2017 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

UF/IFAS - 1862 Extension and Research
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 the state -- 14 academic departments and two schools based at the main campus in Gainesville, 18 off-campus facilities, and an Extension office in each of Florida's 67 counties. Furthermore, UF/IFAS Extension reaches clients in Florida and beyond via print and online resources.

The research mission of UF/IFAS, conducted by the Florida Agricultural Experiment Station, is to encourage innovative study, discover new scientific knowledge and create applications for that knowledge to address challenges facing agriculture, natural resources and interrelated human systems in Florida, our country and our world. Specifically, its goals include:

- Expand our global leadership in basic and applied research in agriculture, naturalresources and interrelated human systems, to build and maintain programs that conduct impactful research.
- Enrich the culture of research discovery by supporting faculty, inspiring innovation, promoting synergies between the three main UF/IFAS units and fostering effective communication between faculty and stakeholders.
- Build satisfaction and quality of life on the job for faculty and staff by providing training and continuing education opportunities, and by nominating researchers at all career stages for awards, honors and other recognitions.

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 2.3 million jobs, $160.7 billion in direct output (revenues), $132.0 billion in value added contributions, and accounting for 14.7 percent of total economic activity in 2015.[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]

In addition to research impacts highlighted in this report, other recent highlights for UF/IFAS Research include:

- During the past 10 years, UF/IFAS plant breeders have released 283 new varieties for commercialization as landscape ornamentals, groundcovers, forages and food crops.
- UF/IFAS entomologist and Dow AgroSciences experts developed the Sentricon® subterranean termite colony elimination system, which exploits the insects' feeding behavior.
- UF/IFAS food scientists determined the folic acid requirements for pregnant women, a discovery that led to food fortification and marketing of new supplements to prevent birth defects associated with folic acid deficiencies.
- UF/IFAS entomologists conducted the first comprehensive studies of mosquito feeding patterns in the Southeast, leading to improved mosquito control programs statewide.
- Florida Sea Grant agents and specialists developed and demonstrated an improved harvesting method for natural sea sponges that improved the chances that cut "stumps" left behind on the sea floor would regenerate; the method is now required by state law.
- UF/IFAS agricultural engineers developed the raised-bed plastic mulch system, which is used extensively worldwide to conserve resources and protect crops from weeds, pests and soilborne diseases.
- UF/IFAS researchers developed a decision support tool that helps the Florida Fish and Wildlife Conservation Commission analyze boat traffic in Florida's waterways. The resulting data are used in evaluating requests to establish no-wake zones and other safety measures. The tool saves taxpayers $1.5 million annually.

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 with an estimated 21 million in 2017. Florida's population is estimated to reach 27.4 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, 2016, 2017). While these program areas are designed to meet state needs, many directly relate to the six NIFA priorities.

A significant challenge this year for UF/IFAS and the state of Florida was the devastation left behind by

Hurricane Irma in September 2017. With an estimated $50 billion in damages, this was the fifth costliest weather disaster on record in the U.S. An estimated 20 million people lost power and six million evacuated their homes. All but four of the 25 tornadoes produced by Irma occurred in Florida.[4] Total agricultural loses in the state due to Irma were estimated at $2.6 billion, with the heaviest losses experienced by the citrus ($760M), greenhouse/nursery/floriculture ($625M), sugar ($382M), forestry ($261M), and beef cattle ($237M) industries.

The UF/IFAS Extension Disaster Education Network (EDEN) point of contact worked with our Communications division to develop a one-stop shop for Extension personnel to find 45 resources posted before and after the hurricane. In addition, we developed printed versions of these to distribute in heavily hit counties that did not have internet/cell phone coverage. About 20 presentations have been given to various groups, including county Extension faculty, commodity groups, city and county administrators, and state officials, to share lessons learned, report on losses, etc.

A survey was conducted of UF/IFAS county Extension faculty to better understand its involvement and impact during the 2017 hurricane season. Since the survey instrument was similar to one used after the busy 2004 season (Hurricanes Charley, Francis, Ivan and Jeanne), we will be able to compare the results over time. Including looking at whether recommended changes were implemented and the outcome of those changes. The results of the study will guide Extension's future role in hurricane preparedness and relief effort, give us a better understanding of the personal and professional needs of our faculty, and help us to develop effective communication, training, curriculum and other resources for future hurricanes and other emergencies.

[1]Hodges, A.W., Rahmani, M., and Court, C.D. 2017. Economic Contributions of Agriculture, Natural Resources and Food Industries in Florida in 2015 University of Florida/IFAS, http://edis.ifas.ufl.edu/fe1020.
[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. 2018. Florida Population Studies, Vol 51, Bulletin 180. University of Florida Bureau of Economic and Business Research. Online: https://tinyurl.com/ybcxhexy.
[4]National Hurricane Center Tropical Cyclone Report, Hurricane Irma, AL 112017. 2018. Online: https://www.nhc.noaa.gov/data/tcr/AL112017_Irma.pdf.

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 third in population growth after California 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 supports science-based information, as well as economic and social discovery, for limited resource farmers, rural and urban citizens and 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 programming to provide 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 Small-Scale Crop and Livestock Production, Alternative Market Development and Rural Economic Development.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	435.0	27.0	320.0	24.0
Actual	474.0	27.0	338.0	26.0

II. Merit Review Process

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

- Internal University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Expert Peer Review

2. Brief Explanation

UF/IFAS (1862) and FAMU/CAFS (1890)
The Extension Leadership Team (ELT) meets monthly to discuss statewide programming and hiring, resource allocation, and professional development. These meetings serve as an ongoing evaluation of the quality and relevance of Extension programs to state program goals as identified by our seven Extension Initiatives. The ELT consists of the UF/IFAS dean and senior associate dean for Extension, FAMU director of cooperative extension program, four statewide program leaders, five district directors, a state specialist in program and professional development, and representatives from IT, communication services, human resources, financial services, and county operations.

Under the seven Initiatives, we have 24 teams called "Priority Work Groups." Both UF/IFAS and FAMU faculty serve on these self-directed teams and typically, a state specialist and a county Extension agent serve as co-leaders. A program leader provides oversight and guidance to the Priority Work Group. Members consist of both state specialists and county agents and together they work on program planning and evaluation, curricula development, and assess the need for new research. Priority Work Groups may consult with external stakeholders as needed. Teams are expected to provide a plan of work and logic model to their program leader and these are posted online. Periodically, the Initiatives hold formal meetings to bring all the Priority Work Groups together to improve the quality and relevance of its Extension programming. In 2017, program leaders focused on implementing changes and improvements to the teams that were identified and/or discussed at a large half-day session of all initiatives and priority work groups in 2016.

UF/IFAS Extension conducts county program reviews, at least 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 conducts a similar review of its academic departments and Research and Education Centers (RECs). The senior vice president for UF/IFAS and deans representing our teaching, research and extension divisions visit about eight departments and RECs each year. Reviewers look at the strengths and challenges of the unit and its programmatic successes and opportunities, and provide recommendations for improvement in research, teaching and extension.

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
- Survey of selected individuals from the general public
- Other (Contact traditional under-served 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 August-December 2016, UF/IFAS conducted a statewide Community Input Survey as a five-year follow-up to our more comprehensive 2011-12 long-range planning initiative that included 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, a Delphi study of key stakeholders and opinion leaders, and input from stakeholders and the public using focus groups and 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 survey. The 2016 survey, with 442 respondents, was distributed online and promoted through our UF/IFAS websites, social media accounts, and blogs. Results were provided to the Extension Leadership Team. In addition, in September 2016 through January 2017, UF/IFAS Extension conducted five listening sessions jointly with the Florida Farm Bureau Federation (FFBF). Held in five locations statewide with County Farm Bureau stakeholders and Extension professionals, these listening sessions are viewed as a first step in finding ways to work more closely on agricultural issues and public awareness. A report summarizing the key findings and recommendations from the listening sessions was distributed to county Farm Bureau chapters, county Extension offices, and statewide Extension and Farm Bureau leadership.
• 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. Recently, 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. In 2016, infographics were developed for the counties so they may share the results more effectively with their county administrators. A data dashboard displaying the most recent five years (roughly the entire state) is under development and should be available in 2018.
• 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.
• UF/IFAS economists conduct periodic studies of the economic value and impact of the work we do with various industries and commodity groups. A recent study looked Florida's environmental horticulture industry and shows it has recovered from the Great Recession and is growing in many sectors. This "green industry" includes landscaping, nurseries, greenhouses, wholesale and retail distributors and allied manufacturing. The survey of more than 1500 businesses in 2015 extends previous studies in 2000, 2005 and 2010. As for specific sectors, economic contributions in landscaping went up by 49 percent, and wholesale and retail distribution increased by 209 percent, though nurseries went down by 49 percent. Respondents expect to invest nearly $90 million from 2016 to 2018 -- making big investments in nursery buildings, equipment and information technology to become more productive and remain competitive in the global market. These surveys not only provide important information to the industry but also helps us determine their current and future needs.
• The Florida-Friendly Landscaping™ program held their first Conservation and Conversation Gala in 2017. The gala helped to raise awareness and funds for the program through an auction. In attendance were many stakeholder groups such as builders and developers, Florida Nursery Growers and Landscape Association (FNGLA) members, homeowner associations, homeowner law firms, and Florida Hospital management. Attendees enjoyed the opportunity for networking and learning more about the FFL program. Due to the gala's success, plans are in place to hold another next year.

FAMU/CAFS has two 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
- Survey of selected individuals from the general public
- Other (Through county extension agents)

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 and continues to be. 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

Last year we invested much effort in collecting information to hear from our stakeholders and update our Extension Roadmap (2013-2023). This year we focused on evaluating and making improvements based on those 2016 Farm Bureau Listening Sessions and the 2016 Community Input Survey described in this report last year. In 2017, the Natural Resources team revised slightly the focus of their three priority work groups. Counties, Research and Education Centers, and academic departments continue to seek advice and perspective from their stakeholders through advisory councils and the like, adjusting their priorities and programs as necessary.

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
{No Data Entered}	{No Data Entered}	{No Data Entered}	{No Data Entered}

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	4790113	1966512	3249627	2073880
Actual Matching	4790113	789308	3249627	760258
Actual All Other	0	0	0	0
Total Actual Expended	9580226	2755820	6499254	2834138

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	363637	0	499375

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger

☑ 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%	12%	30%
205	Plant Management Systems	5%	30%	8%	30%
301	Reproductive Performance of Animals	5%	0%	15%	0%
302	Nutrient Utilization in Animals	5%	0%	8%	0%
303	Genetic Improvement of Animals	5%	0%	13%	0%
304	Animal Genome	5%	0%	6%	0%
305	Animal Physiological Processes	5%	0%	10%	0%
307	Animal Management Systems	5%	20%	1%	20%
402	Engineering Systems and Equipment	5%	0%	4%	0%
403	Waste Disposal, Recycling, and Reuse	5%	0%	1%	0%
404	Instrumentation and Control Systems	5%	0%	1%	0%
501	New and Improved Food Processing Technologies	5%	0%	1%	0%
502	New and Improved Food Products	5%	0%	2%	0%
503	Quality Maintenance in Storing and Marketing Food Products	5%	10%	2%	20%
601	Economics of Agricultural Production and Farm Management	5%	20%	6%	0%
602	Business Management, Finance, and Taxation	5%	20%	1%	0%
603	Market Economics	5%	0%	2%	0%
605	Natural Resource and Environmental Economics	5%	0%	4%	0%
607	Consumer Economics	5%	0%	3%	0%
807	Disaster Preparedness, Mitigation, Response, and Recovery	5%	0%	0%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	150.0	15.0	100.0	10.5
Actual Paid	158.0	7.7	76.9	5.0
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**
1617038	501527	897756	431801
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1617038	339487	897756	143119
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 studies and experiments that will enhance or protect animal, plant, and food systems.
• Conduct genetic research on new forages, improving beef/forage integrated production systems, identifying animals with better pathogen resistance, and applying the latest technologies to select and breed animals that perform best under Florida's climactic conditions.
• Transfer research discoveries to Extension faculty through in-service trainings and EDIS publications.
• Maintain consistent communication with stakeholders to learn and prioritize needs.
• Fund, design and implement websites, conferences, curricula, fact sheets, workshops, field days, demonstrations, and programs to support a robust and resilient Florida food system.
• Publish research findings, program outcomes, and decision support tools.
• Provide leadership at local, regional, state and national levels to disseminate research findings and facilitate communication and foster current and new partnerships.

1890 Research

The small production, marketing and rural economic development project is an integrated effort. The asset building and research projects with other state and local agencies will enhance the economic base of the community while incorporating environmental procedures that will result in high productivity. The following activities will be undertaken during the implementation of the planned program: Research and demonstration studies and needs surveys and focus groups, experimental studies, training of students, workshops and conferences.

The viticulture and small fruit research project is also an integrated effort and will provide for extension and outreach, student/professional training and development and in addition the following:
• 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.

2. Brief description of the target audience

- Producers
- Commodity Associations
- Owners/Operators
- Managers/Supervisors
- Workers/Laborers
- Allied Industry Representatives
- Farmers
- Regulatory agencies
- Local, state and federal government and policymakers
- Tribal government
- International governing bodies
- Harvesting/Packing/Processing/Distribution
- Harvesters/Packers
- Processors
- Food handlers
- Distributors/Transporters
- Retailers
- Consumers
- Buyers
- Entrepreneurs
- Importers/Exporters
- Youth and 4-H (K-12)
- Youth educators
- Extension faculty and professional staff

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1503541	10509511	260	140

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

Patent Applications Submitted

Year: 2017

Actual: 27

Patents listed

1. FL0720 - Oat Cultivar (SunGrains)
2. Coleus Plant Named 'UF13-48-27'
3. Coleus Plant Named 'UF13-42-4'
4. Coleus Plant Named 'UF13-26-7'
5. Strawberry Plant Named 'Florida Beauty'
6. Caladium Plant Named 'Icicle'
7. Lantana camera plant named 'UF-1011-2'
8. Lantana camera plant named 'UF-1013A-2A'
9. FL01143 - Triticale
10. FL98325 (European Union)
11. CITRUS TREE NAMED ?RBB7-34?
12. '331, peanut
13. Coleus Plant Named 'UF14-24-1'
14. Blueberry Plant Named 'C08-141'
15. In Planta Production of Random Biologically Active Peptides
16. Chemical Lure for Asian Citrus Psyllid
17. Material and Methods to Increase Plant Growth and Yield
18. Overproduction of Thaxtomin in Nonnative Streptomyces Species
19. Methods and Means to Improve Thaxtomin Production in Streptomyces Spp
20. Multiplexed PCR Assay for High Throughput Genotyping
21. Use of Xylella Fastidiosa Strain EB92-1 to Generate Tolerance to HLB Disease in Citrus
22. Hybrid Tomatoes and Methods of Making Hybrid Tomatoes
23. Compositions and Methods for Modifying Perception of Sweet Taste
24. Identifying Breeding Priorities for Blueberry Flavor Using Biochemical, Sensory, and Genotype by Environment Analyses
25. Insurance/Derivative Payout That Use the Combination of Rain Frequency and Intensity as Indexes
26. Determining an Insurance Policy That Provides Full Insurance at a Specified Level of Residual Risk
27. "Disease-related biomarkers specific to Florida hybrid bunch and muscadine grape, and uses thereof"

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	105	695	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Improve procedures and techniques of farming operations that will sustain small farm operations
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Improve economic and marketing competitiveness for small and limited resource farmers.
  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	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
2	Improved national and global capacity to meet growing food demands.

Outcome #1

1. Outcome Measures

Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	82420

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In order to remain economically viable in the region, growers will need some combination of the following cropping system strategies: continue to push record yields through improved germplasm, soil moisture management, and crop protection chemistry and schedules, lower production costs, and/or diversify cropping systems. This program seeks to increase yields and/or reduce production costs using the principles of conservation agriculture (minimum tillage, permanent soil cover, and diverse species)combined with improved input management.

What has been done
The program provides tools and information related to soil fertility management for Extension Agents, growers, crop consultants, policymakers, and industry professionals and leaders. The program also provides training to stakeholders that facilitates the collection, management, and assessment of data related to programmatic activity.

Results
Although Extension publications throughout the Southeast recommend a nitrogen (N) credit after peanut between 22-67 kg N/ha, there is a lack of evidence literature to support those recommendations. This past year, a UF/IFAS state specialist has demonstrated through his research and extension program that potential N credits from peanut to subsequent crops depend on: 1. The planting date of the subsequent crop, 2. Residue placement, and 3. Residue load. In every case, potential N credits to subsequent crops were lower than current extension recommendations, but we have documented the first non-zero N credit from peanut residue in the Southeast. This has important ramifications for the regulatory environment throughout the peanut-growing Southeast, but particularly in Florida where water quality issues due to nutrient loading is a primary concern. He also found peanut disease is the single biggest challenge to production. Fungicide applications are the largest single expense during peanut production at 28% of total

operational costs. UF/IFAS researchers designed a new sprayer to improve disease control in peanut. This allows lower spray volumes and increases efficacy of fungicide applications.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #2

1. Outcome Measures

Improved national and global capacity to meet growing food demands.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A farmer is anyone that produces or sells at least $1,000 in agricultural products. A small farmer is an individual, organization or entity with a gross cash income of less than $250,000. More than 90% are small farmers in Puerto Rico. The catastrophic weather event named Hurricane Maria made landfall in Puerto Rican soil and billions of dollars in damages have been reported thus far. This cyclone ripped through the heart of this American territory and crippled its ability to generate electricity, supply water, interrupted communication lines, supply roots, medical services, and devastated agriculture.

What has been done
A UF/IFAS Extension agent with close ties to the agriculture sector, and a native from Puerto Rico, was tasked to serve as the delegate for Puerto Rico at the National Emergency Support Function team for Agriculture and Natural Resources (ESF-11). This team is comprised of members from USDA, American Veterinary Medical Association, Cooperative Extension, and various public and private national and international organizations to assess, coordinate and implement strategies to provide assistance to the agricultural sector or our nation. Together with another UF/IFAS agent, a plan was devised to quantify the needs of the community on the Island, and as communications somewhat improved, they were able to call several farmers to begin this task. The first contact was a 200 head dairy operation that sits in the municipality of Jayuya. It supplied a quota of 109,353 lbs. of milk every two weeks, which adds to a total production of 2.62

million lbs. of milk per year. The impact Hurricane Maria had on this dairy has been like nothing the owners have ever encountered; the entire herd had to be relocated to another city.

Results

The stress from moving dairy cattle in peak production added to the already uneasiness in the herd caused by the cyclone produced an increment in disease and a subsequent reduction in productivity, which in turn resulted in a loss of close to 45% of milk production per day. In the days following the storm milk had to be dumped because there was no way to get the milk to the processor. The owner estimated an annual loss of $592,614.00 for his farm alone, and like this farm (which is a medium sized dairy in the island) there are 280 more; all of which are in the same situation. This included animal losses and damage to farm buildings. The agent estimates a direct loss of $225,000.00 on his farm, due to the costs of medications and the lack of production from cows because they will not be able to get milked, so they will have to be dried (i.e., will not be milked anymore for this production cycle). The agent, along with many NGOs, continues to work with the small farmers in Puerto Rico and ensure they continue their regular milking schedule and find the fuel to run the generators that cool the milk prior to transport; rebuilding the damaged structures on the farm; source feed for lactating and dry cows as well as nourishment for the rest of the herd, and; replacing heifers and cows that have been diseased or that are ill due to subsequent infections after the storm.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
307	Animal Management Systems
403	Waste Disposal, Recycling, and Reuse
601	Economics of Agricultural Production and Farm Management
603	Market Economics
807	Disaster Preparedness, Mitigation, Response, and Recovery

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

1. Hurricane Irma had devastating impact on the state and destruction of some Extension offices
2. State legislature cut 4-H funding in 2017 session and restored funding in 2018 but at

lower level

3. State legislature cut funding for several UF/IFAS centers and programs related to agriculture and natural resources in 2017 and it was not restored in 2018

4. Florida received (and continues to receive) a large influx of Puerto Rican residents due to poor living conditions that remain in that country after Hurricane Maria

V(I). Planned Program (Evaluation Studies)

Evaluation Results

- Number of producers indicating adoption of recommended practices, including Ag BMPs and Mobile Irrigation Lab (MIL): 20,813
- Number of producers reporting increased dollar returns or reduced costs: 7,932
- Number of farmers/ranchers who adopted a new crop variety or animal breed: 3,373
- Number of jobs created, jobs saved, or job promotions, as a direct or indirect result of your Extension program(s): 40,069
- Number of producers who adopted recommended livestock production practices: 6,913
- Number of producers who adopted recommended forage management practices: 938
- Number of new or improved value-added products sold by producers (or other members of the food supply chain): 79
- Number of new food processing facilities of any size (including inspected kitchens, niche meat processors, and larger animal/fruit/vegetable processors): 42
- Number of participants attending educational programming for small farm operators, processors (big and small), or beginning farmers/ranchers showing knowledge gain on recommended practices: 6,150
- Number of participants attending educational programming for small farm operators, processors (big and small), or beginning farmers/ranchers that adopt one or more recommended practices: 1,787
- Number of viable technologies developed or modified for the increased sustainability, profitability, and/or competitiveness of agricultural or horticultural enterprises: 102

Key Items of Evaluation

In the 2017 reporting cycle, we rolled out 87 new indicators/outcomes to UF/IFAS and FAMU/CAFS faculty this year. Many of them are based on the NIFA panel recommendations and NIFA priorities. These statewide data, never before available (or not as readily available in some cases), will be used for this federal report as well as in infographics and data visualizations to highlight the impact of our work. Florida Extension leadership believes these new initiative is an important step to ensuring we have the key indicators needed to communicate the value of our statewide efforts.

In 2018, the Program Development & Evaluation Center will be analyzing how well the indicators worked and providing the results to the Extension initiative and priority work group teams and program leaders, asking them to provide changes, additions, deletions as needed.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Food Safety

☑ 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
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	10%	20%	0%
212	Diseases and Nematodes Affecting Plants	5%	5%	27%	0%
213	Weeds Affecting Plants	0%	10%	6%	0%
215	Biological Control of Pests Affecting Plants	0%	10%	4%	10%
216	Integrated Pest Management Systems	20%	10%	16%	10%
311	Animal Diseases	0%	10%	5%	0%
312	External Parasites and Pests of Animals	5%	0%	2%	0%
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	5%	0%	0%	0%
315	Animal Welfare/Well-Being and Protection	5%	15%	2%	30%
501	New and Improved Food Processing Technologies	5%	0%	0%	20%
504	Home and Commercial Food Service	10%	10%	0%	30%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	5%	0%	2%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%	10%	7%	0%
721	Insects and Other Pests Affecting Humans	0%	0%	7%	0%
722	Zoonotic Diseases and Parasites Affecting Humans	5%	0%	2%	0%
723	Hazards to Human Health and Safety	20%	10%	0%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	26.0	0.5	100.0	0.0
Actual Paid	20.0	6.8	82.4	5.0
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**
204711	435536	1055155	431801
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
204711	314026	1055155	143119
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 studies and experiments that will enhance or protect Florida's food systems and supply.
• Transfer research discoveries to Extension faculty through in-service trainings and EDIS publications.
• Maintain consistent communication with stakeholders to learn and prioritize needs.
• Fund, design and implement websites, conferences, curricula, fact sheets, workshops, field days, demonstrations, and programs to support food safety in Florida.
• Conduct one-on-one consultations with citizens, farmers, etc.
• Publish research findings, program outcomes, and decision support tools.
• Provide leadership at local, regional, state and national levels to disseminate research findings and facilitate communication and foster current and new partnerships.

2. Brief description of the target audience

• Professional food service workers/handlers
• Professional food service managers/operators
• Volunteers who work with food
• Consumers
• Home canners and food preparers
• Small farmers
• Organic farmers
• Agribusiness
• Food entrepreneurs

3. How was eXtension used?

{No Data Entered}

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	151787	1064101	0	0

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

Patent Applications Submitted

Year: 2017
Actual: 7

Patents listed

1. Insect Toxin Delivery Mediated by a Densovirus Coat Protein
2. Methods and Compositions For Preventing or Reducing Infections of Crop Plants By Bacterial and Fungal Pathogens
3. Viral-based Transient-Expression Vector System For Trees That Allows Multiple Applications
4. Method and Apparatus for Quality of Seal and Package Integrity Testing
5. Colored Clays for Agricultural and other Industrial Applications
6. Semipermeable Capsule Improves Flexible Package Performance
7. A Method for Systemic Acquired Resistance (SAR) in Citrus to Protect Trees Against Disease

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	16	72	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Test
  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	Increase number of viable technologies to improve food safety.
2	Increase adoption of safe food handling practices at the individual, family, community, production, and supply system level.

Outcome #1

1. Outcome Measures

Increase number of viable technologies to improve food safety.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Salmonella is the leading cause of bacteria-associated foodborne illnesses in the United States, according to the study. Thus, early detection of the pathogen, by a rapid and sensitive test is important to prevent the illness. Contamination of foodborne pathogens causes an estimated 48 million illnesses, 128,000 hospitalizations and 3,000 deaths annually in the United States, according to a U.S. Centers for Disease Control report in 2011.

What has been done
A team of scientists led by UF/IFAS researchers has found a faster and more precise way to detect salmonella in beef and chicken, a finding that could help prevent major illnesses. In a recently published study (Journal of Food Safety), researchers artificially contaminated food with salmonella. They then tested the food samples using Salmonella-specific antibodies combined with a unique signal amplification technique. Their test found salmonella present after 15 hours and removed other microorganisms that sometimes clutter laboratory results. This is shorter than the two to three days it takes to detect salmonella in a culture, the study shows.

Results
The test has great potential as a simple monitoring system for foodborne pathogens in food samples, which can improve food safety and public health. Even with all the strategies used to minimize contamination of beef and poultry, they are still one of the major food vehicles for salmonella. The test would be suitable for any government research laboratory or industry that routinely tests for Salmonella. The researchers believe the salmonella test showing similar potential for faster detection of other pathogens you can get from eating certain contaminated foods. A similar test has been developed for E. coli in milk and ground beef, and it performed well.

4. Associated Knowledge Areas

KA Code	Knowledge Area
504	Home and Commercial Food Service
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #2

1. Outcome Measures

Increase adoption of safe food handling practices at the individual, family, community, production, and supply system level.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	54563

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Locally grown food accounts for a small segment of the US agriculture, but local food products and their marketing channels continue to grow. As the number of farmers? markets surge, concerns over the safety of food sold at farmers? markets has also increased. In fact, many foodborne pathogen outbreaks have been directly linked to foods sold at farmers? markets (Bridges, 2000; The Packer, 2010; Gardner et al., 2011; FDA, 2011; CDC, 2014). Moreover, a survey study about food safety practices in farmers? markets show that there is a lack of safety practices and of food safety knowledge among market managers and farmers (Harrison et al., 2013).

What has been done
Since 2010, the Small Farms Academy (SFA) has been providing unique, hands-on intensive workshops and field days to small farmers on specific topics in order to sustain existing small farms and increase the number of new small farms.The SFA has created 36 new programs in 24 locations throughout the state of Florida serving a total of 2,615 attendees since 2010. Most attendees had less than 10 years of farming experience and most were farming less than 10 acres, and there was a wide range of types of customers listed, direct and wholesale markets. In 2017, six SFA protected agriculture and hydroponics programs were implemented reaching 105 attendees. In addition, the ?Build Your Own Food Safety Manual? was the training implemented by UF/IFAS where the growers develop their manual. Twenty-seven farms gained knowledge and moved forward to begin food safety compliance. As a result of the programs, 12 farmers were

able to further implement programs on their farm and to plan to have a third-party audit.

Results

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 $120,000 to the 12 farms planning to need a food safety audit. A statewide evaluation was developed to document knowledge gained by attendees at the SMA Product Safety Alliance (PSA) classes in 2017. For PSA training, results showed a significant increase in knowledge after participation in the training.

4. Associated Knowledge Areas

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection
504	Home and Commercial Food Service
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

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

1. Hurricane Irma had devastating impact on the state and destruction of some Extension offices
2. State legislature cut 4-H funding in 2017 session and restored funding in 2018 but at lower level
3. State legislature cut funding for several UF/IFAS centers and programs related to agriculture and natural resources in 2017 and it was not restored in 2018
4. Florida received (and continues to receive) a large influx of Puerto Rican residents due to poor living conditions that remain in that country after Hurricane Maria

V(I). Planned Program (Evaluation Studies)

Evaluation Results

- Number of participants demonstrating improved knowledge of food systems including

food labels, production practices, food production and preservation, food waste management, etc.: 28,693

- Number of participants that adopt self-reliant food system practices, including creating a home or community garden, reducing food waste, preserving food, etc.: 4,928
- Number of adults participating in food safety programs who adopted one or more recommended practices (i.e., handwashing, cross contamination, time and temperature controls, refrigerator temperature): 8,291
- Number of youth participating in food safety programs who adopted one or more recommended practices (i.e., handwashing, cross contamination, time and temperature controls, refrigerator temperature): 9,661
- Number of producers who developed a farm food safety plan: 179
- Number of growers, producers, food workers completing GAPs, GMPs, HACCP, PSA, PC, food safety certification (i.e., ServSafe), or farm food safety educational programs for Exempt and Qualified Exempt operations: 2,811
- Number of viable technologies developed or modified for the detection or characterization of food supply contamination from foodborne threats: 6

Key Items of Evaluation

In the 2017 reporting cycle, we rolled out 87 new indicators/outcomes to UF/IFAS and FAMU/CAFS faculty this year. Many of them are based on the NIFA panel recommendations and NIFA priorities. These statewide data, never before available (or not as readily available in some cases), will be used for this federal report as well as in infographics and data visualizations to highlight the impact of our work. Florida Extension leadership believes these new initiative is an important step to ensuring we have the key indicators needed to communicate the value of our statewide efforts.

In 2018, the Program Development & Evaluation Center will be analyzing how well the indicators worked and providing the results to the Extension initiative and priority work group teams and program leaders, asking them to provide changes, additions, deletions as needed.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Climate Change and Natural Resources

☑ 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	10%	40%	46%	35%
111	Conservation and Efficient Use of Water	25%	30%	12%	35%
112	Watershed Protection and Management	15%	0%	9%	0%
123	Management and Sustainability of Forest Resources	10%	30%	5%	0%
132	Weather and Climate	10%	0%	2%	0%
133	Pollution Prevention and Mitigation	10%	0%	3%	30%
135	Aquatic and Terrestrial Wildlife	10%	0%	14%	0%
136	Conservation of Biological Diversity	10%	0%	9%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	90.0	1.5	40.0	0.0
Actual Paid	110.2	1.5	70.0	8.0
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**
1128138	96786	862796	811180
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1128138	67897	862796	318070
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 studies and experiments that will enhance or protect Florida's environment and natural resources.
• Fund, design and implement websites, conferences, curricula, fact sheets, workshops, field days, demonstrations (e.g., beach cleanups, restoration projects, fish descending methods), and programs to support climate change, natural resources and water initiatives.
• Conduct one-on-one consultations including field visits, with citizens, farmers, etc.
• Transfer research discoveries to Extension faculty through in-service trainings and EDIS publications.
• Maintain consistent communication with stakeholders to learn and prioritize needs.
• Publish research findings, program outcomes, and decision support tools.
• Provide leadership at local, regional, state and national levels to disseminate research findings and facilitate communication and foster current and new partnerships.

2. Brief description of the target audience

• Green industry professionals
• Residents
• Residential communities
• Homeowners associations
• Urban property owners and managers
• Developers
• Homeowners
• Government officials
• Elected officials
• Tour providers
• Biologists
• Commercial and recreational fishers
• Producers and growers
• Large landowners
• Farmers
• Regulatory agencies
• Non-governmental agencies
• Local, state and federal government, planners and policymakers

- Entrepreneurs
- Volunteers
- Youth and 4-H (K-12)
- Youth educators
- Extension faculty and professional staff

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	871618	6110470	0	0

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	48	494	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Test
  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	Development of new knowledge and technologies.
2	Enhance adaptive capacity to climate change.
3	Increase water conservation.
4	Improve Florida's natural resources and environment through the use of trained volunteers.

Outcome #1

1. Outcome Measures

Development of new knowledge and technologies.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Municipalities, non-profit groups, and state government agencies devote significant resources toward tree-planting initiatives intended to maximize and sustain the ecological services and health benefits associated with urban forests (Kendall and McPherson, 2012; Pincetl et al. 2012). Trees shade our homes and help clean the air of our cities. However, their production in the nursery and maintenance in the landscape requires energy and material resources. Some of those processes are mechanized and release greenhouse gases like carbon dioxide. Understanding this balance between tree environmental costs and benefits is crucial to those who plan and plant urban forests as it can help inform species selection, site development and prescribed care measures. In addition to providing shade, trees take in carbon dioxide -- a greenhouse gas -- and convert it and store it as carbon in their woody tissues. Trees generally provide the greatest environmental and economic benefits as they mature and grow to a significant size.

What has been done
In a recently published study in the Journal of Environmental Horticulture, UF/IFAS and University of Illinois researchers used a concept called "carbon neutrality" to examine tree benefits. When trees start storing more carbon than they emit -- offsetting the amount spent by nurseries and foresters in tree care, that?s called ?carbon neutrality. That care can include planting, water, pest control, mulching, pruning and more. According to the study, in general, the bigger the tree, the more environmental benefits you receive. Trees store more and more carbon as they grow. The same holds true for shade. It can take decades for a tree to get to the size where it shades a house. That's why it's so critical to properly maintain trees that are part of a tree-planting program. For the new study, they surveyed urban foresters in the Chicago metropolitan area to see how they grew, planted and maintained maple trees.

Results

Among their many results, the research team found that when foresters changed their tree management practices, such as pruning cycles, they could significantly lower the age at which a tree changes from being a carbon emitter to being a carbon sink. Despite the specific location and type of tree, the author says the findings apply to urban forest programs anywhere. More than half the global population lives in cities, a number expected to increase to 70 percent by 2050 -- all the more reason to study urban forestry costs versus environmental benefits.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
123	Management and Sustainability of Forest Resources
133	Pollution Prevention and Mitigation

Outcome #2

1. Outcome Measures

Enhance adaptive capacity to climate change.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Researchers with the University of Florida Institute of Food and Agricultural Sciences are closer to helping producers better meet global food demand, now that they've combined simulation and statistical methods to help them predict how temperature affects wheat crops worldwide. A global team of 50 scientists, led by those at UF/IFAS, used two different simulation methods and one statistical method to predict the impact of rising temperatures on global wheat production, and all came to similar estimates.

What has been done
This finding, published in a study in the journal Nature Climate Change, is critical in predicting how much wheat and other crops we'll need to feed the world. Predicting crop yields is important because rising temperatures tend to keep fruits, vegetables and other crops from growing as well as they should. This study focused on wheat, but it means we?re closer to more precisely

predicting other crop yields and their response to climate change worldwide. It's the first time that a scientific study compared different methods of estimating temperature impacts on global crop production. Since the different methods point to very similar impacts, it improves our confidence in estimating temperature impact on global crop production.

Results
Global food demand is expected to increase 60 percent ? with 9 billion people by the middle of the 21st century, according to a 2012 study by the Food and Agriculture Organization of the United Nations. One critical crop that helps feed the world is wheat. Globally, China produces the most wheat at about 265 billion pounds per year, while the United States produces about 132 billion pounds, according to the same UN organization. Reliable estimates of climate change impacts on food security require an integrated use of climate, crop and economic models.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate

Outcome #3

1. Outcome Measures

Increase water conservation.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Water demand already exceeds supply in some parts of Florida, and projections show the state could double its current water usage by 2070 if population growth, water-use habits, and irrigation practices do not change (Water 2070 project, a collaboration of FDACS, UF and 1000 Friends of Florida). At least 50% of Florida household water usage is for landscape irrigation.

What has been done
In Palm Beach County the ?Let Every Drop Count? campaign was developed to promote landscape water conservation among county residents. Community based social marketing

(CBSM) techniques were employed to help foster behavior change. These techniques included a logo, pledge certificates, pledge cards, prompts and ancillary materials to reinforce water saving activities. In addition, workshop participants were encouraged to serve as ?water conservation ambassadors? within their communities. The agent continues to train other agents in social marketing behavior change principles. As a result, other extension agents have adopted her model for water and fertilizer education campaigns. In 2017, fifty-two Master Gardener trainees signed a pledge to conserve irrigation on their own properties, or to speak to others about reducing irrigation. According to a two-month follow up study, 45 of 46 respondents fulfilled their pledge. Behavior changes included reducing irrigation frequency from three to two days a week, converting turfgrass beds to landscape beds with microirrigation, and calibrating sprinklers to deliver ½? to ¾? of irrigation. Later, the agent supplemented this campaign with a drive to promote irrigation conservation among large community associations as well as single-family landscapes ? a three-week program called ?Save Money on Your Landscape.?

Results

The ?Let Every Drop Count? respondents adopted new irrigation techniques that will save 1,219,385 gallons of water a year. According to a follow up study, property managers, board presidents and residents who attended the made behavior changes that will save 22,182,312 gallons of water per year. Over the three-year course of the campaign, extension clients reported behavior changes that resulted in an estimated savings of 35,491,679 gallons of water annually. This is enough to supply the yearly water needs of 403 Florida households. Irrigation conservation efforts translated into an annual water bill savings for participating households of over $80,814, plus reduced delivery costs for local water utilities of nearly $60,904 a year. Survey results showed that community based social marketing works. In all, pledge takers spent 205 hours over the course of two years talking to 466 people about irrigation conservation and water quality issues. This translated into an economic value of over $4,564 dollars in donated volunteer time. By raising awareness of Florida?s impending water crisis, these ?water ambassadors? extended the impact of the ?Let Every Drop Count? campaign throughout Palm Beach County. This innovative program is one of many examples of landscape water conservation programs that resulted in at least 176,405,796 gallons of water saved (22 counties reporting) in 2017 ? enough to provide more than 2,000 households with water for one year and an estimated $583,903 in utility savings to the participants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

Outcome #4

1. Outcome Measures

Improve Florida's natural resources and environment through the use of trained volunteers.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
We all live in a Watershed! The rationale behind this program is based on the key concept that everyone lives in a watershed and impacts regulation of water, cycling of nutrients, and ecological diversity. Watershed integrates and moderates the hydrologic and chemical cycle that affects the water quantity and quality of the watershed water resources including groundwater, lakes, rivers, and estuaries. Solving the water quality issues at the watershed scale involves stakeholders' participation, consideration of local water issues, and use of sound science. Unless the watershed-scale pollution prevention programs involve individuals and communities and educate people that everyone lives in a watershed (home to creek to river to estuary), the success in addressing the issues will be limited.

What has been done
In the past, the water related extension programming within UF/IFAS was split between the upland (agricultural and urban) or coastal areas with limited connectivity. While Florida Yards and Neighborhoods (FYN) specifically targets homeowners in urban areas to educate them about the nutrient management practices for lawns, the Florida Sea Grant Program (FSG) targets the coastal communities. In addition to FYN and FSG, several other extension programs that focus on specific land uses within agriculture also exist. However, rarely do the specific programs consider the watershed perspective. Input from county extension faculty has indicated that they are frequently asked to help the clientele (county administration, agricultural producers, etc.) with issues that are watershed specific. The objective of this program is to improve water conservation and water quality in Florida by educating county Extension faculty about watersheds and how to teach their target audiences to save water and meet water quality goals in their watersheds. This state specialist's program integrates results from his two research/extension programs, "Development and Evaluation of Row Crop and Ranchland BMPs" and "Beyond BMPS--Achieving Water Storage and Treatment through a Payment for Environmental Service," to provide watershed education, mainly through organizing and delivering in-service trainings on a variety of water related issues that affect water supply and quality.

Results
Eleven, two-day in-service trainings (2002 to 2017) with a variety of watershed-based themes, have trained 200 multi-program county/state faculty (citrus, vegetable, cattle, urban, natural resources, marine, 4-H) on current and emerging issues such as impacts of land use on water quality, water supply, nonpoint source pollution and its impacts on freshwater and estuarine systems, TMDLs, and water quality regulations. Organized and led the 11th Watershed IST ?

Florida?s land development process, drivers and challenges to sustainable development, and potential solutions? on April 27-28, 2017 in Winter Haven, FL. Presentations to the stakeholders (agriculture, urban, and environmental interests) on sustainable urban development, have helped achieve more informed decisions about the land and water resource management especially as large areas of Florida convert to urban developments. A comprehensive IST for county Extension faculty was held. It consisted of one day of presentations, half-day field trip, a panel discussion with planners, landowners, and engineers talking about lessons learned from a local water initiative and planned conservation development. On a scale from 1-5, the quality and relevance of the program rated 4.5 on most measures. In addition, the revised watershed boundary from this faculty member's research and extension efforts focusing specifically on Lake Trafford watershed delineation (at the request of South Florida Water Management District and Collier County) found 20% errors in the watershed area. As a result of this project, the TMDL and BMAP plans for this basin will be revised.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and 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
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

1. Hurricane Irma had devastating impact on the state and destruction of some Extension offices
2. State legislature cut 4-H funding in 2017 session and restored funding in 2018 but at lower level
3. State legislature cut funding for several UF/IFAS centers and programs related to agriculture and natural resources in 2017 and it was not restored in 2018
4. Florida received (and continues to receive) a large influx of Puerto Rican residents due to poor living conditions that remain in that country after Hurricane Maria

V(I). Planned Program (Evaluation Studies)

Evaluation Results

- Number of producers reporting reduction in fertilizer or pesticide used per acre: 4,529
- Number of new crop varieties and genotypes with climate adaptive traits: 78
- Number of new animal breeds and genotypes with climate adaptive traits: 4

- Number of gallons of water saved by adult residential program participants (e.g., residents, HOAs, community gardens, developers, businesses: 176,405,796
- Number of adult residential participants that adopted one or more best management practices such Florida Friendly Landscaping principles: 35,208
- Number of Master Gardener volunteers: 3,857
- Number of Master Gardener volunteer hours: 285,817
- Number of gallons of water saved by professional landscapers or other Green Industry professionals for the entire year: 15,691,044
- Number of professional landscapers or other Green Industry professionals that adopted one or more best management practices such as GI-BMP: 3,795
- Number of gallons of water saved by production program participants (e.g., producers, farmers, ranchers) for the entire year: 32,480,186,623
- Number of producers that adopted one or more "good" water conservation practices such as reduced irrigation and use of water-saving technologies: 1,491
- Number of producers that adopted one or more "good" water quality practices such as reduced pesticides, animal waste or other pollutants: 2,174
- Number of producers that adopted recommended best practices for production agriculture related to invasive species, pest management, pollutant loads, and wetlands: 8,697
- Number of participants in natural resources programs that promote informed decision-making among citizens, organizations and/or governments: 10,525
- Number of outcomes resulting from informed community members taking action, such as formation of advisory groups, changes in homeowners associations rules, local initiatives and referendums related to natural resources: 99
- Number of participants in programs regarding management or sustainable use of fish and wildlife and wildlife habitat, including control of invasive species and pests, in natural areas and working landscapes including freshwater, marine, and wetland environments, rangelands, forests, parks and other green space in rural or urban areas: 34,690
- Number of acres on which recommended actions were implemented to manage or sustainably use fish and wildlife and wildlife habitat, including control of invasive species and pests, in natural areas and working landscapes including freshwater, marine, and wetland environments, rangelands, forests, parks and other green space in rural or urban areas: 13,404,706
- Number of participants who used information from environmental literacy and sustainability programs in a professional or work-related context as volunteers or employees (including docents, teachers, park rangers, ecotour guides, etc.): 2,929
- Number of adult participants who used information from environmental and sustainability programs to adopt personal stewardship behaviors (e.g., conservation of natural resources in one's home or residential community): 6,438
- Number of gallons of water saved by youth participants for the entire year: 250
- Number of youth participants that adopted one or more best management practices such as Ag BMPs or Florida Friendly Landscape principles: 1,954
- Number of youth participants who used information from environmental and sustainability programs to adopt personal stewardship behaviors (e.g., conservation of natural resources in one's home or residential community): 2,592

Key Items of Evaluation

In the 2017 reporting cycle, we rolled out 87 new indicators/outcomes to UF/IFAS and FAMU/CAFS faculty this year. Many of them are based on the NIFA panel recommendations and NIFA priorities. These statewide data, never before available (or not as readily available in some cases), will be used for this federal report as well as in infographics and data

visualizations to highlight the impact of our work. Florida Extension leadership believes these new initiative is an important step to ensuring we have the key indicators needed to communicate the value of our statewide efforts.

In 2018, the Program Development & Evaluation Center will be analyzing how well the indicators worked and providing the results to the Extension initiative and priority work group teams and program leaders, asking them to provide changes, additions, deletions as needed.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Sustainable 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
131	Alternative Uses of Land	10%	0%	0%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	39%	0%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	6%	0%
204	Plant Product Quality and Utility (Preharvest)	0%	0%	4%	0%
205	Plant Management Systems	10%	0%	17%	0%
206	Basic Plant Biology	0%	0%	25%	0%
403	Waste Disposal, Recycling, and Reuse	10%	0%	1%	0%
511	New and Improved Non-Food Products and Processes	10%	0%	0%	0%
512	Quality Maintenance in Storing and Marketing Non-Food Products	10%	0%	1%	0%
605	Natural Resource and Environmental Economics	10%	0%	3%	0%
607	Consumer Economics	20%	0%	0%	0%
801	Individual and Family Resource Management	20%	0%	4%	0%
	Total	100%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	1.0	20.0	0.0
Actual Paid	2.2	0.0	36.8	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**
22258	0	240102	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
22258	0	240102	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

• 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 promote design, construction, and management practices that measurably reduce energy consumption in new developments.
• 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 with utilities, financial institutions and government to evaluate energy efficiency programs.

2. Brief description of the target audience

• General public
• Homeowners
• Agricultural producers/growers
• Business
• Developers
• Local government
• Homeowners
• Utilities
• Financial institutions

3. How was eXtension used?

{No Data Entered}

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	24685	173052	0	0

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	4	22	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Test
  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	Implementation of sustainable biofuels systems.

Outcome #1

1. **Outcome Measures**

Implementation of sustainable biofuels 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

1. Hurricane Irma had devastating impact on the state and destruction of some Extension offices
2. State legislature cut 4-H funding in 2017 session and restored funding in 2018 but at lower level
3. State legislature cut funding for several UF/IFAS centers and programs related to agriculture and natural resources in 2017 and it was not restored in 2018
4. Florida received (and continues to receive) a large influx of Puerto Rican residents due to poor living conditions that remain in that country after Hurricane Maria

V(I). Planned Program (Evaluation Studies)

Evaluation Results

- Number of farmers who adopted a dedicated bioenergy crop (e.g., carinata): 81

Key Items of Evaluation

In the 2017 reporting cycle, we rolled out 87 new indicators/outcomes to UF/IFAS and FAMU/CAFS faculty this year. Many of them are based on the NIFA panel recommendations and NIFA priorities. These statewide data, never before available (or not as readily available in some cases), will be used for this federal report as well as in infographics and data visualizations to highlight the impact of our work. Florida Extension leadership believes these new initiative is an important step to ensuring we have the key indicators needed to communicate the value of our statewide efforts.

In 2018, the Program Development & Evaluation Center will be analyzing how well the indicators worked and providing the results to the Extension initiative and priority work

group teams and program leaders, asking them to provide changes, additions, deletions as needed.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Childhood Obesity

☑ 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	10%	20%	10%	0%
702	Requirements and Function of Nutrients and Other Food Components	10%	10%	39%	0%
703	Nutrition Education and Behavior	40%	40%	18%	0%
723	Hazards to Human Health and Safety	10%	10%	2%	0%
724	Healthy Lifestyle	30%	20%	31%	0%
	Total	100%	100%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	20.0	0.0	4.0	0.0
Actual Paid	8.8	2.2	8.5	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**
90474	175974	106455	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
90474	33949	106455	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 studies and experiments that will increase taste and nutritional value of food, and develop methods and tools to effectively change behavior in the areas of human nutrition and physical activity.
• Transfer research discoveries to Extension faculty through in-service trainings and EDIS publications.
• Maintain consistent communication with stakeholders to learn and prioritize needs.
• Fund, design and implement websites, conferences, curricula, fact sheets, workshops, field days, demonstrations, and programs to support efforts to reduce childhood obesity.
• Conduct one-on-one consultations with citizens, families, etc.
• Publish research findings, program outcomes, and decision support tools.
• Provide leadership at local, regional, state and national levels to disseminate research findings and facilitate communication and foster current and new partnerships.

At **FAMU** the childhood obesity program will have specific emphasis on low and moderate income communities. The ultimate goals of the program will be improve community food security and availability of healthy food choices and prevention of childhood obesity and reduction of long-term risks for chronic diseases.

2. Brief description of the target audience

• Parents
• Children and youth
• Caregivers
• Adults of all ages, including those with special needs
• Educators (K-12)
• Local, state, and federal agencies
• Non-profit agencies
• Schools and universities
• Businesses
• Faith-based organizations
• State and local health departments
• Hospitals
• Community agencies and organizations
• Master Nutrition Education Volunteers
• Health professionals

3. How was eXtension used?

{No Data Entered}

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	65450	458836	0	0

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	36	3	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Test
  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	Development of methods of change that increase adoption of healthy eating habits by youth and adolescents
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	Children practice healthy eating.
4	Children engage in healthy levels of physical activity.

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	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
701	Nutrient Composition of Food
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

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
2017	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. Nearly 32 million students are served more than 5 billion lunches in a school day in the United States. More than two-thirds of these meals are free- and reduced-price lunches that follow school lunch program guidelines. Students more likely to participate in free- and reduced-price lunch programs are among the same populations most likely to suffer from obesity and related health risks, said Janet Peckham, an economist in the Office of the Commissioner at the U.S. Food and Drug Administration and lead author of the study (published in American Journal of Agricultural Economics). Federal school lunch program nutrition standards require greater availability of fruits, vegetables, whole grains and fat-free or low-fat milk and a reduction in saturated fats and sodium. These guidelines, enacted in 2012, are improving nutrition for school-age children and reducing childhood obesity, according to a new study by a UF/IFAS researcher and economists at Georgia State University, Clemson University and the U.S. Food and Drug Administration.

What has been done
They worked with a county school food services director to develop a novel research model to study school lunch choices children make, combining lunch sales data collected at the cafeteria register with data on student absences. They investigated how the nutritional content of National School Lunch Program entrées chosen by students varied across different socioeconomic and demographic groups and impacted their health.

Results
When healthier menu items replaced less healthy items, researchers found the total calories of the students? lunch choices decreased about 4 percent. Calories from fat decreased 18 percent,

and those from sodium decreased by 8 percent. The key finding is that while students prefer less-healthy school lunch options, income constraints, particularly for those students receiving free and reduced-price meals, cause these students to continue participating in the school lunch program and, hence, these students consume healthier meals. In another key finding, students who received free lunches were more likely to choose entrées with a higher fat content and less likely to select entrées with higher sodium content, the study showed. Students paying full price were more likely to reject entrées high in fat and choose those higher in sodium. They were also more responsive to increases in protein and more frequently replaced their cafeteria choices with lunches from home.

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

Children practice healthy eating.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	36813

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
By learning and adopting healthy eating, lifestyle, and food preparation practices, adult and youth participants can reduce their risk for developing chronic diseases, such as heart disease, hypertension, and diabetes. Research released by a HEALTHY critical trial in a National Institute of Health publication found that school-based intervention could lower the obesity rate in students at highest risk for type 2 diabetes for those kids who started out overweight in sixth grade.

What has been done

The Food, Fun, and Reading program, used in first grade classrooms in Holmes County, was a collaboration between the 4-H and FCS agents to instill awareness in youth at a young age to be conscious about the foods they consume. By learning the MyPlate food group and recognizing which foods belong in each group, youth will become more aware of their healthy eating habits and learn to make good choices when choosing foods and snacks. In a Hamilton County physical wellness program 435 youth participants learned through education and hands-on activities how physical activity along with healthy eating can improve one's health and reduce weight. A similar program in Escambia County, Community Wellness through Nutrition Education.

Results

* In Escambia County, 2,670 children, families, the workforce, and the elderly adopted healthy eating and physical activity habits and behaviors that enabled a healthy body weight and reduced short- and long-term health risks. After participating in the Improving Community Wellness through Nutrition Education programs, 44% adopted at least one healthy eating and lifestyle practice as indicated by pre-post-tests, game scores, and evaluation surveys.
* According to the most recent CountyHealthRankings.org update, Hamilton County returned to the obesity level reported in 2011 of 32% (highest reported was 39% in 2015).

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #4

1. Outcome Measures

Children engage in healthy levels of physical activity.

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

Brief Explanation

1. Hurricane Irma had devastating impact on the state and destruction of some Extension offices
2. State legislature cut 4-H funding in 2017 session and restored funding in 2018 but at lower level
3. State legislature cut funding for several UF/IFAS centers and programs related to agriculture and natural resources in 2017 and it was not restored in 2018
4. Florida received (and continues to receive) a large influx of Puerto Rican residents due to poor living conditions that remain in that country after Hurricane Maria

V(I). Planned Program (Evaluation Studies)

Evaluation Results

- Number of children and youth who reported eating more of healthy foods: 12,036
- Number of children and youth who reported adopting healthy eating patterns: 9,082
- Number of children and youth reporting increased physical activity: 6,217
- Number of children and youth reporting reduced sedentary time: 2,945
- Number of adults/parents who reported eating more of healthy foods: 10,538
- Number of adults/parents who reported adopting healthy eating patterns: 5,157
- Number of adults/parents reporting increased physical activity: 5,501
- Number of adults/parents reporting reduced sedentary time: 3,542
- Number of adult participants demonstrating improvement in health parameters such as physical fitness, body mass index, blood pressure, or blood glucose: 933
- Number of youth demonstrating improvement in health parameters such as physical fitness, body mass index, blood pressure, or blood glucose: 701

Key Items of Evaluation

In the 2017 reporting cycle, we rolled out 87 new indicators/outcomes to UF/IFAS and FAMU/CAFS faculty this year. Many of them are based on the NIFA panel recommendations and NIFA priorities. These statewide data, never before available (or not as readily available in some cases), will be used for this federal report as well as in infographics and data visualizations to highlight the impact of our work. Florida Extension leadership believes these new initiative is an important step to ensuring we have the key indicators needed to communicate the value of our statewide efforts.

In 2018, the Program Development & Evaluation Center will be analyzing how well the indicators worked and providing the results to the Extension initiative and priority work group teams and program leaders, asking them to provide changes, additions, deletions as needed.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Family, Youth and Community

☑ 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
723	Hazards to Human Health and Safety	3%	10%	2%	0%
724	Healthy Lifestyle	5%	5%	5%	0%
801	Individual and Family Resource Management	20%	15%	20%	0%
802	Human Development and Family Well-Being	20%	10%	10%	0%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	2%	0%	0%	0%
805	Community Institutions, Health, and Social Services	10%	5%	15%	0%
806	Youth Development	30%	50%	48%	0%
807	Disaster Preparedness, Mitigation, Response, and Recovery	10%	5%	0%	0%
	Total	100%	100%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	145.0	10.0	6.0	0.0
Actual Paid	168.8	8.8	3.3	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**
1727494	756689	87363	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1727494	33949	87363	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 studies and experiments to develop knowledge and tools that will improve the lives of individuals, youth, families and communities.
• Transfer research discoveries to Extension faculty through in-service trainings and EDIS publications.
• Maintain consistent communication with stakeholders to learn and prioritize needs.
• Fund, design and implement websites, conferences, curricula, fact sheets, workshops, field days, demonstrations, social media and marketing, and programs to support efforts to improve youth development and the organizations and volunteers that support it, family financial stability, homeownership and housing in Florida, health and wellness of residents, and community and economic development.
• Conduct one-on-one consultations with citizens, children and youth, families, etc.
• Publish research findings, program outcomes, and decision support tools.
• Provide leadership at local, regional, state and national levels to disseminate research findings and facilitate communication and foster current and new partnerships.

2. Brief description of the target audience

• Children and adolescents
• Teenagers
• Parents
• Families with children
• Childcare, after-school, and elder care providers
• Educators (K-12)
• Adults of all ages, including those with special needs
• Persons with type 2 diabetes
• Homeowners
• Prospective homeowners
• Renters
• Temporary/seasonal residents
• Housing professionals
• Developers
• Building/construction professionals
• Housing sales professionals
• Residential property managers
• Non-governmental organizations

- Community organizations
- Local business and industry representatives
- Local government and elected officials
- UF/IFAS and FAMU county and state faculty

3. How was eXtension used?

{No Data Entered}

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1155551	8100980	0	0

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

Patent Applications Submitted

Year: 2017

Actual: 3

Patents listed

1. Lactobacillus johnsonii Reduce Discomfort Symptoms in Healthy Humans
2. SOCS 1/3 Mimetics for the Treatment of Autoimmune Diseases
3. Peel and Stick Mosquitoocidal Treatment of Containers

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	14	182	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Test

  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	Youth learn skills to become productive members of the workforce.
2	Individuals and families learn skills to improve family financial stability.
3	Adults learn skills and techniques to improve their quality of life and personal safety.
4	Communities improve in resiliency, economic development, leadership and citizen engagement
5	Communities improve resiliency and economic development
6	Youth improve awareness and interest in STEM and agriculture sciences
7	Reducing harm to communities due to Hurricane Irma

Outcome #1

1. Outcome Measures

Youth learn skills to become productive members of the workforce.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	446759

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many young people are not equipped with the necessary skills to enter the workforce. Employers identify skills such as ?the ability to work in teams, solve problems, and communicate effectively? (Afterschool Alliance, 2017) as key to being prepared to enter the workforce. According to the National Association of Colleges and Employers (2017) 78% of employers look for a future employees ability to ?work in a team?, 77% look for ?problem solving skills?, 75% look for ?written communication skills?, and 71% for ?verbal communication skills?. A survey of Business Roundtable identified that ?critical thinking, problem solving, and communication skills? were all ?highly relevant? to successful employment and they were also the hardest skills to find in future employees (The Business Roundtable, 2017). A review provided by Child Trends shows that there ae ?five critical skills most likely to increase odds of success across all outcomes and which employers expect employees to have: social skills; communication; and higher order thinking skills (including problem solving, critical thinking, and decision making); supported by the interpersonal skills of self-control and positive self-concept? (Lippman, Ryberg, Carney, & Moore, 2015). Finally, for youth to develop these ?soft skills? is critical for human capital development and success in the workplace; and a greater predictor than academic and technical skills for employment and earning power (Kautz, Heckman, Diris, ter Weel, & Borghans, 2014).

What has been done

Florida 4-H programs offer high quality, fun, relevant, and hands-on experiences through 4-H projects ranging in topics from animals and insects to robotics and food science. Through a quality learning environment guided by trained faculty, staff, and volunteers young people form powerful relationships and receive opportunities to learn about careers and practice the skills that will equip them to enter the workforce. Florida 4-H has prioritized our measurement of the following workforce preparation skills; communication, higher order thinking (including goal setting, problem solving, critical thinking, and decision making), and appreciation of differences

(including working with others, respecting others, and valuing culture and diversity).

Results
4-H youth programs, 2017 results:
* 56,490 youth demonstrated improvement in communication skills
* 40,741 youth demonstrated improvement in higher order thinking skills (e.g., decision making, critical thinking, goal setting)
* 39,275 youth demonstrated improvement in appreciation of differences
* Number of youth demonstrating engagement beyond six hours in 4-H.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Individuals and families learn skills to improve family financial stability.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	9134

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In Gadsden County, 752 individuals either submitted e-mails or contacted Extension Educator needing assistance to purchase a home. The primary questions were concerning credit requirement, understanding rent-to-own arrangements, and the lending process. Most participants were reluctant to discuss their credit issues.

What has been done
FAMU Extension educator coordinated with a local community resource center and conducted Home Buyer Education workshops. She use the FANNIE MAE Credit Smart Resources and provided guidance to helping clients improve credit scores.

Results
As a result, FAMU Extension Educator increased knowledge of 752 individuals in first time home buying via workshops as well as one-one assistance. 17 families purchased homes, with approved loans of $1,796,151. 65 individuals achieved credit scores of at least 580 for USDA Loan and 620 FHA after participating in the program, and are searching to purchase homes. 85 individuals reported saving funds for down payment. Three participants received USDA financing evidenced by providing pre-approval from a bank.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #3

1. Outcome Measures

Adults learn skills and techniques to improve their quality of life and personal safety.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	13778

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Subsidized housing (e.g., Section 8) is a US HUD affordable housing voucher mechanism for assisting low-income citizens to transition from temporary to more permanent housing (click here for more information). This transition is a gradual process that can sometimes span more than one generation. One organization whose mission is to expedite this process is Habitat for Humanity. As of 2016, one of its largest US affiliates, HabiJax, in Duval County, began using the UF/IFAS Homeflow Extension program (Cantrell, Ellis, & Harris, 2015) as its baseline educational program for all new homeowner candidates with the goal of minimizing the risk of its future mortgage foreclosures. Habitat homeowners often are single mothers, so their children are finally in a permanent home, neighborhood, and school. Importantly, the exposure to risk of eviction or relocation from rental to rental, neighborhood to neighborhood, school to school, and social temptation to social temptation is vastly reduced.

What has been done

Homeflow provides participants with information about the connections between healthy relationships and healthy dwellings as well as the cost and safety considerations involved with operating and maintaining a healthy home. Other counties are incorporating Homeflow into First-time Homebuyer's programs and other Habitat organizations. After graduation, HabiJax homeowners receive a 0% fixed-interest rate, 30-year mortgage from HabiJax.

Results

In a 2017 study of Jacksonville participants at the end of the program, about three-fourths said they strongly agreed they had confidence to manage finances successfully, save on heating and cooling, and understanding how indoor air quality affects the health of the home and its occupants compared to about one-third feeling this way at the start of Homeflow. In a six-month follow-up survey, respondents reported significant increases in "always" saving for emergencies (up 54%), enforcing the reduction of mealtime distractions (up 47%), maintaining the water tank temperature at 120 degrees (up 34%), and turning on the exhaust vent when bathing (up 33%). At the 3 month follow-up 83% of participants who had closed and moved into their new home reported that they did program their new thermostat and are using it according to the standards discussed during the Homeflow session. Pre- and post-testing examined factors such as perceptions of increased personal and family well-being, ability to build family strengths, meeting individual needs, behaving and communicating in a manner to help home occupants to get along, understanding and reducing conflict, encouraging children's positive behavior, increasing positive while also decreasing negative interactions in family relationships, increasing positive bond, and increasing the happiness and satisfaction in relationships. Every variable showed an increase, from 10% to 35%, with all scores above 85%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety
724	Healthy Lifestyle
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

Outcome #4

1. Outcome Measures

Communities improve in resiliency, economic development, leadership and citizen engagement

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	6131935

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Hurricane Irma, a powerful Category 4 storm, made landfall on Cudjoe Key in the Florida Keys on September 9, 2017 with sustained winds of 130 MPH, gusting to 160 and a storm surge of 8-10' over many of the islands. Of the total approximately 350,000 lobster traps are deployed in or adjacent to the waters of Monroe County (Florida Keys). Initial industry estimates indicated as many as 154,000 of the lobster traps deployed in Monroe County were severely displaced and/or lost as a result of the hurricane. Gear recovery, repair and redeployment of displaced gear is critical to the local economy of the islands. Commercial fishing in Monroe County is the second largest economic engine next to tourism and valued at $900M. It is also the second largest employer with an estimated 4,500 jobs strictly boat related. Structural damage to hotels, restaurants and other infrastructure take considerable time to reactivate (months/years), whereas jump-starting commercial fishing operations can be accomplished in a relatively short period of time (days/weeks). (Source: Capt. Bill Kelly, FKFCA)

What has been done

On September 13 a UF/IFAS Sea Grant Extension agent reached out to the Florida Keys Commercial Fisherman's Association (FKCFA) to help. Per the FKCFA, the biggest issue stakeholders would face is recovering displaced/lost fishing gear and a rapid on-the-water assessment of where the gear was moved to would be of enormous benefit to the industry, save countless manhours of recovery effort and possibly tens-of-thousands of gallons of marine fuel. While rapid damage assessments are commonplace on land, there have never been any such efforts to determine on-the-water impacts and no protocols in place to conduct such an assessment. ?Using the Marathon Airport, MM 51, as a base of operations, each pilot and aircraft were commissioned for three days of flyovers at 6 hours of airtime per day. Just under 15,000 photographs were taken during the three days of flyovers with each photograph displaying both latitude and longitude. On October 4, 2017, within 3-1/2 weeks of the storm, the information was compiled by a UF/IFAS Extension agent and and distributed to fishermen, local government authorities and law enforcement. (Source: Capt. Bill Kelly, FKFCA)

Results

Of the initial estimates of 154,000 severely displaced and/or lost traps an estimated 60,000 were recovered within the first two weeks of making the aerial reconnaissance information available to industry. Recovered gear consisted of traps or portions of traps, ropes and buoys. The economic impact of these efforts to the industry/economy:

- Estimated savings of 150 full days of searching by a lobster boat with trained crew to find the traps we found by plane surveys in two days. $31,500 saved fuel cost, $82,500 saved crew cost.
- Estimated revenue that would have been lost by 150 boat days that otherwise would be used for lobster harvesting: $2,280,000 (based on $9.50 per pound value of lobster at time of the event)
- Value of recovered traps (60,000, but only 65% intact with gear): $1,560,000
- Total estimated economic benefit provided by the FKCFA: $3,954,000

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
807	Disaster Preparedness, Mitigation, Response, and Recovery

Outcome #5

1. Outcome Measures

Communities improve resiliency and economic development

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Havana Northside High School, the first high school built for African Americans, closed in 2003 and contributed to the deterioration of downtown Havana. The traffic through the town is primarily from commuters from south Georgia driving to work or shopping in Tallahassee. The Havana Community Development Center (HCDC) was incorporated 2009 with a plan to use the building as a community service center. The school was granted to the HCDC for a period until such time the organization was able to purchase the property.

What has been done
FAMU Cooperative Extension provided technical assistance in resource acquisition and other programming to support income-generating ventures.

Results
As a result, HCDC received a grant from Historic Preservation Society and other corporate which supported the restoration the old agriculture building and establish a training room. HCDC was also able to secure $50,000 to operate a student entrepreneurship incubator for aeroponics/aquaponics. HCDC eventually secured a $500,000 loan to purchase the school and $250,000 operating funds. These grants and loans will allow HCDC to establish an Onsite Business Incubator, Aquaponics Operation and Farmers Market. HCDC will also initiate research on a Bottled Water Plant, Solar Energy Farm, Bio-Feed Stocks, as well as assist with housing renovation programs and establish an Artists? Colony.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services

Outcome #6

1. Outcome Measures

Youth improve awareness and interest in STEM and agriculture sciences

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	19

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The AgriSTEM program serves to provide open avenues for interdisciplinary communication, education, and enthusiasm among students ranging from K-12 grades.

What has been done
Through experiential learning following state standards, students increase their understanding of information related to topics in entomology, food sciences and natural resources. Students engaged in the hands-on activities developed an interest and excitement about agriculture.

Results
The Agri-STEM activities implemented in the Bond Elementary 5th grade Academy Class demonstrated higher science quiz scores compared to the other 5th grade classes. Both the teacher and the Agri-STEM team agrees that this presence creates a framework to develop pathways to pursue degrees in agriculture and food science disciplines.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #7

1. Outcome Measures

Reducing harm to communities due to Hurricane Irma

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In Florida 2.5 million people (12% of residents) supply their water from private wells. Few public data exist on how many well users regularly test their water or drink from contaminated wells. Residents who have private water wells affected by flooding should assume their water is contaminated by bacteria. Water from a flooded well should not be used for drinking, cooking, making ice, brushing teeth or even washing areas of the skin that have been cut or injured until it is tested. Well owners should test for harmful bacteria annually and after any major flood. If a well is inundated by flood waters or surface water, bacterial contamination is likely. Unlike public water systems, which are regulated by the Florida Department of Environmental Protection and the U.S. Environmental Protection Agency, private wells are the responsibility of the well owners/users.

What has been done
UF/IFAS Extension is targeting communities affected by flooding that occurred during and after Hurricane Irma. It teamed up with Virginia Tech and Texas A&M to offer free bacteria testing for well users affected by Hurricanes Irma and Harvey. The tests check for key disease-causing bacteria possibly carried into wells by floodwaters, including coliform bacteria and E. coli.

Results
The agent coordinated sampling efforts in Florida, where 179 residents across 10 counties had their well water sampled at no cost. Results indicated that and 38% and 2% of wells sampled in Florida tested positive for total coliform and Escherichia coli bacteria, respectively. As a result of this free testing, these residents were made aware that their water was unfit for drinking and that their wells needed to be disinfected.

4. Associated Knowledge Areas

KA Code	Knowledge Area

723	Hazards to Human Health and Safety
802	Human Development and Family Well-Being
807	Disaster Preparedness, Mitigation, Response, and Recovery

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

1. Hurricane Irma had devastating impact on the state and destruction of some Extension offices
2. State legislature cut 4-H funding in 2017 session and restored funding in 2018 but at lower level
3. State legislature cut funding for several UF/IFAS centers and programs related to agriculture and natural resources in 2017 and it was not restored in 2018
4. Florida received (and continues to receive) a large influx of Puerto Rican residents due to poor living conditions that remain in that country after Hurricane Maria

V(I). Planned Program (Evaluation Studies)

Evaluation Results

- Number of adult participants reporting they had lower annual health care costs due to reduced need for medical care or prescriptions: 457
- Number of participants reporting they made changes that improved their physical mobility or safety within their home: 238
- Number of participants adopting one or more behaviors to improve the health of their home: 4,913
- Number of adult participants demonstrating improvement in money management skills or financial capability (i.e., earnings/income, spending, saving, investing, borrowing, protecting): 9,134
- Number of youth demonstrating improvement in money management skills or financial capability (i.e., earnings/income, spending, saving, investing, borrowing, protecting): 4,362
- Dollar value of grants generated by organizations or communities assisted: $5,355,609
- Dollar value of other in-kind resources contributed by organizations and communities: $734,452
- Number of hours that volunteers in your county work with clientele: 39,212
- Number of new or revised plans adopted that have begun to be implemented in a

community, agency, local government, business or disaster: 35

- Number of participants reporting new leadership roles or opportunities undertaken: 665
- Number of businesses created, retained, or expanded: 128
- Number of jobs created or retained: 1,698
- Number of new alliances formed through some type of formal agreement or MOU: 15
- Number of new alliances formed through an informal agreement without an MOU: 121
- Number of youth who demonstrate improvement in communication skills: 56,496
- Number of youth who demonstrate improvement in appreciation of differences: 39,275
- Number of youth who demonstrate improvement in higher order thinking skills (e.g., decision making, critical thinking, goal setting): 40,801
- Number of volunteers who adopt best practices/behaviors that provide youth with a safe and inclusive environment (sense of belonging); a characteristic of a high quality positive youth development (PYD) program: 5,753
- Number of youth volunteers who adopt one or more best practices/behaviors of positive developmental relationships (express care, challenge growth, provide support, share power, and expand possibilities): 3,144

Key Items of Evaluation

In the 2017 reporting cycle, we rolled out 87 new indicators/outcomes to UF/IFAS and FAMU/CAFS faculty this year. Many of them are based on the NIFA panel recommendations and NIFA priorities. These statewide data, never before available (or not as readily available in some cases), will be used for this federal report as well as in infographics and data visualizations to highlight the impact of our work. Florida Extension leadership believes these new initiative is an important step to ensuring we have the key indicators needed to communicate the value of our statewide efforts.

In 2018, the Program Development & Evaluation Center will be analyzing how well the indicators worked and providing the results to the Extension initiative and priority work group teams and program leaders, asking them to provide changes, additions, deletions as needed.

V(A). Planned Program (Summary)

Program # 7

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: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	5.0
Actual Paid	0.0	0.0	0.0	4.0
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	399098
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	155950
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

FAMU (1890) Research

Offshore Studies on Rice Stink Bugs (Hemiptera: Pentatomidae): the Rice Stem Stink Bug Tibraca limbativentris and Oebalus spp, Potential Invasive Pests for U.S. Rice Growers

Objective 1**.** The first objective of this study is to compare the impact of rice stink bug Oebalus pugnax (F.) O. ypsilongriseus, and O. insularis in south Florida rice. Individual rice panicles will be infested using adult rice stink bugs in sleeve cages (10x20cm) in Belle Glade, Florida. Infestation densities will include two rice stink bugs per panicle compared to caged non-infested panicles at milk and soft dough stages of panicle development since this is known to be the most sensitive stage of stinkbug attack. Twenty panicles per treatment will be evaluated.
Rice varieties have been selected for these experiments and are being grown in the greenhouse. It will be ready for the experiments to be conducted in June and July in Belle Glade, Florida. 'Rex' is a commonly grown variety in southern Florida and is one of the varieties currently being grown in the greenhouse to use in the upcoming experiments.
Objective 2. Surveys will be conducted north of the current known range of the O. yspilongriseus and O. insularis. Suitable weeds, rice and grains will be searched starting in the northern most infested area. When the Oebalus become active in May, we will begin surveying weeds north of the current known distribution of the 2 invasive Oebalus spp. We determined that Tibraca limbativentris occurs in Cuba, but hasn't been found in Florida.
Objective 3. The second objective is to determine the field parasitization rate O. yspilongriseus and O. insularis egg masses in south Florida rice. Parasitoids will be compared to those collected from O. pugnax egg masses. Egg masses will be evaluated for parisitization rates during May/Jun/July 2018

2. Brief description of the target audience

FAMU (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 was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	25	650	60	1500

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

Year:	2017
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	1	2	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Electronic identification keys/tools/resources developed

Year	Actual
2017	2

Output #2

Output Measure

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

Year	Actual
2017	5

Output #3

Output Measure

- Analyses conducted on key issues regarding safety and specific target biological control agents studied to determine safety.

Year	Actual
2017	3

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
2017	15

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Digital identification keys/tools/resources for 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 profitibility.
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 identification of invasive species utilized

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Potentially invasive weevil species from the Caribbean islands 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 75 species of weevils on palms has been completed. Among these species 60 of them are pests while 15 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
2017	2

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. Furthermore, offshore studies on the soybean scale provide mitigation strategies for the Crypticerya genistae.

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.

Two ladybeetle predators, Anovia circumclusia and Chilocorus cacti provided successful control of the soybean scale.

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 profitibility.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	3

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

Effectiveness of Seven Trapping Systems on Blueberry Crop in Tallahassee. Highest captured number of female flies were recorded in Scentry trap/Scentry lure. Other trap systems which had similar high captures include: cup trap/yeast bait, Trécé trap/suzukii bait, Trécé trap/Trécé lure, and the Scentry trap/suzukii bait. The lowest number of male flies were captured in the Trécé trap/suzukii bait, cup trap/suzukii bait, and for females in the cup trap/ suzukii bait. These findings indicated the poor performance of the suzukii bait for both sexes. Another disadvantage in using this commercially made synthetic bait was the dark color of the suzukii bait which may have not attracted the flies. The use of synthetic bait (such as the suzukii bait) in comparison to actual food bait is simplistic, reduces vulnerability to spoilage and changes in attractiveness throughout the trapping period. In addition, the 200 ml of suzukii bait often evaporated almost completely by the 7th day leaving behind brown thick syrup-like contents. To solve this issue, it is recommended to mix small amounts of water to thin out the solution to pour out trapped organisms.
Because of its consistency, convenience, and effectiveness, the Scentry trap/Scentry lure for D. suzukii were recommended for monitoring.

Effectiveness of Three Mulches on the Density of the Spotted Wing Drosophila in Blueberries in Quincy, Florida. The study was conducted at the North Florida Research and Education Center, University of Florida in Quincy in May to June 2017 blueberry fruiting season. Three type of mulches (pine bark, pine needle, and weed fabric) were applied in the blueberry field to investigate their effectiveness in capturing the adults of the SWD using the Trece traps. The results of male and female flies captured in all three treatments found mixed, this means that both genders of the SWD have not shown preference to a specific mulch, however, pine needle much attracted more number of flies followed by the control. In contrast, traps installed in the pine bark and weed fabric captured lower number of flies in the blueberry field. This study will be repeated in the 2018 summer fruiting season and results will be compared and evaluated to find suitable mulch(s) to be effectively used for SWD management.

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
2017	2

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, Crypticerya genistae) was carried out or initiated in Trinidad, Dominican Republic, Curacao and Aruba, Bahamas, Jamaica Haiti 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

IPM for fruits and vegetables. Seasonal field days and workshops were provided to stakeholders and clienteles. Using best management practices, conservation biological control and IPM strategies, vegetables, fruits, nut crops, and ornamental growers can reduce to 50-80% the use of pesticides in their farms and to conserve beneficial species (parasitoids, predators, and crop pollinators).

Biological control of the soybean scale which destroys thousands of acres of peanuts in the Caribbean islands.

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.

IPM for fruits and vegetables: The Scentry trap/Scentry lure was recommended as the best trap systems for use in the monitoring and management of D. suzukii in blueberries production.

Soybean scale: The implementation of a biological control strategy for the soybean scale which destroyed thousands of acres of peanut by releasing Anovia circumclusia and Chilocorus cacti was successful in managing the soybean scales in Haiti.

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
2017	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
2017	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. We also provide offshore hands-on trainings, workshops and IPM designs needed to mitigate potential invasive pest species that are threats to the US agriculture.

Results
A total of 20 graduate and 10 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
- Competing Programmatic Challenges

Brief Explanation

UF and FAMU's key evaluations, both quantitative and qualitative, are reported under the State Defined Outcomes and Outputs section. We continue to work on collecting statewide data on more focused, key indicators. While there has been a great deal of effort among the various Initiative teams for the past 2-3 years to create a set of common, statewide indicators, UF/IFAS continues to work on the collection of these key indicators using Qualtrics survey software. We anticipate piloting a new data collection method this spring. This will greatly improve our ability to gather statewide data on issues related to the NIFA priorities and other statewide initiatives.

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 and Outputs section. We continue to work on collecting statewide data on more focused, key indicators. While there has been a great deal of effort among the various Initiative teams for the past 2-3 years to create a set of common, statewide indicators, UF/IFAS continues to work on the collection of these key indicators using Qualtrics survey software. We anticipate piloting a new data collection method this spring. This will greatly improve our ability to gather statewide data on issues related to the NIFA priorities and other statewide initiatives.

Key Items of Evaluation

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
12036	Number of children and youth who reported eating more of healthy foods.
Climate Change (Outcome 1, Indicator 4)	
82	Number of new crop varieties, animal breeds, and genotypes whit climate adaptive traits.
Global Food Security and Hunger (Outcome 1, Indicator 4.a)	
82420	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)	
79	Number of new or improved innovations developed for food enterprises.
Food Safety (Outcome 1, Indicator 1)	
6	Number of viable technologies developed or modified for the detection and
Sustainable Energy (Outcome 3, Indicator 2)	
81	Number of farmers who adopted a dedicated bioenergy crop
Sustainable Energy (Outcome 3, Indicator 4)	
0	Tons of feedstocks delivered.