2008 Florida A&M University Research Annual Report of Accomplishments and Results

I. Report Overview

1. Executive Summary

During FY 2008, 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 (FAMU), 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 students. Faculty, staff and students attended the 15th Biennial Research Symposium in Atlanta, GA, entitled: 1890 Research: Sustainable Solutions for the 21st Century, with a record 35 faculty and 20 students making presentations. FAMU was successful in recruiting four Ph. D. students in entomology. All of them are currently conducting research in biological control. At least 30 publications were released during 2008. Several research workshops and field days were held. At least 30 papers were published.

Total Actual Amount of professional FTEs/SYs for this State

Year:2008	Extension		Research	
	1862	**1890**	**1862**	**1890**
Plan	0.0	0.0	0.0	18.0
Actual	0.0	0.0	0.0	16.0

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
- 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 2008 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. Stakeholders and the 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 accomplishments was the active participation of the Research Advisory Group which provided input regarding the relevancy of the program. 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 underserved 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 outcomes 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. Meetings with 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 their input. The survey results obtained in the past two to three 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 underserved clientele with them, thus giving researchers an opportunity to interact in person with this non-traditional group and collect their 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 and the "Plan of Work." Because of stakeholder input, new initiatives were developed in Biofuels, Food Safety and Specialty Crops. Necessary 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, developing new cooperative initiatives with external groups, and guiding graduate research.

Brief Explanation of what you learned from your Stakeholders
The major concerns and needs that FAMU's stakeholders expressed included: North Florida's need for better herd health protocol for raising meat goat animals and reducing production costs; Goat producers need for more efficient and economic management of small goat herds; Grape growers desire for more information on improved cultural practices for maintaining vineyards, the availability of new grape varieties, and assistance in enhancing the shelf life of Florida grape products; Federal and state agencies interest in learning more about FAMU's latest research in biological control and how to transfer it to the field for better control of invasive pests; Small farmers' need for specialty crops; and Environmental groups' interest in preserving water quality.

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	1652135

2. Totaled Actual dollars from Planned Programs Inputs

	Extension		Research	
	Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
Actual Formula	0	0	0	1239102
Actual Matching	0	0	0	1239102
Actual All Other	0	0	0	0
Total Actual Expended	0	0	0	2478204

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: 2008	Extension		Research	
	1862	**1890**	**1862**	**1890**
Plan	0.0	0.0	0.0	5.0
Actual	0.0	0.0	0.0	4.0

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	311303
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	311303
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

The Center conducts basic and applied research in grape breeding and genetics, biotechnology and proteomics research, vineyard management and cultural practices research, and small fruit improvement and evaluation research. The Center conducts extension and outreach activities to promote grape growing in the state, assists grape growers and small farmers to become more efficient in their operations, increases the general public's awareness of FAMU's viticulture program, and contributes to enhancement of academic programs, including graduate and undergraduate student training in CESTA.

2. Brief description of the target audience

The target audience includes:

- The Florida grape growers, Florida farm wineries, small and limited resource farmers, entrepreneurs, and households interested in grapes and small fruits.

- Students in the College of Engineering Sciences, Technology and Agriculture.

V(E). Planned Program (Outputs)

1. Standard output measures

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

Year	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
	Target	Target	Target	Target
Plan	1100	2000	400	500
2008	750	1500	300	300

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	1

Patents listed
A new fresh fruit muscadine cultivar, 'Majesty'.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	4	6	
2008	0	7	7

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. Increasing the number of grape growers in Florida over the 2007 base- long term measure

Year	Target	Actual
2008	10	10

Output #2

Output Measure

- Professional presentations

Year	Target	Actual
2008	{No Data Entered}	11

Output #3

Output Measure

- Extension and Outreach 1. Grower Field Day 2. Grape Production and Pruning Workshop 3. Grape Harvest Festival

Year	Target	Actual
2008	{No Data Entered}	3

V(G). State Defined Outcomes

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V. State Defined Outcomes Table of Content

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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 ecnomic returns for Florida Grape Growers; Increased acreage of grapes for fresh fruit and processing; Better trained graduate and undergraduate students in viticulture and plant biotechnology.
2	1.New hybrids and selections (2000). 2. Identification and closing of new genes and genetic markers (6). 3. Increased grape acreages in Florida (25 new acres). 4. Increased production and sale of Florida wines (20,000 gallons). 5. Increased number of persons attending and participating in Field Day and Harvest Festival (550 persons). 6. Increased number of graduate and undergraduate students trained in the Center (5 Graduate/8 Undergraduate students).

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 ecnomic returns for Florida Grape Growers; Increased acreage of grapes for fresh fruit and processing; Better trained graduate and undergraduate students in viticulture and plant biotechnology.

2. **Associated Institution Types**

   •1890 Research

3a. **Outcome Type:**

   Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	50	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
205	Plant Management Systems
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
201	Plant Genome, Genetics, and Genetic Mechanisms

Outcome #2

1. **Outcome Measures**

   1.New hybrids and selections (2000). 2. Identification and closing of new genes and genetic markers (6). 3. Increased grape acreages in Florida (25 new acres). 4. Increased production and sale of Florida wines (20,000 gallons). 5. Increased number of persons attending and participating in Field Day and Harvest Festival (550 persons). 6. Increased number of graduate and undergraduate students trained in the Center (5 Graduate/8 Undergraduate students).

2. **Associated Institution Types**

   •1890 Research

3a. **Outcome Type:**

   Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

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

Issue (Who cares and Why)

The Center was established by the FloridaÂ's Legislature to conduct research and provide service to assist in the development of FloridaÂ's grape and wine industry because of the economic importance of grape growing and wine consumption in the state. The CenterÂ's research projects and accomplishments have made it a leader for warm climate grape research in the southeastern region and contributed to the development of FloridaÂ's grapes and wine industry. FAMU has the largest germplasm collection of muscadine grapes and the only muscadine grape breeding program in the whole country.

What has been done

1. Increased optimism and interest in Florida grapes from public and grape growers.
2. Increased awareness and appreciation about FAMU and the viticulture program.
3. Increased number of participants at the Annual Grape Harvest Festival.
4. Increased number of graduate and undergraduate students working on viticulture and small fruit research topics.
5. Helped promote the overall quality of academic programs in CESTA through research projects conducted at the Center and faculty scholastic performances.
6. Helped enhance the research productivity of faculty in CESTA through collaboration and facilities support. Sustained faculty productivity through research publications, professional presentations and research grants received.
7. Increased collaboration between the Center and other academic units, including the DRS, in FAMU and public schools.
8. Sustained industry support for Center through research funding received from Grape Growers Association/ Viticulture Advisory Council.

Results

1. Produced an average of 2,500 new hybrids in the breeding program, and have 50 advanced selections under evaluation.
2. Developed a contemporary mutagenic approach to develop seedless muscadine grapes that is currently being used at the Center.
3. Developed a biotechnology cell culture technique to produce antioxidants from muscadine grapes in vitro. This approach has great commercial and economic promise and the technique is being tested and evaluated by other researchers.
4. Identified six new genes in muscadines that are related to disease tolerance. Four of the genes are unique to muscadines.
5. Muscadine seed extracts have great anticancer properties. Research is continuing to identify solvents to maximize the extraction process.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
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
- Appropriations changes
- Public Policy changes
- Government Regulations
- Other (Loss of Faculty Position)

Brief Explanation

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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

Satisfactory

Key Items of Evaluation

The evaluation was based on:

- Mission, goals and objectives.

- Contribution to academic programs in CESTA

- Research and extension productivity

- Scholarly and professional activities

- Accomplishments

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				25%
112	Watershed Protection and Management				25%
133	Pollution Prevention and Mitigation				25%
136	Conservation of Biological Diversity				25%
	Total				100%

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	**1890**	**1862**	**1890**
Plan	0.0	0.0	0.0	6.0
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	349950
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	349950
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

An Advisory Council of 11 members representing various stakeholders was established to guide the water quality research program. Study sites were selected for quantifying soil erosion and the resulting nutrient loss in agriculture and lands in the Apalachicola River Watershed. Effects are underway to develop databases, decision support tools and techniques for natural resource management in north Florida watersheds. The Center for Water Quality continues to monitor the aquatic insect biodiversity and biological assessment of aquatic insect biodiversity and the biological assessment of aquatic ecosystems in north Florida. Research results were disseminated through publications, meetings with stakeholders and presentations at scientific meetings. The center received support from NOAA, FS, Florida Department of Fish and Wildlife, and NRI/CSREES.

2. Brief description of the target audience

The target audience included: Coastal population of North Florida, agricultural producers, natural resource extension specialists, The Nature Conservancy, environmental protection personnel, forest land owners, aquatic biology scientists, wetland researchers, students, and 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

Year	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
	Target	Target	Target	Target
Plan	250	500	150	200
2008	250	400	150	200

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed
Multi-element Scanning Thermal Analysis (MESTA), pending

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	3	5	
2008	2	4	6

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Target	Actual
2008	0	0

Output #2

Output Measure

- Reduction of NPS pollution entering surface and groundwater; Preservation of coastal wetlands; Improvement of water quality and enhanced sustainability of Florida's water resources; Availability of biotic indices for predicting water quality.

Year	Target	Actual
2008	{No Data Entered}	30

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 stewerdship; Better understanding of aquatic fauna; Well-trained graduate and undergraduate students in soil and water sciences.
2	Reduction of NPS pollution entering surface and groundwater; Preservation of coastal wetlands; Improvement of water quality and enhanced sustainability of Florida's water resources; Availability of biotic indices for predicting water quality; Better- trained undergraduate and graduate students in soil and water sciences.

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 stewerdship; 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
2008	30	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**

    Reduction of NPS pollution entering surface and groundwater; Preservation of coastal wetlands; Improvement of water quality and enhanced sustainability of Florida's water resources; Availability of biotic indices for predicting water quality; Better- trained undergraduate and graduate 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
2008	{No Data Entered}	0

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

   Issue (Who cares and Why)

Water quality and quantity are of major concern in the rapidly growing areas of north Florida. The major watershed in this area, Apalachicola River system, is threatened by prolong droughts, NPS pollution and real estate development in coastal areas. It's critical that we understand the ecosystems in this watershed and thus, help in preserving the wetlands and fresh water streams to sustain agriculture, forestry and overall growth of the region.Coastal environmental protection is very critical in Florida because of the large population living close by. The results of this study increase our capability to forecast and asses risk of coastal environment due to changes of land use and climate.

What has been done

Florida A&M University Center for Water Quality has been involved in wetland research for more than 20 years. During this period, we have characterized the wetlands, both fresh and salt water, their soils, vegetation and the fauna. We are now studying the nutrient cycling in the wetlands and how each of the nutrients, N, P and S are recycled in the system. We studied the basic process of microbial sulfate reduction in freshwater and saltwater wetland systems and applied the results to the understanding of related environmental issues such as hydrocarbon and heavy metal remediation. To better understand the watershed ecosystems, a comprehensive inventory of aquatic insects of the middle and upper corridors of the Apalachicola River Basin was conducted and completed.

Results

Our study showed that the ratio between the total metal and the total inorganic reduced sulfur is a good indicator of metal bioavailability in wetlands and sediments. We developed a simple and rapid Cu sulfide index to quantify the ratio R, which can be used as a convenient chemical indicator for metal toxicity and bioavailability in wetlands and sediments. A relational database (Paradox 10) with GIS applications has been developed for easy species retrievals of the insect fauna in the Apalachicola River Basin. We determined the extent of sulfate reduction in two fresh water wetland soils, i.e., black gum (Nyssa biflona) swamp and titi (Cliftonia monophylla). The faunal diversity for the sampling sites within the watershed depended on the stream size. The relative high diversity of the insect fauna of streams reflects a pristine condition of the areaÃƒÂ‚,Ã,Â's aquatic ecosystem. Thus, we are able to estimate and predict the quality of water within a river system or that of a fresh water stream based on the aquatic insect population.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
136	Conservation of Biological Diversity

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Natural Disasters (drought,weather extremes,etc.)
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

External factors which affected outcomes
·   Assess to study sites in the Apalachicola River Basin area
·   Prolong drought in North Florida
Brief Explanation
Some of the study sites in the wetland areas and the Apalachicola River Basin were inaccessible due to weather conditions or some other reason.

Low water flow in the rivers and streams of North Florida due to prolong drought affected some of the outcomes, because of interruption in sampling periods and changes in vegetation and the fauna.

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)
- Other (1. Characterization of fresh and salt water wetlands and understanding the fate of nutrients in such ecosystems. 2. Sulfur chemistry and heavy metal toxicity in wetlands and sediments. 3. Determination of insect fauna to predict water quality of fresh wa)

Evaluation Results

Developed various models to predict persistence and fate of N, P, and S in wetlands. P flux between water and sediment in freshwater wetlands is dictated by the microbial biogeochemical processes rather than simple chemical/physical P processes. A simple and rapid Cu sulfide index can be used to predict the metal toxicity and bioavailability in wetlands. Developed a comprehensive inventory of aquatic insects of the middle and upper corridors of the Apalachicola River Basin.

Key Items of Evaluation

Development of indices predicting water quality in wetland and fresh water streams.
Seven refereed publications.
Grant proposals written and funded
Students trained in soil and water sciences
Interaction with stakeholders.

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: 2008	Extension		Research	
	1862	**1890**	**1862**	**1890**
Plan	0.0	0.0	0.0	3.0
Actual	0.0	0.0	0.0	4.0

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	336638
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	336638
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

The program activities included implementation of research, training and outreach activities. The research focused on several aspects of the management of native and non-native pests. 1) Regulatory aspects of classical biological control: Stakeholder perceptions of risk communication during the permitting process for entomophagous biological control agents were assessed. 2) Non-native pests: Research on the biology and ecology of *Planococcus minor,* an important polyphagous, high risk invasive pest threat for the United States was conducted in Trinidad. 3) Digital identification keys: A digital identification key for weevil biological control agents of weeds in North America was completed and deployed on the internet. Key components of a digital identification tool for weevils of economic importance were developed. A workshop entitled: 'Making the Most of Lucid Identification Tools' was organized in collaboration with USDA Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology (APHIS PPQ CPHST) partners. 4) Development of IPM and biological pesticides: The relevant APHIS permit allowing laboratory research to assess the potential for development of isolates of *Beauveria bassiana* and *Metarhizium anisopliae* as biopesticides for the control of *Nezara viridula* was received. Primary data on pest management constraints facing small scale farmers' low input and organic farmers in North Florida were collected as a first step in the development of sustainable strategies. Graduate and undergraduate students were trained and research workshops were organized.

2. Brief description of the target audience

The target audience includes: Farmers, federal and state agencies, researchers, and 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

Year	Direct Contacts Adults Target	Indirect Contacts Adults Target	Direct Contacts Youth Target	Indirect Contacts Youth Target
Plan	150	200	50	100
2008	150	300	40	80

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	2	3	
2008	3	5	8

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
2008	0	0

Output #2

Output Measure

- 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.

Year	Target	Actual
2008	{No Data Entered}	50

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	Reduction in entry and spread of invasive species; 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; Well trained graduate and undergraduate students in pest management.

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
2008	50	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
215	Biological Control of Pests Affecting Plants

Outcome #2

1. **Outcome Measures**

    Reduction in entry and spread of invasive species; 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; Well trained graduate and
    undergraduate students in pest management.

2. **Associated Institution Types**

    •1890 Research

3a. **Outcome Type:**

    Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{No Data Entered}	50

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

Issue (Who cares and Why)

Pests are a major constraint to crop production and development of effective solutions that minimize use of
chemicals is a priority for farmers and consumers. Invasive species are a major threat to the nationÂ’s agriculture
and environment and are therefore a priority to regulatory agencies and all citizens.

What has been done

Research was conducted on important invasive pest threats as well as established pests, to generate knowledge on biology, ecology and management. Several lucid identification tools for key taxa are under development.

Results

Generated the necessary knowledge needed to develop a management program against Planococcus minor, a high risk pest threat to the United States. Completed a stakeholder survey on risk communication during the importation of entomophagous biological control agents. This knowledge will be used to improve the importation process. Electronic tools for invasive weevils and Eumolpines of economic importance is near completion. Research to identify key pest management constraints for North Florida small scale vegetable growers is underway. Three Ph.D. and 4 M.S. students are undergoing training.

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

Brief Explanation

No adverse factors affected the outcomes.

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
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Key Items of Evaluation
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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
307	Animal Management Systems				60%
311	Animal Diseases				40%
	Total				100%

V(C). Planned Program (Inputs)

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

Year: 2008	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	83794
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	83794
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

During the 2007□2008 funding year several winter forages (i.e., deermix, ryegrass, rye and oats) were evaluated. In addition, towards the end of 2008, data was collected on four summer forages which included pearl millet, bahiagrass , cowpea and alyceclover were also evaluated. Data was collected on body weight from fifty kids managed in four grazing systems. Preliminary data was made available at several training programs (i.e. goat field day, Certified Master Goat Program) held at Florida A&M University. Producers were informed on which grasses and legumes grow best in North Florida and their impact on growth performance in young kids. During the training program, producers were also trained on how to make efficient use of their pastures, how to rely on a forage based system to reduce the cost of feeding the herd or flock, how to utilize a rotational system to reduce diseases or parasites while preventing soil erosion, how to develop a sound biosecurity plan (i.e., sanitation, quarantine, quality assurance, traffic control) on the farm to prevent the onslaught of disease and parasites, and how to address food safety issues on the farm to prevent disease outbreaks in the food chain. On□farm consultations were also conducted. Recommendations were made on utilizing the various forages species that are currently studied. Producers were advised on the benefits of rotational grazing, forage based production systems, and developing a biosecurity program for their farm. They were also informed on the appropriate grazing height and stocking rates for goats. Surveys were developed to determine the demographics of the producers that attended the meeting, to evaluate what the producers thought of the information presented to them in the training programs, and to determine which practices they plan to adopt on their farms. The results of the surveys will be made available through publications within the next reporting period, and the parasite study will start in the summer of 2009. Other activities on this project include the development of one extension publication (Nurse, G. and F. Okpebhola. 2008 Module 10 – Pasture Production Utilization In: The Certified Master Goat Program. Florida A&M University, Cooperative Extension Program. Tallahassee, FL 32307). Additional publications will be developed as more research based information becomes available from this project.

2. Brief description of the target audience

Underserved, minority, small and limited resource goat producers.

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	250	200	50	100
2008	234	190	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	3	2	
2008	1	0	1

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
2008	0	0

Output #2

Output Measure

- 1. Adoption of sustainable production and management practices. 2. The number of underserved minority, small and limited resource producers that adopt four or more sustainable production and management practices (i.e., developing a forage based production, biosecurity, effective parasite control methods) on their farm to reduce economic losses and to manage the farm more efficiently. 3. Provide research based information growth performance of goats maintained on selected forages to reduce the cost of feeding the herd by relying on a forage based production system. 4. Provide research based information on effective parasite methods in goats to reduce economic losses to producers.

Year	Target	Actual
2008	{No Data Entered}	5

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.
2	1. The adoption of sustainable goat production and management practices. 2. Increased research based information on goats. 3. Small, limited resource, minority, and underserved goat producers.

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 Condition Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	30	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
307	Animal Management Systems
311	Animal Diseases

Outcome #2

1. **Outcome Measures**
    1. The adoption of sustainable goat production and management practices. 2. Increased research based information on goats. 3. Small, limited resource, minority, and underserved goat producers.

2. **Associated Institution Types**

    •1890 Research

3a. **Outcome Type:**
    Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{No Data Entered}	271

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

Issue (Who cares and Why)

Increased the number of underserved minority, small and limited resource producers that adopt four or more sustainable production and management practices (i.e., developing a forage based production, biosecurity, effective parasite control methods) on the their farm to reduce economic losses and manage the farm more efficiently.

Increasing the amount of research based information on forage based production systems for goats in the state of Florida and will begin to find better methods for controlling parasites in goats.

1. Small, minority, underserved and limited resource goat producers.
2. Extension agents and specialists
3. Department of Agriculture and other state and federal agencies
4. Community based organizations
5. According to Bowman (2003), meat goat production continues to be one of the fastest growing livestock industries in the U.S and has proven to be a profitable enterprise for many small farm families. The demand for goat meat among ethnic consumers has continued to increase. There has also been increased evidence of significant health benefits from the consumption of chevon or cabrito.   Because of this increased demand among a diverse population of consumers, many small and limited resource producers are raising goats as an alternative source of income. However, producers in many cases still lack the necessary skills and knowledge to adequately produce quality meat goat products to earn a profit. Other constraints in the industry include internal parasites which are a major problem for goat producers in the southeast. Furthermore, there are only a few medications labeled for use in goats. The cost of feeding the animal and losses due to parasites in goats has caused severe economic losses in the goat industry each year.

What has been done

Training meetings, research and publications have been developed.

Results

Study is still on-going and all data has not been analyzed. Some information will be made available in late 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
311	Animal Diseases

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Natural Disasters (drought,weather extremes,etc.)
- Appropriations changes
- Other (Low kidding rates of does; death of project animals in treatment group; producers not adopting recommended practices on-farm.)

Brief Explanation

Current kidding rates vary from season to season, so enough animals may not be available from year to year for study. Death of project animals may occur if the goats do not respond to parasite treatments or death may occur from natural causes or other causes. Current grazing systems are not irrigated, so when the dry season occurs the grasses may not grow adequately. Most of the funding for this project is taken up in salary, so there is limited funding to expand upon this research. There is a chance that producers may not adopt the recommended production and management practices on their farm due to certain barriers.

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

1. Evaluation Studies Planned
- Before-After (before and after program)
- During (during program)

Evaluation Results
Study is on-going

Key Items of Evaluation

· Growth performance of kids managed under various grazing systems.

· The effects of various anthelimintics methods on parasites in goats.

· The acceptance and adoption of recommended sustainable production practices on-farm.

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
803	Sociological and Technological Change Affecting Individuals, Families and Communities				40%
805	Community Institutions, Health, and Social Services				60%
	Total				100%

V(C). Planned Program (Inputs)

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

Year: 2008	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	157417
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	157417
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

Activities for this year have focused upon assisting underserved residents throughout the state in securing and managing assets that would be instrumental in the response to natural disasters and with land retention (foreclosures, land default). Additionally priority areas for this past year have addressed preservation of natural resources in coastal communities. The church as a resource for community development and educational enhancement is also being developed. We continue to work with limited resource constituents in asset building and identifying underserved minorities.

2. Brief description of the target audience

The target audience for this work has been community based organizations, community leaders-including the church, health care providers and underserved citizens of Florida.

V(E). Planned Program (Outputs)

1. Standard output measures

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

Year	Direct Contacts Adults Target	Indirect Contacts Adults Target	Direct Contacts Youth Target	Indirect Contacts Youth Target
Plan	250	200	100	100
2008	150	250	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	2	1	
2008	0	1	1

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
2008	0	0

Output #2

    Output Measure

- Identification of community-based organizations Identification of services provided by Churches

Year	Target	Actual
2008	{No Data Entered}	2

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 profitable enterprises and practices; improved quality of life for rural families; increased economic returns for small farmers; increased access to program support; identification of new value added enterprises; well trained graduate and undergraduate students.

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 Condition Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	20	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
805	Community Institutions, Health, and Social Services
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #2

1. **Outcome Measures**

   Adoption of profitable enterprises and practices; improved quality of life for rural families; increased economic returns for small farmers; increased access to program support; 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
2008	{No Data Entered}	250

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

   Issue (Who cares and Why)

   The underserved population of Florida has been negatively impacted by the economic and agricultural trends requiring greater attention to their needs. Without support provided by these programs, the populations will continue to lag behind in economic and sociological development.

What has been done

Workshops and conferences as well as one-on-one training has been offered to stakeholders.

Results

Underserved populations have been identified and programs are being implemented to meet specific needs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
803	Sociological and Technological Change Affecting Individuals, Families and Communities

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Competing Programmatic Challenges

Brief Explanation

The state of Florida was subjected to both natural disiasters (hurricanes and tropical storms) and economical downturns which impacted negatively on our clientele. Participants has competing activities and events ocurring at the same time as scheduled research activities.

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
Evaluations are still ongoing.

Key Items of Evaluation
Black Farmers; Community-based Organizations; Asset Building and Underserved Populations.