysis
- Improved food quality Regulations
- Understanding of food regulations

Florida's Performance Goal

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

- Tools For A Healthy Lifestyle
  - Healthy Food Preparation Techniques
- Elder Nutrition and Health
  - Avoiding Food/Drug and Drug/Nutrient Interactions
- Food Safety and Handling
  - Food Safety Basics
  - Food Managers Certification
  - Food Handler Training
  - Food Preservation
- Current Issues in Food Safety and Quality
  - Current Issues in Food Safety and Quality

Florida's Performance Goal:

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

Nutrition, Food safety and Health
- Tools For A Healthy Lifestyle
  - Nutrition Basics
  - Healthy Food Preparation Techniques
  - USDA Food Guide Pyramid

    - Dietary Guidelines for Americans
    - Food Label
    - Eating Well When Eating Out
    - Physical Activity
    - Managing Food Resources
- Weight Management
    - Healthy Food Preparation Techniques
    - Food Label
    - Eating Well When Eating Out
    - Physical Activity
    - Behavior Modification
- Promoting Cardiovascular Health
    - Risk Factors for Heart Disease and Stroke
    - Lifestyle Behaviors That Can Reduce Cardiovascular Disease Risk
    - Healthy Food Preparation Techniques
    - Food Label
    - Eating Well When Eating Out
    - Physical Activity
    - Health Screenings
- Cancer Risk Reduction
    - Lifestyle Behaviors That Can Reduce Cancer Risk
    - Healthy Food Preparation Techniques
    - Food Label
    - Eating Well When Eating Out
    - Physical Activity
    - Health Screenings
    - Risk Factors for Cancer
- Managing Type 2 Diabetes
    - Lifestyle Behaviors That Support Optimal Blood Glucose Control
    - American Diabetes Association Standards of Care
- Elder Nutrition and Health
    - Key Nutrition and Health Concerns in Older Adults
    - Misinformation and Quackery
    - Avoiding Food/Drug and Drug/Nutrient Interactions
    - Fall Prevention
- Maternal and Child Health
    - Nutrition for a Healthy Pregnancy
    - Nutrition for Breast Feeding Women
    - Feeding Infants
    - Feeding Young Children
- Current Issues in Food Safety and Quality
    - Current Issues in Food Safety and Quality
- Current issues in Nutrition and Health
    - Current Issues in Nutrition and Health

Florida's Performance Goal

To Maintain and Enhance Florida's Environment

Water Resources

- BMPs
    - Nutrients

        - Nitrogen
        - Phosphorus
        - Dissolved oxygen
    - Pesticides
        - Selection and use
        - Metals
    - Water
        - Conservation
        - Irrigation
        - Drainage
        - Retention
        - Reuse and recycling
        - Appliances and fixtures
        - Stormwater runoff
        - Ponds and lakes
        - Aquifer recharge
        - Salinity/fresh water
    - Soil
        - Conservation
    - Plants
        - Selection
        - Landscape design
        - Cultural practices
        - Fire
    - Waste
        - Solid waste disposal
        - Wastewater disposal
        - Biological contaminants
        - Pharmaceutical contaminants
        - Metals
    - Pollution prevention
        - Streamside buffers
        - Septic tank installation and maintenance
        - Well siting and maintenance
        - Shoreline maintenance
        - Identifying and managing point sources
- Watershed education
    - Hydrologic cycle
    - Land use patterns and impacts
    - Terrestrial and wetlands ecosystems
    - Policy and processes
    - Waste disposal
    - Habitat protection and creation
    - Nutrient management
    - Stormwater management
    - Impervious surfaces
    - Pasture management
    - Landscape management
    - Shoreline management

Conservation and Sustainable Use of Freshwater and Terrestrial Natural Resources and Ecosystems

- Understanding terrestrial and freshwater systems
    - Ecology of terrestrial systems
    - Ecology of freshwater systems
    - Ecology and biology of threatened, endangered and valued species
    - Importance of water quantity and quality
    - Importance of habitat quantity and quality
    - Importance of invasive species
    - Innovative science to study terrestrial and freshwater systems
- Understanding and improving human interactions with terrestrial and freshwater systems
    - Value of terrestrial systems
    - Value of freshwater systems
    - History, development, implementation and impact of policies and regulations for threatened and endangered species
    - History, development, implementation and impact of policies and regulations for water quantity and quality
    - History, development, implementation and impact of policies and regulations for habitat quantity and quality
    - History, development, implementation and impact of policies and regulations for invasive species
    - History, development, implementation and impact of other policies and regulations
- Environmentally and economically friendly management practices
    - Other environmentally and economically friendly management practices
    - Environmentally and economically friendly management practices for recreational fishing
    - Environmentally and economically friendly management practices for boating
    - Environmentally and economically friendly management practices for land use and ownership
    - Environmentally and economically friendly management practices for recreational hunting
    - Environmentally and economically friendly management practices for non-consumptive uses
    - Environmentally and economically friendly management practices for threatened and endangered species
    - Environmentally and economically friendly management practices for invasive species
    - Environmentally and economically friendly management practices for individuals
    - Restoring terrestrial and freshwater systems to an agreed state
    - Enhancing terrestrial and freshwater systems to an agreed state
    - Disaster preparedness
- Understanding and improving terrestrial and freshwater watershed links
    - Structure and function of watersheds
    - Watershed approach to management
- Promoting and supporting volunteer activities
    - LAKEWATCH monitoring and management
    - Cleanups
    - Restoration
    - Recycling
- Marketing UF/IFAS Extension and Florida Sea Grant
    - Marketing plans
    - Marketing activities

Environmental Education

- Engaging the audience
  - service learning
  - interactive projects
  - interactive presentations
  - meaningful evaluation
- Supporting Education Reform in Florida
  - SSS and FCAT correlations to extension programs
  - interdisciplinary programs
- Supporting community leaders
  - providing research-based information
  - conducting issue-based education programs
  - conflict resolution
  - building partnerships
  - media communication skills

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

- Understanding estuarine, coastal and marine systems
  - Ecology of estuarine, coastal and marine systems
  - Ecology and biology of threatened, endangered and valued species
  - Importance of water quantity and quality
  - Importance of habitat quantity and quality
  - Importance of invasive species
  - Innovative science to study estuarine, coastal and marine systems
  - Sponge Fishery Management
- Understanding and improving human interactions with estuarine, coastal and marine systems
  - Value of estuarine, coastal and marine systems
  - History, development, implementation and impact of policies for threatened and endangered species
  - History, development, implementation and impact of policies and regulations for water quantity and quality
  - History, development, implementation and impact of policies and regulations for habitat quantity and quality
  - History, development, implementation and impact of policies and regulations for invasive species
  - History, development, implementation and impact of other policies and regulations
- Environmentally and economically friendly management practices
  - Environmentally and economically friendly management practices for recreational fishing
  - Environmentally and economically friendly management practices for boating
  - Environmentally and economically friendly management practices for land use and ownership
  - Environmentally and economically friendly management practices for commercial fishing
  - Environmentally and economically friendly management practices for other marine sectors
  - Environmentally and economically friendly management practices for threatened and endangered species
  - Environmentally and economically friendly management practices for invasive species
  - Environmentally and economically friendly management practices for individuals
  - Other environmentally and economically friendly management practices

    - Restoring estuarine, coastal and marine systems to an agreed state
    - Enhancing estuarine, coastal and marine systems to an agreed state
    - Disaster preparedness
- Understanding and improving estuarine, coastal and marine watershed links
    - Structure and function of watersheds
    - Watershed approach to management
- Promoting and supporting volunteer activities
    - Project COAST monitoring and management
    - Cleanups
    - Restoration
    - Recycling
- Fostering the delivery of new value from estuarine, coastal and marine systems
    - Biotechnology
- Marketing UF/IFAS Extension and Florida Sea Grant
    - Marketing plans
    - Marketing activities

Florida's Performance Goal

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

Commercial Horticultural/Urban Forestry Services

- Pesticide Safety
    - Environmental Safety
    - Laws and Regulations
    - Calibration and Equipment
    - Human Safety
    - Labels and Formulations
    - Other
- Best Management Practices
    - Turfgrass Only
        - Turf Selection
        - Installation
        - Irrigation
        - Cultural Practices
        - Fertilization
        - Pest Management
        - Other
    - Landscape Ornamentals Only
        - Design
        - Plant Selection
        - Installation
        - Irrigation
        - Cultural Practices
        - Fertilization
        - Pest Management
        - Other
    - Landscape Ornamentals and Turfgrass
        - Design
        - Plant Selection
        - Installation
        - Irrigation
        - Cultural Practices

        - Fertilization
        - Pest Management
        - Other
- Business Management
    - Marketing
    - Labor issues
    - Budget and finance
    - General Management
- Diagnostic services
- Public policy issues
- Other

The Importance of Diagnostic Tools

- Plant Pest Diagnosis
    - landscape pest basics
    - plant pest cycles
    - relationship of pathogen and the disease
- Diagnostic Services
    - disease diagnosis and pest identification clinics
    - Extension agents and University specialists
    - distance diagnostics
    - EDIS publications
- Interpretation of diagnostics results
    - relationship of the pest and plant injury
    - sources for control options
- Landscape associated biosecurity risks
    - Southern Plant Diagnostic Network
    - select agents and hosts

Residential Landscapes: Under construction

Florida's Performance Goal

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

Life Skills Developed in Youth Through Subject Matter Experiences

- Agricultural Awareness and Literacy
    - Agricultural Literacy/Ag in the Classroom
- Animal Sciences
    - Animal Science Education
    - Livestock
    - Equine
    - Poultry and Embryology
- Environmental Ecology and Natural Resource Conservation
    - Environmental Ecology and Natural Resource Conservation
    - Entomology
    - Forestry
    - Marine and Aquatic Education
    - Wildlife Ecology
- Outdoor Education
    - Shooting Sports/Personal Safety

    - Sportfishing
- Plant Sciences
    - Gardening, Horticulture, and Plant Science Education
- Citizenship
    - Civic & Government Education
    - Community Engagement & Volunteerism
    - Diversity & Multi-Cultural Education
- Communication Skills
    - Interpersonal Communication Skills
    - Presentation and Public Speaking Skills
- Leadership
    - Personal Development
    - Leadership Education
    - Youth/Adult Partnerships
- Leisure Arts and Recreation
    - Performing Arts
    - Recreation, Leisure Arts & Photography
- Science and Technology
    - Science and Technology Education
- Healthy Lifestyles Choices
    - Foods, Nutrition and Food Safety
    - Healthy Lifestyle Choices and Health and Safety Education Programs
- Individual & Family Resources
    - Child Development
    - Clothing
    - Consumer Education
    - Financial Literacy
    - Personal Development

Organizational Strategies and Learning Environments to Support Youth

- Best Practices For Program Delivery Strategies in Community Based Youth Programs
    - Organizing and Managing Community Clubs
    - Organizing and Managing School Enrichment Programs
    - Organizing and Managing 4-H Camp Programs
    - Organizing and Managing Special Interest Programs
    - Organizing and Managing Competitive Events Programs
    - Organizing and Managing Afterschool Clubs/Programs

Volunteer Development and Systems to Support Youth

- Understanding diversity
    - Understanding race, ethnicity, culture
    - Understanding physical and mental abilities
    - Being inclusive of religion, styles, status, philosophy
- Key Project Volunteers
    - Science Projects
    - Livestock Projects
    - Leadership Projects
    - Small Animal Projects
    - Food and Nutrition
    - Environmental Sciences
    - Horsemanship

    - Communication Arts, Sciences
    - Individual and Family Resources
    - Plant Sciences
    - Career Development
- Program Safety and Liability
    - Volunteer Screening
    - Planning safe events and activities
    - Child Protection Procedures
- Youth/Adult Partnerships
    - Mentorship
    - Developing Adult Leadership Skills
    - Developing Youth Leadership Skills
    - How to work in youth and adult partnerships
- Volunteer management systems
    - Volunteer ISOTURE
    - Expanding volunteer recognition
- How to Guide Learning
    - Positive Youth Development
    - Teaching and Learning with the Experiential Model
- Club Management
- How to Evaluate Youth Learning through Interview Judging

Florida's Performance Goals

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

Personal and Family Well-Being

- Family Development
    - Family relations
    - Balancing work/family
    - Preparing for parenthood ("Before You Tie the Knot" curriculum)
    - Understanding and building relationships ("Grandparents Raising Grandchildren" curriculum)
- Child/Youth Development
    - Leadership
    - Teamwork
    - Ways to build self-esteem in children
    - Physical and intellectual development
    - Social and emotional development
- Adult/Elder Development
    - Grief
    - Caregiving
    - Later-life marriage
    - Legal issues ("Grandparents Raising Grandchildren" curriculum)
    - Community resources ("Grandparents Raising Grandchildren" curriculum)
    - Fall Prevention ("Aging in the 21st Century" curriculum)
    - Family Relationships in Later Life ("Aging in the 21st Century" curriculum)
    - Wandering and Alzheimer's Disease ("Aging in the 21st Century" curriculum)
    - Financial Issues ("Aging in the 21st Century" curriculum)
    - Adapting the Home ("Aging in the 21st Century" curriculum)
- Career Development
    - Safe, healthy learning environments
    - Relationships with families

    - Program management
    - Professionalism
    - Observations
    - Train the trainer
    - The Future of Aging is Florida (“Aging in the 21st Century” curriculum)
    - Elder Nutrition (“Aging in the 21st Century” curriculum)
    - Designing educational programs for older adults (“Aging in the 21st Century” curriculum)
- Communication
    - The communication puzzle ("Success and the Single Parent" curriculum)
    - Positive communication skills
    - Communication ("Before You Tie the Knot" curriculum)
- Behavior Management
    - Understanding and guiding your grandchild’s behavior ("Grandparents Raising Grandchildren" curriculum)
    - Age appropriate behavior
    - Ways to prevent misbehavior
    - Positive discipline alternatives
    - Understanding children’s behavior ("Success and the Single Parent" curriculum)
- Self-Development
    - Conflict resolution
    - Anger management
    - Stress managing techniques
    - Time management
    - Taking care of yourself ("Success and the Single Parent" curriculum)
    - Grief
- Family Finances
    - The money crunch ("Success and the Single Parent" curriculum)
    - Financial management ("Before You Tie the Knot" curriculum)

Financial Management and Economic Well-Being

- Consumer Competency
    - Shopping
    - Consumer Choices
    - Consumer Rights, Responsibilities, and Laws
    - Frauds, Scams, and Deceptions
- Credit/Debt Management
    - Credit Report/Score
    - Contracts/Transactions
    - Credit Card Obtaining/Selection/Use
    - Debt Problems/Solutions
- Marketplace Performance
    - Advertising
    - Store Policies
    - Selling Methods and Options
- Consumer Safety
    - Safety Belt Program
    - Home Related
    - Emergency Preparedness
- Financial Security Later in Life
    - Wills, Trusts, and Estate Planning

    - Transferring Property
    - Taxes
    - Retirement Planning
    - Legal Documents
- Financial Literacy
    - Bank Services
    - Record Keeping
    - Budgeting
- Investing For Your Future
    - Savings
    - Wealth Building
    - Investment Strategies
- Protecting Your Assets
    - Life Insurance
    - Health Insurance
    - Disability Insurance
    - Property and Liability Insurance
    - Long-Term Health Care
    - Household Inventory
    - Umbrella Insurance
    - Social Security
    - Important Papers
- Human Capital and Workforce Preparation
    - Identify Career Options
    - Preparing for a Job Interview

Housing and Environment

- Home Ownership Affordability
    - Repair Credit/Debt Management
    - Financing/Mortgage
    - Family Spending Plan
- Maintenance/Upkeep/Renovation
    - Upkeep/Cleaning/Pest Management
    - Simple Repairs
    - Special Needs Adaptation
- Home Furnishings/Interior Design
    - Selection/Care/Use of Appliances
    - Selection/Care/Stain Removal
    - Decorating, Interior Design
    - Universal Design
- Home Purchasing/Housing Options
    - Rental/Leases
    - The Purchasing Process
    - Locating/Selecting Home Financing
- Home Environment
    - Energy, Water Conservation/Quality
    - Closing Your Florida Home
    - Indoor Environmental Quality
    - Lead Concerns/Issues
- Home Building/Remodeling: Construction
    - Environmentally Efficient Construction

    - Structural Durability
    - Energy Efficient Construction
    - Financing
- Home Building/Remodeling: Regulatory Issues
    - Building Codes/Other Related Regulations
    - Lead and Construction
    - Workers Compensation, Insurance, etc
    - Occupational Safety and Health Act
- Safety
    - Home Safety
    - Hurricane Preparedness
- Fraud/Financial Risks
    - Home Equity Loans
    - Deceptive Practices

Florida's Performance Goals

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

Economic Development and Community Services and Infrastructure

- Growth Management
    - Smart Growth Principles
    - Housing
    - Land use planning and conservation
    - Transportation
    - Coastal zone management
- Public Policy Analysis
    - Public Issues Education
    - Issue Analysis
- Economic Development
    - Business Retention and Expansion
    - Entrepreneurship Education
    - Business Planning
    - Marketing
    - Customer Service
    - Tourism Development
    - Understanding the Local Economy
- Community Decision Making
    - Visioning
    - Planning
- Leadership Development
    - Assessing your leadership styles
    - Conflict Resolution
    - How to be a Leader
- CED work w/county leaders

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

- Growth Management
    - Smart Growth Principles
    - Housing
    - Land Use Planning and Conservation
    - Transportation
    - Coastal Zone Management

- Public Policy Analysis
    - Public Issues Education
    - Issue Analysis
- Economic Development
    - Business Retention and Expansion
    - Entrepreneurship Education
    - Business Planning
    - Marketing
    - Customer Service
    - Tourism Development
    - Understanding the Local Economy
- Community Decision Making
    - Visioning
    - Planning
- Leadership Development
    - Assessing your Leadership Styles
    - Conflict Resolution
    - How to be a Leader
- CED work with County Leaders

Community Preparedness

- Preparedness
- Survival
- Recovery
- Special Disaster Topics
- Survival Topics

Safety for Agricultural Operations and Equipment

- General Safety
    - Safety Awareness
    - Worker Health
- Safety Topics
    - Tractor/Vehicle Safety
    - Livestock Safety
    - Chemical Safety
    - Confined Spaces
    - Electrical Safety
- Child Safety and Health
    - Child Safety
    - Child Health
- Safety Standards
    - OSHA Standards

Target Audiences

Florida's Performance Goal

To Enhance and Maintain Agricultural and Food Systems

- General Public
  - Consumers
  - Media
  - Residents
  - Non-residents
  - NEW
- Producers
  - Commodity Associations
  - Owners/Operators
  - Managers/Supervisors
  - Workers/Laborers
  - Allied Industry Representatives
  - Small Farmers
- Government/Regulatory
  - County Government/Regulatory
  - State Government/Regulatory
  - Federal Government/Regulatory
  - Tribal Government/Regulatory
  - Elected Government/Regulatory
  - International Government/Regulatory
- Harvesting/Packing/Processing/Distribution
  - Harvesters/Packers
  - Processors
  - Distributors/Transporters
  - Retailers
  - Importers/Exporters
- Youth
  - 4H(K-12)
  - Other Youth
  - Youth Educators
- Extension Faculty
  - County Extension Faculty
  - State Extension Faculty

Florida's Performance Goal

Processing, Distribution, Safety and Security of Food Systems

- General public
  - Consumers
  - Mass media
  - Residents
  - Non-residents
- Producers

    - Commodity Association
    - Managers/Supervisors
    - Owner/Operator
    - Workers
    - Allied Industry
- Government/Regulatory
    - Elected Officials
    - County Agencies
    - State Agencies
    - Federal Agencies
    - Tribal Agencies
    - International
- Harvesting/Processing/Distribution
    - Harvesting
    - Distribution/Transportation
    - Retail
    - Imports/Exports
    - Processing
- Youth
    - 4-H Youth
    - Youth, Other
    - Youth Educators
- Extension Faculty
    - County Faculty
    - State Faculty

Florida's Performance Goal

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

- Consumers
    - Elders
    - Children
    - Middle school and high school youth
    - Pregnant and Parenting Teens
    - Parents and caregivers
    - Young to middle-aged adults
    - Children, youth, and adults with limited resources
    - Individuals with compromised immune systems
- Food service establishments
    - Food Managers
    - Food Handlers
- Policy Makers and Community Leaders
    - School board members
    - Elected officials
- Educators and Volunteers
    - School Teachers
    - County Extension Faculty
    - State Extension Faculty
    - Family and Community Educators (FCE)
    - Master Gardeners
    - Master Nutrition/Food Safety Educator Volunteers

- 4-H Leaders
- Paraprofessionals
- Extension Advisory Committees
- Agencies and Organizations

Florida's Performance Goal:

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

Nutrition, Food safety and Health

- Consumers
  - Elders
  - Children
  - Middle school and high school youth
  - Pregnant and Parenting Teens
  - Parents and caregivers
  - Young to middle-aged adults
  - Children, youth, and adults with limited resources
  - Adults with type 2 diabetes
  - Overweight and obese adults
  - Adults with blood pressure and/or blood lipid concerns
  - Adults with family history of cancer or concerns about cancer
  - Individuals with compromised immune systems
- Food service establishments
  - Food Managers
  - Food Handlers
- Policy Makers and Community Leaders
  - School board members
  - Elected officials
- Educators and Volunteers
  - School Teachers
  - County Extension Faculty
  - State Extension Faculty
  - Family and Community Educators (FCE)
  - Master Gardeners
  - Master Nutrition/Food Safety Educator Volunteers
  - 4-H Leaders
  - Paraprofessionals
  - Extension Advisory Committees
  - Agencies and Organizations

Florida's Performance Goal

To Maintain and Enhance Florida's Environment

Water Resources

- Agriculture and horticulture producers
  - Farm managers
  - Farm laborers
- Natural resource managers
  - Public land managers

    - Private land managers
- Permanent residents
    - Ranchette and rural homeowners/renters
    - Urban single-family homeowners/renters
    - Multi-family housing owners/renters
    - Property managers
    - Youth/students
    - Coastal communities
- Seasonal residents
    - Seasonal owners/renters
    - Tourists
- Industry
    - Ag/hort support services and supply
    - Hospitality
    - Landscape maintenance
    - Manufacturing
    - Construction
    - Produce packinghouses and processors
    - Waste generators and haulers
- Recreation managers
    - Golf course and sports turf managers
    - Water-based (Marinas and charter boats)
- Government agencies
    - Municipalities
    - Policymakers
    - Water managers
    - Military
- Technical service providers
    - Consultants
    - Landscape designers/architects
    - Irrigation design/installation
- Non-government organizations
    - Environmental groups
    - Service organizations
- Educators
    - State and county extension faculty
    - School teachers

Conservation and Sustainable Use of Freshwater and Terrestrial Natural Resources and Ecosystems

- Recreational fishing sector
    - Fishing tournament organizers
    - Adult participants in fishing tournaments
    - Youth participants in fishing tournaments
    - Charter boat operators
    - Fishing guides
    - Bait and tackle shop retailers
    - Fishing clubs
    - Recreational fishers
- Boating sector
    - Navigational districts
    - Port authorities

    - Marina operators
    - Boatyard operators
    - Eco-tourism providers
    - Boat and boat supply retailers
    - Boating groups
    - Recreational boaters
- Recreational hunting sector
    - Hunting guides
    - Hunting shop operators
    - Hunting clubs
    - Land owners managing for hunting
    - Recreational hunters
- Non-consumptive recreation sector
    - Hiking clubs
    - Hikers
    - Wildlife and birdwatching groups
    - Wildlife and bird observers
    - Dive clubs
    - Divers
- Land owners, users and developers
    - Rural, suburban and urban single family owners
    - Suburban and urban multi-family owners
    - Rural, suburban and urban renters
    - Agricultural producers
    - Rural ranchette owners
    - Lakeshore residents
    - Private pond owners
    - Homeowner associations
    - Developers
    - Landscape designers and contractors
    - Environmental consultants
- Natural resource policy makers
    - Florida Bar Association
    - Municipal planners
    - County planners
    - Regional planners within the state
    - State planners
    - Municipal elected and appointed officials
    - County elected and appointed officials
    - State elected and appointed officials
    - Federal elected and appointed officials
- Natural resource managers and regulators
    - Municipal managers
    - County managers
    - Regional managers within the state
    - State managers
    - Multi-state regional managers
    - Place-based management partnerships
    - Federal managers
    - International managers
    - Private property managers

- Opinion leaders
    - Non-governmental organizations
    - Master Gardeners
    - Environmental groups
    - Wildlife and bird observing groups
    - Conservation groups
    - Other community groups
- Educators and trainers
    - K-5 teachers
    - 6-8 teachers
    - 9-12 teachers
    - College faculty and other researchers
    - 4-H leaders
    - Extension faculty
    - Interpreters
    - Other non-formal educators
- Youth
    - K-5 students
    - 6-8 students
    - 9-12 students
    - College students
    - 4-H participants
    - Other youth groups
- Other segments of the public
    - Underrepresented groups
    - Interested public
    - Volunteers for cleanups
    - Volunteer monitors
    - Volunteer restorers
    - Other volunteers
    - Seasonal residents and tourists

Environmental Education

- Providers of youth and adult based EE programs
    - Extension agents
    - Teachers
    - Non-formal educators
    - Media
    - Partnering agencies and organizations

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

- Biotechnology sector
    - Biotechnology researchers
    - Biotechnology firms
- Recreational fishing sector
    - Fishing tournament organizers
    - Adult participants in fishing tournaments
    - Youth participants in fishing tournaments
    - Charter boat operators
    - Fishing guides
    - Bait and tackle retailers

    - Fishing clubs
    - Recreational fishers
- Commercial fishing sector
    - Commercial fishers
    - Seafood consumers
- Boating sector
    - Navigational districts
    - Port authorities
    - Marina operators
    - Boatyard operators
    - Eco-tourism providers
    - Boat and boat supply retailers
    - Boating groups
    - Recreational boaters
- Other marine related sectors
    - Public aquaria operators
    - Public aquaria visitors
    - Marine attractions operators
    - Marine attractions visitors
    - Dive shop operators
    - Divers
    - Surf shop operators
    - Surfers
    - Aquarium shop operators
    - Aquarists
    - Dive clubs
- Land owners, users and developers
    - Rural, suburban and urban single family owners
    - Suburban and urban multi-family owners
    - Rural, suburban and urban renters
    - Agricultural producers
    - Rural ranchette owners
    - Coastal residents
    - Homeowner associations
    - Developers
    - Landscape designers and contractors
    - Environmental consultants
- Natural resource policy makers
    - Florida Bar Association
    - Municipal planners
    - County planners
    - Regional planners within the state
    - State planners
    - Municipal elected and appointed officials
    - County elected and appointed officials
    - State elected and appointed officials
    - Federal elected and appointed officials
- Natural resource managers and regulators
    - Municipal managers
    - County managers
    - Regional managers within the state

    - State managers
    - Multi-state regional managers
    - Place-based management partnerships
    - Federal managers
    - International managers
    - Private property managers
- Opinion leaders
    - Non-governmental organizations
    - Master Gardeners
    - Environmental groups
    - Wildlife and bird observing groups
    - Conservation groups
    - Other community groups
- Educators and trainers
    - K-5 teachers
    - 6-8 teachers
    - 9-12 teachers
    - College faculty and other researchers
    - 4-H leaders
    - Extension faculty
    - Interpreters
    - Other non-formal educators
- Youth
    - K-5 students
    - 6-8 students
    - 9-12 students
    - College students
    - 4-H participants
    - Other youth groups
- Other segments of the public
    - Underrepresented groups
    - Interested public
    - Volunteers for cleanups
    - Volunteer monitors
    - Volunteer restorers
    - Other volunteers
    - Seasonal residents and tourists

Florida's Performance Goal

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

Commercial Horticultural/Urban Forestry Services

- Professional Horticulture Services/Urban Forestry
    - Recreational turf
    - Professional Horticulture Services
    - Retail and Allied Services
    - Business Owners and Managers
    - Tree Care
    - Pesticide applicators
    - Regulators and Policy Makers
    - Builders and Developers
    - Other

The Importance of Diagnostic Tools

- Florida Residents
    - Homeowners
    - Landscape managers
    - Master gardeners
    - Commercial diagnostic service
    - Lawn maintenance service
    - Landscape design, installation, and maintenance service
    - Urban forestry service
    - Private and public golf clubs
    - Parks and trails
- Solicitors of professional landscape services
    - Homeowners
    - Commercial residential property managers
    - Homeowners associations
    - Rental property managers
    - Business owners
    - Golf clubs
    - Beach resorts
    - Parks and trails (government agency)
    - Department of Transportation

Residential Landscapes: Under construction

Florida's Performance Goal

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

Life Skills Developed in Youth Through Subject Matter Experiences

- Youth
    - Youth all ages (K-12)
    - Youth, ages 8-18
    - Youth 5-7 (grades K-2) years of age
    - Youth 8-10 (grades 3-5) years of age
    - Youth 11-13 (grades 6-8) years of age
    - Youth 14-18 (grades 9-12) years of age
- Extension Staff and Faculty
- Donors
- Volunteers
    - Teachers
    - School Administrators
    - Judges/Coaches for Events and Activities
    - Club Volunteers
    - Teams of Volunteers
    - Certified, Master, or Key Project Volunteers
    - Resource Volunteers
    - Community Organizations
    - Youth Volunteers all ages

Organizational Strategies and Learning Environments to Support Youth

- Volunteers
    - Leaders
    - Teachers
    - Parents or Guardians
    - Youth
    - Resource Volunteers
- School Administrators
    - School Administrators
- Advisory Committee
    - Advisory Committee Members
    - 4-H Foundation
- Donors
    - Donors
- Extension Staff and Faculty
    - Extension Staff and Faculty
- Youth
    - Youth 5-7 (grades K-2) years of age
    - Youth 8-10 (grades 3-5) years of age
    - Youth 11-13 (grades 6-8) years of age
    - Youth 14-18 (grades 9-12) years of age
    - Youth all ages (K-12)
- Organizations
    - Community Organization

Volunteer Development and Systems to Support Youth

- Extension Staff and Faculty
- Volunteers
    - Teachers
    - Club Volunteers
    - Teams of Volunteers
    - Episodic Volunteers
    - Senior Volunteers
    - Certified, Master or Key Project Volunteers
    - Volunteers in Program Management Roles
    - Youth Volunteers all ages
    - Resource Volunteers
    - Community Organizations
    - Donors
    - Family Volunteers
    - Judges and coaches for events, activities
- Boards, Councils, and Committees
    - Boards, Councils, and Committees

Florida's Performance Goals

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

Personal and Family Well-Being

- Individuals/families
    - Families
    - Parents
    - Young Children
    - Youth

    - Couples
    - Caregivers
    - Individuals
    - Elders
    - Grandparents
- Practitioners
    - Family Service Providers
    - Child Care Providers
    - After School Providers
    - Elder Care Providers
    - Teachers
    - Volunteers

Financial Management and Economic Well-Being

- Youth
    - Low Income Youth
    - School-Aged Children
    - Elementary School Children
    - Middle School Children
    - Teens
- Adults
    - College Age/ Young Professionals
    - Low Income/Working Poor
    - Small Farm Families
    - Single Parents
    - Middle Income Adults
- Older Adults
    - Limited Income
    - New Florida Residents
    - Widows/Widowers

Housing and Environment

- Homebuyers
    - Prospective Homebuyers
    - First Time Homebuyers
    - Repeat Homebuyers
- Professional/Business
    - Building/Construction Professionals
    - Sales Professionals
    - Property Managers
    - Banking/Finance Professionals
    - Child Care Professionals
    - Developers
- General Public
    - Senior Citizens
    - Youth
    - Homeowners
    - Seasonal Residents
    - Limited Resource Families
    - Physically Challenged
    - Renters

Florida's Performance Goals

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

Economic Development and Community Services and Infrastructure

- Government
  - Local Government
  - State Government
  - Regional Agencies
- Non-Governmental Organizations
  - Economic Development Organizations
  - Chambers of Commerce
  - Non-Profit Organizations
- Individual citizens and citizen groups
  - Clubs, Community and Other Civic Organizations
  - Individuals
- Quasi-governmental Organizations
  - Economic Development Organizations
  - Tourism Development Councils
  - Housing Authorities
- Businesses
  - Small businesses
  - Minority Businesses
  - Home-based businesses

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

- Government
  - Local Government
  - State Government
  - Regional Agencies
- Non-Governmental Organizations
  - Economic Developmental Organizations
  - Chambers of Commerce
  - Non-Profit Organizations
- Individual Citizens and Citizen Groups
  - Clubs, Community and other Civic Organizations
  - Individuals
- Quasi-governmental Organizations
  - Economic Development Organizations
  - Tourism Development Organizations
  - Housing Authorities
- Businesses
  - Small businesses
  - Minority businesses
  - Home-based businesses

Community Preparedness

- Florida Residents
  - Boaters
  - Marina Owners
  - Adults/Families

    - Extension Agents
    - Workers
    - Coastal Residents
    - Children (6-13)
    - Non-English Speakers
    - Elders
    - Disabled
    - Agricultural Producers
    - Large Animal Owners
    - Small Animal Owners

Safety for Agricultural Operations and Equipment

- Large-scale Operations
    - Producers (Livestock)
    - Producers (Poultry)
    - Producers (Ornamentals)
    - Producers (Crops)
    - Employers/Managers
    - Workers
- Small-scale Operations
    - Farm Families
    - Children
    - Small Farms
- Non-farm Residents
    - Home Owners
- Support Functions
    - Emergency/Rescue/Medical Workers

IV ~ PROGRAMS AND PROJECTS LIST

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 (Extension) (1862, 1890)

Related 1862 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	

Awareness of Agriculture's Importance to an Economy That Ranges From Local to Global (Extension) (1862, 1890)

Related 1862 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	

Processing, Distribution, Safety and Security of Food Systems (Extension)(1862, 1890)

Related 1862 Research:

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

Plant, Animal and Human Protection

Related 1862 Research:

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

To Maintain and Enhance Florida's Environment (Extension)(1862, 1890)

Water Resources

Related 1862 Research:

ENH-03544	HOS-03832	SWS-03834

To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow (Extensiion)(1862, 1890)

Green Industries' BMPs Program
Related 1862 Research:

BRA-03544	BRA-03832	ENH-03544	FTL-03711	JAY-03609

Commercial Horticulture/Urban Forestry Service
Related 1862 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

The Importance of Diagnostic Tools

Related 1862 Research:

FTL-03423	LAL-03571

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 (Extension)(1862, 1890)

Plant, Animal and Human Protection
Related 1862 Research:
FME-03966

Processing, Distribution, Safety and Security of Food Systems

Related 1862 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

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality (Extension) (1862, 1890)

Nutrition, Food Safety, and Health
Related 1862 Research:

FOS-03456	FOS-03846	FOS-03910	FYC-03960	HOS-03559	PLP-03588

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 (1862, 1890)

Plant, Animal and Human Protection

Related 1862 Research:

BGL-03917	FME-03966	SWS-03919

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality (Extension) (1862, 1890)

Parenting, Families, and Care

Related 1862 Research:

BGL-03917	FOS-03513

Nutrition, Food Safety, and Health
Related 1862 Research:

BGL-03917	FME-03966	FOS-03515	FYC-03960	SWS-03919
FME-03477	FOS-03513	FOS-03840	FYC-03960	

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.

To Maintain and Enhance Florida's Environment (Extension) (1862, 1890)

Water Resources
Related 1862 Research:

ABE-03593	BRA-03544	HOM-04016	SWS-03596
ABE-04016	FOS-03548	LAL-03832	

Conservation and Sustainable Use of Freshwater and Terrestrial Natural Resources and Ecosystems
Related 1862 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	

Environmental Education
Related 1862 Research:

BGL-03917	HOM-04016	PLP-03305	SWS-03596

Conservation and Sustainable Use of Coastal and Marine Natural Resources and Ecosystems
Related 1862 Research:

ENH-03564	FRE-03863

The Smart Way to Grow

Residential Landscapes
Related 1862 Research:

FTL-03711	JAY-03609	SWS-03820

Commercial Horticulture
Related 1862 Research:

BRA-03524	ENH-03543	JAY-03609	LAL-03832	PLP-03305	SWS-03820

To Enhance and Maintain Agricultural and Food Systems (Extension)(1862, 1890)

Agricultural Profitability and the sustainable use of Environmental Resources
Related 1862 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	

Awareness of Agricultural importance to an Economy that ranges from local to global (1862, 1890)
Related 1862 Research:

FRE-03769

Plant, Animal and Human Protection
Related 1862 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

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 (Extension) (1862, 1890)

Housing and Environment

Related 1862 Research:
FYC-03923

To Develop Responsible and Productive Youth Through 4-H and Other Youth Programs (Extension)(1862, 1890)

Life Skills Development
Related 1862 Research:

Organizational Development
Research:

Volunteer Development
Research:

To Assist Individuals and Families Achieve Economic Well-Being and Life Quality (Extension) (1862, 1890)

Nutrition, Food Safety and Health

Related 1862 Research:

BGL-03917	FRE-03584	FRE-03660	FRE-04005

Parenting, Families, and Care
Related 1862 Research:

Financial Management and Economic Well-Being
Related 1862 Research:

FRE-03660	FRE-04005

Housing and Environment
Related 1862 Research:

BGL-03917	FTL-03423	FTL-03607

To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities (Extension)(1862, 1890)

Economic Development and Community Services and Infrastructure
Related 1862 Research:
ENH-03543 FRE-03599 FRE-03863

Civic Engagement, Growth, Leadership Development, and Community Decision Making
Research:
Community Preparedness
Research:

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
- Administration and Leadership

Goal 6 Improving Extension Performance (Human Capital) (Extension)(1862)

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

V ~ RESEARCH PROJECTS

FLA-ABE-03285

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

Critical Needs:

National Objectives: 1, 4

Key Themes: #jc95 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 60oC which is thought to be the upper limit for many microorganisms. We observed that methanogenic activity was higher at 55oC than at 60oC 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 projects 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 lose 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

FLA-ABE-03492

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 ware 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:
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 limpograss. 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:

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-ABE-04016

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

Critical Needs:

National Objectives: 4

Key Themes: environmental models; ecosystems; ecosystem management; watershed management; agricultural land; hydrologic models; water quality; nutrient transport; geographic information systems; pasture management; agricultural practices; best management practices; uncertainty; water flow; pollution control; engineering; water pollution

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, improves, and evaluates watershed models and other approaches for TMDL development and implementation to assess and control impacts of agricultural practices on water resources.

Progress:

FHANTM, EAAMOD, and ACRU2000 are being evaluated to determine their applicability for TMDL development in the Lake Okeechobee basin. The models are being tested using data from ongoing BMP demonstration projects on beef ranches in south Florida. FHANTM and EAAMOD were calibrated using runoff and water quality data from a 16-pasture research study started in 1998. Data from 1998-1999 were used in the calibration phase. Data from the same pastures for 2000-2001 were used as an independent verification of the models' performance in predicting runoff and nitrogen and phosphorus loadings from the pastures. Both models were accurate enough to perform screening applications, however neither model accurately tracked the variations in runoff and nutrient loads over the simulation period. Management activities performed on the pastures could not be represented adequately with either model. An initial application of the ACRU2000 model to these pastures indicated some model modifications needed to improve its performance on these sandy, flat, high-water-table pastures. Modification of ACRU2000 to implement these changes is currently in progress. Measurement of pasture runoff and water quality data are continuing in support of this model evaluation research and a new study is being installed on another ranch to provide larger watershed-scale research data for use in continuing model evaluation on a larger ranch scale.

Impacts:

Effective TMDL development and implementation requires knowledge of the effects of Best Management Practices proposed for use in meeting established TMDLs. Modeling tools are extremely valuable in this process because of the lack of adequate water quality and flow data to determine this information. Use of validated models in the development process will result in more efficient planning and more effective TMDL plans.

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; hydrosoil; sprouting; environmental factors; weed control; lakes; ponds; ecosystem management; vegetative propagation; natural areas; longevity; *invasive species; Endangered species;*

Summary:

The submersed aquatic weed hyrdilla 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 hydrosoils 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 hydrosoil 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 PENISULAR 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 genomics, 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 oril) 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 estrosu synchronization programs. This project will evaluate different combinations of estrous 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 estrous synchronization research is to develop an effective estrous 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 estrous 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. Combing 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 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 availability 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 offset this limitation. These strategies have been used jointly and singly to evaluate the best practices to implement as a way to improve transition period feed intake and metabolism. We have limited our research to those strategies that could be implemented 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 signaling 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 Colletotrichium acutatium, 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 in 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 Verticillim lecanii, Verticillium psaliotae, 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 methyl bromide 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 usage 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 the7-8th 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.) 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; lilium; foliage plants; *Plant genomics; plant*

germplasm; plant health; emerging 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 chrysanthemym chlorotic mottle viroid. Molecular and biological characteristics support its possible identity as a new viroid elonging to the Avsunviroidae family, genus Avsunviroid. Furthr 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 non-preferential 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 that 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

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:

.) 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 non-preferential 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 an 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

FLA-ENH-03595

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 ,e 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 ,e3 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 intermediate between the two extremes.

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

Source of Federal Funds: Hatch

FLA-ENH-03602

Title: *TAXONOMY AND BOISYSTEMATICS 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 totaling 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 overuse 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, bromosulfophthalein, 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 microsoimes, which had a subunit molecular weight of 27,000 Da. The transferease has an apparent Km value of 0.91 mM and a Vmax 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 Km value of 0.91 mM and a Vmax of 2.35 micromoles/min/mg protein (toward CDNB). GST-2 showed an apparent Km of 2.26 M and a Vmax of 3.00 micromoles/min/mg proterin (toward CDNB). GST-2 was not immnologically 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 C02, 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 non-target 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. Semielacher 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 0-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, 0-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 Hemicycliophoridae. 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 the 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 mapart. 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 whitefllies 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 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;*

Summary:

The 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 ELDERLYWOMEN*

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 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 nutriture 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 nutriture 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 carmelization, 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

FLA-FOS-03910

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 derivates. 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:h 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 labeling 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 labeling 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 AAEA 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 and 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 fishy (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 use 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 practives to produce marketable flowering plants will reduce fertilizer waste and nutrient run-off from greenhouses

Source of Federal Funds: Hatch

FLA-FTL-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; *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) [RWP1]. 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 Paratachardina 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 (Urocholoa subquadripara) 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 phytoxic 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

FLA-FTL-03711

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/m-2), 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

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 methyl bromide 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:

Two zoysia breeding lines have been selected for submission to the cultivar release committee

Impacts:

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 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 Phytophtora 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 production oospores production (major survival structure) occurred at 18oC, and production also occurred at 14, 20, 24 and 26oC, but not at 6, 12, 30 and 32oC. 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 us 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 VFSMOD-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 recumbent. 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 X 10 E6). 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 genomics; 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 that 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 an 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

FLA-JAY-03609

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 subquadripara), 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 detrmined. 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 mycorrhizae in crop growth under high P fertility is not established. The purpose is to establish the impact of mycorrhizae 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 mycorrhizae 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 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-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 methyl bromide 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 the sigE gene will be useful in selectively amplifying genes for a particular species, and should be useful for the environmental quantitation of different Pasteuria spp. and biotypes that are specific for different species of nematode.

Impacts:
Protocols for the immunodetection of endospores in soil have been further developed to determine the extent to which it is suppressive for infestation of a 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 replications 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.

Impacts:

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.

Source of Federal Funds: Hatch

FLA-ONA-04006

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 1box 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: #jc95 23; 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 mono-graph, 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 Otideaceae 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 INFECTINGNG 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; lilium; *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 (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 high 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 potexvirus and odontoglossum ringspot tobamovirus was detected in all 18 orchid collections surveyed in 1998-1999. Cymbidium ringspot tombusvirus, 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 tombusvirus 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. higginssii 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 PENISULAR 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 dry land 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 lastest 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 conrol 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 Bemesia argentofolii 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 efficious 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

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 coulter 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 coulter 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

VI ~ EXTENSION PROGRAMS

I. To enhance and maintain agricultural and food systems

Focus Area I-1

Title: *AGRICULTURAL PROFITABILITY AND THE SUSTAINABLE USE OF ENVIRONMENTAL RESOURCES:*
National Objectives: 1, 4
Key Themes: Adding Value to New and Old Agricultural Products, Agricultural profitability, Agricultural competitiveness, sustainable Agriculture, water quality,
Summary:

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.

Progress:
Accurate enterprise budgets and analysis
Adoption of alternative enterprises for increased profit or improved sustainability
Adoption of appropriate fertility programs
Adoption of appropriate varieties/breeds/cultivars/rootstock
Adoption of efficient irrigation systems and technologies
Adoption of improved planting practices
Attainment of advanced certification and/or license
Greater understanding and compliance with laws and regulations
Implementation of integrated pest management
Implementation of sustainable rotation systems
Improved efficiency and maintenance of agricultural machinery
Improved processing systems for agricultural products
Improved waste management practices
Improved water management
Increased accuracy of pest ID and control
Increased adoption of BMPs
Increased adoption of precision agriculture practices
Increased application of management practices that enhance product yield and efficiency

Increased communication and interaction with stakeholders
Increased knowledge of effective marketing practices for agricultural products
Increased knowledge of safe worker practices and improved labor safety
Increased management practices for prevention of agroterrorism and food safety issues
Increased public awareness of agricultural production practices
Increased safety of handling fuel, fertilizers, and pesticides
Increased use of record keeping systems
Increased value added product development
Increased wildlife habitat availability
Reduced contamination of natural resource systems
Understanding international competition and markets
Understanding of domestic and international policies

Impacts:

Correct identification of pests
Efficient use of water
Efficient utilization of animal waste
Improved pre- and post-harvest quality
Improved product yield
Improved public perception of production agriculture
Increased acreage of resistant crop/animal varieties
Increased consumer confidence
Increased economic return
Increased environmental benefits
Increased soil organic matter
Increased water quality
Participation in the political process
Reduced pest losses
Reduced pesticide use
Reduced soil erosion and crop damage

Source of Federal Funds: Smith-Lever

Focus Area I-2

Title: *AWARENESS OF AGRICULTURE'S IMPORTANCE TO AN ECONOMY THAT RANGES FROM LOCAL TO GLOBAL*

Critical Needs:

National Objectives: 1, 4

Key Themes: Agricultural profitability, Adding Value to New and Old Agricultural Products, Sustainable agriculture, wildlife management

Summary:

Florida's agriculture and natural resources industry comprises a wide array of economic activities. This industry represents numerous value-added stages, including production, processing, wholesale distribution, retailing, and associated inputs and services. Some of the major production groups are fruits and vegetables, livestock, meat and dairy, forestry, environmental horticulture, seafood, and sugar. In addition, a variety of input and service businesses provide critical supporting roles.

In 2002, the agriculture and natural resource industry generated over 60 billion dollars of output or sales impacts, $21 billion in exports, $3 billion in tax contributions and 650,000 jobs that provided $20 billion in labor income. These impacts are felt at local, state and international levels. For example, Palm Beach County has the largest agricultural receipts of any county in the eastern U.S. In some rural counties, agriculture is the largest

component of the economy. Much of Florida's agricultural produce is exported outside the state, contributing to a $1.5 trillion national agricultural economy.
In addition to these significant impacts, these industries provide the state with various non-monetary benefits, such as wildlife habitat, aquifer recharge areas and areas of open space. These environmental attributes also support the state's large eco-tourism industry. Surveys indicate that over 50 percent of visitors to Florida engage in some type of nature-related activities.
Many citizens in Florida lack an awareness of the importance of agriculture and natural resources to the state's economic, environmental, and social well-being. Agricultural awareness efforts create an informed voting public so that wise choices can be made that benefit Florida's citizens and visitors. Failure to adequately educate the general public could result in the loss of valuable and irreplaceable resources. Rapid population growth places increasing pressures on land, water and environmental quality. Another dimension of agricultural awareness is the tolerance and acceptance of production activities in areas close to urban populations.

Progress:

Greater appreciation for the goods and services from agriculture and natural resources
Greater political support for agriculture and natural resources
Increased awareness of economic impacts of agriculture and natural resources
Increased awareness of environmental impacts of agriculture and natural resources
Increased consumer confidence in Florida's agricultural products

Impacts:

Greater demand for locally produced products by consumers
Greater profitability and more stable producer incomes
Improved access to critical resources used in production
Improved access to domestic and international markets
More balanced policy decisions affecting A&NR
More stable supply of agricultural and natural resource products

Source of Federal Funds: Smith-Lever

Focus Area I-3

Title: *PROCESSING, DISTRIBUTION, SAFETY AND SECURITY OF FOOD SYSTEMS*

Critical Needs:

National Objectives: 1, 2

Key Themes: Plant Production Efficiency, Food Handling, Food safety, Food safety, food security, foodborne illness

Summary:

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 encompasses 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.

Progress:

Better food handling practices
Better food processing
Improved food quality
Understanding of food regulations

Impacts:

Better quality products
More secure food supply
Reduced foodborne illness
Safer food supply

Source of Federal Funds: Smith-Lever

Focus Area I-4

Title: *PLANT, ANIMAL, AND HUMAN PROTECTION*

Critical Needs:

National Objectives: 1, 2, 3, 4

Key Themes: animal health, emerging infectious diseases, invasive species, plant health, Food security, foodborne disease, food safety, food security, foodborne pathogen protection, Human Health,

Summary:

Progress:

Impacts:

Source of Federal Funds: Smith-Lever

II. To maintain and enhance Florida's environment

Focus Area II-1

Title: *WATER RESOURCES*

Critical Needs:

National Objectives: 1, 4

Key Themes: Drought prevention and Mitigation, nutrient management, water quality, plant production efficiency, precision agriculture

Summary:

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.

Progress:

General - BMP endorsement by state and local agencies

- General - BMP implementation
- General - Continued support for education
- General - Greater compliance with laws and regulations
- General - Increase in active stewardship of land and water
- General - Increased communication and interaction between stakeholders
- General - Increased knowledge, awareness, and understanding of water issues
- General - Increased participation in certification programs
- General - Less pollutants entering surface and groundwater
- General - Planning and decision-making processes involve a wider range of stakeholders
- General - UF/IFAS training programs attract key people
- Improved planning processes - Increased participation by UF/IFAS
- Improved planning processes - Models to improve management
- Improved planning processes - Natural resource inventories
- Nutrients - Adoption of nutrient management plans by producers
- Nutrients - Appropriate fertilizer management (storage, handling, sources, rates, application)
- Nutrients - Increased use of soil testing
- Pesticides - Appropriate pesticide management (material selection and application)
- Pollution prevention - Adoption of filter strips
- Soil - Reduced ditch/canal maintenance
- Soil - Reduced erosion
- Waste - Appropriate disposal of non-recyclable waste
- Waste - Recycling/reuse of waste materials
- Water - Adoption of efficient irrigation systems

- Water - Adoption of new technologies for water management
- Water - Appropriate water management (source, volume, scheduling, system efficiency/maintenance/calibration)
- Water - Improved water use efficiency
- Water - Installation or retrofitting of water saving appliances and fixtures
- Water - Reduced outflows
- Watersheds - Science-based policy making
- Watersheds - Wider stakeholder group provides input to manage natural resources

Impacts:
Better relationship between ag and urban or environmental groups
Conditions on permits that help maintain water quality/quantity
Continued/improved support for UF/IFAS
Development of economically and environmentally sustainable production systems
Downstream ecosystem recovery
Improved health and appearance of yards
Improved public image for agriculture
Improvement in comprehensive plans and development codes
Increased crop yields
Increased net farm income
Increased sea grass areas
Increased shellfish harvesting areas
Maintained or improved estuarine environments
Maintained or improved soil fertility/quality
Maintained or improved water quality
Maintained or improved water quantity
More sound decision-making
New and improved policies implemented
Reduced flooding
Reduced impacts on natural systems from recreational activities
Reduced labor costs
Reduced non-point source pollution
Reduced nutrient, pesticide, and metal concentrations/loadings to surface and groundwater
Reduced surface and groundwater withdrawals
Reduced water use
Restoration of natural hydrology and associated ecosystems
Sustainable renewal of ground water resources

Source of Federal Funds: Smith-Lever

Focus Area II-2

Title: *CONSERVATION AND SUSTAINABLE USE OF FRESHWATER AND TERRESTRIAL NATURAL RESOURCES AND ECOSYSTEMS*

Critical Needs:

National Objectives: 4

Key Themes: Agricultural waste management, drought prevention and mitigation, nutrient management, natural resources management, land use, nutrient management, soil erosion, soil quality, sustainable agriculture, water quality, wetlands restoration and protection, yard waste composting, aquaculture

Summary:
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:

1) develop policies that affect natural resources in Florida,

2) implement education, management, conservation, and restoration actions that influence natural resources and ecosystems in Florida, and

3) consume, enjoy, or otherwise benefit from the existence of natural resources and functional ecosystems in Florida.

Progress:

- Number of contact hours per participant in educational or training sessions
- Number of contact hours per volunteer
- Number of datapoints collected by volunteers
- Number of e-mail contacts from clientele
- Number of educational materials distributed
- Number of educational or training sessions
- Number of mail or fax contacts from clientele
- Number of newsletters distributed
- Number of office visits by clientele
- Number of participants in educational or training sessions
- Number of promotional materials distributed
- Number of telephone contacts from clientele
- Number of underserved or minority participants
- Number of uses of the mass media
- Number of visits to clientele
- Number of volunteer hours contributed
- Number of volunteer trainings
- Number of volunteers recruited
- Number of volunteers trained
- Number of web page hits
- Overall satisfaction with service - survey (1 to 5 ranking)
- Percentage increase in awareness or understanding - pre & post tests

- Percentage of participants indicating an increase in awareness or understanding – survey
- Potential number of mass media contacts

Impacts:

- Dollars saved - estimate
- Dollars saved - survey
- Number of management agencies using volunteer data
- Number of other organizations using UF/IFAS Extension and Florida Sea Grant materials, methods or other products
- Number of relevant management changes
- Number of relevant policy changes
- Number of relevant regulatory changes
- Percent of increased awareness or understanding retained - follow-up survey
- Percent of increased awareness or understanding retained - follow-up test
- Percentage increase in calls for and use of UF/IFAS and Florida Sea Grant products or services
- Percentage of knowledgeable individuals indicating a decrease in natural resource impacts - survey
- Percentage of knowledgeable individuals indicating a decrease in user conflicts - survey
- Percentage of knowledgeable individuals indicating an increase or improvement in public participation - survey
- Percentage of participants implementing recommended behavioral change - survey
- Percentage of targeted natural resources protected, restored or enhanced - survey

Source of Federal Funds: Smith-Lever

Focus Area II- 3

Title: *ENVIRONMENTAL EDUCATION*
Critical Needs:
National Objectives: 4, 5
Key Themes: Energy conservation, land use, sustainable agriculture, wildlife management, youth development/4-H,
Summary:
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).

Progress:

- Extension agents will use Best Practices for designing and delivering EE programs
- Extension volunteers will support environmental education programs
- Media outlets will increase coverage of local environmental topics and issues
- Media will receive well-conceived and useful news releases on environmental topics and issues
- Participants will appreciate the complexity and intricacies of Florida's environment
- Participants will be able and motivated to engage in community environmental issues
- Participants will enhance their community through environmental service projects
- Participants will have research-based information on environmental issues
- Participants will understand multiple perspectives on environmental issues
- Participants will use critical thinking skills in environmental problem solving
- Participants will use technology-based programs to promote environmental education
- Partnering agencies and organizations will use Extension materials and programs
- Teachers will use environmental education programs to meet SSS and help prepare youth for FCAT

Impacts:

- Florida citizens are better prepared to understand and engage in environmental problem solving
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Source of Federal Funds: Smith-Lever

Focus Area II-4

Title: *CONSERVATION AND SUSTAINABLE USE OF COASTAL AND MARINE NATURAL RESOURCES AND ECOSYSTEMS*

Critical Needs:

National Objectives: 4

Key Themes: water quality, weather and climate, sustainable agriculture, natural resources management, wetlands restoration and protection

Summary:

Florida is a saltwater state. The whole state falls within the legally defined coastal zone. Its estuarine, coastal and marine systems stretch further than all the other Atlantic states from Georgia to New England. Because they cover six degrees of latitude, Florida's estuarine, coastal and marine systems warrant targeted approaches to research, management, outreach and communications that translate generic information to local applications. Florida's estuarine, coastal and marine systems produce over $5 billion in fisheries and wildlife resources each year, buffer coastal areas from storms, absorb pollutants and provide amenities for coastal settlement, trade and tourism, including over 1 million boaters and divers per year. In addition, over 75% of Florida's population lives in its 35 coastal counties. Hundreds of thousands of acres of seagrass meadows, salt marsh grasses and mangrove forests are critical habitats for sea trout, redfish, oysters and blue crabs, and a total of 80%–90% of the state's commercial and recreational fishery species. If we want the benefits we derive to continue, then we all must act as knowledgeable and concerned stewards.

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. The sustainability of coastal systems and the value they provide requires an understanding of their natural functioning, responses to population growth, extractive and non-extractive uses and other anthropogenic pressures and responses to management efforts.

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:

1) characterize the 'wicked' nature of the problem;
2) translate existing scientific findings into potential solutions for testing, with science broadly defined to include physical, chemical, biological, economic, social and political approaches;
3) highlight critical gaps in our knowledge and research efforts to fill them;
4) facilitate innovative decision-making processes; and
5) 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.

Progress:

- Know status of sponge population
- Number of contact hours per participant in educational or training sessions
- Number of contact hours per volunteer
- Number of datapoints collected by volunteers
- Number of e-mail contacts from clientele
- Number of educational materials distributed
- Number of educational or training sessions
- Number of mail or fax contacts from clientele
- Number of newsletters distributed
- Number of office visits by clientele
- Number of participants in educational or training sessions
- Number of promotional materials distributed
- Number of telephone contacts from clientele
- Number of underserved or minority participants
- Number of uses of the mass media
- Number of visits to clientele
- Number of volunteer hours contributed
- Number of volunteer trainings
- Number of volunteers recruited
- Number of volunteers trained
- Number of web page hits
- Overall satisfaction with service - survey (1 to 5 ranking)
- Percentage increase in awareness or understanding - pre & post tests
- Percentage of participants indicating an increase in awareness or understanding - survey
- Potential number of mass media contacts

Impacts:

- Dollars saved - estimate
- Dollars saved - survey
- Number of management agencies using volunteer data
- Number of other organizations using UF/IFAS Extension and Florida Sea Grant materials, methods or other products
- Number of relevant management changes
- Number of relevant policy changes
- Number of relevant regulatory changes
- Percent of increased awareness or understanding retained - follow-up survey
- Percent of increased awareness or understanding retained - follow-up test
- Percentage increase in calls for and use of UF/IFAS Extension and Florida Sea Grant products or services
- Percentage of knowledgeable individuals indicating a decrease in natural resource impacts - survey
- Percentage of knowledgeable individuals indicating a decrease in user conflicts - survey
- Percentage of knowledgeable individuals indicating an increase or improvement in public participation - survey
- Percentage of participants implementing recommended behavioral change - survey
- Percentage of targeted natural resources protected, restored or enhanced - survey
- Sponge fishery managed in sustainable manner
  Source of Federal Funds: Smith-Lever

III. To develop responsible and productive youth through 4-H and other youth programs

Focus Area III-1

Title: *LIFE SKILLS DEVELOPED IN YOUTH THROUGH SUBJECT MATTER EXPERIENCES*

Critical Needs:

National Objectives: 5

Key Themes: youth development/4-H, Leadership training and development, communication skills, character/ethics education, workplace preparation- youth

Summary:

4-H utilizes a variety of project and subject matter skills to engage youth in areas of interest. Subject matter programs and projects, additionally, become the "vehicle" through which youth engage with other adults, become self-directed learners, set goals, make independent choices and decisions, and gain mastery and accomplishment from their experiences.

Florida 4-H programs target youth development "life skills" as outcomes for young people through the outreach education of subject matter educational programs and projects of the land-grant university. Youth will be able to:

- -Effectively communicate with others;
- -Develop and maintain positive relationships with others;
- -Process information to make effective decisions and positive choices;
- -Lead and contribute to others(peers, family, community);
- -Demonstrate marketable/productive skills for work and family life.

To develop marketable/productive skills for work and family life has been sited by Connel, Gambone, and Smith ( )as a major outcome for positive youth development. Learning to be productive: do well in school; develop positive outside interests and acquire basic life skills for work and family life is a basic transition from youth to adulthood. These skills transcend into economic self-sufficiency, positive family and social relationships and community involvement in adulthood.

Research studies indicate that the more internal assets and life skills/competencies youth build the more likely they are to grow up healthy, confident, responsible and are less likely to become engaged in risky behaviors.

Progress:

0 YOUTH DEVELOP POSITIVE PERSONAL COMPETENCIES
- a Youth demonstrate increased self-confidence.
- b Youth develop a positive attitude toward themselves and their future.
- c Youth demonstrate increased self-responsibility
- d Youth demonstrate character and adhere to a code of ethical principles
- e Youth will pursue safe and diverse recreational activities/hobbies.

1 YOUTH ENHANCE COMMUNICATION SKILLS
- a Youth organize thoughts into public presentations.
- b Youth enhance interpersonal communication skills(speaking, writing or listening)

2 YOUTH PROCESS INFORMATION TO MAKE EFFECTIVE DECISIONS AND CHOICES
- a Youth make informed decisions.
- b Youth demonstrate competencies in goal setting, planning or organizing.
- c Youth demonstrate wise use of resources.
- d Youth develop time management skills.

3 RELATIONSHIP SKILLS
- a Youth develop significant relationships with peers.
- b Youth develop significant relationships with adults.
- c Youth will show respect and consideration for others.
- d Youth and volunteers will value, respect, and practice an appreciation for diversity

4 YOUTH LEAD AND CONTRIBUTE TO OTHERS (peers, family, community)
- a Youth assume leadership roles as evidenced by helping/teaching others.
- b Youth are engaged in civic governance and community decision-making.
- c Youth contribute hours of volunteer service to communities.
- c Youth develop personal competencies of teamwork and cooperation.

5 YOUTH DEMONSTRATE MARKETABLE/PRODUCTIVE SKILLS FOR WORK OR FAMILY LIFE
- a Youth develop employability and workforce preparation skills.
- b Youth develop a positive attitude toward themselves and their future.
- c Youth demonstrate character and adhere to a code of ethical principles.
- d Youth will increase knowledge and skills related to clothing construction, care and selection.
- e Youth demonstrate increase knowledge, skills or improved practices for personal safety.
- f Youth will increase knowledge and skills related to financial stability.

6_a AGRICULTURAL /ENVIRONMENTAL SKILLS
- 1 Youth increase their knowledge of agricultural production and its importance for life.

2 Youth increase their knowledge and best practices for environmental stewardship and conservation of natural resources.
3 Youth will adopt conservation practices to sustain natural resources.

6_b YOUTH ENHANCE SKILLS IN ANIMAL SCIENCES
1 Youth demonstration ability to judge and select quality animals
2 Youth adopt best management practices for animal care
3 Youth adopt safe and ethical management practices for animal welfare.
4 Youth demonstrate ability to show and exhibit animals.

7 YOUTH DEMONSTRATE HEALTHY LIFESTYLE CHOICES
a_1 Youth demonstrate the ability to make healthy food choices
a_2 Youth increase knowledge and safe food handling practices.
b Youth will increase positive activities that promote physical health and well-being
c_1 Youth avoid situations or actions that would put them at risk.
c_2 Youth increase knowledge, skills and adopt best practices for firearm safety.

8 SCIENCE AND TECHNOLOGY SKILLS
a youth demonstrate ability to acquire, process and interpret data.
b Youth can demonstrate knowledge and application of scientific inquiry process.
c Youth demonstrate knowledge of biological principles of living organisms.

9_a LEADERSHIP SKILLS
1 Youth demonstrate attitudes, knowledge, and skills related to forming partnerships with adults.
2 Youth and adults will adopt best management practices for effective youth-adult partnerships.
3 Youth demonstrate involvement in community decision-making.
4 Youth assume leadership roles as evident by helping/teaching others
5 Youth exhibit leadership skills associated with serving as officers in clubs, committees, and councils.
6 Youth develop personal competencies of teamwork and cooperation

9_b CITIZENSHIP AND CIVIC ENGAGEMENT
1 Youth are engaged in civic governance and community decision-making
2 Youth demonstrate an understanding of the democratic process
3 Youth contribute hours of volunteer service to communities

9_Z-STAFF/VOLUNTEER TRAINING OUTCOMES
9Z1-Increased knowledge of events and opportunities
9Z2-Increased use of 4-H and youth development curriculum
9Z3-Developed curriculum to increase experiential learning opportunities
9Z4-Secure adequate, consistent financial resources to support programmatic efforts

Impacts:

- Youth and volunteers will value, respect, and practice an appreciation for diversity.
- Youth are actively engaged in their own development.
- Youth are physically and emotionally safe
- Youth develop a sense of belonging, in an inclusive environment
- Youth develop knowledge and skills necessary for work and family life.
- Youth develop personal competencies of decision-making, goal setting, planning, organizing, managing resources, and self.
- Youth grow and contribute as active citizens through service and leadership.
- Youth will develop and maintain positive relationship with adults

- Youth will develop and maintain positive relationships with others

Source of Federal Funds: Smith-Lever

Focus Area III-2

Title: *ORGANIZATIONAL STRATEGIES AND LEARNING ENVIRONMENTS TO SUPPORT YOUTH PROGRAMS*

Critical Needs:

National Objectives: 5

Key Themes: Leadership training and development, youth development/4-H

Summary:

Florida 4-H annually educates over 240,000 youth enrolled in programs in all 67 Florida counties, reaching youth 5 to 18 years of age. Programs include clubs, day camps, overnight camping programs, school enrichment, and after-school programs. The goal of organizational strategies and learning environments is to support youth programs through developing a structure that effectively manages staff and volunteers.

In an increasingly complex and competitive market for resources, it is important that youth programs be organized for efficient and effective delivery of the overall program. Effective and efficient programs leverage resources and expertise with other youth organizations to maximize outcomes and community impacts.

Progress:

- Adequate policies, procedures, and safeguards exist for all 4-H and youth activities
- Chartered 4-H Clubs
- Collaboration and partnerships in support of the 4-H program
- Developed curriculum to increase experiential learning opportunities
- Frequency of participation
- Knowledge of 4-H philosophy and mission
- Knowledge of events and opportunities
- Knowledge of UF/IFAS Extension philosophy and mission
- Participants contribute volunteer service to communities
- Participants demonstrate ability to acquire, process, and interpret data.
- Participants Demonstrate Citizenship And Civic Engagement.
- Participants demonstrate competencies in goal setting, planning, and organizing
- Participants Demonstrate Healthy Lifestyle Choices.
- Participants demonstrate increased self-responsibility
- Participants Demonstrate Leadership Skills.
- Participants Demonstrate Relationship Skills
- Participants Develop Positive Personal Competencies.
- Participants Enhance Communication Skills
- Participants Lead And Contribute To Others.
- Participants organize thoughts into public presentations.
- Participants Process Information To Make Effective Decisions And Choices.
- Participants report open and frequent communication and information flow
- Participation in 4-H and youth development programs
- Quality of youth programs
- Retention of in 4-H
- Secure adequate, consistent financial resources to support programmatic efforts
- Staff are trained to meet the needs of the 4-H and youth development program

- Use of 4-H and youth development curriculum

Impacts:

- Youth Are Physically And Emotionally Safe.
- Youth Develop A Sense Of Belonging, In An Inclusive Environment.
- Youth Develop Knowledge And Skills Necessary For Work And Family Life.
- Youth Will Develop And Maintain Positive Relationships With Others.

Source of Federal Funds: Smith-Lever

Focus Area III-3

Title: *VOLUNTEER DEVELOPMENT AND SYSTEMS TO SUPPORT YOUTH*

Critical Needs:

National Objectives: 5

Key Themes: youth development/4-H, Leadership Training and Development

Summary:

During 2003, over 13,889 adult volunteers and 1,204 teen volunteers shared their time, energy and talents in support of 4-H youth development programs in Florida. These Florida 4-H volunteers are steadfast in creating supportive environments for diverse youth and adults to reach their fullest potential. Volunteers frequently encounter new challenges and opportunities as they attempt to understand how to work effectively with diverse youth and adults, such as: language, philosophy, religion, income, style, status, education, age, gender, ethnic heritage, race, mental and physical abilities, and sexual orientation.

Last year, 2005 new volunteers became involved in 4-H. Because of the complexity of the program and varying degrees of volunteer management systems in place, all volunteers may not receive sufficient orientation and training to meet their needs and to effectively guide positive youth development using the experiential learning model. As a result, some methods, procedures and policies may appear inconsistent.

Further, 1574 volunteers provided project-specific education for youth, but due to the limited number of subject matter specialists at the state level, agents have few resources to support these valuable volunteers in project-specific education.

Numerous partnerships are being created to maximize the collaborative potential of youth and adults within the 4-H organization at the state, district, county, club and community levels. There are a variety of youth-serving organizations, and many are competing for the same pool of volunteers and financial resources. Florida 4-H programs suffer from a continual reduction of funding and other resources.

Currently there are opportunities for youth to apply volunteer skills, while working with adults in community service. There is even greater opportunity to promote and support in-depth civic engagement. To celebrate that community connection, 4-H groups need a mechanism to track these learning experiences.

Diversity education is an important element in the recruitment and retention of volunteers. The awareness and understanding of diversity will enable volunteers to more adequately meet the needs and interests of all 4-H youth and adults, including: language, philosophy, religion, income, style, status, education, age, gender, ethnic heritage, race, mental and physical abilities, and sexual orientation. By educating Florida 4-H volunteers, more diverse audiences will become interested and involved in the 4-H program.

Consistency in volunteer management systems across the state, district and county levels will create safer and more nurturing environments for youth to flourish while maximizing

resources. Volunteers need educational opportunities to create and model positive development in youth, volunteers and communities.
Key project volunteers will enhance the knowledge base of statewide, project-specific education consistent with positive youth development and the experiential learning model.
4-H will work collaboratively with other community organizations to share research-based education, strengthen the land grant network and achieve the goals of positive youth development and healthy communities. Youth/adult partnerships will increase the visibility of 4-H in communities, which will expand collaborations and increase opportunities for funding and other resources.
Youth and adult volunteers will be engaged in leadership development within the community. These youth/adult partnerships can serve as role ;models and their involvement can be a catalyst for others to participate in their communities. These partnerships will strengthen a community's capacity for positive youth development.
volunteers in an important element of recruitment and retention of volunteers. By educating Florida volunteers, more diverse audiences will become interested and involved.
2. Awareness of all manner of diversity will enable volunteers to meet the needs and interests of all 4-H youth and adults, including: language, philosophy, religion, income, style, status, education, age, gender, ethnic heritage, race, mental and physical abilities, and sexual orientation.
3. A consistent state-wide model for volunteer management systems will provide a safer environment for all participants and fewer potential liability issues.
4.Consistency in volunteer management systems across the state, district and county levels would maximize resources.
5. Volunteers need educational opportunities for positive development in youth, volunteers and communities.
6. Key project volunteers will enhance the knowledge base of statewide, project-specific education consistent with positive youth development and the experiential learning model.
7. Youth and adult volunteers will be engaged in leadership development within the community. These youth/adult partnerships can serve as role models and their involvement can be a catalyst for others to participate in their communities. These partnerships will strengthen a community's capacity for positive youth development.
8. 4-H will work collaboratively with other community organizations to share research-based education, strengthen the land grant network and achieve the goals positive youth development and healthy communities.
9. Youth/adult partnerships will increase the visibility of 4-H in the community, which will expand collaborations and increase opportunities for funding and other resources.

Progress:

- Extension professionals will have competency in volunteer management.
- Extension Youth Development professionals will understand the needs of adults and youth volunteers.
- Volunteers actively recruit diverse participants
- Volunteers adopt best management practices for safety and wellbeing
- Volunteers and Extension staff will demonstrate effective and appropriate teaching/learning methods.
- Volunteers and Extension staff will develop curriculum to increase experiential learning opportunities

- Volunteers and Extension staff will increase their knowledge of events and opportunities
- Volunteers and Extension staff will secure adequate, consistent financial resources to support programmatic efforts
- Volunteers understand how to create a caring environment for youth
- Volunteers will adopt best management practices related to diversity.
- Volunteers will increase skills in leadership and teamwork.
- Volunteers will increase their knowledge and skill is specific areas of subject matter.
- Volunteers will increase their knowledge and understanding of risk management practices
- Volunteers will increase use of 4-H and youth development curriculum
- Volunteers will partner in the management of local and state programs, in new expanded roles.
- Youth and adults will adopt best management practices for youth and adult partnerships

Impacts:

- 4-H organizational structure will increase youth adult partnerships.
- 4-H programs and groups will be inclusive of all families, volunteers and youth.
- 4-H programs and groups will function more effectively
- All 4-H program participants will be physically and emotionally safe.
- Community groups will make better decisions with involvement of youth partners
- Costs associated with litigation will be reduced
- Extension staff will work with volunteers to design new opportunities and creative roles for youth and adult.
- Fewer youth will be involved with risky behaviors.
- The quality of 4-H programs will be improved or maintained.
- Volunteers create positive, supportive relationships with youth
- Volunteers will be recognized for their participation and achievement
- Volunteers will become more involved in organizational decision-making.
- Volunteers will learn and apply leadership skills.
- Volunteers will recognize youth for their participation and achievement
- Youth and volunteers will be able to envision and influence their future.
- Youth and volunteers will benefit from a guiding, coaching, or mentoring relationship.
- Youth and volunteers will value, respect, and practice an appreciation for diversity

Source of Federal Funds: Smith-Lever

IV. To create and maintain Florida friendly landscapes: The smart way to grow

Focus Area IV-1

Title: *RESIDENTIAL LANDSCAPES (INCLUDES FLORIDA YARDS AND NEIGHBORHOODS, MASTER GARDENERS, AND GREEN INDUSTRIES' BMPS)*

Critical Needs:

National Objectives: 1, 4

Key Themes: Home lawn and gardening, ornamental/green agriculture, urban gardening, tropical agriculture, soil quality, sustainable agriculture, yard waste and composting
Summary:
Progress:
Impacts:

Source of Federal Funds: Smith-Lever

Focus Area IV-2

Title: *COMMERCIAL HORTICULTURE/URBAN FORESTRY SERVICES*
Critical Needs:
National Objectives: 1, 4
Key Themes: Adding value to New and Old agricultural Products, agricultural profitability, ornamental/green agriculture, plant health, plant production efficiency, small farm viability, tropical agriculture, urban gardening, forest crops, forest resource management, wildfire science and management
Summary:
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.

Progress:

- Actual use or adoption of practices gained as a result of educational effort (Example: follow-up survey)
- Intended use or adoption of practices gained as a result of educational effort (Example: post survey)
- Knowledge or certification gained as a result of educational effort (Example: pre and post survey)

Impacts:

- Conservation of natural resources
- Efficient use of inputs for landscape management
- Increased professionalism of the industry
- Reduce non-point source pollution
- Use of appropriate business practices
- Use of appropriate cultural practices
- Use of appropriate plant material and design
- Use of integrated pest management

Source of Federal Funds: Smith-Lever

Focus Area IV-3

Title: *GREEN INDUSTRY BEST MANAGEMENT PRACTICES (BMPS)*

Critical Needs:
National Objectives: 1, 4
Key Themes: Home lawn and gardening, ornamental/green agriculture, small farm viability, tropical agriculture, urban gardening, endangered species, integrated pest management, pesticide application, water quality, soil quality
Summary:
Progress:
Impacts:

Source of Federal Funds: Smith-Lever

Focus Area IV-4

Title: *THE IMPORTANCE OF DIAGNOSTIC TOOLS*
Critical Needs:
National Objectives: 1, 4
Key Themes: risk management, precision agriculture, plant production efficiency, information technology
Summary:
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.

Progress:

- Decreased landscape costs, pesticide usage, landscape call backs, disease problems, improper pesticide usage (industry, survey)
- Improved basic diagnostic/identification skills, diagnostic/identification services, landscape maintenance services provided, pesticide usage, Florida landscapes (measured through clientele testimony, comment, survey).
- Increase usage of diagnostic services, demand for professional services that utilize diagnostic services (measured by usage data from clinics, EDIS publications demand)
- Increased awareness of plant pest problems, available diagnostic services, biosecurity risks, control choices (measured with "before and after" questions or surveys)

Impacts:

- Decreased landscape biosecurity risks to agriculture
- Healthy Florida landscapes
- Improved landscape management choices
- Increased support for diagnostic-related Extension services
- Less landscape impact on the environment
- More cost-efficient Florida landscapes

Source of Federal Funds: Smith-Lever

V. To assist individuals and families to achieve economic well-being and life quality

Focus Area V-1

Title: *PERSONAL AND FAMILY WELL-BEING*
Critical Needs:
National Objectives: 2, 3, 5
Key Themes: Food accessibility and affordability, Human health, human nutrition, infant mortality, health care, childcare/dependent care, children, youth and families at risk, family resource management, parenting

Summary:
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 1stin 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).

Progress:

- Accepts child for who he/she is.
- Acknowledges the potential responses of family members (i.e. children, grandchildren, and others).
- Actively communicates with children/teens at their level.
- Advocates for children/teens.
- Allows child to express his/her feelings.
- Allows children to play and express their creative abilities.
- Allows teen to make harmless mistakes.
- Applies the Principles of Universal Design to home assessment.
- Appreciates differences and includes others.
- Asks for and accepts help from others.
- Asks for help when it is needed.
- Asks for help when it is needed.
- Asks for help when needed.
- Asks for what is needed with confidence.
- Assesses cash reserve needs.
- Assesses the impact of social isolation on clients/patients.
- Avoids arguing with child/teen.
- Avoids shouting and yelling at child/teen.
- Calls a break for child to calm down.
- Can identify techniques for working through a conflict.
- Can identify the difference in conflict resolution styles.
- Chooses appropriate meeting times and locations for older adults.
- Communicates at eye level with children.
- Communicates openly about negative/uncomfortable feelings.
- Communicates to community leaders the need for safe walking areas.
- Communicates with children's/teen's parents and guardians.
- Communicates with ex-partner about child's needs.
- Completes or updates legal documents.
- Considers children's input when making household rules.
- Considers grandchildren's input when making household rules.
- Copes with changes in relationships with family and friends.
- Copes with the changes in relationships with family and friends.
- Creates a plan to find community resources that match his/her needs.
- Creates a strong support network.
- Creates an environment that promotes good health and nutrition.
- Creates an environment where child/teen is safe and can grow and learn.
- Describes issues of dehydration with older clients/patients.
- Determines reasons for adolescent's behavior.
- Determines the best custody choices for his/her situation.
- Develops a plan for making home modifications.
- Develops a system for monitoring teen's whereabouts, activities, and safety.
- Develops plan to help provide social support.
- Develops plan to provide informational support.
- Develops plan to provide instrumental support.
- Discusses living trusts with a financial advisor.
- Does not compare one child/teen with another.

- Does not criticize child/teen.
- Does not feel guilty as a working parent.
- Does things together with family members to create happy memories of childhood.
- Encourages children/teens to use their curiosity, exploration, and problem-solving skills.
- Encourages parents to get involved in children's/teen's education.
- Enforces rules with appropriate consequences.
- Enforces rules with appropriate consequences.
- Engages in self-care.
- Enrolls someone with Alzheimer's disease in the Safe Return program.
- Establishes coalition before planning a program for older adults.
- Finds ways to build on the positive aspects of the relationship.
- Frequently encourages children to share their feelings.
- Gives help and encouragement to teammates to foster group success.
- Guides child's behavior.
- Guides children's behavior.
- Has a positive outlook.
- Has a positive outlook.
- Has a positive outlook.
- Has an increased sense of control over daily life.
- Helps child/teen feel better about herself/himself.
- Helps children/teens develop communication skills.
- Helps children/teens to get along with others.
- Helps others reach their goals.
- Holds a family conference to plan for caregiving needs.
- Identifies and discusses daily habits and behaviors with future spouse.
- Identifies and uses community resources.
- Identifies important issues that a couple should discuss about having and raising children.
- Identifies local legal resources.
- Identifies potential problems in spending habits as a couple.
- Identifies sources of stress.
- Identifies support services available to caregivers.
- Identifies the barriers that prevent good use of time.
- Identifies the major factors that affect one's use of time.
- Identifies ways to make the most of available time.
- Ignores misbehavior and praises positive behavior.
- Incorporates demographic trends in policy development.
- Informs local authorities about the Safe Return program.
- Involves child in making rules and consequences.
- Involves others in sharing leadership responsibilities.
- Is firm and kind.
- Is realistic about the number of activities that can be accomplished in a week.
- Keeps angry feelings under control.
- Knows how and when to pamper himself/herself.
- Knows the difference between fixed, periodic, and flexible expenses.
- Knows what behaviors to expect from a grandchild at his/her age.
- Knows what kinds of behaviors to observe.
- Knows what to expect from a child/teen at his/her age.
- Learns and practices empowering behaviors.

- Learns what to realistically expect from teens.
- Listens and acknowledges family member's feelings.
- Listens to and acknowledges family members' feelings.
- Listens to child's point of view.
- Listens to others without interrupting.
- Listens to the other person's point of view.
- Listens without blaming.
- Makes and sticks to a budget.
- Makes decisions based on their knowledge of child/teen development.
- Makes group plans.
- Manages stress associated with coordinating work and family roles.
- Meets with occupational therapist to identify needed adaptive devices.
- Monitors teen's friends closely.
- Monitors teen's whereabouts closely.
- Obtains information about Alzheimer's from the AlzOnLine website.
- Organizes and documents information necessary to locate resources.
- Organizes business with appropriate record-keeping tools.
- Plans and follows an effective daily activity schedule.
- Plans how time will be spent.
- Plans menu for clients based on the four key components of healthful eating.
- Plans menu for clients using Daily Food Guide Pyramid for Elders.
- Plans opportunities to meet children's/teen's different learning styles.
- Practices being more tolerant.
- Practices positive stress management techniques (diet, exercise, relaxation).
- Praises child's/teen's efforts.
- Praises children's/teen's efforts.
- Provides a safe environment for children/teens in their care.
- Provides a variety of activities to help child/teen experience success.
- Provides a variety of activities to help children/teens experience success.
- Provides age-appropriate opportunities that promote physical development.
- Provides an age appropriate environment for children/teens in their care.
- Provides grandchildren with choices and lets him/her choose.
- Provides opportunities for child to make choices.
- Provides regular time for family discussions and interactions.
- Recognizes and plans for the potential for later-life health issues.
- Recognizes signs and triggers of anger.
- Recognizes the benefits of providing care for older family members.
- Recognizes the differences between custody options.
- Redirects children when they misbehave.
- Redirects inappropriate behavior in positive ways.
- Relates the grief process to situations other than death.
- Respects teen's need for personal space.
- Responds to children's physical needs.
- Responds to children's/teen's positive behaviors.
- Responds to grandchildren's positive behavior.
- Responds to grieving friends and family appropriately.
- Reviews current insurance policies.
- Rules and consequences are consistent and age appropriate.
- Seeks child's/teen's input during problem solving.
- Selects affordable, quality child or self-care appropriate for child's needs.
- Selects an appropriate method for recording observations of children's behavior.

- Selects learning activities appropriate for child's/teen's age.
- Shares appropriate feelings clearly and respectfully.
- Shares appropriate feelings clearly and respectfully.
- Shares demographics of aging in Florida with program staff.
- Shares feelings clearly and respectfully.
- Shares information about physical changes related to falling.
- Shares own feelings respectfully.
- Spends "special time" with each child/teen.
- Spends one-on-one time with each child.
- Spends one-on-one time with each family member.
- Spends sufficient time talking with others without distraction.
- Spends time together as a family.
- Spends time together with the family.
- Spends time with child.
- Takes a break when needed.
- Takes a leadership role at home, at school and in the community.
- Takes advantage of personal and professional growth opportunities.
- Takes care of himself/herself (diet, exercise and stress management techniques).
- Takes care of himself/herself (diet, exercise and stress management techniques).
- Takes steps to reduce the risk of falling.
- Talks with teens about their physical changes.
- Tells other caregivers how to reduce the risk of wandering.
- Trainer is confident teaching the subject matter.
- Trainer is knowledgeable on the subject matter.
- Understands and accepts the choices and trade-offs necessary to find balance between work and family.
- Understands and addresses the financial issues related to later-life marriage.
- Understands and supports diverse families.
- Understands child's/teen's behavior.
- Understands cultural differences in expressions of grief.
- Understands different communication styles.
- Understands general process of grief.
- Understands how an individual's values relate to his/her spending habits.
- Understands how one's values relate to their use of time.
- Understands how the anger shown during conflict affects others.
- Understands normal grief behavior in self and others.
- Understands that conflicts can be both positive and negative.
- Understands the benefits of using time wisely.
- Understands the burdens of caregiving for older family members.
- Understands the causes of a child's misbehavior.
- Understands the causes of children's/teen's misbehavior.
- Understands the difference between conflict resolution and conflict management.
- Understands the importance of communication within the couple and between the couple and others.
- Understands the importance of controlling emotions during a conflict.
- Understands the importance of first building a strong relationship with each other.
- Understands the influence of peers on child's/teen's thoughts and actions.
- Understands the pros and cons of nursing home placement.
- Understands the reasons for a grandchild's misbehavior.
- Understands the role of a parent.

- Understands the role of emotions and the importance of controlling them during a conflict.
- Understands the roles and responsibilities of a babysitter.
- Understands the steps in developing a family spending plan.
- Uses a prioritized "to do" list.
- Uses AARP's home safety checklist for home assessment.
- Uses demographic data for program planning.
- Uses design principles for educational materials for older adults.
- Uses different strategies to advertise his/her childcare babysitting business.
- Uses Florida Injury Prevention Program for Seniors (FLIPS) information.
- Uses materials from the Alzheimer's Association.
- Uses media and informal marketing methods to publicize programs.
- Uses more "do's" than "don'ts" when communicating with children.
- Uses more do's than don'ts.
- Uses observations to plan developmentally appropriate activities, based on individual and/or group needs.
- Uses observations to positively direct problem behavior patterns.
- Uses positive methods to control personal emotions.
- Uses space to provide a secure environment that encourages play, exploration, and learning.
- Uses techniques other than spanking.
- Uses the available community resources effectively.
- Uses time savers to make the most of available time.
- Utilizes self-management skills, such as setting limits, delegating, organizing, developing routines, and managing time.
- With family, develops an acceptable division of labor at home.
- Works cooperatively with co-workers.
- Works toward short and long term goals

Impacts:

- Children/Youth demonstrate leadership and teamwork in their relationships with others.
- Couples/individuals have gained knowledge and skills leading to healthy individual and family development.
- Employed parents and individuals have found a balance between work, personal and family roles leading to a healthy, productive, quality life style. Family members have adopted relationship skills leading to healthy individual and family development.
- Older adults and their families have adopted research-based strategies for resolving issues related to aging in American society.
- Parents/staff have adopted research-based practices that are conducive to healthy development of children.

  Source of Federal Funds: Smith-Lever

Focus Area V-2

Title: *FINANCIAL MANAGEMENT AND ECONOMIC WELL-BEING*
Critical Needs:
National Objectives: 5
Key Themes: consumer management, estate planning, family resource management
Summary:

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.

Progress:

- Program participants will achieve an acceptable quality of life by managing available resources well enough to live within their incomes, by budgeting to achieve family goals, and by debt management.
- Program participants will become familiar with financial institutions and how to use them to protect their finances and/or assets to increase savings and reduce debt.
- Program participants will comparison shop to save money and increase satisfaction with purchases.
- Program participants will develop strategies for increasing wealth by using savings and investments.
- Program participants will learn how to evaluate insurance policies, including long-term health, auto, liability, homeowners, umbrella, and Medicare.
- Program participants will learn strategies for reducing death taxes.
- Program participants will learn what records to keep, where to store them and how to prepare a household inventory.
- Program participants will look for and use reliable information and practices relating to the purchase of goods and services.
- Program participants will maintain financial well-being and the orderly transfer of assets by estate planning, making a will, establishing a trust, and/or change in title.
- Program participants will manage credit and debt to achieve family goals.
- Program participants will prepare legal documents needed to maintain financial well-being in later life.
- Program participants will protect themselves, and reputable retailers, by using reliable information for purchases and by recognizing and avoiding fraud and deceptions.
- Program participants will save money and increase financial security by paying bills when they are due and using credit responsibly.
- Program participants will use safety practices, including being prepared for emergencies at home and on the road.

Impacts:

- ____ program participants began an estate plan.
- ____ program participants adopted home safety practices.
- ____ program participants became more knowledgeable about trusts and how they can be used in estate planning.
- ____ program participants became more knowledgeable about ways to decrease death taxes.
- ____ program participants began a household inventory.
- ____ program participants determined income needed for retirement.
- ____ program participants developed a budget.
- ____ program participants developed a plan to increase savings to meet his/her need.
- ____ program participants developed a plan to manage long-term health care.
- ____ program participants developed a system for keeping important papers and records.
- ____ program participants dropped insurance they no longer needed and saved $ ____.
- ____ program participants evaluated automobile insurance.
- ____ program participants evaluated homeowners or renters insurance.
- ____ program participants evaluated life insurance policies.

- ____ program participants evaluated property transfer methods.
- ____ program participants identified ways to fill the gaps of their Social Security coverage.
- ____ program participants kept a record of his/her spending.
- ____ program participants learned about umbrella insurance.
- ____ program participants learned how to use services of banks and other financial institutions.
- ____ program participants learned how to write a check.
- ____ program participants made a plan to postpone retirement.
- ____ program participants made a plan to take a part-time job during retirement.
- ____ program participants made changes in health insurance policies.
- ____ program participants made changes in the title of property to facilitate transferring it.
- ____ program participants modified automobile insurance coverage.
- ____ program participants opened a savings account or added $ ____ to his/her current savings account.
- ____ program participants opened an IRA or added $ ____ to an existing IRA.
- ____ program participants paid bills when due.
- ____ program participants prepared a Health Power of Attorney.
- ____ program participants prepared a living will.
- ____ program participants purchased insurance to fill the gaps found in his/her life insurance policy.
- ____ program participants purchased long-term health care insurance.
- ____ program participants purchased umbrella insurance.
- ____ program participants recognized frauds and scams.
- ____ program participants reviewed and updated his/her household inventory.
- ____ program participants reviewed their Social Security benefits.
- ____ program participants reviewed, revised, or wrote a will.
- ____ program participants saved $ ____ by comparison shopping.
- ____ program participants set up a family/individual trust.
- ____ program participants started a 401K or 403b this year and saved $ ____ as a result.
- ____ program participants used safety belts who previously did not.

Source of Federal Funds: Smith-Lever

Focus Area V-3

Title: *NUTRITION, FOOD SAFETY, AND HEALTH*

Critical Need:

National Objectives: 2, 3, 5

Key Themes: Food handling, food safety, foodborne illness, foodborne pathogen protection, human nutrition, birth weight, health care, infant mortality, children, youth and families at risk, aging

Summary:

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.

According the Centers for Disease Control and Prevention, 76 millions 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. 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.

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. 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.

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. 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.

Progress:

- Accept physical size and choose to have a more positive body image
- Apply food safety principles to infant feeding practices
- Change high-risk lifestyle behaviors to reduce cancer risk
- Change high-risk lifestyle behaviors to reduce cardiovascular disease risk
- Demonstrate improved blood glucose control
- Demonstrate increased knowledge of basic nutrition.
- Demonstrate increased knowledge of cancer risk factors.
- Demonstrate increased knowledge of cardiovascular risk factors.
- Demonstrate increased knowledge of common types of food/drug and drug/nutrient interactions.
- Demonstrate increased knowledge of current food safety and quality issues.
- Demonstrate increased knowledge of current nutrition and/or health issues.
- Demonstrate increased knowledge of food safety issues and recommended safe food handling practices.
- Demonstrate increased knowledge of healthy food preparation techniques.
- Demonstrate increased knowledge of healthy lifestyle practices.
- Demonstrate increased knowledge of nutrient needs throughout the lifecycle.
- Demonstrate increased knowledge of potential health complications of type 2 diabetes.
- Demonstrate increased knowledge of potentially dangerous ergogenic aides.
- Demonstrate increased knowledge of recommended food preservation methods
- Demonstrate increased knowledge of risk factors for foodborne illnesses.
- Demonstrate increased knowledge of special nutrient needs of athletes.
- Demonstrate increased knowledge of techniques used by fraudulent practitioners/quacks.

- Demonstrate increased knowledge of the USDA Food Guide Pyramid.
- Demonstrate increased knowledge of weight gain recommendations for pregnancy.
- Discard outdated medications
- Drink adequate fluids before, during, and following exercise.
- Eliminate potential fall hazards that are identified in the home
- Encourage physical activity in children.
- Evaluate nutrition information using recommended research-based approaches
- Exercise as recommended, to increase muscle strength, maintain balance and increase mobility
- Identify an exercise partner or other type of support system.
- Identify key information on the food label.
- Identify solutions to common gastrointestinal discomforts during pregnancy
- Increase practice of ADA standards of care.
- Indicate intent to avoid potentially dangerous ergogenic aides.
- Indicate intent to change high-risk lifestyle behaviors to reduce cancer risk.
- Indicate intent to change high-risk lifestyle behaviors to reduce cardiovascular disease risk.
- Indicate intent to incorporate regular physical activity as needed, for a more healthful lifestyle.
- Indicate intent to request more healthful food preparation methods, as needed.
- Indicate intent to request nutrient information when eating out.
- Indicate intent to select a diet that meets recommended intake levels of key nutrients.
- Indicate intent to use Food Guide Pyramid to guide food choices.
- Inform health care provider of all medications taken
- Maintain or increase physical activity, as needed for a more healthful lifestyle
- Modify eating behaviors as recommended for managing calorie intake.
- Monitor blood glucose regularly
- Participate in recommended health screenings
- Pass certification exam
- Plan and eat regular meals and snacks
- Plan meals using an accepted food system.
- Practice self-examinations as recommended
- Reduce food costs
- Report change in condition to primary physician
- Review home for potential fall hazards
- Select a diet that meets recommended intake levels of key nutrients.
- Select more often menu items that contribute to a healthful diet
- Show improvement in meeting Food Guide Pyramid recommendations
- Take medications as prescribed
- Use available resources such as WIC, Food Stamps, and commodities
- Use cost effective strategies in planning and preparing meals and snacks.
- Use dietary supplements only as needed for adequate nutrient intake
- Use food labels to make healthy choices.
- Use food preparation techniques and/or ingredients that promote health
- Use good personal hygiene practices.
- Use recommendations of the Dietary Guidelines for Americans to guide food and activity choices.
- Use recommended behavior modification techniques.
- Use recommended cleaning and sanitizing techniques.

- Use recommended food handling practices
- Use recommended infant feeding practices.
- Use thermometers as recommended to reduce risk of food borne illness.
- Use USDA recommended procedures when preserving foods.
- Wash fresh fruits and vegetables before consumption

Impacts:

- ____ adults reduced their health risk by demonstrating improvement in one or more health indicators, such as blood pressure, blood lipids, blood glucose, body mass index, and/or physical fitness.
- ____ adults with diabetes lowered their risk of health complications by demonstrating improved blood glucose control.
- ____ children/youth demonstrated one or more positive lifestyle changes that promote nutritional health, physical fitness, and/or healthy body weights.
- ____ consumers reduced their risk of foodborne illness by increasing the use of recommended good personal hygiene practices, food handling practices, and/or food preservation techniques.
- ____ parents/caregivers adopted child feeding practices that promote nutritional and overall health of children.
- ____ persons with limited resources reduced their nutritional risk by adopting recommended food management and/or eating practices.
- ____ program participants gained knowledge and skills leading to lifestyle behaviors that promote health and improved quality of life.
- ____ women of child-bearing age adopted lifestyle practices that promote positive pregnancy outcome and infant health and well-being.

Source of Federal Funds: Smith-Lever

Focus Area V-4

Title: *HOUSING AND ENVIRONMENT*

Critical Needs:

National Objectives: 4, 5

Key Themes: Energy conservation, hazardous materials, home safety, promoting housing programs,

Summary:

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.

Progress:

- Builders and remodelers who participate in this program will increase knowledge about lead-based paint removal.
- Contractors who participate in the program will increase knowledge about skills necessary to build high quality, structurally durable housing.
- Participants will buy a home that fits the family's needs and finances.
- Program participants will be able to qualify for and purchase his/her own home.
- Program participants will carefully evaluate their needs versus risks and will recognize and avoid approaches used by con artists.
- Program participants will increase knowledge about energy efficient construction methods, materials, and equipment.
- Program participants will increase knowledge about environmentally sound home sites, landscape designs, water management, and related areas.
- Program participants will increase knowledge about finance, costs, loans, financial initiatives, and working with financial professionals.
- Program participants will increase knowledge about the Occupational Safety and Health Act.
- Program participants will increase knowledge about worker's compensation requirements and insurance needs
- Program participants will increase knowledge of building codes and other related regulations.
- Program participants will inspect his/her home and make changes needed to make them safer.
- Program participants will learn how to close their homes for extended periods without experiencing damage or financial loss.
- Program participants will learn to recognize environmental hazards and asthma triggers.
- Program participants will maintain their residences in condition for quality living.
- Program participants will select equipment, furnishings, and supplies that improve the quality of life, conserve energy, and save money.
- Remodelers and workers who participate in the program will learn about lead-based paint risks.

Impacts:

- $ ____ saved through "Do It Yourself" projects that improve the appearances and comfort of the home.
- ____ added to and increased local county/city tax base a total of $ ____.
- ____ families developed a spending plan and follow it.
- ____ homes made improvements that provide greater protection against bad weather.
- ____ homes were purchased.
- ____ number of certification exams passed.

- ____ number of CEU's delivered.
- ____ number of homes adapted to meet special needs.
- ____ number of homes that made renovations to make residence more livable for residents.
- ____ number of people better able to care for themselves because of the changes made to their homes' Universal Design.
- ____ participants cleared up credit problems and qualified for a home loan.
- ____ participants made changes to make their homes safer.
- ____ participants reduced two or more environmental health hazards.
- ____ participants select energy efficient appliances, thus reducing amount of energy used by ~ ____ %.
- ____ participated in the Renter Power Program.
- ____ remodelers and workers learned correct removal of lead paint.
- ____ residents able to stay in home because of renovations.
- ____ residents adopted practices to keep their residences clean and pest free.
- ____ saved $ ____ by performing simple repairs.
- By removing stains, an estimated $ ____ was saved in replacement costs.
- Individuals participated in the Children's Environmental Health Program.
- Participants (especially participants of affordable housing programs) avoided home equity loans.
- Participants closed their homes for a season and experienced no environmental damage or problems.
- Participants located finances to purchase a home.
- Participants obtained reliable information and avoided transactions using exaggerated claims.
- The county's tax rolls increased a total of $ ____ because new homes were purchased or remodeled.

  Source of Federal Funds: Smith-Lever

VI. To achieve economic prosperity and community vitality in Florida's urban and rural areas

Focus Area VI-1

Title: *ECONOMIC DEVELOPMENT AND COMMUNITY SERVICES AND INFRASTRUCTURE*

Critical Needs:

National Objectives: 5

Key Themes: community development, impact of change on rural community, promoting business programs,

Summary:

Communities in Florida are impacted by a number of forces that are national or international in scope, and they face a range of problems including growth management, affordable housing, economic development, overcrowded schools, and environmental protection while trying to provide adequate care for children, the elderly, and low income families and individuals. Florida is the nation's fourth largest state with a current population that exceeds 16 million, and population is expected to reach 20 million by the year 2020. The largest absolute population gains will be in existing urban areas, the fastest growth rates are expected in more rural counties located near the urban areas, and other smaller, rural counties in the southern interior and in the northern parts of the state will experience lower levels of population growth and economic development.

Communities also face pressure from a number of broader social and economic trends. There is a restructuring of the traditional family towards single-parent households and towards households where both parents work, local governments are becoming more specialized in response to more complex state and federal regulatory requirements, economic restructuring has resulted in the decline of traditional jobs and increased numbers of jobs in knowledge oriented industries. Agriculture in rural areas is increasingly dependent on the local economy to provide off farm income, and in urban areas of Florida, high-value crops are competing with urban interests for land and water resources.

Within the context of population growth and economic restructuring, economic development efforts are of paramount concern for Florida and for communities across the state. Florida faces the challenges of providing adequate, quality jobs for a growing population and increasing numbers of high school and college graduates, and the state is concerned with maintaining a strong economy to support the tax base necessary to finance infrastructure needs and public services. Urban areas face the same set of concerns over quality jobs and financing services and infrastructure for growing numbers of residents, and in most cases, urban areas face additional problems of growth management as reflected in the type and location of residential and commercial growth. Rural areas, largely bypassed by the growth in information age jobs face often face declines in employment in traditional occupations without replacement jobs in the new growth industries. At the state level and in both urban and rural communities, economic development programs are being considered and developed to focus on both quality and quantity of jobs.

Economic development concerns offer a range of opportunities for education programs designed to improve the state and local economy through more effective and targeted economic development programs. Program needs include applied research focused on the design and effectiveness of alternative development programs, efforts to develop leadership and technical skills for local residents and officials, programs to teach fundamentals of economic development, and efforts to facilitate the implementation of economic development programs at the state and local level.

Specific programs could include:

1. Business retention and expansion programs.
2. Community visioning and strategic planning.
3. Understanding the local economy.
4. Economic impact analysis.
5. Entrepreneurial education.
6. Business management, planning, finance, sales and marketing.

Progress:

- Community to develop in more efficient manner
- Implementation of smart business planning principles
- Implementation of Smart Growth Principles
- Implementation of smart marketing principles
- number of business retention programs completed
- number of businesses successfully recruited
- number of communities initiating a strategic planning process
- number of communities initiating a visioning process
- number of employees added
- number of employees retained

- number of entrepreneurship education programs completed
- number of local businesses expanded
- number of local businesses retained
- number of local leaders trained
- number of people trained in new business start-ups
- number of small business owners trained
- number of small businesses started
- number of trained leaders joining alumni group
- number of volunteers trained to conduct a local business/community survey

Impacts:

- adoption of smart business planning principals
- adoption of smart growth principals
- adoption of smart marketing principals
- businesses expanded
- businesses retained
- businesses visited
- Community to develop in more efficient manner
- existing jobs retained
- new business start-ups
- new jobs added
- volunteers that visit businesses

Source of Federal Funds: Smith-Lever

Focus Area VI-2

Title: *CIVIC ENGAGEMENT, GROWTH, LEADERSHIP DEVELOPMENT, AND COMMUNITY DECISION MAKING*

Critical Needs:

National Objectives: 5

Key Themes: Leadership training and development, community development,

Summary:

Communities in Florida are impacted by a number of forces that are national or international in scope, and they face a range of problems including growth management, affordable housing, economic development, overcrowded schools, and environmental protection while trying to provide adequate care for children, the elderly, and low income families and individuals. Florida is the nation's fourth largest state with a current population that exceeds 16 million, and population is expected to reach 20 million by the year 2020. The largest absolute population gains will be in existing urban areas, the fastest growth rates are expected in more rural counties located near the urban areas, and other smaller, rural counties in the southern interior and in the northern parts of the state will experience lower levels of population growth and economic development.

Communities also face pressure from a number of broader social and economic trends. There is a restructuring of the traditional family towards single-parent households and towards households where both parents work, local governments are becoming more specialized in response to more complex state and federal regulatory requirements, economic restructuring has resulted in the decline of traditional jobs and increased numbers of jobs in knowledge oriented industries. Agriculture in rural areas is increasingly dependent on the local economy to provide off farm income, and in urban

areas of Florida, high-value crops are competing with urban interests for land and water resources.

In short, the story in Florida is one of profound and prolonged change. As a result, Florida communities and their citizens face a complex set of issues that lend themselves to involvement and engagement on the part of concerned citizens and community groups. Such involvement, however, requires educational programs to develop leadership and analytical skills and programs to provide information on alternative methods for approaching problems.

As noted in the situation statement, communities in Florida are undergoing profound social and economic change. In this environment citizens are increasingly called upon to decide complex issues either through traditional voting procedures at the state and local level or through participation in various meetings, committees and other venues whereby citizens influence government action or organize to take action in some other manner to address a range of problems. The range of opportunities for citizen participation and the complexity of the issues supports a need for education programs in a variety of formats to include training for citizen participants and local government officials dealing with the same set of issues.

1. Public policy education: Includes programs focused on particular policy issues (i.e.; growth management, smart growth, land use regulation, water management, economic development, etc.). Focus is on understanding policy issues, alternatives approaches to solutions, and consequences of the alternatives.

2. Leadership training: Programs focused on developing a trained cadre of citizen leaders at the local and state level to attack the multitude of local problems faced statewide.

3. Technical Assistance: Programs providing technical assistance to local groups, organizations and governments engaged in problem solving activities. Includes facilitation, assistance with strategic planning and visioning, and policy analysis.

Progress:

- Community to develop in more efficient manner
- Implementation of smart business planning principles
- Implementation of smart growth principles
- Implementation of smart marketing principles
- Number of business retention programs completed
- Number of business successfully recruited
- Number of communities initiating a strategic planning process
- Number of communities initiating a visioning process
- Number of employees added
- Number of employees retained
- Number of entrepreneurship education programs completed
- Number of local businesses expanded
- Number of local businesses retained
- Number of local leaders trained
- Number of people trained in new business start-ups
- Number of small business owners trained
- Number of small businesses started
- Number of trained leaders joining alumni groups
- Number of volunteers trained to conduct a local business/community survey

Impacts:

- Adoption of smart business planning principles

- Adoption of smart growth principles
- Adoption of smart marketing principles
- Businesses retained
- Businesses visited
- Community to develop in more efficient manner
- Existing jobs retained
- New business start-ups
- New jobs added
- Volunteers that visit businesses

Source of Federal Funds: Smith-Lever

Focus Area VI-3

Title: *COMMUNITY PREPAREDNESS*

Critical Needs:

National Objectives: 1, 2, 4, 5

Key Themes: risk management, bioterrorism, emerging infectious disease, invasive species, food security, foodborne illness, weather and climate, wildfire science and management, food safety, community development

Summary:

"Disaster" has always been a normal part of life in Florida because of the annual hurricane season. Florida is also susceptible to river floods, droughts, wildland fires, and freezes. For almost 50 years, Florida has consistently ranked as the top state 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 potential impact of disasters on Florida continues to increase with Florida's growth.

One of Florida's great assets is its extensive coastline. At 1350 miles, it is the longest coastline in the continental United States. Florida's coast is heavily built, especially on the east and southwest coasts. These areas face special dangers from hurricane-induced storm surges. Florida's "coastal plain" is also very low-lying and readily subject to flooding. Millions of Florida residents live in areas that could be flooded. In the event of an approaching hurricane, potentially affected coastal communities would have to be evacuated.

Increasing population has resulted in considerable development and urban sprawl. There are huge subdivisions and communities where formerly there was only range, forest, or swamp. Large urban populations have put considerable stress on Florida's water resources, increasing the stress on and competition for resources during drought.

Wildfire can be a significant danger in Florida. The 1998 fire season was one of the worst on record. Development exacerbates the problem because so much development is taking place at the 'wildland-urban interface.'

The last few years have increased awareness of the possibility of intentional disasters, such as attempts to contaminate the food supply or direct attacks against people or buildings. Florida's role as a worldwide tourist destination might make it an attractive target for acts of terrorism. Florida's geographic situation, with its extensive coastline and easy access to the Caribbean, make it an ideal gateway for the illegal entry of people or materials.

Communities need guidance and expertise to prepare for, survive, and recover from the many kinds of events that can challenge them. The key to both surviving a disaster and

recovering quickly is preparedness. A community cannot prepare for literally "anything," but good preparedness and planning are powerful ways of mitigating the impact of the kinds of disasters we already know are likely in Florida.

Florida Extension is well situated to provide information on preparedness, survival and recovery to a wide variety of audiences. Among the factors that make Extension uniquely suited for this task are Extension's educational mission, Extension's tradition of community involvement and the knowledge Extension professionals have of their localities. For example, during and after Hurricane Andrew, the Extension Service played an important role in Miami-Dade County, assisting citizens and linking people and resources.

Further, Florida Extension is engaged with many other agencies and groups working on disaster and terrorism issues, and again, is well positioned to bring a wide variety of resources to bear in creating informational and training materials.

Progress:

- Adults aware of sources of post-disaster aid.
- Adults increase knowledge of appropriate behavior in the event of a general breakdown of municipal services.
- Boat owners aware of sources of post-disaster aid.
- Children understand the concept of a disaster supplies kit.
- Coastal residents aware of how to evaluate shelter in place vs. evacuation.
- Coastal residents develop a disaster plan for various disaster situations.
- Coastal residents develop a disaster plan for various disaster situations.
- Disabled develop a disaster plan adapted to special needs.
- Disabled understand how to evaluate shelter in place vs. evacuation.
- Elders understand how to evaluate shelter in place vs. evacuation.
- Extension agents aware of the mechanisms of governmental response to disaster.
- Large Animal Owners develop disaster plan for all animals, including plan for locating lost animals.
- Non-English speakers aware of sources for disaster preparedness information.
- Small Animal Owners develop disaster plan for all animals, including plan for locating lost animals.
- Workers aware of disaster/emergency situations that might isolate them at the workplace.
- Adults aware of evacuation routes.
- Adults aware of how to evaluate shelter in place vs. evacuation.
- Adults aware of how to live in a shelter.
- Adults aware of location of nuclear power plants.
- Adults aware of need for disaster supplies kit.
- Adults aware of potential mental health impact of various disaster events.
- Adults aware of potential misuse of agricultural chemicals and fertilizers.
- Adults aware of sources of appropriate disaster preparedness information.
- Adults aware of sources of mental health support in the event of disaster.
- Adults aware of sources of post-disaster self-recovery information
- Adults develop a disaster plan for various disaster situations.
- Adults develop disaster plan (shelter in place and evacuation) for pets and livestock.
- Adults identify items to take in case of evacuation.
- Adults prepared to shelter in place.
- Adults understand how to assemble a disaster supply kit.
- Adults understand how to respond to a radiological incident.

- Adults understand secure storage of agricultural chemicals and fertilizers.
- Agricultural Producers aware of agencies to notify in case of invasive pests.
- Agricultural Producers aware of potential impacts of invasive pests.
- Agricultural Producers aware of potential mental health impact of various disaster events.
- Agricultural Producers aware of potential misuses of agricultural chemicals and fertilizers.
- Agricultural Producers aware of role in preventing invasive pests.
- Agricultural Producers aware of sources of appropriate disaster preparedness information.
- Agricultural Producers aware of sources of mental health support in the event of disaster.
- Agricultural Producers aware of sources of post-disaster aid.
- Agricultural Producers aware of sources of post-disaster self-recovery information.
- Agricultural Producers develop a comprehensive disaster plan for their operation for various kinds of disasters
- Agricultural Producers develop an evacuation plan.
- Agricultural Producers develop disaster plan (shelter in place and evacuation) for pets and livestock.
- Agricultural Producers increase knowledge of appropriate behavior in the event of a general breakdown of municipal services.
- Agricultural Producers understand secure storage of agricultural chemicals and fertilizers.
- Boat owners aware of resources for post-disaster self-recovery.
- Boat owners aware of sources of accurate and up-to-date preparedness info.
- Boat owners develop contingency plans in case of various kinds of disasters (includes evacuation plans).
- Boat owners develop hurricane/storm surge disaster plan.
- Boat owners understand how to assemble a disaster supply kit.
- Boat owners understand how to shelter in place on their boat if necessary.
- Boat owners understand storm surge.
- Boat owners understand the potential impact of invasive pests (insect, animal, and plant).
- Boat owners understand the role they can play in port security
- Boat owners understand the sources, transmission and prevention of invasive pests.
- Children aware of how to live in a shelter.
- Children aware of the normal reactions to abnormal circumstances.
- Children aware that animals have needs in disasters.
- Children understand small animals' needs in disasters.
- Coastal residents aware of evacuation routes.
- Coastal residents aware of need for disaster supplies kit.
- Coastal residents aware of sources of information for disaster preparedness.
- Coastal residents aware of sources of post-disaster aid.
- Coastal residents aware of sources of post-disaster self-recovery information.
- Coastal residents develop hurricane/storm surge disaster plan.
- Coastal residents identify items to take in case of evacuation.
- Coastal residents prepared to shelter in place.
- Coastal residents understand how to assemble a disaster supply kit.
- Coastal residents understand storm surge.

- Disabled aware of sources of post-disaster aid.
- Disabled aware of sources of post-disaster self-recovery information.
- Disabled aware of sources of preparedness information.
- Disabled aware of special support services available to assist with evacuation.
- Disabled understand how to assemble a disaster kit adapted to special needs.
- Elders aware of sources of post-disaster aid.
- Elders aware of sources of post-disaster self-recovery information.
- Elders aware of sources of preparedness information.
- Elders aware of special support services available to assist with evacuation.
- Elders develop a disaster plan adapted to special needs.
- Elders understand how to assemble a disaster kit adapted to special needs.
- Extension Agents aware of Extension Disaster Education Network (EDEN).
- Extension agents aware of sources of post-disaster aid.
- Extension agents increase knowledge of Extension involvement in disaster preparedness, response and recovery.
- Large Animal Owners aware of carcass disposal protocols and agencies.
- Large Animal Owners aware of resources available to assist in case large animals must be evacuated.
- Large Animal Owners aware of sources of post-disaster aid.
- Large Animal Owners aware of sources of post-disaster self-recovery information.
- Large Animal Owners aware of sources of preparedness information.
- Large Animal Owners implement plan to prepare to shelter animals in place.
- Marina owners aware of agencies to contact in case of security issues.
- Marina owners aware of appropriate sources of disaster preparedness information.
- Marina owners aware of role to play in port security.
- Marina owners aware of sources of disaster recovery assistance.
- Marina owners develop hurricane/storm surge disaster plan.
- Marina owners understand storm surge.
- Marina owners understand the potential impact of invasive pests (insect, animal, and plant).
- Marina owners understand the sources, transmission and prevention of invasive pests.
- Marina owners use Panic file to develop disaster response plan.
- Non-English speakers aware of sources of post-disaster aid.
- Non-English speakers aware of sources of post-disaster self-recovery information.
- Small Animal Owners aware of changes in animal behavior under conditions of high stress.
- Small Animal Owners aware of how to live in a shelter with a small animal.
- Small Animal Owners aware of issues in evacuating small animals.
- Small Animal Owners aware of locations and requirements of pet-friendly shelters.
- Small Animal Owners aware of sources of post-disaster aid.
- Small Animal Owners aware of sources of post-disaster self-recovery information.
- Small Animal Owners aware of sources of preparedness information.
- Small Animal Owners understand how to assemble a disaster kit appropriate to each of their animals.

- Small Animal Owners understand needs of sheltering in place with small animals.
- Workers aware of potential mental health impact of various disaster events.
- Workers aware of sources of information for disaster preparedness.
- Workers aware of sources of mental health support in the event of disaster.
- Workers increase knowledge of appropriate behavior in the event of a general breakdown of municipal services.
- Workers understand how to assemble a disaster kit for the workplace.
- Workers understand how to shelter in place at the workplace.

Impacts:

- Attending to the mental health issues that accompany disaster can significantly improve coping during disaster and mitigate the long term emotional impact of disaster.
- Extension has special expertise and a special role in the community which can be very valuable in mitigating disaster losses.
- Informed agricultural producers are less likely to inadvertently assist in illegal or dangerous acts.
- Informed agricultural producers are more likely to report a pest invasion early and mitigate its impact.
- Informed agricultural producers increase effective surveillance.
- Informed boaters are less likely to inadvertently assist in illegal or dangerous acts.
- Informed boaters increase the effective surveillance on waterways and ports.
- Informed citizens are less likely to inadvertently assist in illegal or dangerous acts.
- Informed citizens increase effective surveillance.
- Informed citizens increase the effective surveillance on waterways and ports.
- Informed marina owners are less likely to inadvertently assist in illegal or dangerous acts.
- Informed marina owners increase the effective surveillance on waterways and ports.
- Pre-disaster awareness of evacuation needs of large animals can save both animal and human lives.
- Pre-disaster awareness of recovery resources can speed the recovery process and mitigate disaster damage.
- Pre-disaster planning mitigates impact of disasters on health, life, and economy.
- Preparing children for unfamiliar situations can significantly reduce their stress and the demands they place on adults during disaster.
- Proper sheltering of livestock in a disaster can mitigate significant losses.
- Small animals are often important companions and their well-being has a significant impact on owners.
- Understanding the great dangers of storm surge can promote an appropriate response and save lives and property.

  Source of Federal Funds: Smith-Lever

Focus Area VI-4

Title: *SAFETY FOR AGRICULTURAL OPERATIONS AND EQUIPMENT*

Critical Needs:

National Objectives: 1, 5

Key Themes: risk management, farm safety, workforce safety

Summary:
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.

Agricultural safety does not just apply to farm owners or workers. The number of non-farmers that own agricultural equipment and perform agricultural operations -- from using a riding lawnmower or chain saw to working a small hobby farm -- is increasing. The Do-It-Yourself movement has home owners renting all sorts of tillers and wood chippers. As use of this kind of small-scale agricultural equipment becomes more common, so will the injuries that result.

Safety is especially critical to the small farm and the family farm. A major injury or death can mean the end of such an enterprise. It is usual on these farms that every person is productively engaged in farm activities. Small farms often feel pressured to put children to work at very young ages because it is believed that their labor is needed to keep the farm from failing. A serious injury can critically wound farm operations because a worker is unable to perform and often, another worker or family member is diverted to care-taking. All this leads to reduced income and increased medical expenses.

Most agricultural workers in Florida are employed by large corporations. The turnover may be moderate to high, and each worker brings his or her own set of safety standards to the job. It is important for producers to establish safety programs and safety standards so that injuries and deaths are minimized. Every injury in this kind of operation means worker compensation and lost productivity. The problem is compounded if lawsuits are involved, and an injury incident can have a long-term impact on morale and worker-manager relations.

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 shields 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.

Progress:

- Children aware of basic emergency response procedures.
- Children aware of safe ATV use, including minimum age and safety equipment.
- Children aware of safe procedures for handling chemicals, including what they should not handle at all and proper safety equipment.
- Children aware of safe procedures for working with livestock, including minimum age and the danger of crush injuries.
- Children aware of the 'no extra riders' rule.
- Children aware of the minimum age for driving a tractor.
- Children aware of the risks associated with handling chemicals.
- Children aware that there are risks to their safety and health associated with farm work and farm environments.
- Children understand importance of helmet usage when horseback riding.
- Crop Producers aware of basic first-aid and emergency response procedures.
- Crop Producers aware of hazards of chemicals used in operations under their supervision.
- Crop Producers aware of resources to create safety training programs.
- Crop Producers aware of risks to worker health in operations under their supervision, including mental health, hearing, sight, zoonoses, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Crop Producers aware of their liability for worker safety.
- Crop Producers aware of training resources for chemical safety.
- Crop Producers aware of training resources for safety in confined spaces.
- Crop Producers aware of training resources for worker health issues.
- Crop Producers aware of what constitutes a confined space and hazards of working in confined spaces.
- Crop Producers understand appropriate safety measures for safe chemical handling.
- Crop Producers understand appropriate safety measures to protect worker health.
- Crop Producers understand appropriate safety procedures for working in confined spaces.
- Crop Producers understand gases that might be encountered in agricultural settings.
- Crop Producers understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Crop Producers understand the benefits of comprehensive and consistent safety training.
- Crop Producers understand the benefits of safer tractor operations.
- Crop Producers understand the risks of specific tasks carried out under their supervision.
- Crop Producers understand the risks of tractor operation and the means of prevention.
- Crop Producers understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment
- Emergency/ Rescue /Medical Workers aware of agricultural exposures.
- Emergency/ Rescue /Medical Workers aware of electrical hazards to which they may be exposed in an agricultural setting.
- Emergency/ Rescue /Medical Workers aware of hazards of chemicals used in agricultural operations.

- Emergency/ Rescue /Medical Workers aware of resources to create safety training programs.
- Emergency/ Rescue /Medical Workers aware of training resources for chemical safety.
- Emergency/ Rescue /Medical Workers aware of training resources for electrical safety.
- Emergency/ Rescue /Medical Workers aware of training resources for safety in confined spaces.
- Emergency/ Rescue /Medical Workers aware of types of agricultural confined spaces.
- Emergency/ Rescue /Medical Workers understand appropriate safety measures for safe handling of agricultural chemicals.
- Emergency/ Rescue /Medical Workers understand gases that might be encountered in agricultural settings.
- Emergency/ Rescue /Medical Workers understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Emergency/ Rescue /Medical Workers understand the benefits of safer tractor operations.
- Emergency/ Rescue /Medical Workers understand the benefits of safety training specific to the agricultural environment.
- Emergency/ Rescue /Medical Workers understand the risks of tractor operation and the means of prevention.
- Emergency/ Rescue /Medical Workers understand the special risks present in manipulating agricultural vehicles during rescue.
- Emergency/ Rescue /Medical Workers understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Employers/Managers aware of basic first-aid and emergency response procedures.
- Employers/Managers aware of electrical hazards to which workers may be exposed in operations under their supervision.
- Employers/Managers aware of hazards of chemicals used in operations under their supervision.
- Employers/Managers aware of hazards of handling livestock, including zoonotic diseases.
- Employers/Managers aware of OSHA standards, especially standards that directly impact operations under their supervision.
- Employers/Managers aware of resources related to OSHA standards.
- Employers/managers aware of resources to create safety training programs.
- Employers/Managers aware of risks to worker health in operations under their supervision, including mental health, hearing, sight, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Employers/Managers aware of their liability for worker safety.
- Employers/Managers aware of training resources for chemical safety.
- Employers/Managers aware of training resources for electrical safety.
- Employers/Managers aware of training resources for livestock safety.
- Employers/Managers aware of training resources for safety in confined spaces.
- Employers/managers aware of training resources for worker health.
- Employers/Managers aware of what constitutes a confined space and hazards of working in confined spaces.

- Employers/Managers understand appropriate safety measures for safe chemical handling.
- Employers/Managers understand appropriate safety measures for safe livestock handling.
- Employers/Managers understand appropriate safety measures for working with and around electricity.
- Employers/Managers understand appropriate safety measures to protect worker health.
- Employers/Managers understand appropriate safety measures to protect worker health.
- Employers/Managers understand appropriate safety procedures for working in confined spaces.
- Employers/Managers understand gases that might be encountered in agricultural settings.
- Employers/Managers understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Employers/Managers understand the benefits of comprehensive and consistent safety training.
- Employers/Managers understand the benefits of safer tractor operations.
- Employers/Managers understand the risks of specific tasks carried out under their supervision.
- Employers/Managers understand the risks of tractor operation and the means of prevention.
- Employers/Managers understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Farm Families aware of age- and capability-appropriate task assignment.
- Farm Families aware of basic first-aid and emergency response procedures.
- Farm Families aware of electrical hazards to which they may be exposed.
- Farm Families aware of hazards of chemicals used in operations on their farm.
- Farm Families aware of hazards of handling livestock, including zoonotic diseases and allergic reactions.
- Farm Families aware of health risks in operations they perform, including mental health, hearing, sight, infectious disease, allergic reactions and repetitive motion.
- Farm Families aware of how to create a safer environment for farm children.
- Farm Families aware of resources to create safety training programs. Farm Families aware of risks to child health in operations they are asked to perform, including mental health, hearing, sight, infectious disease, allergic reactions and repetitive motion.
- Farm Families aware of safety risks to children in operations under their supervision.
- Farm Families aware of training resources for chemical safety.
- Farm Families aware of training resources for child safety.
- Farm Families aware of training resources for electrical safety.
- Farm Families aware of training resources for livestock safety.
- Farm Families aware of training resources for safety in confined spaces.
- Farm Families aware of what constitutes a confined space and hazards of working in confined spaces.
- Farm Families understand appropriate safety measures for safe chemical handling.
- Farm Families understand appropriate safety measures for safe livestock handling.

- Farm Families understand appropriate safety measures for working with and around electricity.
- Farm Families understand appropriate safety measures to protect their health.
- Farm Families understand appropriate safety procedures for working in confined spaces.
- Farm Families understand gases that might be encountered in agricultural settings.
- Farm Families understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Farm Families understand the benefits of safer tractor operations.
- Farm Families understand the benefits of safety training.
- Farm Families understand the risks of specific tasks carried out on their farms
- Farm Families understand the risks of tractor operation and the means of prevention.
- Farm Families understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Home Owners aware of age- and capability-appropriate task assignment.
- Home Owners aware of basic first-aid and emergency response procedures.
- Home Owners aware of electrical hazards to which they may be exposed.
- Home Owners aware of hazards of chemicals used in operations on their property.
- Home Owners aware of how to create a safer environment.
- Home Owners aware of resources to create safety training programs.
- Home Owners aware of risks to child health in operations involving agricultural equipment and materials, including mental health, hearing, sight, infectious disease, allergic reactions and repetitive motion.
- Home Owners aware of safety risks to children in operations involving agricultural equipment and materials.
- Home Owners aware of training resources for chemical safety.
- Home Owners aware of training resources for child safety.
- Home Owners aware of training resources for electrical safety.
- Home Owners understand appropriate safety measures for safe chemical handling.
- Home Owners understand appropriate safety measures for working with and around electricity.
- Home Owners understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Home Owners understand the benefits of safer tractor operations.
- Home Owners understand the benefits of safety training.
- Home Owners understand the risks of tractor operation and the means of prevention.
- Home Owners understand the risks of using agricultural equipment and materials.
- Home Owners understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Livestock Producers understand the risks of specific tasks carried out under their supervision.
- Livestock Producers aware of basic first-aid and emergency response procedures.
- Livestock Producers aware of hazards of chemicals used in operations under their supervision.
- Livestock Producers aware of resources to create safety training programs.

- Livestock Producers aware of risks to worker health in operations under their supervision, including mental health, hearing, sight, zoonoses, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Livestock Producers aware of their liability for worker safety.
- Livestock Producers aware of training resources for chemical safety.
- Livestock Producers aware of training resources for worker health issues.
- Livestock Producers understand appropriate safety measures for safe chemical handling.
- Livestock Producers understand appropriate safety measures to protect worker health.
- Livestock Producers understand the benefits of comprehensive and consistent safety training.
- Medical Personnel aware of agricultural exposures.
- Ornamental Hort Producers aware of basic first-aid and emergency response procedures.
- Ornamental Hort Producers aware of hazards of chemicals used in operations under their supervision.
- Ornamental Hort Producers aware of resources to create safety training programs.
- Ornamental Hort Producers aware of their liability for worker safety.
- Ornamental Hort Producers aware of training resources for chemical safety.
- Ornamental Hort Producers aware of training resources for worker health issues.
- Ornamental Hort Producers aware of worker health risks in hort operations, including mental health, hearing, sight, infectious disease, allergic reactions, dust inhalation, and repetitive motion
- Ornamental Hort Producers understand appropriate safety measures for safe chemical handling.
- Ornamental Hort Producers understand appropriate safety measures to protect worker health.
- Ornamental Hort Producers understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Ornamental Hort Producers understand the benefits of comprehensive and consistent safety training.
- Ornamental Hort Producers understand the benefits of safer tractor operations.
- Ornamental Hort Producers understand the risks of specific tasks carried out under their supervision.
- Ornamental Hort Producers understand the risks of tractor operation and the means of prevention.
- Ornamental Hort Producers understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Poultry Producers aware of basic first-aid and emergency response procedures.
- Poultry Producers aware of hazards of chemicals used in operations under their supervision.
- Poultry Producers aware of resources to create safety training programs.
- Poultry Producers aware of risks to worker health in operations under their supervision, including mental health, hearing, sight, zoonoses, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Poultry Producers aware of their liability for worker safety.
- Poultry Producers aware of training resources for chemical safety.
- Poultry Producers aware of training resources for worker health issues.

- Poultry Producers understand appropriate safety measures for safe chemical handling.
- Poultry Producers understand appropriate safety measures to protect worker health.
- Poultry Producers understand the benefits of comprehensive and consistent safety training.
- Poultry Producers understand the risks of specific tasks carried out under their supervision.
- Small Farm Owners aware of age- and capability-appropriate task assignment.
- Small Farm Owners aware of basic first-aid and emergency response procedures.
- Small Farm Owners aware of electrical hazards to which they may be exposed.
- Small Farm Owners aware of hazards of chemicals used in operations on their farm.
- Small Farm Owners aware of hazards of handling livestock, including zoonotic diseases and allergic reactions.
- Small Farm Owners aware of health risks in operations they perform, including mental health, hearing, sight, infectious disease, allergic reactions and repetitive motion.
- Small Farm Owners aware of how to create a safe environment for farm children.
- Small Farm Owners aware of resources to create safety training programs.
- Small Farm Owners aware of risks to child health in operations they are asked to perform, including mental health, hearing, sight, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Small Farm Owners aware of safety risks to children in operations under their supervision.
- Small Farm Owners aware of training resources for chemical safety.
- Small Farm Owners aware of training resources for child safety.
- Small Farm Owners aware of training resources for electrical safety.
- Small Farm Owners aware of training resources for livestock safety.
- Small Farm Owners aware of training resources for safety in confined spaces.
- Small Farm Owners aware of what constitutes a confined space and hazards of working in confined spaces.
- Small Farm Owners understand appropriate safety measures for safe chemical handling.
- Small Farm Owners understand appropriate safety measures for safe livestock handling.
- Small Farm Owners understand appropriate safety measures for working with and around electricity.
- Small Farm Owners understand appropriate safety measures to protect their health.
- Small Farm Owners understand appropriate safety procedures for working in confined spaces.
- Small Farm Owners understand gases that might be encountered in agricultural settings.
- Small Farm Owners understand that vehicles are the greatest single cause of injury and death in agricultural operations.
- Small Farm Owners understand the benefits of safer tractor operations.
- Small Farm Owners understand the benefits of safety training.
- Small Farm Owners understand the risks of specific tasks carried out on their farms.

- Small Farm Owners understand the risks of tractor operation and the means of prevention.
- Small Farm Owners understand the three primary factors for safer tractor operations: a safer operator, a safer tractor, and a safer working environment.
- Workers aware of basic first-aid and emergency response procedures.
- Workers aware of electrical hazards to which they may be exposed.
- Workers aware of hazards and risks associated with livestock handling.
- Workers aware of hazards and risks associated with specific chemicals they may come into contact with.
- Workers aware of hazards and risks associated with Tractor/ Vehicle operation.
- Workers aware of hazards and risks associated with working in confined spaces.
- Workers aware of health precautions appropriate to working with livestock, including zoonotic diseases and allergic reactions.
- Workers aware of right-to-know and aware of specific chemicals that might be encountered in tasks they are asked to undertake.
- Workers aware of risks to worker health in operations they are asked to perform, including mental health, hearing, sight, infectious disease, allergic reactions, dust inhalation, and repetitive motion.
- Workers aware of safety measures appropriate to chemical handling, including knowledge of safety equipment.
- Workers aware of safety measures appropriate to livestock handling.
- Workers aware of safety measures appropriate to Tractor/ Vehicle operation.
- Workers aware of safety procedures and equipment appropriate to working in confined spaces.
- Workers aware of their rights to adequate training and safety equipment.
- Workers aware of what constitutes a confined space.
- Workers understand appropriate safety measures for working with and around electricity.
- Workers understand appropriate safety measures to protect their health.
- Workers understand appropriate safety procedures for working in confined spaces.
- Workers understand gases that might be encountered in agricultural settings.
- Workers understand the safety and health risks of operations they are asked to perform and environments they are asked to work in.

Impacts:

- Eliminate incidents which could result in responses by state and federal agencies, including investigations and legal action.
- Fewer animal losses.
- Fewer equipment losses.
- Lower number of insurance claims and lawsuits.
- Maintain productivity.
- Maintain quality of life and productivity.
- Maintain quality of life, productivity, and income.
- Reduce child injury and death.
- Reduce unintentional injury and death.
- Reduce worker injury and death.

Source of Federal Funds: Smith-Lever

VII ~ APPENDIX

Appendix A. Website Addresses

IFAS Program Development and Evaluation - http://pdec.ifas.ufl.edu
County Long-range Planning Priorities Site - http://pdec.ifas.ufl.edu/longrange/county/
County Piorities Summary (PDF) - http://pdec.ifas.ufl.edu/longrange/county/countypriorities.pdf

Appendix B. 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 E) held in February 2003, seven state goals (Appendix J) were identified and announced by interim Extension Dean, Larry Arrington. The state goals are:

1. To Enhance and Maintain Agriculture.
2. To Maintain and Enhance Florida's Environment
3. To Develop Responsible and Productive Youth Through
4. 4-H and Other Youth Programs
5. To Create and Maintain Florida Friendly Landscapes: The Smart Way to Grow
6. To Assist Individuals and Families Achieve Economic Well-Being and Life Quality
7. To Achieve Economic Prosperity and Community Vitality in Florida's Urban and Rural Communities
8. 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 ://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:

1. Biomass/Biofuels
2. Nanotechnology in Agriculture
3. Obesity
4. 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.

Appendix C. Scientific 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 peered 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.

Merit Review

Extension Merit Review of Florida Goal Teams
Goal Number:
Goal Title:
Goal Leaders:
Focus Team Title:
Focus Teams members
Reviewer(s): _____Accept _____Accept with minor revision(s) (Explain required revisions) _____Accept with major revision(s)(Explain required revisions) _____Reject (Explain your reasons for rejection).

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						

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 in-service training activities						
Includes the development of educational products that facilitate delivery of programs by county faculty						

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: January 16, 2004

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.

1) Please evaluate the proposal, considering the following points:

2) 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)

3) Is the work relevant to critical emerging issues in agriculture, rural life, consumers, and science?

4) Does the proposal clearly state the anticipated outcomes of the work, and do these outcomes benefit the scientific, extension, and educational components of IFAS?

5) Do the experimental design and methodology clearly address the stated objectives of the study?

6) In your view, does the project show evidence of high scientific quality? Does this project duplicate research being done through other projects?

7) 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:

1. 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.
2. 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:
    1. 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.
    2. What are the benefits which may result from the proposed research? Express this is terms of new varieties, reduced labor costs, increased production, larger net returns, or other appropriate specific results.
    3. 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.
3. Related Current and Previous Work
    a. 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.
    b. 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.
4. 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.
5. 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.

Appendix D. Research 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 penisular 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 prepartum 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 Chimeral Plants To Environmental Factors
ENH-03602	Taxonomy And Boisystematics 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 Forunderstanding 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

Appendix E. Extension Goal and Focus Areas

UF/IFAS and FAMU/CESTA Extension
Statewide Goals and Focus Areas for 2004-2007[1]

I. To Enhance and Maintain Agricultural and Food Systems

1. 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.

2. 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)*

3. 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)*

4. 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

1. Water Resources *(Example topics include conservation, non-point source pollution, education)*

[1] April 13, 2004

2. 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)*

3. Environmental Education *(Example topics include helping youth understand their interdependence with the environment, local ecosystem, energy and other natural resources)*

4. 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**

1. Life Skills Developed in Youth Through Subject Matter Experiences *(Example topics include positive relationships, service and leadership and effective communication skills)*

2. 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)*

3. 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

1. Residential Landscapes

   a. 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)*

   b. *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)*

   c. *Green Industries' BMPs Program* (Example topics forthcoming)

2. Commercial Horticultural/Urban Forestry Services *(Example topics include community gardens, golf courses, recreation areas, turfgrass and landscape management practices)*

   a. *Green Industries' BMPs Program* (Example topics forthcoming)

3. 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**

1. 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)*

2. Financial Management and Economic Well-Being *(Example topics include strengthening the capacity of families to establish and maintain economic security and build their future)*

3. 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)*

4. 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**

1. 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)*

2. 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)*

3. 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**

1. Advancing New Technologies and Skills *(Example topics include development of disciplinary and interdisciplinary knowledge, information technology skills)*

2. Communications and Marketing *(Example topics include appropriate methods to improve communications with peers, target audiences, stakeholders, and administration)*

3. Extension Foundation Skills *(Example topics include planning, implementation, and evaluation of Extension programs)*

4. Personal and Organizational Health *(Example topics include management/leadership development, team skills, change management, organizational accountability)*

5. 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)*

Appendix F. Extension 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 Activites

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 Commision	Florida

SMPs:
FL101
Multi-State Partners:

Organization	**State**
Hendrix Tractor Company	Alabama

SMPs:
FL102
FL103
Multi-State Partners:

Organization	**State**
Texas A&M University	Texas

SMPs:
FL420
Multi-State Partners:

Organization	**State**
USDA, Farm Service Agency	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	**State**
Extension	Florida

SMPs:
FL113
FL114
FL121
FL214
FL261
FL420
FL714
FL718
Multi-State Partners:

Organization	**State**
Extension 4-H	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, 2003This 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 ImpactFire Ant-Free Nursery Stock CertificationIrrigation UniformityLandscape Installation and Maintenance Organization Program, October 22, 2003Morning session moderatorNursery and Greenhouse Growers Program, November 4, 2003Program 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 becme 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, Mississippis, 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 childhhood 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	**State**
University of Florida	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	**State**
Alabama Extension Service	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	**State**
UGA	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	**State**
Auburn Univ	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**
Louisianna State University	Louisianna

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 **Smith-Lever Funds** $367
Title 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-discplinary 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 **Smith-Lever Funds** $12,142
Title 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	**State**
Alabama Historical Commission	Alabama

SMPs:

FL420

Multi-State Partners:

Organization	**State**
Cooperative Extension	Alabama

SMPs:

FL101
FL102
FL103
FL420

Multi-State Partners:

Organization	**State**
Extension Forester, Auburn University	Alabama

SMPs:

FL102
FL103

Multi-State Partners:

Organization	**State**
Texas A&M University	Texas

SMPs:

FL420

Multi-State Partners:

Organization	**State**
WFREC	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	**State**
Escambia Co. (FL) Extension	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 inflluence 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 nutritionistsInvited. "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, veterinariansInvited. "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 veterinariansInvited. 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 veterinariansInvited. 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 veterinariansInvited. 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 farmersInvited. 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 veterinariansInvited. The Cows Are Always Right!: Evaluating Rations. 6thWestern 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 personnelInvited. 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 Ruminal 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 staffInvited. 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 farmersInvited. 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 farmersWork 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 coordiating 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**
Extension Alabama
SMPs:
FL102
FL103
FL711

Extension Personnel Hochmuth, Robert
Department: Suwannee
Percent Extension Time 2 **Smith-Lever Funds** $2,695
Title Plasticulture 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	**State**
North Carolina State University	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 speciesDevelop educational materials related to aquatic invasive speciesTrain formal and non-formal educators to help them incorporate material on aquatic invasive species into their effortsDevelop rapid response plans related to aquatic invasive species
Multi-State Partners:

Organization	**State**
Georgia Sea Grant College Program	Georgia

SMPs:
FL317

Extension Personnel Jowers, Henry
Department: Jackson
Percent Extension Time 3 **Smith-Lever Funds** $2,484
Title Panhandle Peanut Shortcourse
Extension Activities
Plannng committee for the annual Panhandle Peanut ShortcourseSpeaker at Panhandle Peanut ShortcourseProvide production information as related to peanut production throughout the year
Multi-State Partners:

Organization	**State**
University of Georgia, Research Entomologist	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	**State**
Extension	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	**State**
Texas Livestock	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	**State**
University of Georgia	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	**State**
Alabama Department of Agriculture	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 resposibility 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	**State**
North Carolina State University	North Carolina

SMPs:
FL101
FL107
Multi-State Partners:

Organization	**State**
University of Georgia	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	**State**
Washington State University	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 territoires
Multi-State Partners:

Organization	**State**
4-H	AL; FL; GA; TN;

SMPs:
NONE
Multi-State Partners:

Organization	**State**
Area Rrural 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 and 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 membrs of this ISSC committee. The members are charged with developing and over seeing the implementation of a national education program to educate at-risk individuals of the risk associated with the consuption 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**

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 **State**
UF Florida
SMPs:
FL114
FL116
FL412
FL416
FL712
Multi-State Partners:
Organization **State**
UF Ext Florida
SMPs:
FL114
FL116
FL122
FL412
Multi-State Partners:
Organization **State**
UF Extension 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 2002On 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 2003Unfortunately, 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 session100 % of participants responding to the program survey indicated they gained useful knowledge. The topics identified by participants as most useful for there 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 Confernce		

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	Gerogia

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 prepasre 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	**State**
Perdue Extension Service	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	**State**
UF/IFAS	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	**State**
Isely Farm	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-servive 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	**State**
UGA	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	**State**
Southern Region of USDA FS	TX, AL, MS, AR,

SMPs:
FL420
FL421
Multi-State Partners:

Organization	**State**
Texas Fire Service	TX

SMPs:
FL420
FL421
Multi-State Partners:

Organization	**State**
USFS	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	**State**
UF-Ext.	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	**State**
Alabama Extension	Alabama

SMPs:
FL114

Multi-State Partners:

Organization	**State**
Extension Service	Alabama, Georgia

SMPs:
FL114

Multi-State Partners:

Organization	**State**
Master Gardener Association	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 countiesin conducting 4- H Volunteer Leader Training.

Multi-State Partners:

Organization	**State**
Extension	Georgia

SMPs:
FL715
FL716
FL717

Multi-State Partners:

Organization	**State**
Extension Service	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	**State**
University of Florida/IFAS Extension	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 Managment 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 Managment 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 Managment 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 Managment 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	**State**
Univeristy of Puerto Rico	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-servive 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 Reserarch and Extension. Conduct Trainging 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 SafetyObtaining 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 methdodology and 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 **State**
Cooperative Extension 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 **State**
Louisiana State University Louisiana
SMPs:
FL132
FL312
FL316

Multi-State Partners:
Organization **State**
University of Georgia, Shellfish Aquaculture Laboratory Georgia
SMPs:
FL132
FL312
FL316

Multi-State Partners:
Organization **State**
USDA Risk Management Agency Missouri
SMPs:
FL132

Multi-State Partners:
Organization **State**
USDA Risk Management Agency Regional Services Office 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	**State**
Georgia Sea Grant	Georgia

SMPs:
FL312
FL317

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 rsult of training.
Multi-State Partners:

Organization	**State**
University of the Virgin Islands	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	**State**
Southeast Ag Coalition	Georgia

SMPs:
FL101
Multi-State Partners:

Organization	**State**
University of Georgia	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 satelite 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	Geogia

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 hjas 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/Environmetnal 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	**State**
Auburn University	AL

SMPs:
FL214
FL315
FL714

Multi-State Partners:

Organization	**State**
Baldwin Co. Extension	Al

SMPs:
FL214
FL316
FL714

Multi-State Partners:

Organization	**State**
UF/IFAS Extension	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 OctoberBoard meetings in October and MarchSpring Workshop for all DHIA workers in 22- states participationWorkshops for dairy farm consultants (veterinarians and nutritionists)Meetings of specific work groups/committees PocketDairy CTAP DairyMetrics DHIA BIlling systemTelephone conferencesEmail 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 ares 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/SouthGeorgia Peach Meeting for Florida and Georgia peach growers. We havespeakers from the Universities of Florida, Georgia, Auburn and Clemson, aswell 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

Appendix G. 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 penisular 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 Henny, R. J., Stamps, R. H.,
Hatch Funds $8,692

Research Project # APO-03875
Research Title Development Of New Potato Clones For Environmental And Economical Sustainability In The Northeast
Research Faculty White, J. M., ,
Hatch Funds $1,713

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 $10,318

Research Project # BGL-03827
Research Title Best Management Practices for Turf Systems in the East
Research Faculty Scully, B. T., ,
Hatch Funds $3,269

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 $536

Research Project # BRA-03364
Research Title Biology And Management Of Arthropod Pests Of Vegetables
Research Faculty Schuster, D. J., ,
Hatch Funds $129

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-03554
Research Title Flower Initiation And Development Of Floriculture Crops
Research Faculty Harbaugh, B. K., ,
Hatch Funds $8

Research Project # BRA-03609
Research Title Introduction And Evaluation Of Ornamental Plants
Research Faculty Harbaugh, B. K., ,
Hatch Funds $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 Boisystematics 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, Vaccinium 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 Forunderstanding 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 Infectingng 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 Penisular 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, Vaccinium spp., in Florida
Research Faculty McAuslane, H. J., Liburd, O. E.,
Hatch Funds $372

Research Project # FME-03966
Research Title Predicting mosquito-borne disease transmission in Florida
Research Faculty Day, J. F., ,
Hatch Funds $251

Research Project # FOS-03548
Research Title Solid-phase Extraction Techniques For Pesticides In Water Samples
Research Faculty Moye, H. A., Marshall, M. R.,
Hatch Funds $847

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 $1,308

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-03544
Research Title Improved Nutrition And Irrigation Of Ornamental Plants
Research Faculty Broschat, T. K., Klock, K. A.,
Hatch Funds $162

Research Project # FTL-03711
Research Title Turfgrass Fertility Management and Environmental Impact
Research Faculty Cisar, J. L., ,
Hatch Funds $7,119

Research Project # FTL-03925
Research Title Biological Control of Soilborne Plant Pathogens for Sustainable Agriculture
Research Faculty Elliott, M. L., ,
Hatch Funds $2,373

Research Project # HOM-04016
Research Title Development and Evaluation of Tmdl Planning and Assessment Tools and Processes
Research Faculty Munoz-Carpena, R., ,
Hatch Funds $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 Forunderstanding 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 hemicals
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

Appendix H. 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 Activites:

A functinal 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 Managment in Florida, Extension-Research Demonstrations
Research Project: HOM-03517
Extension Integrated Activites:

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 Activites:

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 Activites:

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 shelfish 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 Activites:
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 Assocation 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 Activites:
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 Activites:
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 Activites:
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 Activites:
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 Activites:
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 Activites:
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 finsihed 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 Activites:
Wildflower Advisory Council Project: Treatment and Germination of Florida Native Wildflower Seeds for Commercial Production and Natural Landscaping; SMPs 121, 420Field plots (weed mgtm. 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 Activites:
CCAP Project - Native Wildflower Seed Production: Effects of Chemical Weed Control and Fertilization on Seed Yield and Quality of Phlox; SMP 121Field plots (weed mgtm. 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 Activites:
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 Progess: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 Activites:

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 Progess: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 Delware 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 postharvst 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 Activites:
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 CoordinatorTask 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 ProgramNumber: 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 Activites:
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; andc. To evaluate retention of food-borne pathogens1 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; andc. 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; andd. 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 ProgramNumber: 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 Activites:
Two novel postharvest treatments for enhancing the safety of fresh fruits and vegetables produced in Florida

Extension ProgramNumber: FS-002-Retail
Extension Program Title: Advisory For Retail Processing With Proper Controls & Variances For Product Safety
Research Project: FOS-2002-007
Extension Integrated Activites:
GOALTo 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.OBJECTIVES1. 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 ProgramNumber: 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 Activites:
1) Development of watermelon water use research/extension project 2) Development of irrigation scheduling research/extension project3) Development and evaluation of irrigation and nutrient BMPs for Southwest Florida

Extension ProgramNumber: IMOK-WAT-2
Extension Program Title: Evaluation and demonstration of cow-calf BMPs in South Florida
Research Project: IMM-00001
Extension Integrated Activites:
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 ProgramNumber: IMOK-WAT-3
Extension Program Title: Evaluation of agricultural reservoirs for water storage in SW Florida
Research Project: IMM-00001
Extension Integrated Activites:
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

Appendix I. FAIR Report

Florida Farm Bureau Federation IFAS Task Force

Carl B. Loop, Jr. Jacksonville
Rick Roth Belle Glade
John Hoblick DeLeon Springs
Wayne Smith Hastings
Ken Smith Brooksville
Pat Cockrell Staff Coordinator

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

FFBF State Board of Directors

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Carl B. Loop Jr. Jacksonville

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 full report can be downloaded at ://pdec.ifas.ufl.edu/FAIR.doc**}**

Reply to the FAIR Report

FLORIDA AGICULTURAL INDUSTRY REPORT ON THE UNIVERISITY 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 Force[2] 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

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.

   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.

   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

[2] 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

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.

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.**

   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.

3. **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.

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.**

   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.

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.**

   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.

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.

   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.

7. **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.

8. **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.

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.

   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.

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.**

    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.

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.

    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.

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.

    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.

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.

    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.

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.

    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.

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.**

    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.

16. **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.

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.

    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.

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.

    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.

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.

    Response

    IFAS is evaluating the feasibility and funding potential for such an initiative.

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.

    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.)

Appendix J. 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

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