2015 University of Florida and Florida A&M University Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

The University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) is a federal-state-county partnership dedicated to developing knowledge in agriculture, human and natural resources, and the life sciences, and enhancing and sustaining the quality of human life by making that information accessible. While extending into every community of the state, UF/IFAS has developed an international reputation for its accomplishments in teaching, research and extension. Because of this mission and the diversity of Florida's climate and agricultural commodities, UF/IFAS has facilities located throughout Florida -- 14 academic departments and two schools based at the main campus in Gainesville, 18 research facilities, and an Extension office in each of Florida's 67 counties.

The research mission of IFAS, conducted by the Florida Agricultural Experiment Station, is to discover new scientific knowledge, encourage innovative study and create applications based on sound science -- delivering solutions to the challenges facing agriculture, natural resources and life sciences in the State of Florida, our country and the world. Specifically, its goals include:

- Building agricultural systems research that is effective in preserving the diversity, building the strength and ensuring the development and economic sustainability of Florida's agriculture.
- Facilitating research within UF/IFAS that focuses on natural resources and environmental systems and emphasizes stewardship of the land and values of diversity in ecological systems. Programs serve to discover the underlying science of our natural resources while finding novel applications to preserve, protect and manage Florida's ecosystems.
- Focusing on human systems research and agriculture's impact on society and human behavioral issues related to food, natural resources, the environment and agriculture.

By seeking ways to enable the success of individual faculty and empowering multidisciplinary teams, we will achieve these goals and will strive to identify and meet future opportunities to further our research mission.

UF/IFAS provides research and development in support of Florida's agriculture, natural resources and related food industries. Agricultural research means that farmers can produce more fiber, food and fuel with the same amount of land and inputs; for the rest of us, research also reduces food prices, improves food safety and helps protect environmental quality. These industries are an economic powerhouse in Florida, providing more than 2 million jobs, $148.5 billion in direct output (revenues), $123.2 billion in value added contributions, and accounting for 15.4 percent of total economic activity in 2013.[1] According to an extensive analysis published in 2010 by a team of agricultural economists, for every $1 invested in U.S. agricultural research and development there's a return of $20 in benefits from increased agricultural productivity.[2]

Due to Florida's subtropical climate, its focus on specialty crops and its access to international ports, exports from Florida to domestic and international markets accounted for more than $65 billion in revenues. As globalization continues to increase -- it is expected to double by 2050 -- the influx of invasive pests and diseases puts greater demands on UF/IFAS research and Extension to maintain gains in agricultural productivity and develop new technologies to increase competitiveness.

The UF/IFAS Extension mission is to develop educational programs targeting critical issues throughout Florida. These will be achieved by continuing to partner with clientele, volunteers, county governments,

and public and private agencies. Teams of faculty and staff statewide focus on seven key areas:

1. Increasing the sustainability, profitability and competitiveness of agricultural and horticultural enterprises
2. Enhancing and protecting water quality, quantity and supply
3. Enhancing and conserving Florida's natural resources and environmental quality
4. Producing and conserving traditional and alternative forms of energy
5. Empowering individuals and families to build healthy lives and achieve social and economic success
6. Supporting urban and rural community resources and economic development
7. Preparing youth to be responsible citizens and productive members of the workforce

Florida Extension (UF and FAMU) has delivered science-based information to foster healthy people, a healthy environment, and a healthy economy for more than 100 years. Florida's economy is based on growth, tourism and agriculture. During the recession our population growth was largely flat, but growth has picked up recently and in 2014 the state passed New York to become the third most populous state at an estimated 19.9 million. Florida's population is estimated to reach 27.2 million by 2045.[3] With this growth comes the need for new information on food and fiber production, water conservation, natural resource protection, alternative energy and conservation, community resource development, and individual and family well-being. Extension will continue to improve the lives of Floridians as we face the challenges of tomorrow and beyond.

The goals and key areas outlined above are based on long-range, strategic planning processes by Florida Extension (UF and FAMU), resulting in the Extension Roadmap (2013-2023) and the Research Roadmap (2009, updated in 2013). While these program areas are designed to meet state needs, many directly relate to the five NIFA priorities.

[1]Hodges, A.W., Rahmani, M., and Stevens, T.J. 2015. Economic Contributions of Agriculture, Natural Resources and Related Food Industries in Florida in 2013. University of Florida/IFAS, http://edis.ifas.ufl.edu/fe969.

[2]Alston, J.M., Andersen, M.A., James, J.S., and Pardey, P.G. 2010. Persistence Pays: U.S. Agricultural Productivity Growth and the Benefits from Public R&D Spending. New York: Springer.

[3]Rayer, S. and Wang, Y. 2016. Florida Population Studies, Vol 49, Bulletin 174. University of Florida Bureau of Economic and Business Research. Online: http://tinyurl.com/hnzk322.

UF/IFAS has seen significant growth and improvement in facilities in 2015 with more planned for 2016; $5 million in projects under construction or in planning. That should boost productivity, retention and recruitment of people who spend their days figuring out how to make Florida agriculture more prosperous and sustainable. In November, we cut the ribbon on a 5,000-square-foot expansion of our Gulf Coast Research and Education Center. The addition will make GCREC big enough to hold 150 people - double the number from a decade ago. By early in 2016 we expect to finish expansion of our Southwest Florida Research and Education Center in Immokalee. It creates lab space for the new faculty and their graduate students to get to work on solutions to agricultural challenges. This fall we had a groundbreaking for renovations on our beef teaching unit in Gainesville. Our vision is to provide housing for students, a center where we can put on workshops and better facilities for the management of animals. Also on campus, we're building a food security lab that will serve as the hub for efforts to take a big-picture look at feeding the world, from production to post-harvest to transport to marketing to consumers' plates. We're planning a 4-H camp in the Welaka State Forest to give our 200,000-plus 4-H'ers a shot at life-changing experiences and develop them as leaders. Large or small, there are constant improvements and maintenance at UF/IFAS facilities across the state, ranging from a new gravel road in Jay to renovated research labs in Homestead. Facilities matter. Modern UF/IFAS facilities mean Florida agriculture is more likely to get all it deserves from its land-grant university. We need to keep pace with Florida farmers' growing needs.

UF/IFAS established, recruited and hired Extension faculty to fill four new food systems positions in 2015: a Food Systems Regional Specialized Agent (Mid-FL REC, Central District), two Sustainable Agriculture and Food Systems Extension agents, a Sustainable Food Systems

Extension agent.

FAMU/CAFS--1890 Extension

Although extension in Florida is made up of a collaboration between the 1862 UF/IFAS Extension and the 1890 FAMU/CAFS Extension (and together they are the Florida Cooperative Extension Service), they will be reported separately as much as possible to provide a clearer picture of the strong programs and impact FAMU and UF-IFAS have individually on Florida and its citizens. The Cooperative Extension Program is the extension educational component of Florida A&M University's land grant mission. The FAMU Cooperative Extension Program, housed in the College of Agriculture and Food Sciences (CAFS), provides research-based educational information and direct technical assistance to improve the quality of life for limited resource citizens. As a result, countless residents in Florida have been enriched through the positive impact of significant information shared by specialists and agents through the Cooperative Extension Program. Reaching out to serve farmers, rural and urban families, elderly, youth, entrepreneurs, small business owners, and underserved communities continues to be a rich tradition of the FAMU Cooperative Extension Program.

FAMU/CAFS--1890 Research

Florida is one of the fastest growing states, currently ranking fourth in population growth after California, New York and Texas. Most of this growth has been taking place in major urban areas, but agriculture continues to play a significant role in Florida's economy. Florida's agriculture is both diverse and unique in terms of farm size, crops grown or livestock maintained, and economic investments. The changing demographics of the state and the consequent needs of our stakeholders dictate that we develop appropriate research programs which would address the key challenges to sustainable development. Our research programs have a particular focus to the needs of small to medium scale, limited resource farmers. 90% of Florida's farms fit the definition of a small farm, which makes our mission particularly crucial in enhancing the overall economy of the state. The major areas of need are captured in the following planned programs:

1. Viticulture and Small Fruits Research
2. Preserving Water Quality of North Florida Watersheds Research
3. Strategic Research for the Management of Invasive Pest Species
4. Small Farm Production, Marketing, and Rural Economic Development

Viticulture and Small Fruits Research continues to provide leadership in the development of the grape and wine industry in Florida through quality research and statewide extension and outreach activities that address the needs and concerns of stakeholders. The Viticulture and Small Fruits Center recently released a fresh fruit muscadine cultivar and is working to release several wine grape cultivars in the near future that will greatly impact the marketability of Florida wines. In the area of plant biotechnology, researchers are working to identify molecular markers that will facilitate the breeding program and best management practices to enhance productivity and reduce cost. In the food biotechnology, researchers are working to develop high efficiency technology in the production of phytochemicals and nutraceuticals from grapes to address childhood obesity, food safety and food security issues. As a member of the USDA National Clean Plant Network, the Center will continue to improve on phytosanitary techniques in pathogen testing and disease elimination therapy and the production of clean vines. The Center will evaluate IPM techniques for vegetables and non-traditional small fruits, including blackberries for North Florida farmers to assist them in identifying alternative enterprises. The viticulture program attracts and supports many students who have chosen to do their research in grapes and small fruits. The faculty shares their expertise, knowledge and experience with the rest of the college by teaching graduate courses and participating in scholarly and professional activities.

Preserving Water Quality of North Florida Watersheds Research is administered through the Center for Water and Air Quality. The Center continues to work with undergraduate and graduate students, conduct need-based research and work with Cooperative Extension Program, as well as a number of diverse stakeholders. Its programs are focused on water quality and quantity issues in Florida Panhandle. Through the planned programs, the Center will continue to provide experiential learning opportunities for students in soils, water and natural resources areas.

Strategic Research for the Management of Invasive Pest Species is implemented by the Center for Biological Control. The problems posed by Invasive Alien Species (IAS) are broad, with impacts at the local, state, national and global levels. IAS pose major threats to agriculture and the environment. Concerted action and the continuum of prevention of imminent threats to the management of established species is required to mitigate the threats. This program takes a multidisciplinary approach with activities across the spectrum from prevention to management and restoration. The specific areas of focus include offshore pest mitigation, onshore development of ecologically based management of invasive insect pests and weeds, development of electronic diagnostic tools and resources for insect identification, assessment of the economic impact of IAS and improving the safety of biological control. The work of the Center integrates projects funded through other agencies which are all broadly focused on development of biologically based techniques for the management of pests. The program of work involves strong collaboration with USDA APHIS and USDA ARS, several state agencies and international cooperators, especially in the context of offshore work on IAS. An integral component of the research program is the training of undergraduate and graduate students and this emphasis will be continued.

Small Farm Production, Marketing and Rural Economic Development Research support science-based research information, as well as economic and marketing information, for limited resource farmers, rural citizens and urban communities to promote their economic and physical well-being. The program works collaboratively with horticulturists, social scientists, agricultural economists, rural development specialists and extension to generate relevant socioeconomic data and to provide relevant outreach support to targeted clientele. The research findings are used to support extension personnel in providing appropriate and relevant programs and services. The program priorities are community development, asset building, food security and small farm production and marketing. Research areas will include Alternative Markets, Crop Production via Protected Agriculture, Small Ruminant Production and Rural Communities.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	418.0	20.0	111.0	24.0
Actual	446.0	20.9	322.0	25.1

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel
- External Non-University Panel
- Expert Peer Review
- Other (Review by Stakeholders)

2. Brief Explanation

UF/IFAS (1862) and FAMU/CAFS (1890) Merit Review

Each year a formal merit review is conducted of each Extension team's current Plan of Action (PoA). This year it was conducted by six Extension specialists associated with UF/IFAS Program Development and Evaluation Center (PDEC) and four program leaders. The evaluation specialist may or may not be directly involved with a particular initiative but understand both logic model theory and the long-range plan for

Florida Extension. The review was largely conducted using an online survey instrument that included multiple questions about each section of the plan-situation statement, program objectives, educational methods, results, and needs. (Team members are encouraged to discuss and document the research resource needs for the next year, including the need for new research.) We also collected open-ended comments related to how the plan can be improved. Results of the merit review were provided to the team leader, Initiative Leadership Team leader, program leader, and Extension deans. Teams are expected to update their plans based on the merit review recommendations and all PoAs are posted to the PDEC website.

UF/IFAS Extension conducts county program reviews, five per year, to insure its educational programming is effective and meets local needs. Teams consisting of state specialists, county faculty (from other counties) and Extension administrators and/or unit leads visit a single county for 2-3 days. Presentations and meetings are held with county Extension staff and faculty as well as county administrators, stakeholders, and clientele. Each review team submits a written report (including SWOT analysis and recommendations for improvements) to Extension deans, program leaders, and the appropriate CED and DED. DEDs select up to three priority items from the report for CEDs to work on over the following year. CEDs are required to complete a one-year follow-up report demonstrating the improvements or changes made to these priority areas. Reports are sent to Extension deans, program leaders, and DEDs and shared with unit leaders as needed. A state specialist is assigned to manage these program reviews and actively analyzes the data to look at statewide trends and patterns.

UF/IFAS (1862) Scientific Peer Review

All USDA funded projects must be submitted to the USDA/NIFA using the REEport system and must be peer reviewed by three researchers, with final approval from the unit leader. Peer reviewers may be a faculty member of the same department, another department at the university, or from another institution. Upon completion of the peer review and unit leader's approval, the project is reviewed at the research dean's office for USDA compliance and submitted to NIFA for their approval. REEport projects are also evaluated annually by the unit leader and program leaders via the Annual Progress Report, as well as the individual faculty's report of accomplishments and a plan of work for the next year. Research faculty at UF/IFAS may be evaluated on the traditional criteria such as quality and quantity of peer-reviewed publications and sponsored research as well as the evaluation data collected to measure the effectiveness of the transfer of research-based information to the community.

FAMU/CAFS 1890 Merit Review

All USDA funded projects must be submitted to the USDA/NIFA using the REEport system and must be peer reviewed with final approval from the unit leader. In order to ensure maintenance of a high quality and accountability of the research program, we have implemented a revised process for the review and monitoring of research projects funded under the **Evans-Allen** program. Project ideas are developed from the bottom up, with ideas being generated by individual or groups of faculty in response to stakeholder needs. Center Advisory Councils play an important role in identifying priorities. Project ideas fall within the priority areas identified in the university's strategic plans. Additionally, the project ideas also link to priority areas for USDA and/or the state of Florida. Full proposals are developed by faculty/unit leader teams and once completed these are subjected to a peer review process. The main objective of the process is to assure quality, scientific merit, feasibility and impact of the proposed research. The review process proceeds through a series of steps. First, a preliminary review of the proposed research was made by the Research Director and discussions are held with the Principal Investigators regarding the relevance and the impact of the research on stakeholders. This was followed by a comprehensive review by three or more subject matter specialists including at least one external reviewer. The internal reviewers was drawn from among the college faculty while external reviewers may be drawn from among 1890 and 1862 scientists, CARET representatives, commodity associations, extension workers and other stakeholders. Comments or suggestions made for improvement of the proposal were then incorporated into the revised proposal. Planned programs were monitored through annual evaluation which included reviews by Center Advisory Councils as appropriate. Upon completion of the peer review and unit leader's approval, the project was reviewed by the Research Director for USDA compliance and submitted to NIFA for their approval. REEport projects are also evaluated annually by the unit leader and program leaders via the

Annual Progress Report, as well as the individual faculty's report of accomplishments and a plan of work for the next year.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Other (Contact traditional underserved clientele)

Brief explanation.

To insure that UF/IFAS and FAMU/CAFS are conducting high quality research and educational programs that address critical state needs, the following methods are utilized to obtain stakeholder input:

• Periodically, Florida Extension (UF and FAMU) conducts a comprehensive statewide needs assessment. In 2011-12, we held listening sessions in every county with clientele and stakeholders; 10 regional meetings to discuss the findings of the listening sessions with our faculty, Extension and Research administrators and unit leaders; conducted a Delphi study of key stakeholders and opinion leaders; sought input from stakeholders and the public using focus groups; and conducted an online survey of nearly 4,300 Floridians. Underserved and under-represented groups were identified by faculty and strongly encouraged to participate in the listening sessions and online survey.

• Each of the 67 county Extension offices has a county-wide advisory committee and each county faculty member is expected to have at least one program advisory committee. County Extension Directors (CED) and District Extension Directors (DED) review the membership of the committees as part of the faculty member's annual review. It is expected that the overall advisory committee is made up of members that represent county demographics and that each of the program advisory committees' membership resembles the demographics of the target audience they serve.

• Each UF/IFAS academic department, school and research center has an advisory council representing various agricultural commodities, natural resource organizations, community and business leaders, etc.

• The Florida Agricultural Council, Inc. (FAC) is a non-profit foundation that consists of five regional advisory councils (RAC) that meet at least once a year and provides a forum to discuss societal trends, educational and technological issues, and economic pressures that affect agricultural and natural resource entities in Florida. The past three meetings the Extension dean has requested their input on four major UF/IFAS Extension initiatives-strategic staffing, revenue enhancement, urban Extension, and total UF engagement with Extension.

• A Customer Satisfaction Survey is conducted annually of 12-14 counties on a five-year rotation. Questionnaires are mailed to Extension program participants, asking them to rate their experience and the information provided. The county-level data are provided to the Extension dean,

DEDs and CEDs for those counties, including information on positive or negative trends and findings. CEDs are encouraged to share the data with their faculty and staff. The Florida Department of Education is also provided a copy of the report.

• County program reviews are conducted in five different counties each year to insure the educational programming is effective and meets the needs of the county. County administrator(s) and stakeholders from each of the key program areas are invited to participate and provide feedback about the quality, effectiveness, and relevance of the Extension programs offered in the county.

• The Center for Public Issues Education (PIE Center) at the University of Florida conducts several interdisciplinary projects that measure the knowledge, behaviors and attitudes of consumers and constituents as it relates to agriculture and natural resources. The PIE Center then shares its findings with the public and stakeholders, including Florida Extension, through educational outreach and training programs using cutting-edge technology. The PIE Center uses online panels purchased through Qualtrics (online survey tool) and oversamples for minorities to ensure their opinions are accurately represented in the survey results.

• The university-wide Challenge 2050 project, led by UF/IFAS Agricultural Education and Communication faculty, was recently created to develop human capacity to meet the needs associated with a population projected to exceed 9.6 billion by 2050. By bringing together interdisciplinary students and faculty, industry partners, and policymakers, and through innovative dialogue, initiatives, coursework, research, and advocacy efforts, we create a foundation for addressing this challenge.

• In 2014 a task force was formed to look at the strategic staffing needs of Florida Extension and provide recommendations for organizational changes as it relates to staffing. Another task force called Revenue Enhancement was formed at the same time and was tasked with identifying and evaluating new or expanded funding sources and opportunities. The recommendations of these task forces was released in 2015 and implementation will occur over several years. However, we do not expect these organizational initiatives to result in significant impact to this Plan of Work.

FAMU/CAFS has 2 academic divisions, including seven program areas, and one Research and Extension Center (REC). There are advisory committees representing the various programs, industries and community and business leaders. In addition research advisory committees helped to identify ways to encourage participation in long range planning. Input from stakeholders were sought from multiple sources and at different levels. Various stakeholder groups such as Florida Grape Growers Association, Florida Meat Producers, Florida Farm Bureau, Florida Fruit and Vegetable Association, Florida Nursery Growers Association, CARET representatives, Florida Water Management District representatives, Florida Mosquito Control Association are represented in the different research program/center Advisory Councils. Through participation in these Councils as well as in other forums, follow-up discussions were held concerning the existing research program priorities and how Florida A&M University's research programs are and will continue to address stakeholder's needs. A show-and-tell event (Research Forum) is held periodically on the campus to encourage stakeholder participation and facilitate interaction with researchers. The College also holds several other public events during the year to gather information from stakeholders. Whenever it is feasible, efforts are made to coordinate relevant activities with extension to avoid duplication.

Viticulture and Small Fruits Research: Stakeholders provided input into all viticulture programs especially at annual conferences and meetings where special sessions were provided to discuss issues and problems. This is the primary source of input from the stakeholders and valuable information and suggestions have been obtained at these meetings. A grower survey was conducted to collect specific information, when necessary. The Florida Viticulture Advisory Council met quarterly and provided a continuous flow of information and critique to the viticulture program. The Center also works closely with the Florida Department of Agriculture to identify and address any special industry needs.

Preserving Water Quality of North Florida Watersheds: The Center for Water and Air Quality encouraged participation of both traditional and nontraditional stakeholders in the development of

the program plan through the Center Newsletter, biennial meetings of the stakeholder group, information disseminated at field days and direct contact either through the mail, email or telephone. Strategic Research for the Management of Invasive Pest Species: The Center for Biological Control continued to expand its Advisory Council to include both traditional and non-traditional stakeholders. This is the primary avenue through which stakeholder inputs are solicited. Additionally, ad hoc surveys to addressed specific issues may be carried out as necessary. Center faculty also participate in activities organized by stakeholders, and solicited feedback on the research program.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

We identify stakeholders through a variety of formal and informal means, including relationships with Extension clientele, partnerships with collaborating organizations or companies, input from county administrators and other elected officials, advertising and social media, and suggestions from advisory committees and commodity groups. In addition to statewide efforts to identify key issues and stakeholders through our long-range planning process (as described in the first narrative), counties and districts as well as academic departments and Research and Education centers, may conduct their own listening sessions, needs assessments, and surveys to identify stakeholders.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public

Brief explanation.

See previous narratives in the Stakeholder Input section.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

Listening was at the core of the Florida Extension Roadmap planning process. Florida Extension actively sought diverse viewpoints regarding Florida's future through listening sessions, interviews, focus groups, and surveys that involved a wide range of citizens, educators, health care providers, state agencies, industry/trade associations, businesses, local governments, community leaders, and faculty members. This process identified a wide range of key issues that affect Florida's people, its economy, and its environment. As a result of this effort, we used that information to map out our statewide initiatives in our Extension Roadmap 2013-2023, recently developed strategic staffing and revenue enhancement plans and began an Urban Extension initiative. We use the Roadmap to guide our annual review and update of our statewide teams' action plans.
Input received from stakeholders through other formal and informal methods (described earlier) is used by administrators and faculty to evaluate and update the Extension and the Research Roadmaps as needed. The Florida Ag Council remains a very important source of input on organizational and programmatic initiatives. At the county level, stakeholder input is considered when making adjustments to planned programs, staffing, finances, administration, etc.
1890 Research
Stakeholder input was used in overall program assessment, planning and resource allocation. Thus the input was used determining the direction and emphasis of the entire research program including modifying existing projects, but also in identifying new issues that needed to be addressed and hiring of new staff. The input was also factored in the development/revision of center/program strategic plans, and thus guided the development of extra mural grants and other complimentary activities.

Brief Explanation of what you learned from your Stakeholders

The Extension Roadmap was designed to guide Florida Extension in meeting the needs expressed by stakeholders during this intensive and comprehensive long-range planning process. Two new teams were formed for water and energy and others were revamped to better fit the needs as expressed by our stakeholders. Due to the timing of this needs assessment, there was a lot of concern around economic issues such as jobs and workforce development of youth, financial management for families, niche market for small farmers and farm economics in general, and community economic development. Even with the more recent recovery we are seeing in Florida, economic issues remain a high priority for stakeholders.
Recent studies conducted by the PIE Center on water issues provide a great deal of information that can be used to shape Florida Extension programming in several areas. For example, four in five Floridians say water is a highly or extremely important issue--roughly equal to the issues of healthcare and the economy--and three in five believe that saltwater intrusion is an important issue. The survey looks at various water conservation practices and gauges the public's likelihood and willingness to engage in those practices. A second study examines perceptions of agricultural water use among the public and policymakers. Overall, local government officials were more confident

than the public in the quantity and quality of Florida's water supplies. On the other hand, they were less trusting than the public when asked about farmers' water practices. This study and a third study of landscape irrigation practices shows much opportunity for Florida Extension to educate the public on best management practices given their lack of knowledge and/or willingness to change.

1890 Research

Inputs from stakeholders confirmed that the following issues were still of critical concern: 1) development of small farmer specialty crops such as grapes, small fruits and vegetables 2) water quality and quantity, 3) invasive alien species and biosecurity, 4) rural development and development of small ruminant production, 5) development of bioenergy opportunities especially for small farming systems and 6) climate change as a cross cutting issue.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
4782341	1869745	3988835	2142288

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	3991046	2243694	3403101	2341001
Actual Matching	3991046	934872	3403101	1170501
Actual All Other	0	0	0	0
Total Actual Expended	7982092	3178566	6806202	3511502

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	0	0	696038

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Increasing the sustainability, profitability, and competitiveness of ag and hort enterprises

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	5%	0%	0%	0%
204	Plant Product Quality and Utility (Preharvest)	5%	5%	0%	0%
205	Plant Management Systems	5%	10%	0%	0%
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	5%	0%	0%
212	Pathogens and Nematodes Affecting Plants	5%	5%	0%	0%
213	Weeds Affecting Plants	5%	5%	0%	0%
215	Biological Control of Pests Affecting Plants	5%	5%	0%	0%
216	Integrated Pest Management Systems	5%	5%	0%	0%
301	Reproductive Performance of Animals	5%	5%	0%	0%
302	Nutrient Utilization in Animals	5%	5%	0%	0%
303	Genetic Improvement of Animals	5%	0%	0%	0%
305	Animal Physiological Processes	5%	5%	0%	0%
306	Environmental Stress in Animals	5%	5%	0%	0%
307	Animal Management Systems	5%	10%	0%	0%
311	Animal Diseases	5%	5%	0%	0%
403	Waste Disposal, Recycling, and Reuse	5%	0%	0%	0%
404	Instrumentation and Control Systems	5%	0%	0%	0%
503	Quality Maintenance in Storing and Marketing Food Products	5%	10%	0%	0%
601	Economics of Agricultural Production and Farm Management	5%	10%	0%	0%
603	Market Economics	5%	5%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	80.0	11.0	0.0	0.0
Actual Paid	164.4	11.7	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1471139	911270	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1471139	379696	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. In service training workshops will be developed using research-based information.
2. EDIS publications targeting specific sectors, needs assessment reports, and risk assessments for specific industries and geographies.
3. Building diversified teams, including county and state faculty within and beyond UF/IFAS and stakeholder leaders whose expertise is valuable to food systems and enhance educational programming, as evidenced by the number/dollars of funded competitive grants and publications.
4. Utilizing available data (economic, census, case studies, etc.) and GIS data to analyze and visualize Florida's capital infrastructure, areas of food insecurity, and production areas by agricultural commodity, identify and prioritize the top three opportunities for market, infrastructure, and distribution development with significant potential impact, and secure sufficient funding to execute at least one of these programmatic priorities.
5. Support the development of common evaluation metrics to be used in food system educational programs at the county/regional/state levels and provide trainers with tools to evaluate the efficacy and impact of their programs.
6. The UF/FAMU Small Farms and Alternative Enterprise web site has become the main portal for small farmers and allied industry members to find information important to Florida's small farms industry. The site has very popular since it was launched in 2005, reaching approximately two million hits annually in 2011 -2015. Many small farm meeting evaluations indicate attendees use the web site regularly and find educational programs through the site's events calendar. Overall, the impact is the web site provides an efficient preferred method for small farmers to find educational information and has become the "go to" site for small farmers in Florida and beyond. During 2015, the Small Farms and Alternative Enterprises Website received 1.1 million hits, following a 3-4 year trend of lower overall hits and page views. This lower number is likely due to insufficient funding for a part time or full time webmaster to keep the topic teams active. However, the overall impact for the Small Farms and Alternative Enterprises team is very positive as we see the website maturing and keeping its reputation as a great resource for

small farmers on the internet.

7. One hundred attend a Fall Crop Field Day the FAMU REC that provide participants with crop tours that focused on fall vegetable, fertilizer rate application for scotch bonnet peppers and protected agriculture. Two-one hundred foot rows of Brussel sprouts, broccoli, Swiss chard, cauliflower, mustard, kale, and romaine & red leaf lettuce. Another four-one hundred foot row of collard greens and cabbage were also grown to demonstration cool season crop production. Homeowner gardening systems, in-ground and raised beds were demonstrated in an urban garden plot. A Scotch bonnet pepper production area containing varying fertilization rate was also demonstrated. The field day also included a forum with USDA panelist from NRCS, NASS, Florida Rural Development, Small Farmer Distribution Network and Farm Service
Agency on resources available for beginning farmers and those already farming.

2. Brief description of the target audience

- Producers
- Commodity Associations
- Owners/Operators
- Managers/Supervisors
- Workers/Laborers
- Allied Industry Representatives
- Small Farmers
- Government/Regulatory
- County government
- State government
- Federal government
- Tribal government
- International governing bodies
- Harvesting/Packing/Processing/Distribution
- Harvesters/Packers
- Processors
- Distributors/Transporters
- Retailers
- Importers/Exporters
- Youth and 4-H (K-12)
- Youth Educators
- Extension FacultyF
- Food handlers
- Extension professional

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1644476	9674249	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	166	0	166

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. Outcome Measures

Change in Knowledge Agricultural and Natural Resource Industry Profitability and the Sustainable Use of Environmental Resources

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	61429

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Manatee County is a key vegetable production area in west-central Florida, and approximately 2,500 acres of potato and 1,500 acres of snap beans are grown there annually. If all of this acreage were converted to center-pivot irrigation, an overall savings of over 860 million gallons in potato and 132 million gallons of water in snap bean could be realized. Education of potato and snap bean producers and potential center-pivot conversion would not only save water but help to maintain water quality. Further research is being conducted to develop plant nutrition programs that compliment overhead irrigation in potato and snap bean in this region.

What has been done
Seepage irrigation is the most commonly used irrigation method for both potato and snap bean production in Florida. However, seepage is much less efficient than other methods. In a partnership with Southwest Florida Water Management District, Dr. David Liu is leading a three-year study comparing center pivot irrigation to seepage irrigation in four locations in Manatee County, FL, for growing snap beans and potatoes. In spring 2014, this agent helped organize a grower field day demonstration that was conducted at one of the trial sites. Before visiting the field, growers gathered for a classroom-style educational session that introduced the ?what and why? of what they would see in the field. Twenty-five participants attended this Potato and Snap Bean Field Day.

Results
Seventy-two percent (18 out of 25) of participants showed interest in converting to center pivot irrigation as indicated by a verbal survey. Initial studies have shown that on average, center-pivot uses 40-60% less water than seepage, saving approximately 345,000 gallons per acre in potato and 88,000 gallons per acre in snap bean.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
403	Waste Disposal, Recycling, and Reuse
503	Quality Maintenance in Storing and Marketing Food Products
603	Market Economics

Outcome #2

1. Outcome Measures

Change in Behavior Agricultural and Natural Resource Industry Profitability and the Sustainable Use of Environmental Resources

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	29854

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A key issue within global agricultural research and development is the need to positively focus on the sustainable development of small farmers, resource poor farmers and their communities. Though small farmers make up to 90% of the worlds farmers, often they have not had equal

access and participation in programs and training designed to assist large producers and agribusinesses. Generally, agricultural research and extension have sought out medium and large farmers thought more successful, innovative, and readily able to adopt technology and contribute to growth and development. A recent USDA Census indicated that about 91% of all farms in the United States are small farms. Small farms represent over 90% of all farms in Florida, this includes resource poor farmers.

What has been done
FAMU's agricultural extension programs are active participatory capacity building programs designed to assist and equip underserved farming populations and their communities toward a thriving sustainable development. These programs use participatory, multidisciplinary integrated systems approach to provide relevant education programs, hands-on training and technical assistance to underserved farming populations and their communities.

Results
Of the 70 persons who attended FAMU community agriculture workshops, 89% indicated that they will adopt water conservation practices within one year. 85% indicated that they will adopt mulching principles. 100% of respondents indicated that they will adopt the use of soil test to determine fertilizer requirements.

Five young agro-entrepreneurs who graduated from FAMU New & Beginning Farmers Training Program pooled their resources to purchase a 36 acre farm site to grow fresh produce for school market.

Through FAMU's Small Farm to School Program, a beginning farmer cultivated markets with seven school districts in Georgia. These schools purchased approximately 10,000 pounds of leafy greens, 200 bushels of sweet potatoes, 400 pounds of butternut squash and 400 bushels of sweet corn from participating farmers.

With assistance from FAMU's Small Farm to School Program, eighteen (18) beginning agro-entrepreneurs received training in food hub development and value-added processing. This group sold fresh produce to local schools through the Mississippi State Commodity Procurement System. Products sold this year included 1,200 cases of collards, 1,600 cases of turnips, 2,000 bushels of sweet corn, 650 cases of green beans. For 2016, three additional produce items will be added to the list to be sold including watermelon, broccoli crowns and butternut squash.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals

306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
503	Quality Maintenance in Storing and Marketing Food Products
601	Economics of Agricultural Production and Farm Management
603	Market Economics

Outcome #3

1. Outcome Measures

Change in Condition Agricultural and Natural Resource Industry Profitability and the Sustainable Use of Environmental Resources

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	16486

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The estimated market value of Scotch Bonnet hot pepper in north Florida for FY 2015 exceeded $1,000,000.00 for the first time since the crop was introduced as an alternative crop in the 1990?s. The hot pepper market, in which Scotch Bonnet is a favored commodity, has the capacity to absorb more than 20,000 pounds of fresh Scotch Bonnet peppers per week.

What has been done
FAMU's agricultural extension programs are an active participatory capacity building programs designed to assist and equip underserved farming populations and their communities toward a thriving sustainable development. These programs use participatory, multidisciplinary integrated systems approach to provide relevant education programs, hands-on training and technical assistance to underserved farming populations and their communities.

Results
One farmer growing Scotch Bonnet hot pepper has expanded his operation to more than 10 acres and plans to expand even further next year to 50 acres. This farmer has provided employment for 16 additional individuals and markets fresh and value-added hot pepper produce both nationally and internationally. Another farmer growing Scotch Bonnet hot pepper has expanded

his operation, now operates in two states (FL and GA) and has provided employment for 8 full time workers. He also provides a market for smaller growers by purchasing their produce for re-sale to his established markets in New York and south Florida. Farmer claims that hot pepper is a profitable business. He has established a refrigeration unit to cut down on spoilage and modified his fertilizer regime. As a result, his profits have increased significantly over last year's and he has been able to purchase a vehicle to assist with shipping. He is now able to support himself financially from his farm business.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
503	Quality Maintenance in Storing and Marketing Food Products
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Change in Knowledge Awareness of Agriculture's and Natural Resource's Importance to an Economy That Ranges From Local to Global

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	12316

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agricultural literacy is the knowledge and perception of agriculture that an individual has (Wright, Stewart, & Birkenholz, 1994). Several scholars have indicated that US youth and adults are no longer agriculturally literate (Frick, Birkenholz, Machtmes, 1995; Mayer & Mayer, 1974; Wright et al., 1994). It is likely, a large and growing number of Florida residents and visitors have low agricultural literacy due industrialization, urbanization, in-effective communication, and increasing concerns with agricultural practices. The large urban and non-native Florida population further impacts the need for increased awareness of agriculture and the environment as many are unfamiliar with Florida agriculture and/or have limited opportunities to observe Florida agriculture. With an Extension presence in all of Florida?s 67 counties, often in urban areas, Extension is well positioned to reach youth, adults, and policy makers and increase their awareness of Florida agriculture and the environment. Extension can help increase the agricultural literacy and awareness of Florida residents and visitors by offering programming aimed at providing information about agriculture and the environment so that these audiences are able to form attitudes and opinions, gain knowledge, make behavior changes, and increase their economic support of Florida agriculture through increased purchases of Florida-grown food.

What has been done

In Santa Rosa County, Extension Agents host an annual farm tour for local officials and area residents. The farm tour has been operated in Santa Rosa County for 49 consecutive years in collaboration with various agricultural support agencies and the board of county commissioners. The tour is a day long and takes participants to various agricultural and forestry operations to experience agriculture and the environment in person while discussing issues facing the industry. A total of 173 local officials and area citizens participated in the tour this year. In its 49th year, the tour has gained so much interest that it is no longer advertised and there is a waitlist to participate in the tour.

Results

As a result of the 2015 Santa Rosa County Farm tour, 99% of participants reported in a post-tour evaluation that they were more aware of the value agriculture and the environment adds to the community, and they indicated that they had a greater appreciation for agriculture and the environment. More than 90% of participants reported being more aware of the economic contributions of agriculture to the local area, they had a greater appreciation for others in their community, they learned something new about agriculture, and they gained knowledge of issues facing agriculture and the environment. The information presented during the farm tours positively influenced they way 92% of participants think about agriculture and the environment. Lastly, 99% expressed intent to share what they had learned with others and 90% expressed intent to make informed decisions on issues facing agriculture and the environment. Over the years, the Santa Rosa County Farm tour has gained high involvement in the tour from local community leaders and elected officials which has resulted in strong support for agriculture and Extension in the county.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
403	Waste Disposal, Recycling, and Reuse
503	Quality Maintenance in Storing and Marketing Food Products
601	Economics of Agricultural Production and Farm Management
603	Market Economics

Outcome #5

1. Outcome Measures

Change in Behavior Awareness of Agriculture's and Natural Resource's Importance to an Economy That Ranges From Local to Global

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	4690

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
To enhance their competitiveness and economic viability, farmers and producers are in need of programming on new and/or alternative practices, products, and process.

What has been done
At the UF/IFAS Extension Office in Orange County, five hydroponic demonstration systems were created and maintained during the year with an additional 3 systems continued from the previous year including one aquaponic system.

Results

* 64% of demonstration attendees taking a post-program survey indicated they now recognize the income potential of new crops and new production systems.
* 76% said they would repurpose their existing ornamental greenhouses to produce high value vegetable crops and seek new markets to diversify their operations.
* Attendees showed a 35% increase in knowledge surrounding important steps in starting a successful vegetable farm business.
* They showed a 62% increase in knowledge about marketing vegetables in wholesale and retail markets.

The Hydroponic Short Course programs have directly increased the number of successful greenhouse operations in Florida, resulting in more locally available produce. These operations have also led to more successful local farmers markets in Florida due to the increase in local produce.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
503	Quality Maintenance in Storing and Marketing Food Products
603	Market Economics

Outcome #6

1. Outcome Measures

Change in Condition Awareness of Agriculture's and Natural Resource's Importance to an Economy That Ranges From Local to Global

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Change in Knowledge Protecting Florida from Existing and Emerging Pests and Diseases

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	14835

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Rugose spiraling whitefly was first identified in Miami-Dade County in 2009. Since then it has been reported on more than 60 plant species, including plants commonly encountered in urban landscapes, and has spread rapidly through many south and central Florida counties. Any bodies of waters such as pools and ponds are greatly affected by these infestations. Actual damage to the plants will vary depending on the type of plant but can include leaf yellowing, defoliation, and overall decline of the plant. Responses to this whitefly have ranged from excessive use of pesticides to tree removal.

What has been done
County agents were identified to participate in a project to help monitor for whitefly pests and their natural enemies. An in-service training was planned for these county agents in which received training and hands-on practice to identify, sample, handle, rear, and ship whiteflies and their natural enemies. Included in the training, each county agent receives a Whitefly Toolkit that would contain a small field microscope and all the supplies necessary to identify, sample, and rear whiteflies. The county agents will survey sites within their county and will provide a monthly whitefly and/or natural enemy report and sample for identification. Each county agent will log into a database with information on their monthly samples. These data will help determine the types of whiteflies, frequency and level of infestations and potential natural enemies. Participation in this program not only provides data on invasive whiteflies but is an opportunity to train county agents and provide them with the tools to monitor for these pests. This training provides the basis for future training on what to look for and how to monitor and sample pests.

Results
The populations of rugose spiraling whitefly have continued to decline since the establishment of the parasitoid, E. noyesi due to the natural and planned movement of the parasitoid. Educational efforts and materials have incorporated information about this parasite and the reduction in use of

pesticides. The database was established in which the county agents will report their monthly results.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems

Outcome #8

1. Outcome Measures

Change in Behavior Protecting Florida from Existing and Emerging Pests and Diseases

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	7252

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Working in partnership with state agencies, professional organizations and industry, UF/IFAS provides training for thousands of Florida?s workers each year to improve their skills, knowledge and job opportunities. Programs such as the Green Industry Best Management Practices (32,398 participants in 2007-14) and Pest Management University (1,411 participants) certify employees of local businesses and government in sustainable landscape practices, including safe and effective pesticide use, which help protect Florida's water supply.

What has been done
Through the Florida Pesticide Certification and Licensing program, UF/IFAS has worked with the Florida Department of Agriculture and Consumer Services (FDACS) to train more than 10,000 new licensed pesticide applicators over the past eight years, and nearly 14,000 have renewed their license by taking continuing education courses.

Results
Currently there are about 65,000 pesticide applicators holding some type of state-issued pesticide license or certificate. The mean annual salary in Florida of those who are employed as pesticide

handlers, sprayers, and applicators is $32,200, according to the latest U.S. Bureau of Labor Statistics -- adding more than 2 billion to Florida's economy. The average wage for a licensed pesticide applicator is 37 percent higher than for a regular landscaping worker -- an annual salary difference of $8,680. In 2014, this economic benefit statewide is valued at $25 million ($8,680 x 2831 certifications), with nearly one-half ($12M) attributed to state and local government employees.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems

Outcome #9

1. Outcome Measures

Change in Condition Protecting Florida from Existing and Emerging Pests and Diseases

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	4691

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Increasing the sustainability, profitability and competitiveness of Florida agriculture is becoming increasingly difficult as Florida?s
urban areas continue to grow rapidly and the traditional and more isolated farm population shrinks. Concomitantly, the number of
small farms (<$250,000 annual sales) is increasing, now over 90% of all Florida farms, along with significant pest problems on all farms
and in communities and natural areas. Protection of plant, animal and human health using integrated pest management (IPM) is
particularly challenging in Florida because of the mild climate and global agricultural markets that cause the state to be susceptible to
the accidental or intentional introduction of invasive pests.

What has been done
A team of University of Florida IFAS Extension faculty has developed a series of video modules for those interested in learning how to manage pests using integrated pest management (IPM) strategies on a whole farm or whole landscape level. When they watch these short video modules, they learn how to implement strategies such as using trap crops and insect monitoring traps; creating plant habitat for beneficial insects; using birds, bats and owls as pest predators; enhancing the landscape for native pollinators; and scouting to best target management strategies. These modules were developed at the UF IFAS Suwannee Valley Agricultural Extension Center near Live Oak, FL which has a 300 acre farm that has been transformed into a Living IPM Laboratory putting into real life practices these IPM strategies.

Results
The farm is now implementing several innovative IPM strategies to manage pests and has reduced pesticide use by more than 50%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems

Outcome #10

1. Outcome Measures

Change in knowledge related to processing, distribution, safety and security of food systems

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	13984

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food system participants from producers to processors are obligated to reduce risk of enteropathogens to ensure a trustworthy food supply. The Centers for Disease Control and Prevention (CDC) estimate 48 million cases of foodborne illness, 128,000 hospitalizations, and 3,000 deaths occur each year from foodborne microorganisms (http://www.cdc.

gov/foodsafety/cdc-and-food-safety.html). The commodities that have led to the most outbreakrelated illnesses were fruits and nuts (24%), vine and leafy vegetables (23%) and beef (13%). In response to these and other food safety issues, the federal government has enacted the 2011 Food Safety Modernization Act (FSMA), the most drastic change in food legislation since the 1936 Food, Drug, and Cosmetic Act. In addition to regulatory compliance, there is an expectation of food safety throughout the food system to significantly exceed standards defined by FSMA. The rule is expected to be fully implemented in 2016.

What has been done

The major of our extension effort focused on the Food Safety Modernization Act (FSMA) and both Packinghouse and Juice HACCP. Our past program, the Good Agricultural Practices (GAPs)training program, while still relevant, is slowly being supplanted by the Produce Safety Rule and Preventive Controls training efforts. In 2015, we conducted and/or participated in 22 workshops on GAPs, HACCP and numerous others workshops on various food safety topics. These meetings reached a substantial portion of the Florida produce industry with specific emphasis on tomatoes. In 2015 we conducted four Packinghouse and two juice HACCP training courses. These programs remain nationally and international recognized. The Juice HACCP program serves approximately 75-80% of the juice industry in the US and is only one of a small handful in the country that continues to conduct training. Our Packinghouse HACCP course is the only International HACCP Alliance recognized course of its kind. This program with eventually be replaced by our planned FSMA training efforts, but has served to assist Florida packers meet national and international standard.

Results

11th Annual Florida Tomato Food Safety Workshop had 129 participants this year that represented 30 commercial tomato grower/packer/shippers, pretty much the entire Florida industry. The total number of registrants similar to that in 2014. This high participation rate reinforces the importance of this program to our Florida tomato industry and our partnership with the Florida Tomato Exchange. Pre/post-tests were completed by 104 participants to qualify for a Certificate of Completion. The test results showed that the average participant had a pretest score of 61/100, and the post-test score was 77, an increase of 26%. Of the 65 survey respondents (50% response), 23 were food safety coordinators, 15 were grower/packers, 12 were production/packinghouse managers and 15 identified themselves in sales/compliance/consultants/extension agents. Overall content ratings for the workshop ranged from 4.13 to 4.69, with 5.0 = best.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
503	Quality Maintenance in Storing and Marketing Food Products

Outcome #11

1. Outcome Measures

Change in behavior related to processing, distribution, safety and security of food systems

Not Reporting on this Outcome Measure

Outcome #12

1. Outcome Measures

Change in condition related to processing, distribution, sagety and security of food systems

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	6094

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food safety training, with a certificate of attendance, is critical for citrus growers, producers, packers and harvesters to pass their various food-safety program requirements and for economic success in domestic and international markets. Certain Fresh Citrus training programs, i.e., Food Safety, Personal Hygiene and WPS, are considered ?major musts;? and failing to comply with audit requirements can result in failing the audit, causing the company extra costs in lost production and additional audit inspections/requirements.

What has been done
Extension specialist and agents provided food hygiene, personal hygiene, and workplace health training to local citrus growers, producers, packers, and harvesters. The Small Farms Food Safety Training program
conducted with 52 farms was the first such training implemented by UF/IFAS where the growers actually develop their food safety manual.

Results
In 2015, 8 of the 10 (80%) Indian River Citrus League packinghouses
participated in the training programs, plus three other packinghouses in the state and 16 producers and harvesting companies. More than 30 individual companies/businesses participated, resulting in 1,508 documented/trained employees in Food Safety. The overall 2015 Fresh Citrus Training/GlobalGap team's coordinated teaching (English & Spanish) resulted in 5,480 trained in five program offerings. Indian River Citrus League estimates value of each program per person is
approximately $50 per person based on training costs if they paid private consultants. Thus, the overall value of training was $274,000 = 5,480 trained @ $50/attendee/program).

In 2015, 52 farms showed gained knowledge from pre/post tests and moved forward to begin food safety compliance by developing their manuals. As a result of the programs, 17 farmers were able to further implement programs on their farm and to pass a third party audit. On those farms which completed the audit, the impact was their ability to sell their product in the US wholesale food system. The value of developing their own food safety program is estimated at $5,000-$10,000, depending on farm size; resulting in an overall savings of $170,000 to the 17 farms planning to need a food safety audit.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
503	Quality Maintenance in Storing and Marketing Food Products

Outcome #13

1. Outcome Measures

Change in knowledge related to climate variability and climate change

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.
Florida also has three international shipping ports: Miami, Jacksonville and Tampa. Florida also has six international airports. Florida also had an estimated 105 million tourists in 2015, including more than 11 million from overseas. It has been estimated that this

international influx into Florida has made us the entry point of one new invasive pest, plant or disease each week.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UF and FAMU's key evaluations, both quantitative and qualitative, are reported under the State Defined Outcomes section. We continue to work on collecting statewide data on more focused, key indicators. UF/IFAS is currently working on an "Extension Toolbox" in Qualtrics that will store common survey instruments and questions for all our major planned programs to be used by UF and FAMU Extension county faculty and state specialists. This will greatly improve our ability to gather statewide data on issues related to family and consumer science.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Enhancing and protecting water quality, quantity, and supply

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%	0%	0%	0%
111	Conservation and Efficient Use of Water	75%	0%	0%	0%
112	Watershed Protection and Management	20%	0%	0%	0%
	Total	100%	0%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	1.0	0.0	0.0
Actual Paid	56.3	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
503802	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
503802	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Workshops
- Presentations/webinars
- Displays at educational events
- Classes/courses
- Youth programs
- Development of durricula and other educational materials
- Demonstrations
- Individual and small group consultations

2. Brief description of the target audience

- All populations living in and visiting Florida including youth and elderly
- Government officials
- Elected officials

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	465251	2737017	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	36	0	36

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Improving knowledge related to water conservation
2	Imrpoving water quality
3	Increasing public awareness of water issues
4	Improving water conservation among Floridians.

Outcome #1

1. Outcome Measures

Improving knowledge related to water conservation

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	9403

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Water is among Florida's most valued resources, and water needs are already exceeding capacity in some parts of the state. Conservation of existing water resources is considered an important source of additional water. House irrigation is one of the largest uses of fresh water (Maupin et al., 2012) and nearly three-quarters of some household's water consumption may be for landscape irrigation (Haley et al., 2007). Irrigation can often be reduced by more than half without compromising landscape health.

What has been done
A cross-sectional study of 669 Floridians who use and have decision-making power over home landscape irrigation was conducted to explore behavioral differences resulting from engagement with Extension. Current engagement in key landscape water conservation behaviors was examined in connection to past engagement in UF/IFAS Extension programs and regularity of interactions with residents' local Extension offices.

Results
Floridians who had participated in water or natural resources-related Extension program were more likely than non-participants to engage in nearly every landscape water conservation practice as were those who regularly interact with their local Extension office. Some key findings:
* 50.0% of Extension users replaced high water plants with drought-tolerant plants compared to 15.5% of non-Extension users.
* 73.4% of Extension users replaced high volume irrigated areas with low vs. 46.1% among non-users.
* 65.2% of Ext. users use rain barrels compared to 34.4% of non-users.
* 55.8% of program participants follow watering restrictions compared to 20.9% of non-participants.

* 54.0% use a rain sensor to turn off irrigation when not needed vs. 22.0% of non-participants.
* 64.2% of participants converted turfgrass to landscape beds vs. 40.7% of non-participants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

Outcome #2

1. Outcome Measures

Imrpoving water quality

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	8166

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Florida's water resources are at risk for pollution due to distinctive geologic features, climate and population pressures. According to the Florida Department of Environmental Protection, more than 60 percent of nonpoint source pollution comes from diverse sources such as fertilizer and pesticide runoff from farms, suburban and urban landscapes.

What has been done
The Green Industries-Best Management Practices (GI-BMP) training program was developed by the Florida Department of Environmental Protection and endorsed by the pest control industry. In 2015, the GI-BMP program provided a total of 176 classes to 3387 industry professionals resulting in 2555 attendees receiving a certificate of completion. Overall program passing rates for in-person training was 91%. Since the early development of the Green Industry BMPs, primarily focused on turf fertilization, the pest control and commercial turf industry have faced increasing challenges. These challenges included fertilizing under stricter guidelines for sources, rates and timing, particularly in the multiple counties and cities statewide where local ordinances prohibit fertilization with nitrogen and phosphorous during the time of greatest need and most active growth of the grasses. Many companies were losing accounts, spending considerably more on inputs and not maintaining acceptable quality lawns. Extension was able to provide science based information from the previous 10 years of nitrate leaching research to help our clientele

learn and adopt new strategies to maintain healthy, good quality lawns for their clients with fewer total inputs and reduced environmental problems due to nitrogen movement.

Results

Using pre/posttest instruments, 2589 participants indicated an increase in the following behaviors:
* 78% "always" remove debris, clippings and fertilizer prills from storm drains compared to 50% before attending the training.
* 73% "always" calibrate fertilizer equipment compared to 37% prior to training.
* 73% "always" establish fertilizer free buffer zone around water bodies compared to 35% prior to training.
* 71% "always" educate clients about the importance of GI-BMPs compared to 28% before training.
* 70% "always" use IPM to determine pest control method(s) compared to 31% prior to training.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

Outcome #3

1. Outcome Measures

Increasing public awareness of water issues

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	3435

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The management of South Florida?s marine and estuarine habitats is complicated by a myriad of local, regional and federal entities, which have authority to plan, regulate and manage human activities in coastal and ocean environments. There exists a need to coordinate the diverse interests and priorities of management, regulatory and outreach organizations into a cohesive

planning process for habitat conservation and restoration that is framed by an ecosystem-based approach and easily communicated to the public.

What has been done
Collaboration between Florida Sea Grant, extension professionals, various governmental organizations, and local decision-makers to conduct an integrated ecosystem assessment that prioritized management goals for South Florida coastal and estuarine habitats. Nine workshops were organized to solicit input from stakeholders representing different sectors (academic, research, management and decision makers) as input to the ecological goal-setting process.

Results
The Marine and Estuarine Goal Setting for South Florida (MARES) planning framework is now helping to guide management and restoration activities. The MARES serves as a decision support tool for guiding ecosystem-based management in south Florida. A pictorial guide published as ?Tropical Connections? is helping managers communicate with stakeholders about how the South Florida ecosystem functions and the role that humans can play in altering, managing and protecting these fragile coastal and estuarine resources.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

Outcome #4

1. Outcome Measures

Improving water conservation among Floridians.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Despite having extensive water resources and high rainfall, water resources are stressed by the

20 million people who live in Florida.To meet the expected demand of 22 million estimated population in 2025, Florida will need 9.1 billion gallons of fresh water per day, a 26.4 percent increase from today?s demand. As the demand continues to grow, water supply needs are already exceeding capacity in some areas of the state and forecasted growth and demand must be addressed by the development of additional water supplies.

What has been done

UF/IFAS Extension addresses the need to conserve water by conducting major statewide programs such as the Florida-Friendly LandscapingTM and Master Gardener programs which consist of group educational events, workshops, and one-on-one educational programming statewide. These activities are designed to reach Florida residents and to help them conserve water by encouraging the adoption of sound landscape water conservation practices and technologies. These programs are conducted in all 67 counties throughout the state and are often in partnership with local governments with the support of volunteers.

Results

Because of UF/IFAS water conservation programs, Floridians are adopting sound landscape management practices than minimize water waste. During 2015, 30 Extension agents reported a combined estimated water savings of 40,180,618 gallons of water annually, based on Extension clients? reported behavior change. This is enough water to supply nearly 496 households with water per year [based on the average of 6.75 thousand gallons per household per month], and this water savings is valued annually at a total of $129,381 in water bill savings for participating households [based on the average statewide value of $3.22 per 1,000 gallons] and $80,361 in water delivery costs for utilities [based on the average cost of $2.00 per 1,000 gallons in delivery costs] statewide.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other

stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UF and FAMU's key evaluations, both quantitative and qualitative, are reported under the State Defined Outcomes section. We continue to work on collecting statewide data on more focused, key indicators. UF/IFAS is currently working on an "Extension Toolbox" in Qualtrics that will store common survey instruments and questions for all our major planned programs to be used by UF and FAMU Extension county faculty and state specialists. This will greatly improve our ability to gather statewide data on issues related to family and consumer science.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Enhancing and conserving Florida's natural resources and environmental quality

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%	0%	0%	0%
102	Soil, Plant, Water, Nutrient Relationships	10%	20%	0%	0%
104	Protect Soil from Harmful Effects of Natural Elements	5%	0%	0%	0%
112	Watershed Protection and Management	10%	10%	0%	0%
123	Management and Sustainability of Forest Resources	10%	10%	0%	0%
124	Urban Forestry	10%	45%	0%	0%
132	Weather and Climate	5%	0%	0%	0%
133	Pollution Prevention and Mitigation	5%	0%	0%	0%
134	Outdoor Recreation	5%	0%	0%	0%
135	Aquatic and Terrestrial Wildlife	10%	0%	0%	0%
136	Conservation of Biological Diversity	10%	15%	0%	0%
605	Natural Resource and Environmental Economics	10%	0%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	50.0	2.0	0.0	0.0
Actual Paid	35.6	1.6	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
318568	124264	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
318568	51776	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Workshops
- Presentations/webinars
- Displays at educational events
- Classes/courses
- Youth programs
- Development of curricula and other educational materials
- Demonstrations
- Individual and small group consultations

2. Brief description of the target audience

- Regulators Elected officials, policy makers, agencies
- RegulatedDevelopers, consultants, large landowners, commercial agriculture, large business, NGOs (nongovernment organizations)
- Public citizens,
- Small businesses
- HOA (home owners associations)
- Youth
- Educators
- Tour providers
- Land managers
- Biologists
- Developers
- County planners
- Elected officials
- Commercial and recreational fishers

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	382691	2251325	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	20	0	20

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Provide needed information for successful community decision making in the area of natural resources and environmental quality
2	Develop effective natural resource operations
3	Increase environmental literacy and stewardship training
4	Increase use of volunteers for teaching environmental literacy and promoting stewardship.

Outcome #1

1. Outcome Measures

Provide needed information for successful community decision making in the area of natural resources and environmental quality

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	3354

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Yankeetown, Florida is a small low lying Gulf Coast Community at the mouth of the Withlacoochee River. The Town is surrounded by salt marsh and boasts an excellent recreational fishery. The Town owns a small protected area known as the Withlacoochee Gulf Preserve that it co-manages with a local land trust. The Preserve offers regular environmental education programming. Yankeetown and the Preserve are seeking ways to promote the Preserve as the basis for sustainable economic development and to make it available as a center for citizen science.

What has been done
The Town teamed up with Florida Sea Grant legal specialists and University of Florida eco-hydrologists to obtain a grant from the Florida Department of Economic Opportunity to explore the potential for creating an ?adaptation action area? under Florida?s comprehensive planning legislation. The legislation creates a space for local governments to create adaptation policies.

Results
The Town Commission formally adopted both a science plan and a business plan that explicitly focused on adaptation as the organizing framework for both natural resource protection and economic development. Local government embraced adaptation and citizen science as an integrating strategy for natural resource protection and economic development.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

605 Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Develop effective natural resource operations

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	2138

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
When left un-controlled, invasive species such as wedelia, asparagus fern, silverthorn, lantana, and Brazilian pepper can alter local native flora and fauna effectively destroying the biodiversity of coastal habitats. In 2014, the state of Florida spent $100 million to control invasive aquatic and terrestrial plants. Recently, Cooperative Invasive Species Management Areas have formed in Florida to manage the spread of invasives.

What has been done
Florida?s marine extension program is spearheading efforts to control or eradicate exotic plants in state managed coastal lands through Cooperative Invasive Species Management Areas (CISMA). Florida Sea Grant facilitated efforts for invasive species education, habitat enhancement efforts, and social media campaigns throughout northwest Florida in support of CISMA?s management of 800,000 acres of coastal land in Florida?s Panhandle.

Results
pproximately one-third of the participants in the CISMA group have incorporated active invasive species control measures on the lands that they manage. During 2014, three exotic removal workshops and 15 removal programs have been implemented educating 247 landowners and resource users about exotic removal. In addition, 130 participants providing 390 volunteer hours, totaling $8,283 in savings to local governments, were used to remove non-native vegetation from 30 acres of distressed coastal lands. A volunteer-based Cooperative Invasive Species Management Area (CISMA) program chaired by Florida Sea Grant?s marine agent treats 30 acres of coastal lands in Florida?s Panhandle region distressed by non-native vegetation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
123	Management and Sustainability of Forest Resources
132	Weather and Climate
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
605	Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

Increase environmental literacy and stewardship training

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	22109

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Bark beetles are destructive pests and the term is familiar even to lay public, but few people have ever seen one. The beetles are important to the environment because some species help clean up dead wood. Unfortunately, other species are pests that can wipe out entire tree populations of some species. And some beetles can attack fruit trees. The beetles are so small that they are easy to transport yet hard to find and are now becoming a growing threat to our forests and crops.

What has been done
The UF Forest Entomology lab developed a citizen science project in which participants (primarily children and nature enthusiasts) use a simple trap to collect bark beetles in their backyard. Then they receive feedback about the species that live around their homes, and the specimens are used for our research. Participants of this project learn about bark beetles, their ecology and possible impacts. In 2015 we reached over 300 people with training and presentations. Our audience ranged from undergrad programs and elementary school students and teachers, to summer camps, master gardeners, 4-H programs, Florida Master Naturalist and citizens interested in science and nature. Our program impacted people from Florida, Minnesota, Montana

and Nebraska.

Results
In 2015 we reached over 300 people with training and presentations. Our audience ranged from undergrad programs and elementary school students and teachers, to summer camps, master gardeners, 4-H programs, Florida Master Naturalist and citizens interested in science and nature. Our program impacted people from Florida, Minnesota, Montana and Nebraska. The program's website was viewed by nearly 5000 unique visitors. Assessments conducted showed the project significantly improves attitudes toward science, and entomology in particular.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
136	Conservation of Biological Diversity
605	Natural Resource and Environmental Economics

Outcome #4

1. Outcome Measures

Increase use of volunteers for teaching environmental literacy and promoting stewardship.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Florida Project Learning Tree (FPLT) advances environmental literacy and promotes stewardship through excellence in environmental education, professional development, and curriculum resources that use trees and forests as windows on the world. FPLT is now the fourth largest program in the nation. It is supported and delivered by a volunteer network.

What has been done
175 volunteers engaged 71,500 youth and adults in PLT activities. Trained facilitators provided 54 professional development workshops in a variety of curriculum areas to 907 educators throughout the state. Approximately half of the workshop participants are classroom teachers will teaching

PLT activities to 370,000 students. Building on workshop training are PLT designated schools and EE Centers. 54 workshops were conducted by 61 facilitators, reaching all 7 PLT regions in Florida. The length of the workshops varied: 1 was half-day, 32 were full day, 11 were 2 days, and 4 were up to 5 days. 17 different types of workshop trainings were conducted.

Results

This year PLT EE Centers' staff donated 14,750 volunteer hours to PLT programing, reaching over 58,000 (45,535 youth and 12,742 adults). In 2015, $443,957 dollars were contributed via volunteer hours, sponsorships, and in-kind donations. An additional $33,000 was secured through grant awards. PLT FFS Florida Arbor Day Initiative was developed to promote reading to elementary students so as to provide a greater awareness of the importance of trees. Why Would Anyone Cut Down a Tree by Roberta Burzynski was provided to PLT Schools, PLT Environmental Centers, participating foresters, and environmental educators who attended the 2014 statewide Florida PLT Conference. Over the month of January 2015, 883 youth were read to by volunteers who donated 1370 hours to this effort. Educators reported that they will use PLT activities with their students as a result of the training. Thirty-six percent will use the curriculum weekly, 32% will use the curriculum with their students weekly, 38% will use it monthly, and 30% will use it several times a year. Elementary and middle school teachers are more likely to use the curriculum weekly or monthly, whereas high school educators typically use the curriculum several times a year. This is mainly due to the nature of the curriculum because the high school materials are topic specific.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
124	Urban Forestry
132	Weather and Climate
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.
Florida also has three international shipping ports: Miami, Jacksonville and Tampa. Florida also has six international airports. Florida also had an estimated 105 million tourists in 2015, including more than 11 million from overseas. It has been estimated that this international influx into Florida has made us the entry point of one new invasive pest, plant or disease each week.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UF and FAMU's key evaluations, both quantitative and qualitative, are reported under the State Defined Outcomes section. We continue to work on collecting statewide data on more focused, key indicators. UF/IFAS is currently working on an "Extension Toolbox" in Qualtrics that will store common survey instruments and questions for all our major planned programs to be used by UF and FAMU Extension county faculty and state specialists. This will greatly improve our ability to gather statewide data on issues related to family and consumer science.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Producing and conserving traditional and alternative forms of energy

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	10%	0%	0%	0%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%	0%	0%	0%
204	Plant Product Quality and Utility (Preharvest)	10%	0%	0%	0%
205	Plant Management Systems	10%	0%	0%	0%
403	Waste Disposal, Recycling, and Reuse	10%	0%	0%	0%
404	Instrumentation and Control Systems	10%	0%	0%	0%
607	Consumer Economics	20%	0%	0%	0%
801	Individual and Family Resource Management	20%	0%	0%	0%
	Total	100%	0%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	1.0	0.0	0.0
Actual Paid	4.7	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
42058	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
42058	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Energy Supply:

- Develop and deliver educational programs that work with citizens, businesses and government to support development of a sustainable and renewable energy supply in Florida.
- Develop and deliver programs that transfer new, research based technologies for renewable energy and alternative energy sources to Florida citizens and communities.
- Develop and implement extension educational programs to train producers, and processors about production, best management practices, marketing, processing technologies and distribution of bio-based feedstock.
- Develop and deliver programs for policy makers and consumers to increase biofuels literacy.
- Consult with landowners, developers and government to promotedesign, construction, and management practices that **measurably**reduce energy consumption in new developments (i.e., Plum Creek)

Energy Conservation:

- Develop/deliver educational programs addressing energy issues (i.e., Sustainable Floridians)
- Create websites to increase knowledge of personal energy use (i.e., www.MyFloridaHomeEnergy)
- Support energy efficient retrofit programs (i.e., PACE, Florida Energy Efficient Loans)
- Work utilities, financial institutions and government to evaluate energy efficiency programs

2. Brief description of the target audience

- General public
- Agricultural producers/growers
- Business
- Lcoal government

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	47177	277538	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Greater number of bio-based alternative energy production industries
2	Increased agricultural industries that have the ability to produce sustainable feedstocks for the commercialization of advanced biofuels and renewable chemicals.
3	Developed high yielding biomass feedstocks year round that do not compete with food crops and can promote economic stability and security for the long term.
4	Adoption of best management practices for the production and transportation of bio-fuel feedstocks.
5	Greater numbers of well-informed citizens locally engaged in activities that will promote sustainability.
6	Improved web access to reliable residential energy efficiency information and recommendations.
7	Increased availability of financing for measurably effective energy efficiency residential retrofits.
8	Improved cost effectiveness of utility demand side management programs (DSM).
9	Adoption of more resource efficient designs and management structures.

Outcome #1

1. Outcome Measures

Greater number of bio-based alternative energy production industries

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Increased agricultural industries that have the ability to produce sustainable feedstocks for the commercialization of advanced biofuels and renewable chemicals.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The establishment of a biofuel industry has the potential to significantly benefit regional and local communities and to provide enormous gains for agriculture, especially in areas where diseases have taken out citrus groves.

What has been done
We are at an innovative approach to developing a biofuel and biogas industry in the state of Florida using an eTuber and Energy Beet rotation system. The eTuber sweet potato has 50% more dry matter than current leading varieties of sweet potatoes grown in Florida. As a result, it has a greatly increased ethanol producing potential and the eTuber?s starch can be processed with the technology used in a corn ethanol plant. The crop tolerates heat, requires little irrigation, and has been shown to produce 4 to 5 times as much starch per acre as corn. The 'energy beet' is a non-edible biomass crop that is ?Generation 1.5? simple sugar crop: does not need to be converted from starch and can produce twice as much sugar per acre as corn. In addition, energybeets ferment without the need for enzymes. The by-products can be used as a livestock feed supplement.

Results

Preliminary results from field trials with eTuber and energybeet show the potential for about 2200 gallons of ethanol per acre per year, considerably higher than the 450 gal/acre typical of corn ethanol in the Midwest.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #3

1. Outcome Measures

Developed high yielding biomass feedstocks year round that do not compete with food crops and can promote economic stability and security for the long term.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Sugarcane byproducts (i.e., bagasse, which is biomass remaining after the juice is extracted from the stalks) and other energy grasses (such as energy cane, giant reed, elephant grass, and erianthus) can be used to produce cellulosic ethanol, known as second-generation ethanol.

What has been done
The online EDIS publication and international presentations played a key role in getting international attention towards our newly released energy cane cultivars.

Results
Five new energy cane cultivars are developed and released for marginal soils in Florida. We have signed an agreement with CIRAD, France to let them test our energy cane cultivars in their environment. This agreement increased the collaboration possibilities between UF and CIRAD on sugarcane and energy cane research. Commercial production of these cultivars in France will benefit the sugarcane and energy cane breeding programs in Florida. Our collaboration with Costa Rica on energy cane research and extension resulted in 3000 acres of energy cane planting with our cultivars.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #4

1. Outcome Measures

Adoption of best management practices for the production and transportation of bio-fuel feedstocks.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Greater numbers of well-informed citizens locally engaged in activities that will promote sustainability.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1201

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
607	Consumer Economics
801	Individual and Family Resource Management

Outcome #6

1. **Outcome Measures**

Improved web access to reliable residential energy efficiency information and recommendations.

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Increased availability of financing for measurably effective energy efficiency residential retrofits.

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Improved cost effectiveness of utility demand side management programs (DSM).

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Adoption of more resource efficient designs and management structures.

2. **Associated Institution Types**

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Leon Extension office building serves as Leon County government?s ?Sustainability Demonstration Center.? It shows how a 50-year-old building lacking a high-tech building envelope can be renovated into an extremely energy-efficient office building by means of lighting, insulation and window upgrades, and outfitted with alternative energy systems to become a grid-tied, net-metered ZNE facility.

What has been done

Between 2013 and 2015, 247 citizens and students have participated in 22 tours of the building?s energy systems, and a plug-in electric vehicle (EV). 131 students have engaged in hands-on activities during 7 day-camp sessions that teach the energy concepts of the building?s systems and EVs. The adult tours always generate questions about the cost of installing solar PV, and ROI. A wall poster was developed that walks citizens step-by-step through the process of calculating what size solar PV array would be required to make their home zero-net, and gives all of the complicating caveats to what is a relatively simple and easy calculation. Four 4-page illustrated fact sheets were written to give interested tour participants a full description of each of the building?s alternative energy systems, and also the 40,000 gallon rainwater harvesting/cistern storage system. Four 10,000-gallon underground cisterns (re-purposed fiberglass gasoline storage tanks) store and provide irrigation water for an extensive demonstration garden maintained by Master Gardeners: comprised of ornamentals, vegetables and fruit trees.

Results

Leon County Extension?s 13,000 SF building was the 33rd commercial/institutional building in the US to be certified ?Zero Net Energy? (ZNE) by the New Buildings Institute (NBI), in January 2014. Research staff at NBI headquartered in Vancouver, Washington profiled the Leon County Extension building as a case study proving that older office buildings can be successfully renovated to achieve next-generation performance standards. ZNE buildings are ultra-energy-efficient structures that produce at least as much energy onsite as they consume over the course of a year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
607	Consumer Economics
801	Individual and Family Resource Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UF and FAMU's key evaluations, both quantitative and qualitative, are reported under the State Defined Outcomes section. We continue to work on collecting statewide data on more focused, key indicators. UF/IFAS is currently working on an "Extension Toolbox" in Qualtrics that will store common survey instruments and questions for all our major planned programs to be used by UF and FAMU Extension county faculty and state specialists. This will greatly improve our ability to gather statewide data on issues related to family and consumer science.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Empowering individuals and families to build healthy lives and achieve social and economic success

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	20%	30%	0%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%	5%	0%	0%
723	Hazards to Human Health and Safety	10%	5%	0%	0%
724	Healthy Lifestyle	10%	10%	0%	0%
801	Individual and Family Resource Management	20%	25%	0%	0%
802	Human Development and Family Well-Being	10%	5%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	10%	15%	0%	0%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%	5%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	40.0	3.0	0.0	0.0
Actual Paid	66.7	1.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
596867	138114	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
596867	57547	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct workshops and meetings
- Deliver services
- Develop products, curriculum, resources
- Provide training
- Provide counseling
- Make assessments
- Work with the media
- Develop partnerships

2. Brief description of the target audience

- Childcare, after-school, and elder care providers
- Individual and family service personnel
- Parents, couples, and individuals
- UF/IFAS and FAMU county and state faculty
- Children and adolescents, families with children, adults of all ages including those with special needs.
- At-risk persons including older adults and persons who are obese, have a family or personal history, or are in a high-risk ethnic group.
- Persons with type 2 diabetes
- Food service operators: food handlers (adults; youth); consumers; volunteers, and county faculty
- Consumers
- Homeowners
- Prospective homeowners
- Renters
- Temporary/seasonal residents
- Households with child(ren) age 6 years and younger
- Seniors
- Persons with disabilities
- Housing professionals
- Developers
- Building/construction professionals
- Housing sales professionals
- Residential property management professionals

- Non-government organizations
- UF/IFAS faculty and staff
- Extension county faculty
- Community organizations

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	557594	3280257	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	41	0	41

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Change in Knowledge Personal and Family Well-Being
2	Change in Behavior Personal and Family Well-Being
3	Change in Condition Personal and Family Well-Being
4	Change in Knowledge Personal Financial Education
5	Change in Behavior Personal Financial Education
6	Change in Condition Personal Financial Education
7	Change in Knowledge Health and Nutrition
8	Change in Behavior Health and Nutrition
9	Change in Condition Health, and Nutrition
10	Change in Knowledge Sustainable Housing and Home Environment
11	Change in Behavior Sustainable Housing and Home Environment
12	Change in Condition Sustainable Housing and Home Environment
13	Change in Knowledge Sustainable Organizations and Communities
14	Change in Behavior Sustainable Organizations and Communities
15	Change in Condition Sustainable Organizations and Communities
16	Changes in knowledge related to issues of childhood obesity
17	Changes in behavior related to nutrition that will reduce childhood obesity

18	Changes in physical activity that will lead to reduced childhood obesity
19	Changes in Weight loss that leads to reduced health issues related to childhood obesity

Outcome #1

1. **Outcome Measures**

   Change in Knowledge Personal and Family Well-Being

   Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

   Change in Behavior Personal and Family Well-Being

   Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

   Change in Condition Personal and Family Well-Being

   Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

   Change in Knowledge Personal Financial Education

   Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

   Change in Behavior Personal Financial Education

2. **Associated Institution Types**

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	4445

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Over 27% of Floridians do not have enough assets to live for 3 months at the poverty level (http://www.spotlightonpoverty.org/map-detail.aspx?state=florida). The Florida Master Money Mentor program delivers a valuable service to working Floridians who are struggling to maintain financial stability. Over 25% of Floridians rely on costly alternative financial services to manage their money (https://www.fdic.gov/householdsurvey/). Tax time is a crucial moment for financially fragile households, who often overpay for tax preparation and refund anticipation loans (http://www.accountingtoday.com/news/Tax-Prep-Fees-Average-65444-1.html).

What has been done
The Florida Master Money Mentor Program is an intense one-on-one mentoring experience that helps Floridians attain financial organization and work toward financial stability. Volunteer mentors work with clients who have typically already received financial education from county agents. In 2015, 1587 clients were mentored by volunteers who contributed 5753 hours (with an estimated value of $132,721). The Fresh Start Florida program offers workshop on budgeting to avoid fees. Free taxpayer preparation and financial education is offered through the UF/IFAS VITA program.

Results
In 2015, 1587 clients received one-on-one financial coaching, for a total of 5753 contact hours with volunteer mentors (estimated value of $132,721). These sessions include individualized assistance to help clients reach their credit, spending, and saving goals. Successful clients improve their credit, reduce debt, increase savings, and maintain better financial records. In 2015, 425 people attended 25 Fresh Start Florida workshops in Duval County, and 365 people completed course to receive second-chance accounts. Eighteen volunteers helped prepare 211 free tax returns for residents of six Florida counties, saving approximately $273 each, for a total economic impact of $80, 655.20 generated from preparation savings.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #6

1. Outcome Measures

Change in Condition Personal Financial Education

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	3780

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Since the Great Recession it has become much more difficult to buy a home due to new laws and higher required credit scores.

What has been done
FAMU's Cooperative Extension Money Management/First Time Home Buyers training and assistance works to help clients understand that they can become home owners and become stronger. Much of the work is individualized, and FAMU Extension's involvement is often customized to fit the needs of the clientele if necessary.

Results
One participant had a stable job, paid $750 month for rent, but had a very low credit score. She had a goal to repair her credit to a score that would get her qualified for FHA loan or USDA loan. A credit repair program was personalized with her using CreditSmart, and understanding the benefits of online banking and autopay accounts. After several months and debt load reduced, her score was high enough to qualify for an FHA loan. However, she was required to have 3.5% down for her home purchase. Within months, she had saved enough using a strict budget program. In January 2015, she found a recently built home, that was bank-owned and closed on a brand new 3 bedroom house with payments of $518 which included her annual taxes and insurances. She now saves money, and improved her personal financial situation within one year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #7

1. Outcome Measures

Change in Knowledge Health and Nutrition

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	28864

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Seafood is a $65 billion industry in the U.S., and consumption is at an all-time high. Keeping seafood fresh and safe for consumers is a challenging task for the industry. The Hazard Analysis and Critical Control Point protocol, or HACCP, is a quality control system that helps the seafood industry comply with federal seafood safety regulations. For more than two decades, Florida Sea Grant has helped lead the development of the national HACCP seafood safety training curriculum for the seafood industry.

What has been done
Continuous seafood HACCP training ensures that seafood industry workers have consistent experience and knowledge. In Florida, more than 200 individuals from seafood importers, processors and public health inspection agencies received seafood HACCP training. In addition, Florida Sea Grant issued the Spanish-language translation of the FDA Hazards Guide, the guidance that assists seafood processors develop their HACCP plans.

Results
Federal authorities have specifically cited the HACCP training as one of the leading factors of the significant decline of fish-associated foodborne illness outbreaks over the last decade. Continuous seafood HACCP training helps sustain Florida?s 347 seafood processing plants by reducing weak links in an industry heavily reliant on seafood workers to complete basic sanitation tasks. ore than 200 Florida seafood industry workers are trained in a national food safety curriculum that has brought the significant decline of fish-associated foodborne illness outbreaks over the last decade.

4. Associated Knowledge Areas

KA Code	Knowledge Area

703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #8

1. Outcome Measures

Change in Behavior Health and Nutrition

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	18360

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Diabetes affects an estimated 29.1 million Americans and 1 in 10 Floridians. Many more Floridians are at risk of developing the disease and do not know it. Without lifestyle changes to improve health, approximately 15?30 percent of people with prediabetes will go on to develop the condition within five years. Making modest behavior changes can help prevent, delay, and even reverse the long term complications of the disease.

What has been done
Formed in 2014, the UF Diabetes Institute is a collaboration of more than 100 researchers campuswide. UF/IFAS Extension serves as an outreach and education arm of the institute. Take Charge of Your Diabetes (TCYD) is an in-depth, nine session (2 hours each) DSME program developed by UF Dept. Family Youth and Community Sciences faculty offered to adult Florida residents to identify and address barriers to healthy eating and physical activity, as well as understanding important information about ways to proactively manage type 2 diabetes.

Results
In Suwannee County, 81% of the Take Charge participants did not know their cholesterol, triglyceride or A1c numbers at the beginning of the course. By the end of the training 88% knew their numbers. Moreover, 94% were using a food system such as counting carbs or calories, or spacing carbs during the day, 47% showed improved blood pressure readings (others were already successfully controlling theirs), and 88% lost weight. All participants indicated in a follow-up survey that they were still compliant in checking their feet, drying their toes, checking their

blood glucose at least once a day, and taking medication as prescribed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #9

1. Outcome Measures

Change in Condition Health, and Nutrition

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	14293

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Duval County Urban Gardening program was created in 1978 to improve the nutrition and health of low income families.

What has been done
Extension staff and Master Gardeners provided 48 workshops and 29 Train the Trainer classes on food production, nutrition and food preservation; managed 33 community gardens; established 5 new gardens; write bi-monthly newsletter; provide planting demonstration gardens to show correct planting practices; maintain website with educational material.

Results
The community gardens provided food to 1577 individuals in 2015. The total garden production area is 867,512 sf with an estimated food value of $1.7 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area

703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #10

1. Outcome Measures

Change in Knowledge Sustainable Housing and Home Environment

Not Reporting on this Outcome Measure

Outcome #11

1. Outcome Measures

Change in Behavior Sustainable Housing and Home Environment

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1218

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many Lake County residents are seasonal residents or leave their homes for an extended period, which can lead to costly home repairs.

What has been done
Three Closing Your Seasonal Home in-person programs were conducted providing education. The workshop's topics included moisture problems, deterioration of the exterior, and intrusion of burglars and vandals. An article in a local newspaper further spread the information as well as led to over 100 emails requesting the information from the program.

Results

Closing Your Seasonal Home participants were evaluated 9 months after the program using an online survey. This provided time for them to return to their homes after their extended absence. Of those who responded to the survey:
* 91% stated that they improved their home preparation procedures (30 of 33 respondents).
* 82% used the Closing Your Home Checklist provided at the program (27 of 32 respondents).
* 79% took steps to eliminate mold and mildew from their homes (26 of 33 respondents).
* 30% made new or additional preparation for storms (10 of 32 respondents).
* Respondents reported that due to the program they had avoided a water leakage problem, had reduced utility bills, and eliminated mold problem.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

Outcome #12

1. Outcome Measures

Change in Condition Sustainable Housing and Home Environment

Not Reporting on this Outcome Measure

Outcome #13

1. Outcome Measures

Change in Knowledge Sustainable Organizations and Communities

Not Reporting on this Outcome Measure

Outcome #14

1. Outcome Measures

Change in Behavior Sustainable Organizations and Communities

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

Change in Condition Sustainable Organizations and Communities

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Convicted felons face many obstacles when they are released, especially finding employment. They are less like to commit further criminal activities if they are employed. Having a job allows them to contribute to their families and this can lead to stronger, more positive relationships and improved mental health. Community's benefit through increased taxes, less crime, avoid high costs associated with re-incarceration.

What has been done
Sixteen inmates participated in a 6-week, science-based training program that focused practical farming and horticultural skills. The program is a partnership between the Gadsden County Sheriff's Department, Redeemed, Inc., and FAMU Cooperative Extension. The overall goal of the program is to reduce recidivism and assist inmate re-entry into the job market by providing them with horticultural job skills.

Results
Six Gadsden County Jail inmates earned a State of Florida Green Industries - Best Management Practices certification. One inmate has been employed with a local landscape maintenance business and another with the Gadsden Central Academy.

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #16

1. Outcome Measures

Changes in knowledge related to issues of childhood obesity

Not Reporting on this Outcome Measure

Outcome #17

1. Outcome Measures

Changes in behavior related to nutrition that will reduce childhood obesity

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	299

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
According to the Florida State Nutrition, Physical Activity, and Obesity Profile, (Centers for Disease Control, 2012) 147 billion dollars is spent on medical cost for obese adults. About 14% of Florida's adolescents are considered overweight and 10% are obese. Adolescents are not eating a sufficient amount of fruit or vegetables. Less than 25% of the youth that participated in the study were active for a total of 60 minutes per day.
As a racially diverse state, Florida?s rate of obesity in youth is higher than the national average. Hispanic and African American rates of obesity outpace the national average. Furthermore, of the 852,000 youth under 18 years old, 21 percent live in poverty, and therefore typically do not receive the proper nutrition education and physical activity needed to have an ideal weight (Kids Count, 2009). Regardless of their background, socio-economic status, race or gender 4-H members thrive through participation in healthy living programs. They are 2.4 times more likely to delay sexual intercourse by grade 11, have significantly lower drug, alcohol, and cigarette use than their peers, and are 2.3 times more likely to exercise and be physically active (Tufts University, 2012).

What has been done
Florida 4-H members in 2015 participated in a National 4-H program to promote healthy living identified as Eat4Health which was sponsored through a grant from National 4-H council and United Health Care as the funding agency. 299 participants in grade 4-7, from seven FL counties were surveyed. Each county was required to administer six hours of educational programming focused on healthy living behaviors utilizing teens as teachers.

Results
Nutrition Knowledge
* 202 of 241 Florida youth (84%) learned how to make healthy food choices (95.2% nationally)
* 207 of 242 Florida youth (86%) learned why it is important to eat a healthy diet (94.9% nationally)

Nutrition Choices/Behaviors
* 214 of 253 Florida youth (85%) drink more water (92.6% nationally)
* 95 of 254 Florida youth (77%) eat more fruits and vegetables (88.4% nationally)

Physical Activity Attitudes
* 266 of 277 Florida youth (96%) reported "being active is good for me" (92.6% nationally)
* 266 of 276 Florida youth (96%) reported "physical activity will help me stay fit" (91.5% nationally)
* Only 26 of 272 Florida youth (10%) reported that they NEVER exercise 60 minutes every day (36.3% nationally).

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #18

1. Outcome Measures

Changes in physical activity that will lead to reduced childhood obesity

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
More than 28% of Florida youth are overweight or obese. Each year obesity-related healthcare costs in Florida total more than $67 billion.

What has been done
Florida's Family Nutrition Program (FNP) reached 103,680 SNAP-eligible Floridians in 37 counties with evidence-based nutrition education.

Results
Youth participating in FNP programs significantly increased physical activity and intake of fruits, vegetables, and low-fat/fat-free milk. Adults participating in 6-week FNP cooking classes reported significant increase in the intake of fruits and vegetables, use of nutrition facts labels, and use of MyPlate principles for menu planning.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #19

1. Outcome Measures

Changes in Weight loss that leads to reduced health issues related to childhood obesity

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in

financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UF and FAMU's key evaluations, both quantitative and qualitative, are reported under the State Defined Outcomes section. We continue to work on collecting statewide data on more focused, key indicators.UF/IFAS is currently working on an "Extension Toolbox" in Qualtrics that will store common survey instruments and questions for all our major planned programs to be used by UF and FAMU Extension county faculty and state specialists. This will greatly improve our ability to gather statewide data on issues related to family and consumer science.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Strengthening urban and rural community resources and economic development

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	20%	30%	0%	0%
610	Domestic Policy Analysis	20%	10%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	20%	30%	0%	0%
805	Community Institutions, Health, and Social Services	20%	10%	0%	0%
903	Communication, Education, and Information Delivery	20%	20%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	7.0	2.0	0.0	0.0
Actual Paid	21.3	1.9	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
190604	440860	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
190604	183692	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct workshops and meetings
- Deliver services
- Develop products, curriculum, resources
- Provide training
- Provide counseling
- Make assessments
- Work with the media
- Develop partnerships

2. Brief description of the target audience

- Planners/Zoning officials
- General public
- Citizen committees
- Elected officials
- Regional Planning Councils
- Local government
- Technical users such as developers/builders/landowners/engineers
- Florida Association of Counties
- Extension faculty
- League of Cities
- State Legislators
- Post-secondary students

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	170948	1005668	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	3	0	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. Outcome Measures

Change in Knowledge Growth Management and Land Use Policy

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Change in Behavior Growth Management and Land Use Policy

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Change in Condition Growth Management and Land Use Policy

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Change in Knowledge Civic Engagement, Leadership, and Community Development

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	7361

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ready access to quality, nutritious, sustainable food remains a constant challenge in today?s society. Food insecurity affects more than 56,000 Sarasota County residents, roughly the 14% national average, contributing to myriad health issues and increased health care costs. Numerous programs address the problem, but the problem persists.

What has been done
Extension recently hosted a roundtable featuring two-dozen representatives from nine Sarasota County government departments, the Florida Department of Health and IFAS programs to discuss what they do, where they do it, impacts and barriers. The aim of this first-ever meeting of these key players was to educate ourselves about the topic and each other?s work, opportunities for collaboration and action. Before the meeting?s end, attendees were linking programs and projects so that outcomes and lessons learned could be shared and built upon.

Results
Survey questions at the beginning and end of the meeting showed a 32 percent increase in the number of attendees who felt food security was a very important issue, a 31 percent increase in the number of attendees who felt that Sarasota County was very active in addressing issues of food security, and all who answered a post-event questionnaire stated that the meeting was a valuable use of time.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
610	Domestic Policy Analysis
805	Community Institutions, Health, and Social Services
903	Communication, Education, and Information Delivery

Outcome #5

1. Outcome Measures

Change in Behavior Civic Engagement, Leadership, and Community Development

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Change in Condition Civic Engagement, Leadership, and Community Development

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Change in Knowledge Economic Development

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	2530

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Communities rely on new businesses for economic vibrancy and community vitality.

What has been done
As a part of Food Entrepreneurship Extension program, which is aimed to assist food entrepreneurs in Florida by providing information on topics related to starting and successfully managing food business, a workshop was offered, ?How to Start Food Business in Florida: Introduction to Food Entrepreneurship.? Totally 34 people attended the workshop. Most attendees were those who plan to start food-related business in Florida, but also include cottage food operators, small-sized food business owners, and extension agents. This workshop provided audience with general information on food safety and quality, basic food science, business planning, and federal and state regulatory requirements for food businesses with 13 speakers who are from UF/IFAS, Federal and State government agencies, or successful local business owners.

Results
Out of 34 attendees, 29 completed evaluation survey questions, and all of them (100%) were very satisfactory with the workshop content and 93% replies they are very satisfactory with speakers (other 7% were satisfactory). 100% of respondents said they would they would recommend this workshop to others. Pre- and post-quizzes showed their knowledge gain from 67% to 83%, and 100% of respondents indicated their knowledge/skills improved through the education at the workshop (79% indicated significant improvement). In the follow-up survey that was given 6 months later to 21 people who agreed with future personal contact after the workshop, 4 people (19%) indicated they have moved forward with their business planning and/or product development. This workshop will be offered annually and I have been working with several county faculty to offer the workshop in other Extension District as well. This program is expected to serve as a great resource for any Floridian who start food business in the state, and ultimately

contribute to economic development and entrepreneurship in Florida.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #8

1. Outcome Measures

Change in Behavior Economic Development

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Change in Condition Economic Development

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UF and FAMU's key evaluations, both quantitative and qualitative, are reported under the State Defined Outcomes section. We continue to work on collecting statewide data on more focused, key indicators.UF/IFAS is currently working on an "Extension Toolbox" in Qualtrics that will store common survey instruments and questions for all our major planned programs to be used by UF and FAMU Extension county faculty and state specialists. This will greatly improve our ability to gather statewide data on issues related to community and economic development.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Preparing youth to be responsible citizens and productive members of the workforce

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
806	Youth Development	100%	100%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	60.0	3.0	0.0	0.0
Actual Paid	97.0	4.7	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
868008	629186	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
868008	262161	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Life skills developed in youth through subject matter experience

1.Youth participate in at least 6 hours of learning 4-H subject matter during the year through 4-H club projects, classroom, afterschool or camping experiences.

2. 4-H Youth participate in beyond Club/ Classroom Experiences such as residential camp, leadership trainings, workshops and experiences, day camps, and structured educational events / activities.

Additional educational methods include: camp counselor training, judging/exhibit workshops, training clinics, youth leadership council, demonstration/project portfolio workshops, recognition programs, community service projects, and county fair experiences.

Organizational strategies and learning environment for youth programs

4-H Clubs:

1. Training volunteers on elements that contribute to club charter, risk management, affirmative action compliance, quality programming, fiscal management, etc.

2. Quality management of chartering process

3. Training clubs to demonstrate excellent in recognition standards, marketing, and community service.

4-H In the Classroom

1. Classroom teachers and/or volunteers are trained and receive curriculum and training to teach students in subject matter area.

2. Students learn 4-H subject matter area during the school year.

3. 4-H marketing materials on subject matter areas & other delivery systems are created and distributed to teachers and students.

4-H Residential / Day Camping

1. Camp committees plan, implement, and evaluate quality camp experiences focused on subject matter and life skill development.

2. Teens will actively participate in and complete 24 hours of Camp Counselor training

3. Subject matter presentations will be delivered/experienced at residential and day camps.

Advisory Committees

1. Community networking for membership. Needs assessment. Handbook development, training in youth program organization.

2. Training of committee members throughout the year. Follow-up and support for members with focused responsibilities.

Expansion and Review Committee

1. Utilize personal and ethnic marketing strategies to reach underserved audiences.

2. Committee training for member which outlines the function of the committee.

3. Agent training to assist agents in developing this committee.

Volunteer Development

- Written position description will be completed.

-Workshops and activities will be completed related to child protection

-Orientation and training workshops and seminars will cover topics in youth development, organizational culture and strategies, recognition, youth project study areas, access & equity, youth program development, and partnerhsips

- Field and office consultations will be planned for volunteers with expanded roles.

-Project training workshops/seminars will be held.

-Volunteers will be sustained, supported, and recognized for their work.

2. Brief description of the target audience

- Youth ages 5-18 enrolled in Florida 4-H programs
- Adult and youth volunteers in the 4-H program
- Florida families with youth enrolled in the 4-H program between the ages of 5 and 18
  - Parents and grandparents of youth ages 5-18 in the 4-H program
  - Teens (14-18) in the 4-H program
  - Adults interested in engaging in positive youth development

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	753727	4434082	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	40	0	40

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Change in Knowledge Life Skills Developed in Youth Through Subject Matter Experiences
2	Change in Behavior Life Skills Developed in Youth Through Subject Matter Experiences
3	Change in Condition Life Skills Developed in Youth Through Subject Matter Experiences
4	Change in Knowledge Organizational Strategies and Learning Environments for Youth Programs
5	Change in Behavior Organizational Strategies and Learning Environments for Youth Programs
6	Change in Condition Organizational Strategies and Learning Environments for Youth Programs
7	Change in Knowledge Volunteer Development and Systems to Support Youth
8	Change in Behavior Volunteer Development and Systems to Support Youth
9	Change in Condition Volunteer Development and Systems to Support Youth

Outcome #1

1. Outcome Measures

Change in Knowledge Life Skills Developed in Youth Through Subject Matter Experiences

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	92293

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There has been much discussion and emphasis on attracting more students into STEM fields, especially women and minorities. According to Change the Equation, an organization formed by 100 U.S. CEOs in 2010 to support this effort, little has changed in the diversity of the STEM workforce since 2001.

The group, a coalition of Fortune 500 companies focused on increasing STEM education, on Tuesday hosted a panel discussion on the stagnant nature of STEM diversity and what needs to be done to better target women and minority students who may represent overlooked talent in schools nationwide. Although the overall face of the workforce throughout the country is changing ? particularly with a higher representation of younger and minority individuals ? the demographics of STEM fields have remained largely unchanged.

What has been done
FAMU Cooperative Extension Program hosted 40 students in the Ag-Discovery and AgTech Century 21 Summer Programs. Both programs targeted middle and high school students to increase their awareness of agriculture, and provided experiential learning in animal science and veterinary medicine through laboratory and field activities.

Results
Over 90% of the students cited an increase in and the program helped them to decide their career path. Also, students indicated that their experience of the programs make them interested in attending FAMU.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Change in Behavior Life Skills Developed in Youth Through Subject Matter Experiences

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	46025

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many studies have cited the need for youth to be exposed to opportunities that help to develop and hone workforce ready skills. One of the top skills many employers are seeking out is communications in both the written and verbal form. As quoted in the article ?Extension?s Role in Preparing Youth for the Workforce: A Challenge to Extension Professionals? (Cochran, Catchpole, Arnett, Ferrari, 2010), ?Organizations are looking for employees with skills for success in the knowledge economy, skills such as work ethic, teamwork, communication, and problem solving?.
As cited from the Journal of Extension, Extensions role in preparing youth for the workforce, it is stated ?the skills necessary for success in a 21st century workforce correlate with those gleaned from positive youth development programs (Kazis & Kopp, 1997; Levin, 1994). And out of school time programs are recognized as an ideal place for development of workforce preparation skills (Cochran & Ferrari, 2009; Schwarz & Stolow, 2006).

What has been done
Educational programs provided for young people that enhance communication skills through various project areas is a priority of skill attainment for Florida 4-H?ers. 204,201 youth are enrolled in at least one 4-H project through various delivery methods from school enrichment programs, sharing opportunities at various competitive events from clubs to state contests, club and individual projects that promote project sharing, and public speaking competitions. Youth enrolled in a public speaking project across Florida 4-H, either independently or part off a school enrichment program is 103,774. The target audience for projects that enhance communication

skills are youth ages 8-18 across all demographics. Programming is provided to youth directly from the 4-H agent or through a volunteer who has been trained by a UF/IFAS Extension 4-H Faculty member. Providing workshops in public presentations, training teachers who conduct school enrichment programs, and coaching youth as they advance from sharing their project at a 4-H club meeting to county and district contests. Some senior age youth (14-18) will even advance to compete statewide or even regionally/nationally. Multiple partners work with the Florida 4-H program across all counties with one of our long-standing partners being the Tropicana Products, Inc.; which supports our statewide school enrichment contest through the printing of all curriculum resources and purchase of awards for classroom, school and county contests along with providing one scholarship from each county for a contest winner to attend their local residential 4-H camp. Both UF/IFAS Extension 4-H faculty and volunteers utilize techniques such as experiential learning and provide opportunities for young people to share knowledge learned in their project through mentoring younger members, completing project books, and presenting speeches at local, district, statewide, and regional/national contests.

Results

As a result of youth participating in diverse project areas (i.e. entomology, equine & shooting sports) youth gain the workforce preparedness (life) skill of communication through intentional efforts of the agent and/or volunteer. A sampling of 296 youth ages 11-13 (grades 4-7) representing 22 counties was collected through an online or pencil/paper survey to assess the perceptions of youth regarding their 4-H experiences from the National 4-H Common Measures survey instrument. Some key findings include:

* 70% said they always "respect others."
* 60% said they always "listen well to others."
* 57% said they always "work well with other youth."
* Two-thirds say they always (39%) or usually (25%) "have confidence to speak in front of groups."
* Nearly all youth said they always (60%) or usually (32%) "take responsibility for [their] actions."

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Change in Condition Life Skills Developed in Youth Through Subject Matter Experiences

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Change in Knowledge Organizational Strategies and Learning Environments for Youth Programs

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Change in Behavior Organizational Strategies and Learning Environments for Youth Programs

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Requests for assistance in creating a school garden almost doubled in the last year. School gardens provide students with new knowledge and skills about gardening and food systems while providing physical exercise which is lacking for many of today's youth and helps with childhood obesity.

What has been done
The City of Tallahassee, Leon County Sustainable Communities and FAMU Extension Community Resource Development have joined in the effort to expand and improve gardening in schools and afterschool programs. As a result, many afterschool programs are incorporating gardening in their activities.

Results
Students are gaining the knowledge and skills to manage these gardens while getting physical exercise from working in the plots. Exercise helps them to sleep well and this contributes to improved mental health as they feel less stressed. Exercise also helps to boost the self-confidence in children. 25 youth showed an 80% increase in knowledge of agricultural terms. One teacher also indicated that she has seen significant improvement in the behavior of the children in her class. Their attention and willingness to follow directions has been improving and usually peaks on the days of our visits.

The number of community gardens in Leon and Wakulla Counties has increased. In Leon County, the number of gardens has reached 45 representing a 20% increase over the previous year. Some of the gardens full to capacity with a waiting list. The amount of food been produced has been steadily increasing. At least 80% of all the public schools in Leon and Wakulla Counties have school gardens and some even have multiple gardens.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #6

1. Outcome Measures

Change in Condition Organizational Strategies and Learning Environments for Youth Programs

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Change in Knowledge Volunteer Development and Systems to Support Youth

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	10252

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The strength of the context in which young people participate, along with the development and nurturing of the "spark" or project interest through strong relationships with adults significantly affects the ability of a young person to develop into a confident and secure "idealized personhood" (Lerner et al., 2002). Along with the importance of establishing developmental relationships within this quality setting (context); the opportunities for youth to be "empowered" will position young people to claim a spot on the pathway to "thrive" and accumulate strengths associated with positive youth development (PYD) such as academic, social, emotional, and behavioral outcomes (Scales, Benson, & Roehlkepartain, 2011). As noted the importance of developmental relationships surrounding the interests and efforts of a young person and providing them with a sense of belonging, safety and structure is crucial to their ability to develop into a contributing adult. Research reported in the National 4-H Impact Assessment (Peterson, B., et

al., 2000) indicates that a caring adult is a strong element in positive youth development. The importance of training faculty and volunteers in these best practices and how to implement and adopt quality practices are crucial to the success of positive youth development.

What has been done

As a result of three state extension specialists, two state specialized agents and five regional specialized agents, UF/IFAS Extension Faculty offering focused and intentional training in the indicators of quality Positive Youth Development programs for new faculty (new agent orientation), seasoned faculty (in-service trainings), and volunteers (statewide virtual training); along with mentoring and field visits; county faculty implement the practices that support these indicators specifically that of Belonging (Essential Elements, Kress 2003) and train volunteers in these practices. It is essential that both County extension faculty and volunteers provide a quality experience that will provide a context in which effective programs that promote behavior adoption can occur. Across the state of Florida approximately 72 county faculty and 13,529 (from ES237 report) volunteers receive training that leads to a high quality youth development program.

Results

A sampling of 296 youth ages 11-13 representing 22 counties was collected through an online/pencil paper survey to assess the perceptions of youth regarding their 4-H club experiences from the National 4-H Common Measures survey instrument. Key findings include:
* 50% strongly agree that they are "comfortable making their own decisions."
* 61% strongly agree that they "don't let friends talk me into doing something I don't want to do."
* 54% strongly agree that they have "a plan for reaching [my] goals" and a similar number strongly agree they can "change my plan when I need to."
* 37% strongly agree that they "know how to deal with stress in positive ways" and an additional 48% said they agree with the statement.
*

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #8

1. Outcome Measures

Change in Behavior Volunteer Development and Systems to Support Youth

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Change in Condition Volunteer Development and Systems to Support Youth

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

4-H continues to gather data through the Common Measures national surveys. These data allow us to compare Florida to the rest of the country. UF and FAMU's key evaluations, both quantitative and qualitative, are reported under the State Defined Outcomes section.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Natural Resources and the Environment--1862 & 1890 research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%	0%	1%	0%
102	Soil, Plant, Water, Nutrient Relationships	0%	0%	39%	35%
104	Protect Soil from Harmful Effects of Natural Elements	0%	0%	1%	0%
111	Conservation and Efficient Use of Water	0%	0%	8%	35%
112	Watershed Protection and Management	0%	0%	7%	0%
123	Management and Sustainability of Forest Resources	0%	0%	1%	0%
132	Weather and Climate	0%	0%	3%	0%
133	Pollution Prevention and Mitigation	0%	0%	7%	30%
134	Outdoor Recreation	0%	0%	4%	0%
135	Aquatic and Terrestrial Wildlife	0%	0%	12%	0%
136	Conservation of Biological Diversity	0%	0%	17%	0%
	Total	0%	0%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	20.0	5.0
Actual Paid	0.0	0.0	45.6	7.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	695479	696782
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	695479	348391
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct research experiments
- Construct research facilities
- Develop products, curriculum and best management practices
- Partnering

1890 Research (Preserving Water Quality of North Florida Watersheds)

The activities in the planned program include: Investigate the effects of biochar amendment in soil in terms of its water and nutrient retention capability, soil productivity enhancement and nutrient pollution reduction capabilities; Design of a low-cost pyrolyzer for on-site biochar production; Design of a low-cost rainwater harvesting system; Identify hydroperiod indicator of wetlands; record and interpret aquatic biota information**.**

2. Brief description of the target audience

- Agricultural Producers/growers
- Florida residents/ Stakholders
- Ag industry
- Small farmers

1890 Research (Preserving Water Quality of North Florida Watersheds)

The general public, agricultural producers in the Apalachicola River Basin, soil and water conservationists and small and limited resource farmers.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	321	321

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Improve methods for appraisal of soil resources
2	Improve soil, water and nutrient relationships
3	Improve the management of saline and sodic soils and salinity
4	Increase protection of soil from harmful effect of natural elements
5	Improve conservation and efficient use of water
6	Increase watershed protection and management
7	Improve methods for managing range resources
8	Improve management and control of forest and range fires
9	Improve management and sustainability of forest resources
10	improve urban forestry
11	improve Florida agroforestry
12	Identify alternative uses of land
13	Increase knowlege related to weather and climate
14	Improve pollution prevention techniques and mitigation
15	Improve methods of protecting aquatic and terrestrial wildlife environment
16	Improve conservation of biological diversity
17	Increase air resource protection and management

Outcome #1

1. Outcome Measures

Improve methods for appraisal of soil resources

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
Soil scientists have long recognized that soil organic matter is difficult to be characterized holistically because it is a complicated mixture of solids, which can?t be extracted completely. Same difficulty is in the characterization of biochar, a soil amendment that has great potential for improving soil productivity, conserve water and nutrients, reducing environmental pollution and sequester carbon.

What has been done
1890 Research
We are applying a novel multi-element scanning thermal analysis (MESTA) technology to characterize both soil organic matter and biochar holistically.

Results
1890 Research
We showed that the MESTA can characterize soil organic matter and biochar much cost-effectively and conveniently than other analytical technologies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources

Outcome #2

1. Outcome Measures

Improve soil, water and nutrient relationships

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
Conservation of water and nutrients is critical for farmers and the general public because agricultural systems need to be sustainable.

What has been done
1890 Research
We investigate biochar as an amendment to conserve water and nutrients and enhance soil productivity.

Results
1890 Research
Preliminary results show that biochar amendment in soil can significantly enhanced soil productivity and in the meantime conserve water and nutrient use in agriculture.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

Outcome #3

1. **Outcome Measures**

Improve the management of saline and sodic soils and salinity

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Increase protection of soil from harmful effect of natural elements

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Improve conservation and efficient use of water

2. **Associated Institution Types**

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
Farmers are concerned about water conservation especially in irrigated fields.

What has been done
1890 Research
We studied the effects of biochar amendment on soil water holding capacity.

Results

1890 Research
1% biochar amendment in a sandy soil increased soil water content by 35% at the field capacity when compared to the control.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

Outcome #6

1. Outcome Measures

Increase watershed protection and management

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
Hydrologists are looking for convenient indicators for observing complicated hydroperiod condition of a wetland. The hydroperiod condition of a wetland is a major indication of the hydrologic conditions of the drainage area.

What has been done
1890 Research
We studied vegetation and soil sulfur chemistry indicators of wetlands.

Results
1890 Research
Our results show that vegetation indicator is good for indicating the hydroperiod of brackish and salt marshes and soil sulfur chemistry is good for indicating the hydroperiod of freshwater wetlands.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #7

1. **Outcome Measures**

Improve methods for managing range resources

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Improve management and control of forest and range fires

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Improve management and sustainability of forest resources

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

improve urban forestry

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

improve Florida agroforestry

Not Reporting on this Outcome Measure

Outcome #12

1. Outcome Measures

Identify alternative uses of land

Not Reporting on this Outcome Measure

Outcome #13

1. Outcome Measures

Increase knowlege related to weather and climate

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many coastal communities in Florida are experiencing impacts from flooding and other consequences of rising seas. The key question is how coastal communities would respond if their primary residences are permanently inundated. Current adaptation strategies include building sea walls and relocation. Building sea walls is expensive and not feasible in some coastal areas. Population relocation may be a viable alternative but changes to land use and social costs must be quantified economically for this option to be implementable.

What has been done
A public perception survey was conducted in partnership with Bay County, Florida, to provide decision-makers with information on coastal residents? attitudes toward a variety of future adaptation strategies, including preference for residential relocation, if their properties became inundated. A population dynamics model was developed to identify available lands for residents to move to whose primary residences would be permanently inundated due to sea level rise.

Results
The results show that 74% of respondents would move if their primary residence was permanently inundated, and most of them prefer to move to other part of the same county. The model also identified upland areas available for relocation to take place. Model output is being

used by the City of Panama, Florida to evaluate future planning and zoning designations as a first step in preparing for possible land use changes. Florida researchers helped Panama City evaluate the social and economic drivers that underlie population relocation as a sea level rise adaptation strategy.

4. Associated Knowledge Areas

KA Code	Knowledge Area
132	Weather and Climate

Outcome #14

1. Outcome Measures

Improve pollution prevention techniques and mitigation

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The principal objective of this project is to evaluate the feasibility of producing biofuels from indigenous Florida algal species grown using wastewater nutrients. Photosynthetic algae represent a large and diverse group of organisms that have only a limited history of characterization and exploitation. The application of resource production from algae is relatively untapped, with the potential to produce biofuels, food, fibers and nutraceuticals on a large scale. Phycoprospecting - selecting indigenous algae with intrinsic characteristics amenable to bioresource production and waste mitigation - offers a sustainable path forward for widespread algae-based bioresource development. When cultured locally, indigenous algae are adapted to the prevailing regional abiotic and biotic factors. Native algae commonly inhabit local waste resources and pose no risk of becoming noxious invasives. Methods for culturing algae can utilize anthropogenic waste resources including wastewater nutrients and CO2 from fossil fuel combustion. Recalcitrant problems of culture stability, biomass density, harvesting, and product refining may be overcome by exploring native biological material.

What has been done

The principal objective of this project is to evaluate the feasibility of producing biofuels (biodiesel and biogas) from indigenous Florida algal species using wastewater nutrients. The objectives of

this project are to: develop screening techniques for high lipid content algae; sample urban, aquacultural, and agricultural aquatic environments for indigenous algal species; and identify and characterize lipid levels in these species. Further objectives will investigate optimal culture conditions and nutrient requirements. Bench-scale and outdoor growth studies will be performed on selected algae to optimize nutrient loading rates, lipid production rates and algal growth. Additional considerations include the evaluation of waste toxicity on indigenous algae as well as the effectiveness of waste remediation by the algae. The resulting data will be used to examine the biological and technical feasibility of operational schemes comparing algal growth on agricultural versus urban wastewater streams. The project tasks will include field collection, laboratory studies, bench-scale and outdoor research on algae growth for biofuel production and wastewater remediation, and biological and technical feasibility analysis for large-scale implementation. The ideal algal species should have consistently high growth rates over ambient temperature ranges, reproducible high biomass productivity and lipid content, and a robust ecological dominance to compete with other indigenous species in outdoor cultures under a broad range of nutritional requirements. The target audiences for this research include a diversity of stakeholders involved and interested in sustainable technology, renewable energy and wastewater management, as well as climate change mitigation and environmental resource protection and conservation.

Results

lgae bioremediation offers an innovative and environmentally sound strategy for the management of nutrient-rich wastewaters. In particular, algae have potential application in the remediation of ammonia-nitrogen from landfill leachate. Using algae for advanced wastewater treatment and nutrient removal could lower the costs of remediation. Thus, algae offer an effective, economical, and sustainable solution for synergistic biofuel production and wastewater remediation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation

Outcome #15

1. Outcome Measures

Improve methods of protecting aquatic and terrestrial wildlife environment

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual

2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
Excess fertilizer loss through leaching is a major concern of the public in terms of environmental protection of water quality.

What has been done
1890 Research
We studied nutrient (fertilizer) retention potential of biochar in soil systems.

Results
1890 Research
The study is ongoing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife

Outcome #16

1. Outcome Measures

Improve conservation of biological diversity

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
Aquatic insect diversity and population are indicators to the health of a waterbody and its drainage area. Not much knowledge has been accumulated in this regard.

What has been done
1890 Research
A field survey of the Trichoptera of the Chipola River basin was conducted.

Results
1890 Research
Survey results were completed. A manuscript was prepared and submitted to the journal Checklist.

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity

Outcome #17

1. Outcome Measures

Increase air resource protection and management

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
The public are concerned about the particulate matter (PM) emission from prescribed burnings used to manage forests.

What has been done
1890 Research
We studied the emission factors of PM in prescribed burnings of forests.

Results
1890 Research
We developed method to trace sources of PM in the air and evaluated the accuracy of the

published PM emission factors.

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.
Florida has three international shipping ports: Miami, Jacksonville and Tampa. Florida also has six international airports. Florida also had an estimated 105 million tourists in 2015, including more than 11 million from overseas. It has been estimated that this international influx into Florida has made us the entry point of one new invasive pest, plant or disease each week.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2015, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in this report, are evaluative methods for insuring our research projects are valid and useful.

1890 Research

Our experimental designs were examined by peers to be statistically rigorous. After the experiments were completed, the results were analysed statistically accordingly. We used published standard analytical procedures for chemical and physical property laboratory analyses. Most of our laboratory procedures followed standard QA/QC protocols. The

reports and manuscripts prepared for publication were peer-reviewed internally or externally. For innovative analytical technology we developed, such as multi-element scanning thermal analysis (MESTA) technology, we used reference chemicals and materials to interpret the results of unknown samples. We also used traditional methods to verify and calibrate the MESTA technology.

Key Items of Evaluation

1890 Research

Significance of the problem, Methodology, Testing of hypotheses, Objectives of the study, Results, Statistical analysis and significance, Conclusion, Specific and Broader impacts.

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Plants and their systems--1862 & 1890 research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	11%	10%
202	Plant Genetic Resources	0%	0%	3%	10%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	5%	5%
204	Plant Product Quality and Utility (Preharvest)	0%	0%	4%	15%
205	Plant Management Systems	0%	0%	16%	10%
206	Basic Plant Biology	0%	0%	7%	10%
211	Insects, Mites, and Other Arthropods Affecting Plants	0%	0%	16%	5%
212	Pathogens and Nematodes Affecting Plants	0%	0%	23%	15%
213	Weeds Affecting Plants	0%	0%	4%	0%
215	Biological Control of Pests Affecting Plants	0%	0%	4%	5%
216	Integrated Pest Management Systems	0%	0%	7%	15%
	Total	0%	0%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	38.0	7.0
Actual Paid	0.0	0.0	84.5	11.0
Actual Volunteer	0.0	0.0	0.0	120.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	1121595	1060080
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	1121595	530040
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct research experiments
- Partnering

1890 Research

Small Farms, Marketing and Rural Development

The research findings are used in support of land grant programs to provide relevant programs and services. The projects focus on developing research and experiential learning opportunities relative to small farm production and marketing, food security, community development and asset building.
One project evaluated alternative market opportunities with local schools in order to increase income-generating potential, as well as the development of local and regional food systems, to strengthen the links between producers and consumers. The project established two on-station and one on-farm demonstrations to evaluate production capabilities for small-scale crop producers. These production demonstration sites evaluated variety selection, low-cost production and harvesting practices, production scheduling, post-harvest handling, food safety and value-added processing. All on-farm production trials were successful, and products were utilized in value-added training sessions for producers and as marketing samples for schools. As a result of the marketing trials with three school districts, the butternut squash and sweet corn will be incorporated into the menus for the 2015-16 school year. A second project is designed to address small farm needs while building capacity for Protected Agriculture investigations at the FAMU Research and Extension Center. Production sites were established to evaluate year-round vegetable production (fall, winter, spring, summer) for both small-scale farmers and gardeners. Fall and spring crops were intercropped with sunflowers for biological control of pests (stinkbugs). Production practices and cost effectiveness were evaluated for dissemination to small-scale clientele. Educational materials were developed and disseminated in-person and via web-based resources, including cole crop production, leafy greens production, eggplant production, Small Farm to School informational posters (collard greens, turnip greens, green beans, kale, sweet potatoes, butternut squash).

Center for Viticulture & Small Fruit Research

- Conventional breeding, evaluation and selection of hybrid vines for fresh fruit and wine.
- Embryo rescue, molecular, and mutagenic transformation to develop seedless muscadines.
- Identification, isolation, screening, characterization, and validation of genetic markers of viticulturally important genes.
- Identification, isolation, screening and validation of metabolities and proteins relating to growth function, fruit and wine quality, and disease tolerance.
- Stressed induced biochemical and molecular changes in grapes.

- Evaluation and understanding of antioxidant capacities of phytochemicals in grapes.
- Understanding the effects of grape phytochemicals in preventing diseases and obesity.
- Functional expression of flavonoid nutraceuticals in grapes.
- Identification of management practices for grapes and small fruits.
- Evaluation of non-traditional small fruits, including blackberries and raspberries.
- Evaluation, screening and production of 'clean vines' for industry.
- Extension and outreach conducted:

Farm visits, workshops, seminars and meetings were used to provide knowledge and information to grape growers and farmers to help them solve problems.
Presentations and demonstrations were conducted to stakeholder groups to expose them to new ideas and management practices in fruit and vegetable production.
Organized the Grape Harvest Festival that has attracted increasing number of attendees each year.
Conducted vineyard visits to assist grape growers solved problems.
Conducted workshops and seminars for grape growers, small farmers, and the local community.
Conducted tours for farmers, grape growers, students, FAMU alumni, and industry personnel.
Participated in undergraduate and graduate student training and development, and experiential training programs.
Participated in youth development training programs and summer programs.
Participated in collegiate activities relating to student recruitment.

- Student training and development:
  - Undergraduate experiential learning in viticulture and small fruit.
  - Student recruitment.
- Professional development:
  - Faculty will be encouraged to be active in professional associations.
  - Conduct quality and innovative research for new discoveries.
  - Professional collaboration with research institutions/universities will be encouraged.

2. Brief description of the target audience

- Farmers/producers
- Florida citizens with an interest in plants and plant science
- Members of the general public

1890 Research (Viticulture and Small Fruit Research)
The target audience will be all grape growers, processors (wineries), hobbyists and persons who are interested in grapes, wines, and non-traditional small fruits. Small farmers, particularly, minorities and limited resource farmers will also be targeted to promote grape growing as an alternative crop.

Small Farm, Marketing and Rural Development
The target audience for this program includes small/limited resource farmers, extension professionals, rural residents, families and community groups.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	4600	1200	260	140

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year:	2015
Actual:	61

Patents listed

1. UFi 9EC - Sweet Corn (USA)
2. Horizon 306 (LA05006) - Oat Cultivar (USA)
3. FL24D' Red Clover Cultivar (USA)
4. SWEET ORANGE TREE NAMED OLL-4 (USA)
5. SWEET ORANGE TREE NAMED N13-32 (USA)
6. Sweet Orange Tree Named B9-65 (USA)
7. LB8-9 (Peru)
8. Citrus Rootstock Named UFR-3 (USA)
9. Citrus Rootstock Named UFR-16 (USA)
10. Citrus Rootstock Named UFR-4 (USA)
11. Citrus Rootstock Named UFR-2 (USA)
12. FL96-43 (New Zealand)
13. FLX-1 (New Zealand)
14. LB8-9 (Australia)
15. Florida 127 (South Africa)
16. FL 05-107 (South Africa)
17. Coleus Plant Named UF12-82-3 (USA)
18. Coleus Plant Named UF12-22-1 (USA)
19. Citrus Rootstock Named UFR-6 (USA)
20. FL 05-107 (Australia)
21. Florida127 (Australia)
22. Citrus Rootstock Named UFR-1 (USA)
23. Citrus Rootstock Named UFR-15 (USA)
24. Citrus Rootstock Named UFR-5 (USA)
25. Blueberry Plant Named FL03-228 (USA)
26. Blueberry Plant Named FL98-423 (USA)
27. SWEET ORANGE TREE NAMED UF 11-1-24 (USA)
28. Blueberry Plant Named FL06-203 (USA)
29. Mandarin Tree Named 7-6-27 (USA)
30. Blueberry Plant Named FL06-377 (USA)
31. Blueberry Plant Named FL07-399 (USA)
32. 297 - Peanut (USA)
33. Citrus Rootstock Named UFR-17 (USA)
34. FL0567, Oat (USA)
35. Blueberry Plant Named FL98-325 (Mexico)
36. Grapevine plant named BN5-4 (USA)
37. Coleus Plant Named UF12-73-5 (USA)
38. Coleus Plant Named UF12-74-3 (USA)
39. Enhanced Heat Stability of The Maize Endosperm ADP-Glucose Pyrophosphorylase by Manipulation of Evolutionarily- Identified Amino Acids (PCT)
40. Antimicrobial Compounds And Their Use in Treating Plant Disease (CIP) (USA)
41. Methods and Systems for High Voltage Treatment of Plants (USA)
42. Chemical Lure for Asian Citrus Psyllid (USA)
43. Loop-Mediated Isothermal Amplification Methods for the Detection of Rhizoctonia Solani (USA)
44. Slow-Release Fertilizer Compositions with Graphene Oxide Films and Methods of Making Slow-Release Fertilizer Compositions (PCT)
45. Pteris Vittata Phytase Nucleotide and Amino Acid Sequences and Methods of Use (PCT)
46. Use of Aldehydes to Enhance Disease Resistance of Plants to Liberibacters (PCT)
47. Drought Tolerant Plants (PCT)
48. Methods and Compositions For Preventing or Reducing Infections of Crop Plants By Bacterial and

Fungal Pathogens (USA)
49. Antimicrobial Compounds and Their Use In Treating Plant Disease (USA)
50. Use of Aldehydes Formulated with Nanoparticles to Enhance Disease Resistance of Plants to Liberibacters and Systemic Bacteria (USA)
51. Use of Polyamines and Polyamine Transporters to Provide Furfural Tolerance (PCT)
52. Bacteria and method for improving plant growth and health using the same (USA)
53. Plant Defense Inducers, 2-Deoxy-D-Glucose and Oxalic Acid Have Positive Control Effect Against Citrus HLB (USA)
54. Use of Aldehydes Formulated with Nanoparticles to Enhance Disease Resistance of Plants to Liberibacters (USA)
55. Artificial Self-sufficient Cytochrome P450s (USA)
56. Methods of Identifying Biologically Active Random Peptides in Plants and Libraries of Plants Expressing Candidate Biologically Active Random Peptides (USA)
57. Synthesis of n-hexanal from Linoleic Acid by a Carotenoid Cleavage Dioxygenase Enzyme (USA)
58. Methods and Devices for Reduction of Plant Infections (USA)
59. The Shrunken2-ISM Allele of Maize (PCT)
60. Combining Genetic Traits for Furfural Tolerance (USA)
61. Disease-related biomarkers specific to Florida hybrid bunch and muscadine grape, and uses thereof (USA)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	579	579

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Hybrid seedlings from breeding program

Year	Actual
2015	1425

Output #2

Output Measure

- Advanced hybrid selection

Year	Actual
2015	11

Output #3

Output Measure

- Genetic markers identified and cloned

Year	Actual
2015	7

Output #4

Output Measure

- Conventional crosses from breeding program

Year	Actual
2015	12

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Development and use of bioherbicides can help to diversify weed control options, supplement chemical herbicides, and provide an alternative to methyl bromide
2	Discover, develop, evaluate and disseminate knowledge and information necessary to support the agronomic-related industries of the State and nation,
3	Promote and enhance the production and utilization of agronomic commodities and the management of pest plant species for the benefit of society.
4	Developing and disseminating environmentally and economically sound technolo-gies related to water management and plant nutrition that will increase production and utilization efficiencies
5	Develop horticultural characteristics, disease and host/plant resistance through classical genetics and molecular techniques, allowing the creation of marketable products for consumers
6	Research and develop crop production and physiology information and will set an example for the industry in environmen-tally safe practices.
7	Research and solve immediate technical problems facing the fruit and vegetable industries including the development of new information, materials and techniques to increase the efficiency of production, harvest and post-harvest handling
8	Develop new food plant cultivars that have improved quality characteristics.

Outcome #1

1. Outcome Measures

Development and use of bioherbicides can help to diversify weed control options, supplement chemical herbicides, and provide an alternative to methyl bromide

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Discover, develop, evaluate and disseminate knowledge and information necessary to support the agronomic-related industries of the State and nation,

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	17

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
Sothern growers are in need of new knowledge generated and applicable to the unique growing demands and specifics of the warm climate grapes (muscadines and Amarican native bunch hybrid grapes).

What has been done
1890 Research
New information and educational materials provided to the growers.

Results
1890 Research
Vineyard visits and inspections.
Workshops, field days, and seminars for grape growers, small farmers, processors and general public.
Harvest festival for general public.
Special presentations to high school and middle school students.

Lab and field tours for farmers, students, public, and government officials.
Promotional displays to promote program.
Student training and development:

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #3

1. Outcome Measures

Promote and enhance the production and utilization of agronomic commodities and the management of pest plant species for the benefit of society.

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
The fruit and vegetable production in North Florida specifically for small farmer has not achieved its full potential due to a lack of research on the interaction of location, environment, soil, cultural and management practices as they relate to chemical composition of different fruit varieties and dissemination of new and improved farm technology including the availability of new and improved cultivars. These growers and schools have sought FAMU?s assistance in helping them to expand their knowledge by conducting research, trainings and demonstrations that address common problems experienced. Similarly, the lack of interest in agriculture, particularly in fresh fruit and vegetable in K12 schools causes a makes it difficult for precollege youth to accept and benefit from the consumption of fresh fruits and vegetables.

What has been done
1890 Research
1) we evaluated the nutraceutical values and recommend improved fruit and vegetable cultivars

for adaptability to North Florida growing conditions that are more appealing to our youth and young adults; 2) trained small farmer, extension agent and students in horticultural best management practices through workshops and field days; 3) conducted ?on-farm? demonstrations of improved technology and profitability; and 4) provided experiential learning to K12 campuses through horticultural demonstrations to create interest in and appreciation for fresh fruits and vegetables.

Results
1890 Research
Demonstration trial study has been initiated on the effect of location, environment, soil, cultural and management practices on chemical composition and characteristics of selected small fruits using ?trap crops? and minimal pesticides and chemicals.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

Developing and disseminating environmentally and economically sound technolo-gies related to water management and plant nutrition that will increase production and utilization efficiencies

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Develop horticultural characteristics, disease and host/plant resistance through classical genetics and molecular techniques, allowing the creation of marketable products for consumers

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
Grape cultivar improvement is one of the most important projects for the continuous and dynamic growth of Florida grape and wine industries.

What has been done
1890 Research
The Viticulture Center maintains the largest collection of muscadine and bunch grape (Florida hybrids) germplasm to support its breeding program.

Results
1890 Research
Released a new US Patent: 9,051,38, Issue date June 9, 2015Mehboob Sheikh, Devaiah Kambiranda , Hemanth Vasanthaiah : "Disease-related biomarkers specific to Florida hybrid bunch and muscadine grape, and uses thereof"

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems

Outcome #6

1. Outcome Measures

Research and develop crop production and physiology information and will set an example for the industry in environmen-tally safe practices.

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

1890 Research

Pierce's disease is the main limitation for the majority of the Southeastern U.S. and commercial grape growing is solely based on the native muscadines and Florida hybrid bunch grapes. Warm climate grapes matured under rainy season, which pose a great challenge on the vinification qualities of the produce. Grape cultivar improvement is one of the most important projects for the continuous and dynamic growth of Florida grape and wine industries.

What has been done

1890 Research

The Center conducts research in grape developmental biology/in vitro cultivation and provide service in the area of best vineyard management and production practices for warm climate grapes. The research focuses on evaluating the health benefits of American native grapes and the impact of trellis systems and management practices such as pruning, spacing and rootstock performance on yield and fruit quality of muscadine and Florida hybrid grapes. A major component of the Center activities is its extension and outreach program. The faculty and staff worked closely with the state viticulture and horticulture industry and assist growers by providing new relevant scientific information and hands on training. The Center conducted on site visits, workshops on pruning, vineyard establishment and management practices year around. Our research and service as the National Clean Plant Center for Southern Grapes helping the local grape and wine industry to grow and sustain as well as contributed to the national standards for clean planting material of the muscadine and Florida native hybrid varieties.

Results

1890 Research

?The new wine analytical lab has been set up and is ready to serve the vinification and bio-processing research activities and the industry with basic analyses aligned to the OIV standards.
?Two additional field labs are under development in the Modular Unit: Postharvest Evaluation and Plant Pathology.
?New area of research related to grape allergenicity and food safety was lunched and is already used as a training ground for student experiential learning.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
206	Basic Plant Biology

Outcome #7

1. Outcome Measures

Research and solve immediate technical problems facing the fruit and vegetable industries including the development of new information, materials and techniques to increase the efficiency of production, harvest and post-harvest handling

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
Pierce's disease is the main limitation for the majority of the Southeastern U.S. and commercial grape growing is solely based on the native muscadines and Florida hybrid bunch grapes. The rapid expansion of wine industry in Florida and southeastern U.S. already predispose the viticulture enterprise to several disease problems such as Eutypa dieback, crown gall, and leafroll virus. Due to the detrimental impact of these diseases, we have identified them as the high priority diseases for research and development in the state and the region. It is our certainty that teaching, research, and extension in this area will keep the viticulture industry viable by minimizing the disease incidence.

What has been done
1890 Research
The Southeastern Vine Improvement and Distribution Program is focused to provide services to the Southeastern ((PD?s restricted) Viticulture region by:
Producing high quality disease free muscadine and Florida hybrid grape varieties.
Conduct research and developed rapid methods for diagnostic of muscadine and PD tolerant American native grape varieties for crown gall, viruses and Eutypa
Sustain the foundation block G1/G2.
Establish ?Diagnostic Facility for American Native Grapes?
Assist the extension and certification program.

Results
1890 Research
* Nursery request for 5 new variety and breeding lines to undergo disease elimination and to be included in the ?Clean Vine Foundation Block" was received and are under processing.
* A rapid highly specific early monitoring program for Eutypa dieback in muscadine grapes using molecular diagnostics has been developed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems

Outcome #8

1. Outcome Measures

Develop new food plant cultivars that have improved quality characteristics.

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	13

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1890 Research
The southern grape industry is seeking high quality stable red color red wine varieties: bunch grapes and muscadines as well.

What has been done
1890 Research
To speed up the evaluation of our advanced selections and in cooperation with industry partners (FGGA members and our stakeholders in neighboring states) a fast 2 years evaluation trial have been deployed to deliver novel, disease-resistant varieties with desired wine aroma and flavor characteristics, seedlesness and attractive large berry appearance.

Results
1890 Research
Executed the 1st license agreement for "Majesty" muscadine grape variety with the FL nursery. Two additional licensing requests and agreements for ?Majesty? muscadine variety have been completed with the office of the VP for Research and University General Counsel Office.

Eleven advanced breeding lines including two seedless bunch grape hybrids, three seedless and three seeded muscadine for fresh consumption, and two bunch and one muscadine for wine-making are under aggressively testing in the University?s experimental vineyard and commercial vineyards in FL. Ultimately, this work will build a breeding and evaluation pipeline that is expected

to result in quick cultivar release and increased profit for Florida grape growers.
?New gene transcripts "Gene Bank Submissions":
Lilian Oglesby, Anthony Ananga, Violetka Tsolova. 2014. Vitis rotundifolia Myb transcription factor (MybA1) mRNA, partial cds. GenBank: KJ513437.1

Lilian Oglesby, Anthony Ananga, Violetka Tsolova. 2014. Vitis rotundifolia Myb transcription factor (MYBCS1) mRNA, partial cds. GenBank: KJ513438.1

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
206	Basic Plant Biology

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.
lorida has three international shipping ports: Miami, Jacksonville and Tampa. Florida also has six international airports. Florida also had an estimated 105 million tourists in 2015, including more than 11 million from overseas. It has been estimated that this international influx into Florida has made us the entry point of one new invasive pest, plant or disease each week.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2015, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate

measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in this report, are evaluative methods for insuring our research projects are valid and useful.

1890 Research

The evaluation results indicated that the program achieved satisfactory progress towards meeting the goals in the plan of work. Program faculty have been very productive in terms of publishing their research in reputable journals and participating in relevant scientific meetings. They have also been successful in procuring external grants from various agencies to further support the program. The results from these evaluations will be used to make appropriate recommendations for small and limited resource farmers. Extension and outreach activities have been very successful and effective. Stakeholder and public participation in events such as workshops, grape field days, IPM field day, seminars and grape harvest festival has been high.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Animals and their systems--1862 & 1890 research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	0%	0%	9%	10%
302	Nutrient Utilization in Animals	0%	0%	12%	10%
303	Genetic Improvement of Animals	0%	0%	17%	0%
304	Animal Genome	0%	0%	3%	0%
305	Animal Physiological Processes	0%	0%	9%	10%
306	Environmental Stress in Animals	0%	0%	11%	5%
307	Animal Management Systems	0%	0%	7%	20%
308	Improved Animal Products (Before Harvest)	0%	0%	0%	10%
311	Animal Diseases	0%	0%	23%	10%
312	External Parasites and Pests of Animals	0%	0%	4%	5%
313	Internal Parasites in Animals	0%	0%	0%	10%
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	0%	0%	2%	5%
315	Animal Welfare/Well-Being and Protection	0%	0%	3%	5%
	Total	0%	0%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	2.0	1.0
Actual Paid	0.0	0.0	17.8	0.1
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	427695	26507
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	427695	13254
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct research experiments
- Partnering

1890 Research (Small Farm, Marketing & Rural Development)
The research findings are used in support of land grant programs to provide relevant programs and services. The projects focus on developing research and experiential learning opportunities relative to small farm production and marketing, food security, community development and asset building. The project focuses on research in the area of forage production, reproduction and animal health that could have several benefits to small-scale livestock and small ruminant producers, including investigate and develop efficient forage-based production systems. A database search was conducted using PUB MED to help identify plants with the appropriate tannin levels for study. Six warm season (e.g., hairy indigo, sun hemp, lespedza) forages and three cool season forages were identified that could be grown in north Florida. The tannin content of these forages ranged between 1.7 to 38.5 g kg-1 of DM.

2. Brief description of the target audience

- Residents of Florida interested in animals and animal science.
- Growers//Ranchers
- Producers/packaging
- General public
- Government officials
- Scientists

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 2

Patents listed

1. Sustained Release Devices for Repellents of Insects to Protect Horses and Other Animals (PCT)
2. Methods and Devices for Sustained Release of Substances (USA)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	108	108

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Improve reproductive performance of animals
  Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Improve reproductive performance of animals
2	Improve nutrient utilization in animals
3	Improve genetics in animals
4	Increase knowledge in area of animal genome
5	Improve animal physiological processes
6	Reduce environmental stress in animals
7	Improve animal management systems
8	Improve animal products (before harvest)
9	Increase knowledge and decrease incidence of animal diseases
10	Reduce instances of external parasites and pests of animals
11	Reduce internal parasites in animals
12	Identify and reduce toxic chemicals, poisonous plants, naturally ocurring toxins, and other hazards affecting animals
13	Increase animal welfare/well-being and protection through improved BMPs

Outcome #1

1. **Outcome Measures**

Improve reproductive performance of animals

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Improve nutrient utilization in animals

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Improve genetics in animals

2. **Associated Institution Types**

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The structure of the beef cattle industry in the United States in general, and in Florida in particular, is primarily based on crossbreeding. Although official figures are unavailable, it could be conservatively estimated that over 80% of beef cattle marketed in the US are crossbred. National beef cattle genetic improvement programs are still largely based on phenotypic and pedigree information, and continue to be the responsibility of breed associations. Genomic information has begun to be used as a complementary source of information, but it has yet to be fully incorporated into national beef cattle evaluation procedures.

What has been done
This research was aimed at comparing multibreed beef cattle evaluations for growth traits using four scenarios defined in terms of availability of phenotypic, pedigree, and genotypic information to represent genetic evaluations in purebred and in commercial cattle herds.

Results
Calves with Brahman fractions over 80% had higher birth weight (BW) and lower weaning weight (WW) and postweaning growth (PWG) than calves with Brahman fractions 20% or lower. Crossbred calves with Brahman fractions between 40% and 60% had the highest WW, whereas calves with Brahman fractions between 37.5% and 60% had the highest PWG. These results indicated that the polygenic model and genomic?polygenic model 1 should be preferred. Thus, to obtain the benefit of genotyping a fraction of the herd, commercial producers would need to keep complete pedigree records as well as individual animal phenotypes. However, high genotyping costs still make the polygenic model preferable for commercial beef cattle operations.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals

Outcome #4

1. Outcome Measures

Increase knowledge in area of animal genome

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Improve animal physiological processes

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Reduce environmental stress in animals

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
With the human population growing globally, the number of horses housed in confinement continues to increase. As a result, concerns over air quality for horses and their caretakers and the need to protect water quality are also on the rise.

What has been done
This research and extension program is currently focused on the relationships between management and horse behavior and welfare with emphasis on air quality in equine facilities, stereotypic behavior in horses, horse temperament and learning/training, implementation of best management practices on equine operations, and education and certification of Agriculture Law Enforcement personnel. The overall goal is to foster adoption of sound management practices that will lead to improvements in the health and well-being of humans, animals, and the environment.

Results
Research focused on ammonia emissions in equine facilities and on startle response in young stock-type horses during the past year resulted in 3 scientific abstracts presented at the national Equine Science Society and International Society for Equitation Science meetings. The Livestock Education and Certification for Agriculture Law Enforcement courses resulted in a 41% and 37% increase in attendee knowledge in the March and December 2015 offerings, respectively. These trainings represent a collaborative educational effort between state specialists, county faculty, and state agencies. Evaluations from the 2015 Florida Equine Institute and county extension programs indicate that presentations delivered on the care and management of horses including information on stereotypic behaviors, herd health, nutrition, and equine body condition scoring, have been useful and continue to be of interest to and needed by equine clientele throughout the state.

4. Associated Knowledge Areas

KA Code	Knowledge Area
306	Environmental Stress in Animals

Outcome #7

1. **Outcome Measures**

Improve animal management systems

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Improve animal products (before harvest)

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Increase knowledge and decrease incidence of animal diseases

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Reduce instances of external parasites and pests of animals

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Reduce internal parasites in animals

Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

Identify and reduce toxic chemicals, poisonous plants, naturally ocurring toxins, and other hazards affecting animals

Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

Increase animal welfare/well-being and protection through improved BMPs

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2015, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in

this report, are evaluative methods for insuring our research projects are valid and useful.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Agricultural, natural resources, and biological engineering--1862 & 1890 research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
402	Engineering Systems and Equipment	0%	0%	19%	0%
403	Waste Disposal, Recycling, and Reuse	0%	0%	44%	0%
404	Instrumentation and Control Systems	0%	0%	34%	0%
405	Drainage and Irrigation Systems and Facilities	0%	0%	3%	0%
	Total	0%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual Paid	0.0	0.0	4.7	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	110546	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	110546	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Research using multiple research methods

2. Brief description of the target audience

- General public
- Tourists
- Ag producers
- Government officials
- Industry

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year:	2015
Actual:	8

Patents listed

1. Heat Stable Mutants of Biosynthesis Enzymes (CON of 12769) (USA)
2. Induced Expression of Proteins in Insect Cells (PCT)
3. Multiplexed PCR Assay for High Throughput Genotyping (USA)
4. Modification of The Xylan Utilization System For Production of Acidic Xylooligosaccharides From Lignocellulosics (PCT)
5. A Method for Genome Complexity Reduction and Polymorphism Detection (CON of 13656) (USA)
6. Integrated Miniature Polarimeter and Spectrograph using Static Optics (USA)
7. Engineering the Pathway for Succinate Production (CON) (USA)
8. Engineering Escherichia Coli for Production of Butyric Acid (USA)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	77	77

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Develop strucutres, facilities and engineering systems that will improve Florida agriculture and natural resources.
2	To improve methods related to waste disposal, recycling and recuse
3	To increase the efficiency and decrease labor requirement in ag and forestry production
4	To develop effective instrumentation and information that are important aspects of pre- and post-production agriculture.
5	To develop effective water management systems that include surface, subsurface drainage and all irrigation systems

Outcome #1

1. Outcome Measures

Develop strucutres, facilities and engineering systems that will improve Florida agriculture and natural resources.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

To improve methods related to waste disposal, recycling and recuse

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Photosynthetic algae represent a large and diverse group of organisms that have only a limited history of characterization and exploitation. The application of resource production from algae is relatively untapped, with the potential to produce biofuels, food, fibers and nutraceuticals on a large scale.Our research in phycoprospecting of local habitats reveals a diversity of indigenous algae with significant lipid content, which suggests a high potential for biofuel production from the cultivation of Floridian algae. Wastewaters concentrate the nutrients algae need to thrive. If fast growing algae can be successfully cultured on wastewaters, the algae-to-biofuel industry becomes significantly more viable. Using algae for advanced wastewater treatment and nutrient removal could lower the costs of production.

What has been done
The project tasks will include field collection, laboratory studies, bench-scale and outdoor research on algae growth for biofuel production and wastewater remediation, and biological and technical feasibility analysis for large-scale implementation. Aquacultural, agricultural and municipal wastewater facilities will be sampled for both benthic and planktonic algae. The target audiences for this research include a diversity of stakeholders involved and interested in

sustainable technology, renewable energy and wastewater management, as well as climate change mitigation and environmental resource protection and conservation.

Results

Algae bioremediation offers an innovative and environmentally sound strategy for the management of nutrient-rich wastewaters. In particular, algae have potential application in the remediation of ammonia-nitrogen from landfill leachate. Using algae for advanced wastewater treatment and nutrient removal could lower the costs of remediation. Thus, algae offer an effective, economical, and sustainable solution for synergistic biofuel production and wastewater remediation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
405	Drainage and Irrigation Systems and Facilities

Outcome #3

1. Outcome Measures

To increase the efficiency and decrease labor requirement in ag and forestry production

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

To develop effective instrumentation and information that are important aspects of pre- and post-production agriculture.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

To develop effective water management systems that include surface, subsurface drainage and all irrigation systems

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2015, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in this report, are evaluative methods for insuring our research projects are valid and useful.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Food and non-food prodcuts: Development, Processing, Quality, and Delivery--1862 & 1890 Research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	0%	0%	15%	0%
502	New and Improved Food Products	0%	0%	23%	0%
503	Quality Maintenance in Storing and Marketing Food Products	0%	0%	50%	0%
511	New and Improved Non-Food Products and Processes	0%	0%	12%	0%
	Total	0%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	30.0	2.0
Actual Paid	0.0	0.0	6.3	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	97084	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	97084	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct research experiments
- The **FAMU** food safety program will gather and analyze data on small organic farmers to capture their fruit and vegetable growing practices and post-harvest handling. It will also formulate food safety education modules that will be tailored towards reaching the small organic growers. These research based modules will be used by extension personnel. The program will also develop protective washes for fruits and vegetables specifically for use on tomatoes, cantaloupes and green leafy vegetables focusing on gram negative bacteria.
- **UF** will conduct research experiments related to both food and non-food products that provide new knowledge in the areas of development, processing, quality and deliver of products.

2. Brief description of the target audience

State, national and international stakeholders will be affected by food and non-food developing, processing, quality and delivery conducted by **UF** research.These may include but are not limited to:

- producers
- regulatory bodies
- consumer groups
- general public

For **FAMU** research target audiences will include small to medium sized limited resource producers, processors, retailers and consumers.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year:	2015
Actual:	2

Patents listed

1. Methods for Increasing Grain Yield (USA)
2. Material and Methods to Increase Plant Growth and Yield (CIP of 14461) (USA)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	16	16

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- FAMU Specific food chains assessed to identify sources of contamination

Year	Actual
2015	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Develop new and improved food processing techniques
2	Develop new and improved food products
3	Improve quality maintance in storing and marketing food products
4	Develop new and improved non-food products and processes
5	Develop quality maintenance methods in storing and marketing non-food products
6	Reduction in the incidences of food borne illnesses
7	Identify BMPs that would decrease food borne illness in development, processing, food quality and delivery of food products.

Outcome #1

1. Outcome Measures

Develop new and improved food processing techniques

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Develop new and improved food products

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Fungi are an extremely diverse group of eukaryotes that includes economically and ecologically important plant and animal pathogens, edible mushrooms, toxic mushrooms, and decay organisms. Despite their importance in both natural and anthropogenic ecosystems, fungi are notoriously difficult to identify and remain poorly known.

What has been done
Identify, characterize, and document the fungi of the Southeastern USA (particularly Florida) and to deploy knowledge about fungi and fungal biology to appropriately benefit Florida stakeholders.Explore the viability of edible fungi (such as the pecan truffle Tuber lyonii, the oyster mushroom Pleurotus ostreatus, and the shiitake mushroom Lentinula edodes) as specialty crops in the state of Florida.

Results
More than 100 new fungal collections were identified and added to the FLAS collection, building a legacy for identication and clarification of these groups. These fungi as well as more than 5000+ additional herbarium specimens were cataloged and recorded into the Mycoportal database. Specimen data are now searchable and downloadable for the public. Edible fungi in the Tuber lyonii species complex from across the Eastern USA were analyzed using ITS rDNA to

assessdiversity, revise current species concepts, and determine the number of cryptic species. A book chapter is currently being created based on this information. Two newCladophialophoraspecies were discovered in Florida
Several potential human poisoning cases were assessed in coordination with Florida Poison Control personnel and our lab communicated with national-level poison control experts to generate an overview of fungal poisonings in the USA. Our lab also diagnosed fungi for several veterinarians for potential poisonings by fungi. Active communication with stakeholders (including extension agents, pecan growers, professional mycologists, and citizens) to identify fungi and diagnose fungal plant disease issues and wood decay issues.

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products

Outcome #3

1. Outcome Measures

Improve quality maintance in storing and marketing food products

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
These studies are designed to develop improved technologies for storage of horticultural crops after harvest. The use of ethylene-action inhibitors will provide for longer postharvest shelf life and also enable fruits to be harvested at more advanced stages of development, ensuring higher quality during storage and retail presentation. Analysis of alternative cell death pathways in harvested crops and in response to storage stress should lead to storage or treatment protocols specifically designed to delay these processes.

What has been done
Investigate the effects of 1-MCP technology on fruit quality and storage disorders, and its interaction with cold storage and CA storage technology. Investigate the metabolic and physiological processes that underlie the responses of fruit to postharvest technologies. Results of these studies will be distributed to horticultural and other plant scientists through publication in

peer-reviewed scholarly journals, presentations at national/international scientific conferences, and incorporation into course curricula, as well as through presentations to related industry audiences.

Results

Internal discoloration of mango fruit that is seen in U.S. markets primarily in fruit imported from South America, but has also been observed in fruit grown in China, appears to be a chilling injury symptom. 1-MCP may be more useful for mango markets that do not require mandatory quarantine hot water treatment(QHWT).

4. Associated Knowledge Areas

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products

Outcome #4

1. Outcome Measures

Develop new and improved non-food products and processes

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Develop quality maintenance methods in storing and marketing non-food products

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Reduction in the incidences of food borne illnesses

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products

Outcome #7

1. Outcome Measures

Identify BMPs that would decrease food borne illness in development, processing, food quality and delivery of food products.

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2015, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in

this report, are evaluative methods for insuring our research projects are valid and useful.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 13

1. Name of the Planned Program

Economics, markets, and policy--1862 & 1890 research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	0%	0%	13%	0%
602	Business Management, Finance, and Taxation	0%	0%	12%	0%
603	Market Economics	0%	0%	12%	0%
604	Marketing and Distribution Practices	0%	0%	6%	0%
605	Natural Resource and Environmental Economics	0%	0%	33%	0%
606	International Trade and Development	0%	0%	1%	0%
607	Consumer Economics	0%	0%	10%	0%
608	Community Resource Planning and Development	0%	0%	2%	0%
609	Economic Theory and Methods	0%	0%	2%	0%
610	Domestic Policy Analysis	0%	0%	7%	0%
611	Foreign Policy and Programs	0%	0%	2%	0%
	Total	0%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual Paid	0.0	0.0	17.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	286134	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	286134	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct research experiments
- Partnering on a national and an international level

2. Brief description of the target audience

- International partners and stakeholders
- Agribusiness
- Producers
- Policy makers (county, state, regional, national, international

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	80	80

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Provide economic analysis of issues confronting Florida stakeholders including assessment of the competitive position of Florida crops in the international marketplace
2	Research factors that influence consumers' subjective perceptions about food consumption that will allow agribusiness, ag producers, and policy makers to respond more effectively to sonsumer and producer concerns
3	Understand and develop policy necessary for improved development of international trade

Outcome #1

1. Outcome Measures

Provide economic analysis of issues confronting Florida stakeholders including assessment of the competitive position of Florida crops in the international marketplace

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Aquaculture and capture fisheries provide a significant source of protein and economic activity for people in the United States and other countries. In addition to pond, tank, cage, and raceway production, aquaculture broadly interacts with capture fisheries by providing hatchery-raised fish and shellfish that are released into the wild to enhanceor rebuild wild stock populations, thereby providing support for both commercial and recreational fisheries (NOAA Fisheries 2012). Capture fisheries also interact with aquaculture products in exchange markets, regulatory environments, and economic development activities. The importance of the multifaceted relationship between aquaculture and capture fisheries suggests a need for reliable economic studies of these two critical resources, especially as management, regulatory, and market demands change over time.

What has been done
Improve the development of seafood markets by focusing on analyses of new marketing themes, market niches, and alternative seafood products Increase the organizational and institutional efficiency of the aquaculture and fishery sectors by analyzing the regulatory environment and developing ideas to support the sectors. Primary methods may include (but are not limited to) designing and administering surveys, assembling secondary data, estimating empirical models, preparing documents for the industry and academic audiences, presentations to all stakeholder groups, involvement in workshops, and development of cooperative projects that integrate disciplines in order to expand the collaborate network of researchers and reach of the overall project.

Results
In article published in PLOS One, we introduced the Fishery Performance Indicators (FPIs), a broadly applicable and flexible tool for assessing performance in individual fisheries, and for establishing cross-sectional links between enabling conditions, management strategies and triple bottom line outcomes. Conceptually separating measures of performance, the FPIs use 68

individual outcome metrics?coded on a 1 to 5 scale based on expert assessment to facilitate application to data poor fisheries and sectors?that can be partitioned into sector-based or triple-bottom-line sustainability-based interpretative indicators. Variation among outcomes is explained with 54 similarly structured metrics of inputs, management approaches and enabling conditions. Using 61 initial fishery case studies drawn from industrial and developing countries around the world, we demonstrate the inferential importance of tracking economic and community outcomes, in addition to resource status.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
603	Market Economics
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
606	International Trade and Development
607	Consumer Economics

Outcome #2

1. Outcome Measures

Research factors that influence consumers' subjective perceptions about food consumption that will allow agribusiness, ag producers, and policy makers to respond more effectively to sonsumer and producer concerns

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In Florida and throughout the United States, food-related issues such as food safety and use of new food technologies continue to be top concerns among consumers.

What has been done
Since consumers? opinions regarding food issues is important to both the sustainability of the agricultural industry and human life as we know it, the UF/IFAS Center for Public Issues

Education (PIE Center) initiated a study to explore the attitudes, perceptions, and opinions of Floridians around food issues. This survey examined what Floridians think about (1) their perceptions of food safety of various food products, (2) their concerns regarding food safety, (3) their overall attitude toward food safety, (4) their knowledge of food safety practices (5) their perceptions of genetically modified food, and (6) their intent to purchase genetically modified food.

Results

* The majority of respondents agreed or strongly agreed that fruits and vegetables were safe.
* Respondents identified eggs and milk as the safest animal products, followed by whole cuts of meat (steak, pork chops, chicken), ground products (sausage, ground beef), and seafood.
* The majority of respondents were worried about the safety of pesticide and antibiotic residues in food, while about half of respondents reported concerns with the safety of food additives and preservatives.
* Just under half the respondents agreed or strongly agreed that food safety is a major concern, while slightly less respondents agreed or strongly agreed that food safety is a major concern of Americans.
* Most respondents did not understand the science of genetically modified food nor could they identify what foods were genetically modified, but a large portion had read or heard about the technology
* Respondents were generally unsure about the benefits of genetically modified food and believed that the
technology tampered with nature.
* About one-third of the respondents were unsure if they had purchased genetically modified food in the past
or in the present.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
603	Market Economics
604	Marketing and Distribution Practices
607	Consumer Economics
609	Economic Theory and Methods
610	Domestic Policy Analysis

Outcome #3

1. Outcome Measures

Understand and develop policy necessary for improved development of international trade

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2015, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in this report, are evaluative methods for insuring our research projects are valid and useful.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 14

1. Name of the Planned Program

Human nutrition, food safety, and human health and well-being-- 1862 & 1890 research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
701	Nutrient Composition of Food	0%	0%	13%	0%
702	Requirements and Function of Nutrients and Other Food Components	0%	0%	4%	0%
703	Nutrition Education and Behavior	0%	0%	10%	0%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%	0%	10%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%	0%	35%	0%
721	Insects and Other Pests Affecting Humans	0%	0%	18%	0%
722	Zoonotic Diseases and Parasites Affecting Humans	0%	0%	5%	0%
723	Hazards to Human Health and Safety	0%	0%	2%	0%
724	Healthy Lifestyle	0%	0%	3%	0%
	Total	0%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	3.0	2.0
Actual Paid	0.0	0.0	17.4	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	459030	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	459030	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct research
- Partnering

2. Brief description of the target audience

UF Targets will include:

- Florida residents
- Families, parents and children
- Foodindustry
- General public
- Regulatory agencies

At **FAMU** target audience will include: low to moderate income families, school, nutrition and health professionals, community leaders and local and state level agencies.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year:	2015
Actual:	11

Patents listed

1. Bed Bug Sticky Trap with Specific Textured Surface (USA)
2. Resistance Breaking insecticides fo rthe Malaria Mosquito (USA)
3. Structurally Novel Insecticides for the Malaria Mosquito (USA)
4. Bioinspired Insect Traps (PCT)
5. Dual Action Lethal Containers and Compositions for Killing Adult Mosquitos and Larvae (China)
6. Dual Action Lethal Ovitrap (Mexico)
7. Bed Bug Sticky Trap with Specific Textured Surface (USA)
8. Type I Interferon Mimetics as Therapeutics for Cancer, Viral Infections, and Other Diseases (CIP) (PCT)
9. SOCS1/3 Mimetics for the Treatment of Autoimmune Diseases (PCT)
10. Furniture Protector Against Bed Bugs and Other Crawling Insects (USA)
11. Lactobacillus Supplement for Alleviating Type I Diabetes (USA)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	118	118

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Identified ways to increase acceptance of sustainable change in eating and exercise
2	Research in the area of human nutrition, food safety and human health and well-being addressing problems and opportunities to the food industry and quality of life in Florida and throughout the world
3	Development of methods of change that increase adoption of healthy eating habits by youth and adolescents

Outcome #1

1. Outcome Measures

Identified ways to increase acceptance of sustainable change in eating and exercise

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Research in the area of human nutrition, food safety and human health and well-being addressing problems and opportunities to the food industry and quality of life in Florida and throughout the world

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Consumers and consequently the food and dietary supplement industries have become very interested in products that maintain digestive and immune health. Prior to marketing products using structure/function claims, substantial evidence must be available to support the claim. This evidence is lacking especially when it comes to health outcomes. The proposed research will use human and animal models to investigate health outcomes and the potential mechanisms by which zinc and prebiotics support digestive and immune health. This information would add value to foods containing these food components. Additionally, identification and consumption of foods or food components that maintain digestive and immune health may improve quality of life and reduce health care costs.

What has been done
The research examined the effect of food and food components on gastrointestinal and immune health using animal and human models to examine health outcomes and the potential mechanism providing for maintenance of health.

Results

Our work demonstrated that probiotics modulate the fecal microbiota, immune function and clinical outcomes. Specifically the proportion of psychologically stressed young adults who reported a cold/flu on any given day was lower at weeks 2 and 3 of a 6-week period when they consumed Bifidobacterium longum ssp. infantis R0033or Bifodobacterium bifidum R0071. When older adults consumed a combination of Lactobacillus gasseri KS-13, Bifidobacterium bifidum G9-1, and Bifidobacterium longum MM-2, a less inflammatory profile was observed for immune proteins (cytokines) and fecal microbial communities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

Development of methods of change that increase adoption of healthy eating habits by youth and adolescents

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The National School Lunch Program (NSLP) was established in 1946 with the dual-goal of reducing government commodity surpluses while providing low-income children nutritious meals. The NSLP has become one of the largest nutrition-assistance programs in the United States with over eighty percent of all primary and secondary schools participating. In 2011, over five billion lunches were served to an average of 31.7 million students per day (USDA, 2012). The current program provides free and reduced-cost lunches for income-eligible students and minimally subsidizes paid lunches for students that are not eligible for a free or reduced-cost meal. New guidelines effective beginning in the 2012/13 increase the availability of healthful foods (fruits,

vegetables, and whole grains), while reducing the levels of sodium and saturated fats and controlling calorie levels. The new guidelines come at a time when record high rates of childhood obesity are attracting a great deal of public attention. Previous research investigating the healthfulness of the NSLP is mixed with some studies finding a positive relationship between NSLP participation and child overweight (Millimet, Tchernis, & Husain 2010; Schanzenbach 2009) while other studies found the opposite relationship (Gundersen, Kreider and Pepper 2012).

What has been done

This research aims to contribute to this debate by employing a variety of secondary data, primary data and experimental data. Furthermore, researchers seek to determine if the effects differ by participation status (free, reduce-cost and paid), an aspect not frequently explored in previous research, makes a difference. Using a unique dataset tracking daily entrée choices and their nutritional value among elementary students at a suburban school district, researchers contributed to understanding the healthfulness of the NSLP.

Results

While controlling for age, gender, and race, students that purchase free lunch choose entrees with less sodium than students purchasing either reduced-price or paid lunches. Relative to students purchasing free-lunches, students purchasing paid lunches also choose entrees with more protein and fat and entrees with fewer carbohydrates.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2015, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in this report, are evaluative methods for insuring our research projects are valid and useful.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 15

1. Name of the Planned Program

Families, Youth. and Communities--1862 & 1890 research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	0%	0%	16%	0%
802	Human Development and Family Well-Being	0%	0%	5%	0%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	0%	0%	23%	0%
805	Community Institutions, Health, and Social Services	0%	0%	8%	0%
806	Youth Development	0%	0%	48%	0%
	Total	0%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual Paid	0.0	0.0	8.4	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	141686	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	141686	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct Research Experiments

1890 Research
1. In service training workshops will be developed using research-based information
2. A centralized website will be implemented (as a component of the Florida Climate Institute's website) containing:
• Resource library of internally vetted articles, government documents, lectures, NGO reports and links to websites
• List and links to existing UF/FSU and FAMU research programs related to climate variability and change
• In-service training presentations
• Extension curriculum materials (PowerPoint presentations, EDIS publications, other resources)
• Funding opportunities, especially via RFPs which require an Extension component
3. EDIS publications targeting specific sectors, needs assessment reports, and risk assessments for specific industries and geographies

2. Brief description of the target audience

1890 Research
Producers - Commodity Associations - Owners/Operators - Managers/Supervisors - Workers/Laborers - Allied Industry Representatives - Small Farmers - Government (Local, State and Federal) - Processors - Food Handlers - Extension Professionals - NOAA - Seagrant - Educators

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	17	17

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. Outcome Measures

Decrease crime and violence in youth populations

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
All youth need support from their communities if they are to mature into caring, responsible adults. As children develop into adolescents, they will become more aware of their relationship with their immediate surroundings, including their immediate neighborhood and greater community. Community programs, institutions, and
individuals within those environments may actively support the transition by increasing youths? awareness of community issues over
time. Particularly, youth may be encouraged to begin to identify their role as citizens in the local community and the relationship that exists between the neighborhoods that they reside in and the larger community area. This includes gaining awareness and understanding of behaviors that are developmentally appropriate and without risk as well as an awareness of those farther out on the greater risk continuum that will be detrimental to a positive developmental trajectory.

What has been done
While various studies have focused on aspects of quality of life, well-being, community, and asset building, few have considered the integrated effects of youth perceptions of community protective factors and perceived social behavioral risk factors. Participants in this study were enrolled in after-school programs in two communities in central Florida over a period of three years. The first community (C1) is located in a rural county and this community has high rates of drug use, crime and unemployment, and a predominately African-American population. The second
community (C2) is located in a migrant agriculturally based county, and this community has a large Hispanic/Latino population that
works in the agricultural sector. The purpose of the funded project was to serve youth placed at risk and their families by providing after-school programs in communities where no comprehensive after-school programming existed for teens. The focus of the program content was to investigate timely and relevant issues within the respective communities. Teens in the program analyzed issues and learned how to become involved in the community decision-making

process. There were 163 participants involved in the after-school programs during the 3-year period under study; however, 30 of the
participants were enrolled in multiple years resulting in 133 distinct participants. The youth ranged in age from 11 to 19 years with a mean age of 13.26.Two separate instruments were designed and selected for research use.

Results

The results of this study indicate that youth perceptions of community overall may provide protective factors for vulnerable youth living in stressful environments. Implications for field practitioners, such as after-school program leaders, youth development professionals, and youth prevention workers are to continue to increase efforts toward increasing resiliency for youth placed at risk. By focusing on building strengths in the community and empowering youth to build the capacities and skills they need
to become healthy and contributing citizens, it will shift their focus from problems to solutions. An environment that promotes a sense of belonging, community service and a climate of high expectations will encourage youth to look beyond the immediate local environment into the future. When youth become more involved
in their local community, they become more invested and protective of it. Potentially, this may pay off in the long run by having youth so proud of their community and their role in it, that they would reverse the cycle of negative behaviors occurring by their peers, as well as minimize their own potential for risk-taking behaviors.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's
population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2015, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in this report, are evaluative methods for insuring our research projects are valid and useful.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 16

1. Name of the Planned Program

Program and Project Support, and Administration, Education, and Communication-- 1862 & 1890 research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
901	Program and Project Design, and Statistics	0%	0%	18%	0%
902	Administration of Projects and Programs	0%	0%	24%	0%
903	Communication, Education, and Information Delivery	0%	0%	58%	0%
	Total	0%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.3	0.0
Actual Paid	0.0	0.0	2.1	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	63852	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	63852	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activity in this program supports other issue-based programs and include the study of leadership and communication as well as ways to increase distance education, social marketing and multimedia technology.

2. Brief description of the target audience

- County and state faculty
- Government
- Students
- General public

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	78	78

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Improve project and program design
2	Improve the evaluation, surveys, sampling methods and statistical analysis used in developing strong research projects and extension programs.
3	Improve educational processes, needs and methods needed to achieve educational goals.

Outcome #1

1. Outcome Measures

Improve project and program design

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Improve the evaluation, surveys, sampling methods and statistical analysis used in developing strong research projects and extension programs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Florida's agricultural and natural resources industries are currently facing some of their greatest challenges in bridging a green divide between those with differing perspectives on how to sustain a viable agriculture industry while protecting natural resources and the environment. Florida's population increased by almost 219,000 people between July 1, 2010 and July 1, 2011, which was the third largest increase in all U.S. states (Clouser, 2011). These increases have led to amplified interactions between urban and rural citizens surrounding contentious public issues such as water allocation, pesticide and fertilizer application practices, immigration policies, and environmental regulation. Research has shown that public perceptions of agricultural practices are often inconsistent with the reality of agricultural and natural resource practices (Goodwin, Chiarelli, & Irani, 2011). By developing a deeper understanding of how the public makes decisions around public issues, educational initiatives and communication messages can be formulated to assist in developing well-rounded public perspectives and the leadership capacity of those in the agricultural and natural resource industry thereby increasing an understanding of critical issues, potentially influencing voting behavior. An informed public that votes appropriately on issues impacting agriculture and natural resources has important implications for future practice.

What has been done

A longitudinal study will be conducted examining how Florida citizens' critical thinking style influences the way they think about and make decisions around critical water issues. The study will use an online survey design, implemented with a random panel of Florida citizens on an annual basis, to identify Florida citizens' a) critical thinking styles, b) perceptions of specific current water quality and water quantity issues, c) use of natural water sources in Florida, and d) engagement in water conservation behaviors. Data will be analyzed to determine if and how critical thinking style influences perceptions and/or behaviors and disseminated in the form of EDIS publications and journal articles with the intent of IFAS extension programs using this information to target participants to water focused programming.

Results

The research results have been used to develop educational programming and communication messages towards specific styles of critical thinking to determine if targeted programming makes a difference in their ability to think critically and make decisions about critical issues. Research examining how crtiical thinking style impacts communication needs surrounding agricultural water use and food issues including GM science was conducted this past year. The findings are currently being used to develop short, online videos that can deliver messages using the right sources to a very targeted population.

4. Associated Knowledge Areas

KA Code	Knowledge Area
901	Program and Project Design, and Statistics
902	Administration of Projects and Programs
903	Communication, Education, and Information Delivery

Outcome #3

1. Outcome Measures

Improve educational processes, needs and methods needed to achieve educational goals.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Many parts of the state are still struggling due to the economy and many areas are starting to grow again. This leads to greater numbers of people in need of help. Changes in financing and home ownership since the Great Recession continue to have an impact on Florida's population. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in past years continue to have some impact. We continue to evaluate our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2015, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in this report, are evaluative methods for insuring our research projects are valid and useful.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 17

1. Name of the Planned Program

Strategic Research for the Management of Invasive Pest

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
135	Aquatic and Terrestrial Wildlife	0%	0%	0%	25%
211	Insects, Mites, and Other Arthropods Affecting Plants	0%	0%	0%	25%
215	Biological Control of Pests Affecting Plants	0%	0%	0%	25%
216	Integrated Pest Management Systems	0%	0%	0%	25%
	Total	0%	0%	0%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	5.0
Actual Paid	0.0	0.0	0.0	7.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	0	557632
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	278816
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1890 Research

Expert information systems.
A computer based identification tool was developed using the LUCID platform with the support from APHIS. It provides a digital identification key for invasive weevil species in the United States and the Caribbean Countries and an identification resource for cultivated palms in the United States and Caribbean. The tool comprises of 76 weevil species. Of these, 20 species are considered pollinators of palms. Our specific efforts also focused on development of two subcomponents encompassing the key coleopteran groups: weevils and chrysomelids. A comprehensive list of around 80 species of weevils on palms has been completed.
Offshore research:
Objective 1: Interdiction records from the Florida Department of Agriculture and Consumer Services Department of Plant Industry were searched for interdiction records for Aleurodicus pulvinatus. (FDACS-DPI). The records were obtained from Greg Hodges. To date, there have been no interceptions of A. pulvinatus in Florida. The closest interception to the continental U.S.A. to date has been Paradise Island, The Bahamas on 17 June 2011. This is about 3 miles from Nassau which is about 187 miles from Miami, Florida. It was recovered from the bird of paradise Flower, Strelitzia nicolai (Strelitziaceae). It was intercepted in San Juan, Puerto Rico in April 2006 on Melaleuca quinquenervia (Myrtaceae). It was collected in 2010 in The Turks and Caicos Islands from seagrape Coccoloba uvifera, buttonwood, Conocarpus erectus. [Work on objective 1 is ongoing.]
Objective 2: Cocos nucifera is the main host of A. pulvinatus. Alternate hosts occurring in Florida include avocado, Persea americana, an important specialty crop. Seagrape also known as the baygrape, Coccoloba uvifera (Caryophyalles: Polygonaceae) is a popular landscaping and ornamental plant in south Florida. It is also common in The Bahamas. Black pepper, Piper nigrum (Piperales: Piperaceae), is a minor host and is cultivated on a small scale in south Florida. Plants in the laurel family (Laurales : Lauraceae) also serve as a minor host. M. quinquenvervia is the most prominent of 60 exotic species found in the Everglades.

Benefits and risks of biological control agents:
The effectiveness of risk communication activities for entomophagous biological control agents were compiled. Data on classical and fortuitous biological control were collected for use to populate existing or new databases. These data allow the testing on hypothesis relating to safety issues.

2. Brief description of the target audience

1890 Research
The target audience include: federal and state agencies, farmers, consumers, industry, extension workers and pest management specialists. For instance, the information on the interception of invasive species will be used by government agencies (USDA-APHIS, USDA-ARS), State agencies and general public and private industry. The work on offshore pests is aimed at safeguarding US Agriculture, farmers, food and ornamental growers, the nursery industry and government agencies.

3. How was eXtension used?

Extension collaborates with the PIs of the projects to transfer new technologies to the stakeholders by designing and implementing participant-oriented programs. The extension also conducts workshops and field-days to train stakeholders in the adoption of new technology.

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	250	650	70	1600

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	6	17	23

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Electronic identification keys/tools/resources developed

Year	Actual
2015	2

Output #2

Output Measure

- Knowledge generated on specific target pests and used for the development of contingency plans.

Year	Actual
2015	6

Output #3

Output Measure

- Analyses conducted on key issues regarding safety and specific target biological control agents

studied to determine safety.

Year	Actual
2015	2

Output #4

Output Measure

- Target biological control agents introduced and established against specific insect pest or weed targets.
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Undergraduate and graduate students trained through mentorship and involvement in research programs.

Year	Actual
2015	27

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Digital identification keys/tools/resources for the identification of invasive species utilized
2	Strategies for the identification, prevention or management of invasive species
3	Integrated pest management approaches adopted by farmers leading to greater profitability.
4	The introduction and spread IAS minimized.
5	More effective management of aquatic weeds in first order springs.
6	Trade between the US and partners through implementation of strategies to mitigate the introduction of invasive insects pests and weeds.
7	Well trained undergraduates and graduates contribute to the effective management of native and non-native pests.

Outcome #1

1. Outcome Measures

Digital identification keys/tools/resources for the identification of invasive species utilized

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Potentially invasive weevil species from the Caribbean countries to the United States: This system includes 42 invasive weevil species in 26 genera. Of these, 6 species are already established in the United States. The remaining species have great potential to become of economic importance to the United States as well as in Caribbean Countries.

What has been done

A computer based diagnostic keys using the LUCID platform has been developed

Results
A comprehensive list of around 80 species of weevils on palms has been completed. Among these species 60 of them are pests while 20 are considered plant pollinators.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

Strategies for the identification, prevention or management of invasive species

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Florida faces a disproportionate risk from invasive pests which are a major threat to agriculture and the environment. Farmers, the general public, ornamental industry, and various state and federal agencies involved in efforts to mitigate the threats of invasive pests are concerned with these threats.

What has been done
Offshore studies are being conducted to generate knowledge that is critical for the development of mitigation measures against several pest threats. Studies on the red palm weevil (RPW), Rhynchophorus ferrugineus, in Curacao focused on development of optimal methods for operating pheromone traps and acoustically assessing infestations in individual trees. In addition, offshore studies on the coffee mealybug in the Dominican Republic provide useful insights for the development of the management strategy for Planococcus lilacinus.

Results
From a country-wide survey of 131 locations in 19 provinces in the Dominican Republic, eleven (11) species of invasive mealybug were identifies along with the parasitoid Leptomastix dactylopii and the predators, Cryptolaemus montrouzieri and Cycloneda sanguine.

Bucket traps with pheromone lures and a molasses food-bait mixture captured RPW adults reliably for about eight days. A portable, user-friendly acoustic sensor system enabled identification of larvae in individual infested trees through the use of signal processing analyses that screened out bird and wind noise. This information will assist future efforts to monitor, control, or eradicate RPW in Curacao, Aruba and nearby islands and the United States, should the pest gain entry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Integrated pest management approaches adopted by farmers leading to greater profitability.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The decline of honey bee populations is causing serious problems for crop pollination, thus, production of crops and vegetables has declined to less than 50% for certain growers in the United States. Using best management practices and IPM strategies, vegetables, fruits, nut crops, and ornamental growers can reduce up to 50-80% the use of pesticides in their farms and secure a good level of profitability. This approach should help conserve beneficial species (parasitoids, predators, and crop pollinators).

What has been done
A study on monitoring and development of pest management strategies to control Drosophila suzukii and invasive pest of soft-skinned fruits was initiated. Several varieties of blueberries and strawberries were grown at the Center for Viticulture and Small Fruits Research and monitoring data were recorded.

Results
The preliminary results indicated that all nine traps including control were successful in capturing adults of the SWD during the five weeks study period. The maximum number (70 flies) of male and female caught during the first week were in T9: Scentry Trap + Solution Bait followed by 65 flies in T4: Scentry Trap + Scentry Bait and 49 flies in T3: Trece Trap + Trece Lure + Solution Bait. In contrast, trap T6 (2 adults), T7 (7 adults), T5 (8 adults), T8 (16 adults) and T2 (32 adults)

were able to capture much less number of adult flies. During the 2nd week T3 and T4 caught higher number of flies 28 and 20, respectively. In the third week similar trends were prominent. During the 3rd and 4th weeks period T1, T3, and T4 captured most of the flies. In the last week, T3 captured the most flies (26 adults). Overall, T3 showed highest number of flies caught during each week when compared to other traps. Among the treatments, two treatments captured highest number of flies in five weeks including the Trece Trap + Trece Lure + Solution Bait (183 adults) followed by 151 flies in Trece Trap + Trece Lure + Solution Bait.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

The introduction and spread IAS minimized.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Government regulations regarding globalization of trade and transport has multiplied concerns of introduction of invasive species. This threat has increased as trade has grown and so have the complexities of trade especially in agricultural products. Increase in temperature improves the survival and rapid spread of arthropods pests to new environment where they become very destructive and difficult to control.

What has been done
Offshore research on seven high risk species (Planococcus lilacinus, Rhyncophorus ferrugineus, Rhyncophorus cruentatus and Rhyncophorus palmarum, Oxycarenus hyalinipennis, Tuta absoluta, and Anastrepha grandis) was carried out or initiated in Trinidad, Dominican Republic, Curacao and Aruba, Bahamas, Jamaica and Panama with a view to generate data on biology,

ecology, surveillance and control.

Biological control of Hydrilla verticillata. A survey of the upper 1.5 miles of the river of the Wacissa Springs Group was conducted. A descriptive scale of 0-3 was used with 0 indicating Hydrilla undetected and 3 completely choked. Survey results of the Wacissa River indicated varying levels of Hydrilla infestations. Thus, for mitigation purpose, cultures of Hydrilla were established in the laboratory from Wacissa Big Blue Spring, Wacissa #2 and Garner Spring. The Hydrilla tip mining midge, Cricotopus lebetis were reared in the laboratory for release into Wacissa River to assess its effectiveness in controlling Hydrilla.

Results

Red palm weevil: Studies on Rhyncophorus ferrugineus were continued in Aruba and Curacao with efforts being targeted on development of trapping methods. The preliminary results of the acoustical analyses for R. ferrugineus indicated that early instar larvae were detectable in the field. This information is useful should the pest become introduced into the United States. In addition, data indicated that no R. cruentatus or R. cruentatus were captured in the survey in Aruba and these two species did not appear to be current threats to palms on the island

Hydrilla; The development of a biological control strategy for the invasive weed, Hydrilla verticillata was continued. Surveys of the Wacissa River indicated varying levels of Hydrilla infestations. For this purpose, the Hydrilla tip mining midge, Cricotopus lebetis was reared in the laboratory for release into Wacissa River to assess its effectiveness in controlling Hydrilla.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #5

1. Outcome Measures

More effective management of aquatic weeds in first order springs.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual

2015 1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Hydrilla, an invasive and noxious weed is considered the second most important aquatic weed world-wide behind water hyacinth. Currently, many springs and first order streams in Florida are infested with this weed. As a result, the ecosystem has degraded, and the spring and river's ecological and recreational value has drastically diminished. Thus, the understandings of the risk of spread of Hydrilla to non-infested bodies of water and methods to mitigate the risk are needed. A range of stakeholders including: fisherman, canoeists, kayakers, boaters, swimmers, scuba divers, water resource managers, private industry is affected.

What has been done

Field experiments were conducted to determine (a) whether or not C. lebetis can reduce the ability of hydrilla to outcompete and displace native American grass; (b) to determine how deep C. lebetis neonates can swim to locate hydrilla in the water and whether or not the water depth is a limiting factor in the establishment/survival of C. lebetis and (c) to determine the field host range of C. lebetis

Surveys of the Wacissa River indicated varying levels of Hydrilla infestations.

A web site was established to disseminate knowledge to these groups. An awareness campaign has been mounted using brochures and other paraphernalia such as, hats, and rulers.

Results

Hydrilla and Vallisneria have been planted in tanks in a 2x2 factorial design and C. lebetis were released into the tanks to investigate their efficiency in controlling. Data indicated that C. lebetis was able to feed on several native plant species. The web site is active and is providing knowledge to these groups. Public awareness materials
have also been disseminated to stakeholders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

Trade between the US and partners through implementation of strategies to mitigate the introduction of invasive insects pests and weeds.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Well trained undergraduates and graduates contribute to the effective management of native and non-native pests.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A safe agricultural system is critical to national security but U.S. crops, a cornerstone of our nation's economy, are vulnerable to attack. Events at the beginning of the new millennium further complicated issues relating to bio-security. More than ever, a plethora of actions are required in order to effectively safeguard our nation. Thus, more innovative and scientific programs must be developed in order to increase the number of well trained professionals to fill critical positions in research and regulatory functions in various agencies.

What has been done
A central component of our work on invasive species is to train both graduate and undergraduate students to undertaken such professional careers. These students are involved in experiential learning, attending and presenting their research results at professional meetings.

Results
A total of 15 graduate and 3 undergraduate students have been involved in projects related to invasive alien species.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The overall implementation of the research program in the Center for Biological Control (CBC) was evaluated by the Advisory Council of CBC in December 03, 2015 and found it to be satisfactorily.

Key Items of Evaluation

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
0	Number of children and youth who reported eating more of healthy foods.
Climate Change (Outcome 1, Indicator 4)	
0	Number of new crop varieties, animal breeds, and genotypes whit climate adaptive traits.
Global Food Security and Hunger (Outcome 1, Indicator 4.a)	
0	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
Global Food Security and Hunger (Outcome 2, Indicator 1)	
0	Number of new or improved innovations developed for food enterprises.
Food Safety (Outcome 1, Indicator 1)	
0	Number of viable technologies developed or modified for the detection and
Sustainable Energy (Outcome 3, Indicator 2)	
0	Number of farmers who adopted a dedicated bioenergy crop
Sustainable Energy (Outcome 3, Indicator 4)	
0	Tons of feedstocks delivered.