

2007 Florida A&M University Research Annual Report

Status: Accepted
Date Accepted: 05/01/08

2007 Florida A&M University Research Annual Report

I. Report Overview

1. Executive Summary

During FY 2007, the planned programs were developed to address the critical issues and needs identified by our stakeholders. These programs enhanced the cooperative relationship between Florida A&M University, the Florida Dept. of Agriculture, Florida Grape Growers Association, Florida Goat Producers, Florida Fruit and Vegetable Growers, Tall Timbers (an environmental group), North Florida Small Farmers Coop and other groups and agencies within the state. FAMU became an active partner in: promoting the grape industry within the state; developing small animal herd health protocols; developing strategies to control off-shore invasive insect pests; and, preserving the quality of water. Active involvement of graduate and undergraduate students in research projects resulted in a pool of well qualified students, many of them minority. FAMU was successful in recruiting four Ph. D. students in entomology. All of them are currently conducting research in biological control. Two major publications were released during FY 2007: "Challenges and Opportunities in Agricultural research- Meeting Food and Fiber Needs in the 21st Century" and "IMPACT! Meeting Needs of Our Stakeholders and Improving the Lives and Livelihoods of Small and Limited Resource Farmers." A 'Research Forum' was held for our stakeholders, where three new products were released: a new and improved variety of muscadine grape, named 'Majesty' (patent pending); A digital weevil identification tool; and, a new strain of Bt to control mosquitoes (patent pending). Dr. Y. P. Hsieh, Professor in Water Quality, received a competitive NRI grant for \$260,000. A total of 21 papers were published.

Total Actual Amount of professional FTEs/SYs for this State

Year:2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	16.0
Actual	0.0	0.0	0.0	18.0

II. Merit Review Process

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

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

2. Brief Explanation

Florida A&M University used a multi-prong approach in reviewing the research proposals and projects this year. The main objective of the process was to assure the quality of research, scientific merit of the proposed research and its potential impact on the stakeholders. First, a preliminary review of the proposed research was made by the Research Director and discussions were held with the Principal Investigators regarding the relevancy and the impact of the research on stakeholders. This was followed by a comprehensive review by at least two or more reviewers which included: internal and external subject matter specialists, peer review by 1890 and 1862 scientists, CARET representatives, commodity associations/stakeholders, extension workers and others. The comments or suggestions made for improving the proposal were incorporated into the revised proposal and reviewed again by the Research Director, prior to submission to CSREES for approval. The quality of research was continuously monitored through annual reports, impact statements, personal communications, presentations, scientific publications and annual accomplishment reports.

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
- Survey of traditional stakeholder groups
- Survey specifically with non-traditional groups
- Other (Input from under -served clientele)

Brief Explanation

The stakeholder input was sought, encouraged and actively obtained in FY 2007 through planned events, unscheduled activities and personal contacts. Various stakeholder groups such as: Florida Grape Growers Association, Florida Meat Producers, Farm Bureau, Florida Fruit and Vegetable Association, Florida Nursery Growers Association, CARET representatives, Florida Water Management District Representatives, Florida Mosquito Control Association and others were contacted and encouraged to respond to a formal survey requesting their input. Planned events such as field days, growers meetings, advisory council meetings and listening sessions were announced through various media and stakeholders and public-at-large were invited to participate and provide oral and written comments. Follow up discussions were held concerning the existing research program priorities and how Florida A&M University's research programs were addressing stakeholders' needs. One of the major accomplishment was the active participation of the Research Advisory Group which provided input regarding the relevancy of the program. A show -and -tell event (Research Forum) was held on the campus to encourage stakeholder participation and facilitate interaction with researchers. One hundred and fifty participants attended the event. Names of under-served clientele were obtained from the extension paraprofessionals and personal invitations were sent to them to participate in various events.

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
- Open Listening Sessions
- Needs Assessments
- Use Surveys
- Other (State Department of Agriculture)

Brief Explanation

Many different approaches were used to identify individuals and groups who represent Florida A&M University's stakeholders. State agencies, commodity associations/groups, farm bureau, county extension agents, CARET representatives, nonprofit public advocacy groups and environmental organizations were asked to provide names of individuals and groups who might benefit from FAMU's programs. Small farmers and under-served groups were identified by the University's field staff, paraprofessional workers and the extension personnel. Field days, on-farm demonstrations and other activities were also used to identify the stakeholders. The faculty and research administrators participated in several statewide meetings and workshops held by the Florida Department of Agriculture and Consumer Services, Florida Department of Environmental Protection and other organizations. One of the major outcome of such meetings was to identify the potential stakeholders and individuals who could serve as members of the advisory committees for various research programs.

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 the general public (open meeting advertised to all)
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Other (Through county extension agents)

Brief Explanation

The stakeholder input was collected throughout the year in informal and formal meetings and by personal contacts. Meetings were held with various commodity groups on and off campus to understand their needs and concerns. Two meetings of the Florida Grape Growers were held on the campus where research results were presented and stakeholder input was requested. Similarly, Florida Meat Goat Producers, Florida Mosquito Control Association, Representatives of Florida Farm Bureau, Florida Department of Agriculture and other organizations were asked to conduct their meetings on the campus and thus we were able to learn more about their programs, inform them of our programs and also receive input from them. The survey results obtained in the past two years were further refined to reflect the true needs of FAMU's stakeholders. At the field days and workshops, extension workers brought several small farmers and under-served clientele with them, thus giving researchers an opportunity to interact in -person with this non-traditional group and collect the input.

3. A statement of how the input was considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities
- Other (College -wide strategic plan)

Brief Explanation

There were two major ways the stakeholder input was used. First, in developing the overall Research Program, the following issues were considered: what exactly the stakeholders were asking for, how best the current programs were meeting their needs, what modifications were needed to further streamline the Research Program, what were some of the emerging issues which needed to be addressed and how best to allocate the existing resources. The input was used in developing research priorities, the 'Plan of Work'. Because of stakeholder input, new initiatives were developed in Biofuels, Food Safety and Speciality Crops. New faculty and staff were employed to address these issues. Secondly, the input from each of the center advisory committees was used in modifying research priorities and in developing new cooperative initiatives with external groups and in guiding graduate research.

Brief Explanation of what you learned from your Stakeholders

The major concerns and needs that FAMU's stakeholders expressed included: Better herd health protocol for raising meat goat animals in north Florida and how to reduce production costs; More efficient and economic management of small goat herds; Grape growers wanted more information on improved cultural practices for maintaining vineyards and availability of new grape varieties; They also wanted to know if we could help them in enhancing the shelf-life of Florida grape products; Federal and state agencies were interested in learning more about our latest research in biological control and how it could be transferred to the field for better control of invasive pests; Small farmers identified their need for speciality crops and environmental groups were interested in preserving the quality of water.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	1635859

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	0	0	0	1414747
Actual Matching	0	0	0	409466
Actual All Other	0	0	0	592370
Total Actual Expended	0	0	0	2416583

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

V. Planned Program Table of Content

S. NO.	PROGRAM NAME
1	Viticulture and Small Fruit Research
2	Water Quality Research
3	Biological Control of Insect Pests
4	Statewide Goat Research Program
5	Small Farm, Value-Added Enterprises and Rural Families

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

Viticulture and Small Fruit Research

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				25%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants				25%
205	Plant Management Systems				50%
	Total				100%

V(C). Planned Program (Inputs)

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	5.0
Actual	0.0	0.0	0.0	4.5

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	319683
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	289941
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	309473

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research studies were conducted to evaluate the impact of training/trellis systems and various canopy management practices on the production efficiency and fruit quality of three Florida bunch grape varieties- Blanc du Bois, Stover and Cynthiana and three Florida Muscadine varieties- Carlos, Noble and Fry. The grapevines from different treatment plots were carefully monitored and evaluated for various growth parameters during the growing season. A biotechnological approach was evaluated to improve disease tolerance, drought resistance and nutraceutical characteristics of grapes. Also, some innovative processing methods were studied to enhance the storage stability of Muscadine red wines.

2. Brief description of the target audience

The target audience included: commercial grape growers in Florida and southeastern United States, small farmers who are currently growing grapes or interested in starting this enterprise, extension workers, fresh fruit buyers, food processors and public-at-large.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	100	250	75	100

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	1

Patents listed

A new improved muscadine cultivar 'Majesty'

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	2	6	8

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Research and Extension publications; Grant proposals submitted and funded; Dissemination of results to stakeholders; Training of graduate and undergraduate students.

Year	Target	Actual
2007	0	0

Output #2

Output Measure

- New improved varieties of muscadine grapes

Year	Target	Actual
2007	{No Data Entered}	1

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Greater profitability and competitiveness; Increased value of grape commodities; Improved cooperation between the industry, state and federal agencies resulting in transfer of technology that will lead to growth and higher economic returns for Florida Grape Growers; Increased acreage of grapes for fresh fruit and processing; Better trained graduate and undergraduate students.
2	Identification of genes associated with disease/insect resistance in muscadine grapes

Outcome #1**1. Outcome Measures**

Greater profitability and competitiveness; Increased value of grape commodities; Improved cooperation between the industry, state and federal agencies resulting in transfer of technology that will lead to growth and higher economic returns for Florida Grape Growers; Increased acreage of grapes for fresh fruit and processing; Better trained graduate and undergraduate students.

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #2**1. Outcome Measures**

Identification of genes associated with disease/insect resistance in muscadine grapes

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The information regarding the functional grape genome is still lacking and this has hampered the development of improved muscadine and bunch grapes in Florida. Growers need new grape cultivars for higher yields, disease/insect resistance and better processing quality.

What has been done

FAMU in cooperation with USDA, ARS, Fort Pierce initiated a grape functional genomic project. The major focus of this project was to develop molecular markers to identify the genes associated with improved berry quality and disease/insect resistance in muscadine grapes.

Results

Through the cooperative efforts of FAMU and ARS, 30,000 pieces of ESTs (a short sequence of genes) have been sequenced from which 10,000 genes were assembled. The sequence analysis led to the discovery of genes uniquely found in the native grape species. A new improved cultivar 'Majesty' was released.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms

V(H). Planned Program (External Factors)**External factors which affected outcomes**

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

Brief Explanation

The major external factors which affected the research outcome were: the continuous drought in North Florida and South Georgia reduced grape yields; increased incidence of insect infestation and associated higher cost; reluctance of new producers to plant grape vines or increase the existing acreage and diminished state support for grape research.

V(I). Planned Program (Evaluation Studies and Data Collection)**1. Evaluation Studies Planned**

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

The Viticulture and Small Fruit Program at FAMU is the largest and best equipped facility dedicated to the warm climate grape research in the south and southeastern United States. The program holds the largest collection of muscadine germplasm in the world. Several new cultivars are at different testing stages. A new improved muscadine cultivar 'Majesty' was released to stakeholders (A patent has been filed by the university). The center conducted two major events for the stakeholders: a Field Day for providing hands-on training was attended by 30 grape growers and a Grape Harvest festival for public-at-large attended by 450 people. Ten students received training in viticulture. Three students conducted their Master's research on some aspect of viticulture. The faculty received several grants and published 8 papers.

Key Items of Evaluation

Molecular Markers for Disease/insect Resistance in Muscadine Grapes
 Majesty- A New Improved Muscadine Grape Variety Developed at Florida A&M University
 Nutraceutical Properties of Muscadine Grapes
 Training Students in Viticulture

Program #2

V(A). Planned Program (Summary)

1. Name of the Planned Program

Water Quality Research

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water				50%
112	Watershed Protection and Management				50%
	Total				100%

V(C). Planned Program (Inputs)

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	5.0
Actual	0.0	0.0	0.0	5.0

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	364558
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	79088
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	90876

V(D). Planned Program (Activity)

1. Brief description of the Activity

Close coordination was established with the Florida Department of Environmental Protection, Florida Water Management Districts, US Forest Service and the Natural Resource Conservation Service (NRCS/USDA) in designing and executing research to study water quality issues within the state. Research studies were undertaken to study the wetland processes and water quality of North Florida, develop a Biotic Integrity Index for forested ecosystems and to monitor the water quality in the Apalachicola River Basin in North Florida.

2. Brief description of the target audience

Coastal area residents, small and limited resource farmers, natural resources extension specialists, environmental protection personnel, aquatic biology scientists, wetland researchers, local, state and federal agencies.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	55	20	10	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	1

Patents listed

Multi-element Scanning Thermal Analysis (MESTA)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	4	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Research publications Grant Proposals Submitted and Funded Dissemination of Results to Stakeholders Training of Graduate and Undergraduate Students

Year	Target	Actual
2007	0	0

Output #2

Output Measure

- Development of a biotic index for water quality and a model for salinity in wetlands

Year	Target	Actual
2007	{No Data Entered}	0

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Reduction in the amount of agriculture runoff into groundwater; Adoption of program recommendations for improving water quality; Preservation of Florida's water resources; Improved environmental stewardship; Better understanding of aquatic fauna; Well-trained graduate and undergraduate students in soil and water sciences.
2	Development of salt marsh water salinity model
3	Biotic Integrity Index Development for Forested Ecosystems

Outcome #1**1. Outcome Measures**

Reduction in the amount of agriculture runoff into groundwater; Adoption of program recommendations for improving water quality; Preservation of Florida's water resources; Improved environmental stewardship; Better understanding of aquatic fauna; Well-trained graduate and undergraduate students in soil and water sciences.

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	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
112	Watershed Protection and Management
111	Conservation and Efficient Use of Water

Outcome #2**1. Outcome Measures**

Development of salt marsh water salinity model

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Coastal environmental protection is very critical in Florida. Soil pore water salinity plays a very important role in determining the distribution of vegetation, plant productivity and biogeochemical processes in coastal marsh ecosystems and thus affects the surrounding environment. A reliable model is needed to predict such changes.

What has been done

We developed a salt marsh water salinity model by modification to several key features for different climate zones. This model was calibrated and validated using field observations.

Results

The model had a good agreement with the field observations. Our analyses indicate that the pore water salinity in a coastal marsh could be well predicted by the model and that it could help us in determining salinity distribution in a coastal marsh in response to climate change and sea-level rise.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #3**1. Outcome Measures**

Biotic Integrity Index Development for Forested Ecosystems

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The Apalachicola River Basin in north Florida is one of the top five 'Biodiversity Hot Spots' in the continental United States. US Fish and Wildlife Service, Forest Service and several environmental groups need information for better resource management and conservation efforts in maintaining the integrity of the river basin.

What has been done

Benthic samples collected from the basin were sorted, curated, identified and analyzed. A cluster analysis of the sampling data was performed to develop a matrix and a biological assessment of the watershed.

Results

As a result of our biotic survey, an inventory of aquatic insects is available as baseline data for biomonitoring activities in forested aquatic ecosystems. Species richness differences among various sampling stations were found to be largely a function of stream size. Ravine-head had far fewer species(3-7) than did lower-reach stations (20 species). The insect community structure was found to be controlled by both regional biogeographic differences and habitat differences.

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.)
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

The major external factor that affected the water quality research in FY 2007 was the prolonged drought in Florida and the southeastern United States. Many of the freshwater streams which were being monitored over the years dried-up and aquatic insect population was affected. Protection of Florida wetlands is subjected to changing government regulations.

V(I). Planned Program (Evaluation Studies and Data Collection)**1. Evaluation Studies Planned**

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

The Water Quality Program at FAMU takes an interdisciplinary approach to protect, improve and maintain water resources and quality in Florida and the Southeast. It provides information to other agencies, groups, research and extension workers and public-at-large to address similar issues. There is an excellent cooperative working relationship between the program and NRCS, FS, Florida Department of Environmental Protection and non-governmental organizations. Over the years, the program achieved the following: developed a mesh-bag method to assess soil and nutrient erosion, developed a prototype of UV-based system to decontaminate water, generated biotic index for freshwater streams and developed Best Management Practices for selected Florida crops. A well-equipped and functioning water analysis laboratory has been established. There is good track record of training students, publications and grant activities.

Key Items of Evaluation

Development of a salt marsh salinity model that can be used to predict changes in sea level, river discharge volume, tide, precipitation and temperature in coastal systems.

Development of Multi-element Scanning Thermal Analysis (META), patent is pending.

An inventory of aquatic insects (available at FAMU) as baseline data for biomonitoring of fresh water stream.

A biological assessment of water quality in the Apalachicola River Basin in north Florida

Program #3**V(A). Planned Program (Summary)****1. Name of the Planned Program**

Biological Control of Insect Pests

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
215	Biological Control of Pests Affecting Plants				100%
	Total				100%

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	2.0
Actual	0.0	0.0	0.0	3.5

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	350148
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	12394
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	192021

V(D). Planned Program (Activity)**1. Brief description of the Activity**

A permit request was submitted to USDA-APHIS to allow assessment of several foreign isolates of *Metarhizium anisopliae* and *Beauveria bassiana* against *Nezara viridula*. It is under review by APHIS. Research to better understand risk in working with entomophagous biological control agents was conducted. Studies on the biology and ecology of *Planococcus minor*, a potentially serious invasive pest was carried out in Trinidad. A digital identification tool for weevil biological control agents was released. Efforts to develop a digital identification tool for economically important weevils are continuing.

Research to assess the insect-plant interactions that may affect population dynamics, behavior and ecology of thrips in regard to tropical soda apple (an important weedy host) was initiated.

2. Brief description of the target audience

The target audience include: small-scale farmers, organic vegetable producers, organic gardeners, vegetable producers, extension workers and biological control scientists/entomologists.

The target audience for this research includes: Farmers, federal and state agencies, researchers, organic producers and conservationists across the nation. Part of the research is specifically targeted to regulators of biological control.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	150	30	50	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	3	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Identification of biological control agents against indigenous and non-indigenous pests. Development of effective and efficient IPM strategies. Research and extension publications. Training of graduate and undergraduate students

Year	Target	Actual
2007	0	4

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Better control of pest species using natural enemies; More efficient production and greater profitability; Efficient use of agricultural chemicals (pesticides) by producers; Development of better pest identification tools; Reduction in spread of invasive species; Well-trained graduate and undergraduate students in biological control research area.
2	Improved knowledge base in identification of invasive species and identification of biological control agents.

Outcome #1**1. Outcome Measures**

Better control of pest species using natural enemies; More efficient production and greater profitability; Efficient use of agricultural chemicals (pesticides) by producers; Development of better pest identification tools; Reduction in spread of invasive species; Well-trained graduate and undergraduate students in biological control research area.

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants

Outcome #2**1. Outcome Measures**

Improved knowledge base in identification of invasive species and identification of biological control agents.

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Identification of new biological control agents is needed to reduce the potential impact of invasive pests on crop plants and to reduce the risks associated with high pesticide use.

What has been done

Field studies in the Caribbean region were conducted to discover new biological control agents. USDA/APHIS personnel and port inspectors were trained to identify potential invasive pests in a workshop entitled 'Making Most of Lucid Identification Tools.'

Results

An interactive digital identification tool for weevil biological control agents was released. It covers 38 weevil species in 28 genera. The system allows for easy and accurate identification of the potential biological control agents, even by non-taxonomists. This tool is distributed free of charge to end users.

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges
- Other (Permitting Requirements)

Brief Explanation

The delay in getting permit from USDA-APHIS to import some of the entomophagous biological control has affected the progress and some of the outcomes. The permitting process is under review by APHIS and hopefully will be approved in the near future. Also, the insect rearing facilities need to be updated to meet current agency requirements.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

The Biological Control Program comprises a partnership between FAMU, the Agricultural Research Service and the Animal and Plant Health Inspection Service of the United States Department of Agriculture. The two USDA agencies have placed three scientists and three staff members at FAMU to conduct cooperative research on vegetable pests and to explore economically important biological control agents. The FAMU program receives approximately \$250,000 per year in support from the agencies. The track record of the program in training students, publications and grant activity has been outstanding. Currently, there are 4 Ph.D. and 3 MS students enrolled in this program. Several identification tools and keys for various insect groups have been released. Working with the Caribbean Invasive Species Group, the Program assisted in designing on-line tools for the port authority in Florida to quickly identify the invasive insect species before they could become a major pest in the United States.

Key Items of Evaluation

A digital identification tool for weevil biological control agents.
Four doctoral students enrolled in the Biological Control Program at FAMU.
Development of Lucid keys and other expert systems.

Program #4

V(A). Planned Program (Summary)

1. Name of the Planned Program

Statewide Goat Research Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals				10%
302	Nutrient Utilization in Animals				10%
307	Animal Management Systems				30%
311	Animal Diseases				20%
502	New and Improved Food Products				10%
601	Economics of Agricultural Production and Farm Management				20%
Total					100%

V(C). Planned Program (Inputs)

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	2.0
Actual	0.0	0.0	0.0	2.0

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	112384
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research studies were conducted to develop strategies to control parasites in young goats and also to develop effective feeding systems for weanling kids.

2. Brief description of the target audience

Small and limited resource farmers, minority farmers, extension workers, goat producers, herd-health professionals, meat goat processors, animal scientists and students.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	100	50	30	20

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Research and Extension Publications Grant proposals submitted and funded Dissemination of results to stakeholders Training of graduate and undergraduate students

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	More use of sustainable production practices; Reduction in feed and health costs; Enhanced marketable products and markets; Greater profitability and competitiveness; Well-trained graduate and undergraduate students.

Outcome #1**1. Outcome Measures**

More use of sustainable production practices; Reduction in feed and health costs; Enhanced marketable products and markets; Greater profitability and competitiveness; Well-trained graduate and undergraduate students.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	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
311	Animal Diseases
502	New and Improved Food Products
302	Nutrient Utilization in Animals
301	Reproductive Performance of Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Availability of animals)

Brief Explanation

During the reporting period, the most important external factor that affected research outcome was the long drought in the southeast US resulting in scanty growth of pasture and browse plants. Animals did not gain weight as fast as they should have. Also, it was hard to purchase animals from outside sources.

V(I). Planned Program (Evaluation Studies and Data Collection)**1. Evaluation Studies Planned**

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study

Evaluation Results

This project is in its first year of implementation and hence no evaluation was done.

Key Items of Evaluation

None

Program #5

V(A). Planned Program (Summary)

1. Name of the Planned Program

Small Farm, Value-Added Enterprises and Rural Families

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management				30%
803	Sociological and Technological Change Affecting Individuals, Families and Communities				30%
805	Community Institutions, Health, and Social Services				40%
	Total				100%

V(C). Planned Program (Inputs)

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	2.0
Actual	0.0	0.0	0.0	3.0

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	267974
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	28043
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

A study was designed and is now being implemented to better understand the role of community-based organizations and community voices which are making a difference in selected Black-Belt areas.

Research studies were conducted to develop hot pepper as a potential value-added crop for small farmers in North Florida.

2. Brief description of the target audience

The target audience for this planned program include: small / limited resource farmers, home gardeners, extension workers, rural residents and families, community groups, vegetable growers, etc.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2007	75	50	25	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	2	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Production practice options for reducing the over-reliance on chemicals; More efficient cultural practices; Increase in economic returns to small farmers; Number of families availing the program recommendations; New value-added ventures; Number of small farmers participating; Number of graduate and undergraduate trained.

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Adoption of profitable enterprises and practices; Improved quality of life for rural families; More efficient use of agricultural chemicals by producers; Increased economic returns for small farmers; Identification of new value-added enterprises; Well-trained graduate and undergraduate students.
2	Adoption of hot pepper as a value-added crop by small farmers

Outcome #1**1. Outcome Measures**

Adoption of profitable enterprises and practices; Improved quality of life for rural families; More efficient use of agricultural chemicals by producers; Increased economic returns for small farmers; Identification of new value-added enterprises; Well-trained graduate and undergraduate students.

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	0	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
803	Sociological and Technological Change Affecting Individuals, Families and Communities
601	Economics of Agricultural Production and Farm Management
805	Community Institutions, Health, and Social Services

Outcome #2**1. Outcome Measures**

Adoption of hot pepper as a value-added crop by small farmers

2. Associated Institution Types

•1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Our stakeholders have identified the need for speciality crops which would give them higher economic returns. Limited resource farmers, vegetable producers and home gardeners make continuous requests for information on propagation material and growing of hot peppers. For some producers, it has become a potential value-added crop.

What has been done

Research and extension studies were conducted to establish hot pepper as a potential value-added crop for small farmers in Florida. Specific cultural practices were devised to improve the production; markets were identified for the product and value-added products such as hot sauce, pepper mash and condiment blends were developed.

Results

The FAMU Hot Pepper program is a joint effort between research and extension and it continues to serve a broad and diverse audience in Florida. The comparative yields for various production systems have been made available to the farmers to make a prudent decision. A marketing link between the producers in north Florida and the processor in south Florida has been established.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)**External factors which affected outcomes**

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

Brief Explanation

Hot pepper production in North Florida was adversely affected by the prolonged drought and additional irrigation increased the cost of production by at least 10 percent or more. We could not raise as many seedlings for distribution to small farmers as we had done in the past.

V(I). Planned Program (Evaluation Studies and Data Collection)**1. Evaluation Studies Planned**

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

In this program, two projects were implemented. The first dealt with community based organizations and how they are making a difference in selected Black Belt communities. The project is in its first year of implementation. Oral histories have been recorded from various community based organizations and a coding system has been developed for analyzing the information.

The second project dealt with a speciality crop (hot pepper) and its potential for higher economic returns for small farmers. Evaluation of this project shows that various varieties of hot peppers are easily adaptable to north Florida conditions. The research established the best management practices for Scotch Bonnet hot peppers and provided this information to growers. Value-added products developed from hot peppers are being tested for their consumer appeal. Potential markets for hot peppers have been identified and links between producers and buyers have been established. Most of the goals proposed in the original proposal have been achieved.

Key Items of Evaluation

Growing hot peppers in north Florida.
Value-added products developed from hot peppers.
Identification of markets for hot peppers in Florida.