

**V(A). Planned Program (Summary)**

**Program # 10**

**1. Name of the Planned Program**

Global Food Security and Hunger--Research

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	5%	
202	Plant Genetic Resources	0%	0%	5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	5%	
204	Plant Product Quality and Utility (Preharvest)	0%	0%	5%	
205	Plant Management Systems	0%	0%	5%	
212	Diseases and Nematodes Affecting Plants	0%	0%	5%	
216	Integrated Pest Management Systems	0%	0%	5%	
302	Nutrient Utilization in Animals	0%	0%	5%	
306	Environmental Stress in Animals	0%	0%	5%	
307	Animal Management Systems	0%	0%	5%	
311	Animal Diseases	0%	0%	5%	
312	External Parasites and Pests of Animals	0%	0%	5%	
313	Internal Parasites in Animals	0%	0%	5%	
402	Engineering Systems and Equipment	0%	0%	5%	
403	Waste Disposal, Recycling, and Reuse	0%	0%	5%	
404	Instrumentation and Control Systems	0%	0%	5%	
405	Drainage and Irrigation Systems and Facilities	0%	0%	5%	
501	New and Improved Food Processing Technologies	0%	0%	5%	
502	New and Improved Food Products	0%	0%	5%	
503	Quality Maintenance in Storing and Marketing Food Products	0%	0%	5%	
	<b>Total</b>	0%	0%	100%	

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	40.0	0.0
<b>Actual Paid</b>	0.0	0.0	112.9	0.0
<b>Actual Volunteer</b>	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	1372129	0
<b>1862 Matching</b>	<b>1890 Matching</b>	<b>1862 Matching</b>	<b>1890 Matching</b>
0	0	1372129	0
<b>1862 All Other</b>	<b>1890 All Other</b>	<b>1862 All Other</b>	<b>1890 All Other</b>
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Conduct research experiments

**2. Brief description of the target audience**

Growers/ranchers  
 Producers/packers  
 Buyers  
 General Public  
 Government Officials  
 Scientists

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

<b>2014</b>	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Actual</b>	0	0	0	0

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

**Patent Applications Submitted**

Year: 2014  
Actual: 53

### Patents listed

1. Tomato Catechol-O-Methyltransferase Sequences And Methods Of Use
2. Detection of Symptomatic Citrus-Greening Leaves using Polarized Light
3. A Method for Genome Complexity Reduction and Polymorphism Detection
4. Citrus Tristeza Virus Based Vectors for Foreign Gene/s Expression
5. Heirloom Cultivars for a Better Tasting Tomato
6. Citrus Trees with Resistance to Citrus Canker
7. Ty-1Markers for TYCLV Resistance
8. Method for Artificial Selection
9. Manipulation of Color, Stature and Nutraceutical Content of Plant Products Using Narrow-Bandwidth Light (combined with 14497)
10. Application of Biofilm Formation Inhibiting Compounds Enhances Control of Citrus Cancer
11. Material and Methods to Increase Plant Growth and Yield
12. Roof-Ventilated High Tunnels (RVHT)
13. Enhanced Heat Stability of The Maize Endosperm ADP-Glucose Pyrophosphorylase by Manipulation of Evolutionarily-Identified Amino Acids
14. Methods and Devices for Reduction of Plant Infections
15. Development of Bacillus Subtilis Strains for Production of Xylooligosaccharides
16. Drought Tolerance Conferred by XB3 and its Mutants
17. Hormone-Induced Expression of IProteins in Insect Cells
18. Slow-Release Fertilizer with Graphene Oxide Films
19. A Cecropin-Melittin Hybrid Peptide With A Reduced N-Terminal Extension Confers High Levels Of Resistance To Xylella Fastidiosa In Transgenic Grapev (DIV)
20. Pteris Vittata Phytase Nucleotide and Amino Acid Sequences and Methods of Use
21. Aldehydes and Methods of Synthesis by Catalysis with Carotenoid Cleavage Dioxygenase Enzymes
22. Citrus Tristeza Virus Based Vectors For Foreignn Gene/S Expression (CIP)
23. Methods for Increasing Grain Yield
24. Mandarin Tree Named 'C4-15-19'
25. Peach Tree Named 'UFGem'
26. Sweet Orange Tree Named 'OLL-8'
27. Peach Tree Named 'Gulfatlas'
28. Blueberry Plant Named 'FL98-325'
29. Garden Gem
30. UF-GNV-2013-2
31. Ruellia Plant Named 'R10--105-Q54'
32. Citrus Rootstock Named 'UFR-2'
33. Citrus Rootstock Named 'UFR-3'
34. Citrus Rootstock Named 'UFR-4'
35. Citrus Rootstock Named 'UFR-16'
36. Blueberry Plant Named 'C03-038'
37. Blueberry Plant Named 'C03-158'
38. Citrus Rootstock Named 'UFR-1'
39. Citrus Rootstock Named 'UFR-5'
40. Citrus Rootstock Named 'UFR-6'
41. Citrus Rootstock Named 'UFR-15'
42. Blueberry Plant Named 'C04-014'
43. Blueberry Plant Named 'C04-051'
44. Blueberry Plant Named 'C05-178'
45. Blueberry Plant Named 'C05-190'

- 46. Pummelo Grapefruit Hybrid Tree Named '914'
- 47. 511 Peanut
- 48. Citrus Rootstock Named 'UFR-17'
- 49. Coleus Plant Named 'UF08-5-10'
- 50. Coleus Plant Named 'UF08-19-10'
- 51. Coleus Plant Named 'UF09-8-37'
- 52. Coleus Plant Named 'UF10-45-12'
- 53. Coleus Plant Named 'UF12-30-6'

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

<b>2014</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Actual</b>	0	542	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	Increase plant Production through the development of improved plant production BMPs
2	Improve Plant Protection through the development of new science and BMPs
3	Improve Animal Production through the development of BMPs
4	Improve animal protection through the development of new science and BMPs
5	Identify and increase quality and production of animals and plant systems through the development of new science in agricultural, natural resources and biological engineering
6	Reduce hunger and increase food productivity based on improved methods of processing, improving quality and delivery of animal and plant foods

**Outcome #1**

**1. Outcome Measures**

Increase plant Production through the development of improved plant production BMPs

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

Improve Plant Protection through the development of new science and BMPs

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The Polk County UF/IFAS Cooperative Extension Service provides citrus growers with citrus tree cold acclimation information during the winter. This information is used by growers to make informed decisions on the use of microsprinkler irrigation for citrus tree cold protection. Information on cold acclimation is generated in the lab using a process that measures electrolyte leakage from damaged frozen leaves.

**What has been done**

Leaf leakage is measured at progressively colder test temperatures to determine the critical temperature at which 50% of leaf cells are damaged. Field observations have held out the validity of using this 50% benchmark methodology as a threshold for citrus leaf damage. Beginning in 2005 eight central Florida grove locations per year have been used for the collection of weekly leaf samples from 15 Nov to 15 Mar of each year. Five leaves from the same six trees each year at each location are collected to determine the weekly citrus leaf freezing point temperatures. Data collected demonstrate the dynamic nature of citrus tree acclimation during the winter and between individual years. Critical citrus leaf freezing temperatures ranged from -8.30 to -2.70C

depending on the year.

### **Results**

Results of annual grower surveys indicate that there has been over the past seven years a significant percent reduction in the amount of irrigation water that has been pumped for citrus tree cold protection in central Florida. Grower's average estimated savings over the seven year period ranged from no savings to over 50% depending on the year. The mean average water savings for the seven year period was 19.28% when growers considered the critical citrus leaf freezing temperature data in making cold protection decisions. This demonstrates that savings in water and pumping costs can be realized by the use of relevant research information that has been appropriately transferred to growers.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
212	Diseases and Nematodes Affecting Plants
216	Integrated Pest Management Systems

### **Outcome #3**

#### **1. Outcome Measures**

Improve Animal Production through the development of BMPs

Not Reporting on this Outcome Measure

### **Outcome #4**

#### **1. Outcome Measures**

Improve animal protection through the development of new science and BMPs

Not Reporting on this Outcome Measure

## **Outcome #5**

### **1. Outcome Measures**

Identify and increase quality and production of animals and plant systems through the development of new science in agricultural, natural resources and biological engineering

### **2. Associated Institution Types**

- 1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	0

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Strawberry growers found spotted wing Drosophila (SWD) maggots when harvesting. It was also found that SWD lives year round in this area and this different from where it is a pest in other parts of the country which is information needed for researchers to develop IPM strategies for this pest.

#### **What has been done**

Working with an IFAS Entomologist, the agent located 16 cooperators and took grad students to fields and help set up SWD traps and collect data. Agent assisted with reporting of trapping results to growers so they could take action when SWD was collected from traps in their field. In at least 50% of the fields in February SWD was found in traps. Growers took action by spraying and no growers had rejections.

#### **Results**

A major finding from this study was the presence of a new type of fruit fly in the traps as well as larvae found in strawberry. The researcher relayed to growers that this pest may be a new emerging pest and be of bigger concern to them than SWD. Researcher said this study would not have happened without the help of agent in getting growers' cooperation to do the work in their fields. This has led to knowing about a possible threat early on so research can start working on control measures.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems
312	External Parasites and Pests of Animals

## **Outcome #6**

### **1. Outcome Measures**

Reduce hunger and increase food productivity based on improved methods of processing, improving quality and delivery of animal and plant foods

### **2. Associated Institution Types**

- 1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	0

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

It has been estimated that the annual collective economic loss attributed to weeds in Florida pastures and rangeland is in excess of \$180 million. These losses include a reduction in forage quality as well as cattle stress from plant toxicity or physical injury. Therefore, research is needed to develop management strategies that will allow producers to reduce these losses through increased forage production (i.e. higher animal stocking rates per unit area), increased forage quality, decreased incidence of animal toxicity and reduced physical injury from weeds.

#### **What has been done**

One specific aspect of this project looks at developing management strategies for perennial weeds in improved forage systems. Broomsedge is becoming increasingly problematic in bahiagrass pastures in south Florida. Preliminary evidence suggests that either phosphorous or copper fertilization may help in increasing the competitive ability of bahiagrass over broomsedge species. Therefore, research was initiated in 2012 to begin to understand the effects of lime, nitrogen, phosphorous, potassium, and micronutrients on broomsedge stands in bahiagrass pastures.

#### **Results**

Since broomsedge is a short-lived perennial plant, results from this experiment will likely not be realized until 2015. However, there is an observational difference in bahiagrass stand and grazing with fertilizer plots compared to non-fertilized plots. Smutgrass is currently the number one invasive grass in perennial grass pastures and hayfields in Florida. Current research is

investigating the effects of multi-year sequential applications of hexazinone at reduced rates in comparison to a one-time full rate of hexazinone. This research indicates that smutgrass density is the same when using ½-rate of hexazinone over two years compared to a full rate in one year 3 years after the initial treatment. Since hexazinone is an expensive herbicide, allowing ranchers to reduce the use rate over two years reduces annual costs and spreads out the risk of hexazinone failure from limited or excessive rainfall after application.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
307	Animal Management Systems

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Economy
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

##### Brief Explanation

Many parts of the state are still struggling due to the economy. This leads to greater numbers of people in need of help. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in year's past continue to have some impact. We are in the process of evaluating our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

#### V(I). Planned Program (Evaluation Studies)

##### Evaluation Results

In 2014, UF/IFAS Research did not conducted a formal or comprehensive evaluation of the summation of all research conducted on areas related to this program area. Surrogate measures such as expenditures, patents and peer-reviewed publications are included in this report for each planned program. The competitive funding process and administrative oversight, as well as the peer review process and stakeholder input process described in this report, are evaluative methods for insuring our research projects are valid and useful.

##### Key Items of Evaluation

No additional information to provide.