

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
204	Plant Product Quality and Utility (Preharvest)	5%	5%	0%	
205	Plant Management Systems	5%	5%	0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	5%	0%	
212	Pathogens and Nematodes Affecting Plants	5%	5%	0%	
213	Weeds Affecting Plants	5%	5%	0%	
215	Biological Control of Pests Affecting Plants	5%	5%	0%	
216	Integrated Pest Management Systems	5%	5%	0%	
301	Reproductive Performance of Animals	5%	5%	0%	
302	Nutrient Utilization in Animals	5%	5%	0%	
306	Environmental Stress in Animals	5%	5%	0%	
307	Animal Management Systems	5%	5%	0%	
308	Improved Animal Products (Before Harvest)	5%	5%	0%	
311	Animal Diseases	5%	5%	0%	
312	External Parasites and Pests of Animals	5%	5%	0%	
313	Internal Parasites in Animals	5%	5%	0%	
315	Animal Welfare/Well-Being and Protection	5%	5%	0%	
402	Engineering Systems and Equipment	5%	5%	0%	
405	Drainage and Irrigation Systems and Facilities	5%	5%	0%	
503	Quality Maintenance in Storing and Marketing Food Products	5%	5%	0%	
603	Market Economics	5%	5%	0%	
	Total	100%	100%	0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	80.0	11.0	0.0	0.0
Actual Paid Professional	122.5	13.5	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1177936	817263	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1177936	817263	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

2. Brief description of the target audience

- Producers
- Commodity Associations
- Owners/Operators
- Managers/Supervisors
- Workers/Laborers
- Allied Industry Representatives
- Small Farmers
- Government/Regulatory
- County government
- State government
- Federal government
- Tribal government

- International governing bodies
- Harvesting/Packing/Processing/Distribution
- Harvesters/Packers
- Processors
- Distributors/Transporters
- Retailers
- Importers/Exporters
- Youth and 4H(K-12)
- Youth Educators
- Extension Faculty

3. How was eXtension used?

{No Data Entered}

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1559852	3547159	0	0

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

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	187	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Change in Knowledge Agricultural and Natural Resource Industry Profitability and the Sustainable Use of Environmental Resources
2	Change in Behavior Agricultural and Natural Resource Industry Profitability and the Sustainable Use of Environmental Resources
3	Change in Condition Agricultural and Natural Resource Industry Profitability and the Sustainable Use of Environmental Resources
4	Change in Knowledge Awareness of Agriculture's and Natural Resource's Importance to an Economy That Ranges From Local to Global
5	Change in Behavior Awareness of Agriculture's and Natural Resource's Importance to an Economy That Ranges From Local to Global
6	Change in Condition Awareness of Agriculture's and Natural Resource's Importance to an Economy That Ranges From Local to Global
7	Change in Knowledge Protecting Florida from Existing and Emerging Pests and Diseases
8	Change in Behavior Protecting Florida from Existing and Emerging Pests and Diseases
9	Change in Condition Protecting Florida from Existing and Emerging Pests and Diseases

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	394270

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Small Farms Mean Big Impact for Florida Agriculture

Small farms represent over 90% of all farms in Florida, based on the USDA definition of a small farm as one with up to \$250,000 in sales. These farms make about 15% of all farm product sales in Florida and have gained much greater visibility as an important sector of the agricultural industry in the "Sunshine State." Small farmers and allied organizations have identified critical issues facing small farms in Florida. The issues include access to profitable markets, business skills development, accessible technical information, and alternative crops and enterprises.

In the 2013 report "Local Food Systems in Florida: Consumer Characteristics and Economic Impacts," researchers Dr. Alan Hodges and Thomas Stevens from the Department of Food and Resource Economics at the University of Florida found that Florida households purchasing local foods did so primarily at Farmer's Markets (61%) and that fruits and vegetables were the items most commonly purchased. The value of fruit and vegetable sales among all local markets (farmer's markets, restaurants, community supported agriculture, and retail grocers) in Florida totaled nearly 3.3 billion dollars over a 12-month period in 2011-2012. These statistics represent the small to mid-sized farms that rely predominately on direct to consumer sales and are representative of the clientele group targeted for Florida's small farms and alternative enterprises Extension programs.

What has been done

The University of Florida (UF/IFAS) and Florida A&M University have collaborated for many years to address the needs of Florida's small farm community by maintaining a website that is designed for one-stop shopping-from "getting started" to "evaluating an alternative enterprise" to "finding a market," etc., as well as holding regional and statewide trainings, workshops and meetings. Since 2009, the annual statewide Florida Small Farms and

Alternative Enterprises Conference (FSFAEC) has provided 2,500 individuals with up-to-date, research-based, in-depth educational information. Participants at this three-day event include current and prospective farmers and ranchers, allied industry representatives, consumers, educators, researchers, and students. The conference aims to facilitate solutions-based collaboration by encouraging networking and an open dialog among members of Florida's small farms community through concurrent educational sessions led by industry experts and noted researchers.

As part of the 2013 conference, two pre-conference tours were held—one for livestock and one for horticulture. A total of 88 conference attendees participated in the tours (46 for livestock and 42 for horticulture). At the end of the tours, most participants in both pre-conference tours reported having a better understanding of the startup considerations for the operations they visited (91% and 86% for livestock and horticulture, respectively), of the day to day operations of the farms they visited (98% and 86%), and of the marketing considerations for the operations visited (98% and 88%). The vast majority of participants (91% livestock and 76% horticulture) indicated that they will use the information presented to improve future farm decisions. About 40% of participants in both tours plan to begin a farm operation similar to the ones they visited.

The 2013 SFAEC was held August in Kissimmee, Florida. Seven in ten participants were current (40%) or prospective (30%) farmers and ranchers. Educators, researchers, and students accounted for almost 20% of the respondents and the remaining 10% was comprised of allied industry representatives, consumers, and others. About 300 individuals attended at least one of the three workshops and 35 sessions that were offered. More than one-third (35%) of the 2013 participants said they had attended the previous year's conference and had modified their practices as a result of the experience.

Results

After attending the 2013 conference workshops and sessions, eight in ten (80%) attendees reported feeling "moderately" or "completely confident" to apply the knowledge gained to their farms or organizations, locate additional information, locate supplies, locate services, increase their networking with members of the small farms industry in Florida, identify challenges that small farmers face, and identify opportunities for small farmers. About 90% of conference participants reported learning gains as a result of attending those workshops and training sessions. When asked if they would attend the FSFAEC in the future, about 85% of all respondents gave a positive response. The mixture of activities is appreciated by attendees since a large number of respondents reported networking and learning as a very valuable part of their conference experience.

4. Associated Knowledge Areas

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

306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection
402	Engineering Systems and Equipment
405	Drainage and Irrigation Systems and Facilities
503	Quality Maintenance in Storing and Marketing Food Products
603	Market Economics

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	23298

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

FAMU Small farms can mean big impacts in the area of small animal production.

What has been done

26 producers attended the five day FAMU Master Goat and Sheep Certification Program. The participants were exposed to nutrition and pasture management, marketing, herd health, reproduction/breeding, and mortality composting to help improve the quality of animals raised in order to increase their income potential.

Results

Based on survey results, 92% (24) of the participants increased their knowledge in herd health, nutrition and pasture management, breeding/reproduction management and marketing. After the

training program was over, 9 producers' farms were inspected. These producers adopted 7 or more sustainable production practices (i.e., record keeping, biosecurity, pasture rotation, nutrition management) as a direct result of attending the FAMU training program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection
402	Engineering Systems and Equipment
405	Drainage and Irrigation Systems and Facilities
503	Quality Maintenance in Storing and Marketing Food Products
603	Market Economics

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	10675

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Peanuts are produced from Marion County to Escambia County. In 2012, there were 210,000 acres planted with a yield total of 780,000,000 pounds of peanuts produced. One of the limiting factors in peanut production is disease management. The target audience of this program is peanut producers and extension educators.

What has been done

The resources used to deliver this information included, but were not limited to, local, regional and state extension meetings, field visits, on-farm research, disease diagnosis and electronic disease updates. Through each of these resources, stakeholders were provided information about fungicide efficacy and the importance of spray coverage on the plant. Collaborations with peanut researchers in Georgia also provided information about fungicide application timings, peanut canopy defoliation effects and nematode management. Clientele were also presented information about environmental conditions conducive for disease development and techniques for preliminary field diagnosis. The most significant resource provided to producers as a result of the broad scale collaborations has been the Peanut Rx pre-plant risk assessment index that uses fungicide efficacy results. Peanut Rx is a resource that assesses and combines peanut data from peanut specialists at the University of Florida, University of Georgia, Auburn University and the University of South Carolina.

The future focus of this program is to deliver critical disease and management information in a timely manner to stakeholders. Social media platforms (Facebook, Twitter and PestAlert Blog) are being developed to provide clientele with live updates about current issues facing peanut growers across the state. Also, in 2014 a disease platform will be developed on the University of Florida's PeanutFARM website that will assist growers with managing soil-borne and foliar fungal disease issues during the growing season.

Results

Every peanut producer understands that they will have to make multiple fungicide applications throughout the peanut growing season. It has been determined through informal surveys that many growers use Peanut Rx in some form for their fungicide decisions. Peanut Rx can provide economic returns to growers by reducing spray applications or improving their effectiveness. For example, if growers use Peanut Rx to reduce their spray applications by 1 spray then they would save approximately \$15 per acre. In 2012, when Florida growers planted 210,000 acres of peanuts the total savings using only half of the acres planted would have been valued at 1.58 million dollars. On the other hand, if growers were able to increase their yields by 150 lbs per acre using Peanut Rx as a spray guide, then their crop value would have improved by \$45 per acre which is equal to roughly 3 fungicide applications. These examples indicate how minor adjustments to a growers spray program can result in significant economic impacts for the peanut industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection
402	Engineering Systems and Equipment
405	Drainage and Irrigation Systems and Facilities
503	Quality Maintenance in Storing and Marketing Food Products
603	Market Economics

Outcome #4

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	21167

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Producers in the north central region of the state, primarily produce Bermudagrass for hay. Hay produced from this forage is a primary source of nutrition for beef cattle, dairy cattle, horses and goats. For some farmers, this hay is also a primary cash crop sold to livestock producers. The target audience is hay producers.

What has been done

The spring of 2013 proved to be a difficult opening to the growing season for many of these hayfields across Central Florida. Numerous reports from hay growers indicated that the grass was not responding as it had in years past to traditional management practices. By May, it became evident that hay production was going to be greatly diminished and some fields were approaching complete failure. Some growers were predicting that fields would have to be completely renovated and replanted, resulting in at least a 75% reduction in hay yields for the year. A group of UF-IFAS Extension faculty members initiated a fact finding mission to analyze potential causes of Bermudagrass hayfield decline. Working with both area producers and allied support, soil and tissue analyses indicated unusually low potassium levels. Test plots were established in several hayfields in Pasco, Sumter and Hernando counties to check responses from additional potassium fertilization. Faculty provided technical assistance for field testing and a field day to report findings to a group of 47 hay producers.

Results

Hayfields treated with fertilization recommendations obtained through this project have recovered dramatically and are now being harvested. Introducing these improved practices saved hay producers in Central Florida over a quarter of a million dollars (250,000 dollars) in losses this year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals

315	Animal Welfare/Well-Being and Protection
402	Engineering Systems and Equipment
405	Drainage and Irrigation Systems and Facilities
503	Quality Maintenance in Storing and Marketing Food Products
603	Market Economics

Outcome #5

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	2349

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Tropical/ornamental fish production is an important industry for Florida. One of the limiting factors in addition to water quality is disease.

What has been done

Through our extension diagnostic laboratory, we clarify for many fish disease submissions the factors which are causing fish losses. One major example this past year, we identified the re-emergence of a bacterial disease affecting zebra danios on multiple farms and resulting in significant economic impact. In addition to determining proper antibiotics by culture and sensitivity tests, we were able to educate the affected producers on this disease and wholesalers and introduced several of them to management with the use of a commercially available vaccine (for another species) for use against this particular disease, with positive results.

Results

Florida fish farmers working with our disease diagnostic laboratory, which runs complete necropsies with bacteriology and histology, are using antibiotics appropriately for bacterial diseases and chemicals appropriately for parasitic diseases. This means reduced misuse of drugs

and chemicals with resulting reduction in potential for antibiotic resistance, reduced labor and drug and chemical costs, and healthier live product for sale. Florida fish farmers, through work with us in disease diagnostics and outreach fish health management extension programs have collectively estimated savings of a minimum of \$1,000,000.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection
402	Engineering Systems and Equipment
405	Drainage and Irrigation Systems and Facilities
503	Quality Maintenance in Storing and Marketing Food Products
603	Market Economics

Outcome #6

1. Outcome Measures

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

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	530

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

FAMU Training for small farmers can add to the economic gain of limited resource producers but also have an economic impact on communities.

What has been done

FAMU As a result of the FAMU Master Farmer Program, a total of 30 limited resource farmers received training through the program. Seven (7) farmers have since graduated and received Master Farmer certificates to help add visibility to their farm businesses and to authenticate their farm operations.

Results

One farmer now realizes gross profits in excess of \$50,000 annually from growing and marketing Scotch Bonnet Hot Peppers. He has established lucrative hot pepper markets in Atlanta, Jacksonville, Orlando, Tampa, Miami, New Jersey and New York, and even exported value added hot pepper mash to Australia.

These trainings can also add to new products. Five new farmers producing alternative crops, including scotch bonnet peppers, sorrel, callaloo and biofuel crops. One farmer transitioned from cottage industry to commercial production and processing of jams, jellies, juices, nectar, syrups, tea bags, iced tea and pepper sauce.

4. Associated Knowledge Areas

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

311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection
402	Engineering Systems and Equipment
405	Drainage and Irrigation Systems and Facilities
503	Quality Maintenance in Storing and Marketing Food Products
603	Market Economics

Outcome #7

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	12363

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sugarcane orange rust is a disease that can severely limit sugarcane production. Plant cane and ratoon crops appear to be equally susceptible to orange rust. Mature cane is as susceptible as young sugarcane plants, and the disease persists through hot summer months. Severe rust infections can cause reductions in both stalk mass and stalk numbers, thereby reducing cane yield.

What has been done

Seminars, workshops and field days have been conducted for sugarcane producers to provide information so that they manage the disease. During a Sugarcane Orange Rust field day, 85% (52) of the 61 participants correctly described environmental factors favoring the development of orange rust pustules and correctly identified the six sugarcane varieties (which occupy 80% of the sugarcane acreage) that are currently most susceptible to the orange rust pathogen and openly discussed the environmental factors that contributed to 2012 and 2013 being a very heavy orange rust year. As a result of numerous informal group field visits to infested fields and scheduled field

days to sugarcane orange rust fungicide demonstration trials, 100% of the grower and crop consultant participants (93 participants) could correctly identify sugarcane orange rust pustules on leaf tissues, discerned them from prior brown rust infections, and understood the region within the sugarcane plant canopy where orange rust infections typically appear first. Following a meeting of 61 sugarcane farm managers and farmers representing roughly 90% of the sugarcane acreage, over 70% of the participants (43) expressed their intent to use two different fungicide chemistries, in order to avoid the development of fungicide resistance, during future sugarcane orange rust outbreak occurs.

Results

Almost all of the industry's most common varieties have become moderately to highly susceptible to sugarcane orange rust, and yield losses in excess of 40% have been recorded. Estimates of yield losses in commercial plantings of sugarcane derived from comparisons of treated and untreated fields indicate losses due to orange rust of roughly 11.5% in sugarcane biomass yield and 13% loss in sucrose per acre. Data showed that early spraying, before orange rust inoculum built up, was effective in reducing late season pressure. Because of unprecedented early season spore counts in the 2012 and 2013 growing season, Extension-recommended fungicide control measures significantly lessened these biomass and sucrose losses by encouraging early season fungicide applications.

Given that a sugarcane variety like CP80-1743 which occupies 18.8% of the planted sugarcane acreage in Florida, and is considered very susceptible to orange rust; use of extension-recommended fungicide application programs on this variety to preserve just a 10% improvement in sugar yield equates to roughly \$11.6 million in improved revenues [assuming very conservative estimates for cane yield (33 tons/acre), sugar content (11%) and a sugar price of \$0.20/(lb sugar)].

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #8

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	3152

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Because of serious pest problems in citrus, producers are looking to viable alternatives. One of these alternatives is peaches. Citrus and other producers are the targeted audience.

What has been done

The objective of the peach extension program is to increase Florida peach acreage and aid growers in successfully establishing, producing, and harvesting a high-quality peach crop. This can be measured by surveying growers, shippers, and marketers about their volume and quality each season. Workshops, field days and seminars are consistently offered to producers.

Results

One outcome of the stone fruit extension program has been the expansion of the Florida peach industry. This year, growers were able to harvest almost 1 million pounds of fruit, with a value of nearly \$4 million, made possible with guidance from the University of Florida Stone Fruit extension team. Acreage has increased 20% in 2012-2013 alone, for a total estimated acreage of 1,200 acres. The industry continues to grow, and further impacts from our efforts will result in expansion of the Florida peach industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
603	Market Economics

Outcome #9

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	6687

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Florida

Three newly introduced invasive whitefly species are a special threat to urban and suburban landscapes due to the wide host range, damage, and nuisance they cause. Most of the plant species affected by these pests are used extensively in south and central Florida landscapes which are also in close proximity to the largest ornamental production areas in Florida. These landscape infestations create extensive pest reservoirs increasing the spread to production areas and ultimately other states. The ficus whitefly has already been reported in San Diego, California, with another potential site in Los Angeles County. Moreover, populations in the most southern Florida counties appeared to be declining but 2013 brought an enormous resurgence of this pest and its damage.

Current management of these whiteflies is heavily reliant on the use of systemic insecticides in the neonicotinoid class. Due to the systemic nature of these products and their effectiveness against whiteflies, they are the products of choice. One of the growing concerns regarding the use of this chemistry is the effect on pollinators, particularly bees. This has been an important and ongoing issue for many years. However, with increasing and widespread use of these products, implications in pollinator decline and colony collapse disease, and incidents of large bee kills, there is a need to assess our use of these products. As more information is gathered, the use of these products may be more limited. It is imperative that Florida works toward the protection of our pollinators as well as alternatives to sound, long-term and biologically based pest management.

What has been done

Research focus has been placed on the selection and rearing of different whiteflies in high quantity necessary for use in rearing natural enemies. University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) will begin to distribute natural enemies in the Spring of 2014 to county Extension agents. Funding (\$5,000 per site) has been obtained and is currently being allocated to six agents. A greenhouse at the UF/IFAS Mid-Florida Research and Education Center has been completed for use in mass rearing natural enemies.

Biological control and public awareness and education are the most effective tools for long term management of these pests. To increase awareness, multi-agency Florida Whitefly website for homeowners and professionals was launched in April 2012, an online learning module for landscape professionals was released in May 2012(see Resource Links). The website has high traffic from both homeowners and landscape professionals and will be updated frequently.

Results

In a community project that combined the use of select insecticides and the release of both parasitoids and predators, one type of whitefly population was reduced 90% in one year. In

the second year, no insecticides were applied at a savings of more than \$50,000 to the community. In addition, procedures for mass rearing and releasing *E. noyesi* and *E. guadeloupae* were developed and tested on a small scale at other field sites. Based on current surveys, the establishment of *E. noyesi* and reduction of RSW whiteflies in Monroe and Miami-Dade Counties is being documented. These data, along with past biocontrol successes against *Aleurodicus* whiteflies using *E. noyesi*., and anecdotal observations of declines in RSW populations following the appearance of *E. noyesi* and *E. guadeloupae* generate a strong argument for prioritizing these two parasitoids in future biocontrol efforts against RSW in south Florida. The release strategies for each of these parasitoids will be further refined in 2014-2015 and the rearing of promising natural enemies of other types of whiteflies will be pursued.

Chemical control options are limited, costly, and not environmentally sustainable. Additionally, FDACS-DPI has a history of successful research and landscape pest management with biological-based control strategies. Furthermore, the potential success of biological control is supported by their current status in their countries of origin, Asia and Central America, as being only occasional, sporadic pests. Frequently, whiteflies may become only occasional pests if either a key natural enemy or a complex of natural enemies sufficiently maintains populations below economic and aesthetic thresholds. Biological control is the only self-perpetuating integrated pest management option and the only practical approach to reducing established populations in landscape settings where more intensive management methods are prohibitively expensive or environmentally undesirable.

4. Associated Knowledge Areas

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

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

Florida is still heavily impacted by the economic downturn and although the economy appears to be improving it is expected that sequestration will be an issue and this is delaying a stronger economy. Public education in Florida has lost more than 50% of state funding and has been impacted by other losses or increases such as the failure of tuition to be increased to bring the state more into line with other state tuitions. Counties across the

state are impacted by devolution from the state level and this also has a direct impact on the land-grant universities.

Natural and national disasters can also affect the number of volunteers available to work with youth and Florida citizens and this is an area that the land-grant universities use to support programs. Natural disasters such as hurricanes, fires, storms and flooding are common within the state leading to many issues that impact the land-grant colleges.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Constant vigilance must occur when dealing with global security and hunger. Our priority must be the protection of our food supplies and the need to be aware of hunger in the world and the best management practices that lead to an increase in food supplies to reduce hunger. Since Florida is one of the few states able to grow food year round in the United States, many truck crops as well as fruits and vegetables that grow in the winter months supply not only Florida but many parts of the world. Because we are a port state we also must be aware of the many threats related to invasive plants, pests and diseases that can enter into the state. It has been estimated that the U>S> is attacked by at least one new invasive plant, pest or animal on a monthly basis. As a port state that also has multiple airports, Florida must be on guard at all times and find ways to fight those invasive species that have already invaded as well as those that have not yet arrived but could potentially threaten Florida agriculture, the environment or the people who live in or visit the state.

Because of the need for increasing food crops and dealing with food security issues, there are many educational programs being taught by UF/IFAS and FAMU/CAFS Extension faculty related to these issues. In this area well over 1,600,000 people have been reached directly in programs. An additional 3.5 million have been reached indirectly. Of those surveyed, almost 70,000 increased their knowledge, 29,470 made changes in behavior and 13,141 made changes that impacted others or their communities or beyond in areas related to food security and global hunger including issues related to profitability and sustainable, processing, distribution, safety and security of food systems, and existing and emerging pests and diseases.

Key Items of Evaluation

Sustainable irrigation practices for water conservation and greater sustainability of vegetable production systems

Cabbage and potato are the most important winter/spring crops in northeast Florida. Together, they had a 2009 crop cash receipts value of \$205 million. Florida's production of cabbage and potato is ranked first and fourth, respectively, among eastern U.S. states.

Farmers in northeast Florida often water their crops using seepage irrigation. With this method, wells pump water from the ground to a pipeline system that carries the water to

individual furrows in the fields. Seepage irrigation is considered a low-efficiency method for cabbage and potato, because it requires a large volume of water to maintain the high water table these crops need. The St. Johns River Water Management District estimates that a potato crop under seepage irrigation uses about 600,000 gallons of water per acre per season. The combination of high water withdrawal rates and drought has caused saltwater intrusion in some areas in northeast Florida, drastically increasing the salt content of water from some deep wells.

Irrigation water management has another important role in keeping agriculture sustainable And that is minimizing nutrient losses to the environment. Florida soils do not retain water or nutrients well, so crops typically need to be supplied with both. More efficient strategies for fertilizer rate, timing and placement are needed to minimize nutrient losses and maintain crop yield.

For vegetable production to meet future regulations and to remain economically viable, growers will be required to successfully implement best management practices (BMPs) that increase water and fertilizer use efficiencies.

Over the past two years, University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) state vegetable production specialists and other Extension faculty introduced farmers and industry personnel to more sustainable irrigation practices and enhanced irrigation management strategies. This will result in water conservation and greater sustainability of vegetable production systems.

As of December 2013, a total of 13 northeast Florida vegetable growers are introducing more efficient irrigation systems through the Tri-County Agricultural Area Cost-Share Program, which is a partnership between the Florida Department of Agriculture and Consumer Services, Florida Department of Environmental Protection, St. Johns River Water Management District and the USDA's Natural Resources Conservation Service. The program will cover some costs of converting seepage irrigation systems to other irrigation practices with potential for water conservation.