

2011 Florida A&M University Research Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

This annual report provides an overview of the accomplishments of the Florida A&M University (FAMU) planned research programs during 2011. These activities were carried out through the College of Engineering Sciences, Technology and Agriculture which was renamed the College of Agriculture and Food Sciences (CAFS) during 2011. As in previous years, the annual report for the FAMU Extension Program was prepared jointly with the University of Florida and is therefore not covered in this report. However, because of the integrated nature of some of the research and extension activities, it is inevitable that some extension activities especially those that are driven by research faculty will also be reported here. Furthermore, the research, extension and teaching programs continue to forge strong integrated linkages to ensure effective delivery of the mission. During 2011, the planned programs continued to address a range of critical issues and needs identified by stakeholders. The cooperative partnerships between FAMU and its stakeholders and cooperators including: state and federal agencies, industry and non-governmental entities were further enhanced. Among some of the key stakeholders and cooperators engaged were: Florida Department of Agriculture and Consumer Services, Florida Farm Bureau, Florida Grape Growers Association, Florida Goat Producers, Florida Fruit and Vegetable Growers, Tall Timbers (an environmental group), North Florida Small Farmers Cooperative, the US Department of Agriculture - Agricultural Research Service and Animal and Plant Health Inspection Service, and many other entities. FAMU's research program was organized around five programmatic areas which address critical issues at the state and national levels as follows: Viticulture and Small Fruits Research, Preserving Water Quality of North Florida Watersheds, Strategic Research for the Management of Invasive Pest Species, Rural Development and Statewide Goat Research and Bioenergy Research. As part of the efforts to deal with budget shortfalls, FAMU closed the Public Health Entomology, Research and Education Center thus bringing this program to an end. A summary of the activities and results from each of the active program is provided below.

Viticulture and Small Fruits Research: The Viticulture and Small Fruits Research Program is an active partner in promoting the grape industry within the state. The program is implemented by the Center for Viticulture and Small Fruit Research which conducts a wide range of research projects to address industry needs and concerns, and provides service to help stakeholders in the industry. The Center also conducts research in non-traditional small fruits, including chestnuts, for North Florida. The faculty is involved in statewide extension and outreach activities as well as in teaching and training graduate and undergraduate students. During 2011 research efforts were focused in the following areas: development of new and improved grape cultivars for Florida, screening for fruit rot, downy mildew and crown gall diseases in muscadine grapes, evaluation of Florida hybrid bunch grapes germplasm for disease resistance, identification of best management practices for Florida grapes and small fruits, identification of important viticulture genetic markers, identification of proteins and metabolites relating to disease tolerance and important physiological functions of grapes, identification of constraints in sugar metabolism in muscadine grapes, evaluation of gene expressions and differential to determine disease tolerance in muscadine and Florida hybrid bunch grapes, evaluation of the effects of water stress/drought on biochemical and molecular changes in grapes, evaluation of triploids and tetraploids for development of seedless muscadine grapes, development of disease and virus free explants of muscadine and bunch grapes for the clean vine project, invitro evaluation of strains of subepidermal cells of muscadine pericarp

for use as a source of flavonoid compounds, development of new value-added products from grapes and small fruits and evaluation of chestnuts and non-traditional small fruits, blackberries and raspberries for North Florida. During 2011, 7 papers were published. In addition, 1,500 hybrid seedlings from the breeding program were produced, and 73 hybrid selections of seedlings. Our patent application on the production of in-vitro strains of subepidermal cells of muscadine grapevine pericarp for use as a source of flavonoid compounds is pending and research on value-added products has yielded encouraging results culminating in the submission of three patent applications for the production of nutraceuticals. The program was also continued contributing to the teaching program through support of graduate and undergraduate student research and training. In 2011, two students graduated from the M.S. program. The program was also involved in a range of extension and outreach activities including: workshops, grape field days, IPM field day, seminars and a grape harvest festival. Stakeholder and public participation at these events has been strong.

Preserving Water Quality of North Florida Watersheds: The mission of the Center for Water and Air Quality is to protect, improve, and conserve the quality and the quantity of Florida's water resources; enhance sustainable water management practices; and, address stakeholder needs in managing and mitigating water pollution problems. During 2011, the Center programs were directed towards: studying the effects of land cover/land use changes in the Apalachicola River Watershed on soil erosion and water quality and the biodiversity in freshwater streams within the watershed. This program was funded through the Evans-Allen Funds. However, the faculty was successful in securing several additional grants to address the goals and objectives of the program. The most significant being the NASA funded project on extending the use of the Best Management Practices (BMPs) to reduce fertilizer application through the use of modeling tools. We were successful in developing an interface between the NASA's COAST model and the WAM (Watershed Assessment Model) for use by our stakeholders in selecting the most judicious combinations of BMPs to reduce excessive N and P runoff into the river systems. This tool is now being tested on a more extensive level. Through two Capacity Building Grants, we have built a fully functional Soil and Water Analysis Laboratory, which is being used for our research project as well as by the graduate and undergraduate students. A LIMS Database software has been installed to track soil and water analysis data in the center. The use of such a system was demonstrated to the college-wide audience and other 1890 universities. The Center Faculty worked on a new curriculum for the graduate program in Soil and Water Science. The Center actively recruited graduate students in this new program which now has 4 students pursuing their Master's degree. Five undergraduate students from Agronomy, Forestry and the Biological and Agricultural Systems Engineering were provided experiential learning opportunities in the center laboratories. We facilitated for students from K-12 to conduct their class projects on water quality problems. The Center faculty in conjunction the Florida Department of Agriculture and Consumer Services conducted a workshop for stakeholders on understanding and selection of Best Management Practices involving proper use of fertilizers, pesticides, irrigation and various cultural practices. Twenty five farmers and extension paraprofessionals benefitted from the workshop. In 2011, we further strengthened our collaboration with stakeholder groups, NGOs, other 1890 and 1862 institutions and state and local agencies. Research accomplishments in the third year of the Evans-Allen funded project on the Apalachicola watershed study included: installation of Mesh-bags and the mesh sheet at the study site in Marianna, Florida (Mears Farm). These experiments were conducted to measure soil erosion and nutrient loss under different slopes and a fallow-peanut-cotton rotation. Differential GPS technology was used to record the micro topography of the farm and connect the slopes of similar magnitudes. The capability of observing soil erosion under un-obstructed natural field runoff conditions is a critical gap in soil erosion research information. The deployment of mesh-bag method in our study can help to fill this gap and advance our understanding of soil and nutrient erosion processes in a watershed. The results of the soil erosion study show significant differences between the amount of top soil moved from high, medium and low slopes, respectively, under fallow conditions. Such soil movement diminished under the peanut crop. The nutrient loss along with soil data will be reported in the next report, once the N and P analysis are completed. The biodiversity of aquatic fauna found in two freshwater streams in the Apalachicola watershed may be used as a good indicator of stream water quality and help in developing

plans to prevent the future degradation of the watershed.

Strategic Research for the Management of Invasive Pest Species: Research under the planned program, 'Strategic Research for the Management of Invasive Pest Species' is implemented by the Center for Biological Control. In 2011, the Center began implementing its third five year strategic plan. The Center's research is focused in two key areas: management of invasive alien species (IAS), and development of integrated pest management. The Center's focus on these two areas recognizes that an effective approach for dealing with IAS requires a multi-pronged, approach that emphasizes prevention in the first instance. Should alien invasive species gain entry, then emphasis switches to early detection and eradication, and as a last resort, management. Therefore the strategic research on IAS cuts across the spectrum from prevention to management and restoration, with a particular focus on the following: Offshore pest mitigation, development of ecologically based management of invasive insect pests and weeds; Development of electronic diagnostic tools and resources (Expert Information Systems) for insect identification; Assessment of the economic impact of IAS and improving the safety of biological control. In addition to the Evans-Allen funds, the program of work is also supported through other grants from NIFA and cooperative agreements with APHIS and ARS. The Center is also actively involved in training undergraduate students. During 2010, the Center hosted 10 graduate and 5 undergraduate students, who are intimately involved in the research activities. Center faculty also participated in several training workshops and other extension led activities.

During 2011 the work funded under the Evans-Allen program was focused on two core areas: offshore research on high risk species and onshore management of established invasive species. Offshore research focused on generation of data on, surveillance, monitoring, biology, ecology and management of four high risk pest threats (*Planococcus lilacinus*, *Rhyncophorus ferrugineus*, *Oxycarenus hyalinipennis*, *Tuta absoluta* and *Anastrepha grandis*) in Dominican Republic, Curacao, and Aruba and Panama. Efforts were continued to process and identify mealybugs collected during extensive surveys in the Dominican Republic during the previous year. Initial surveys were conducted in Kenya to document occurrence of *O. hyalinipennis* and to identify potential areas for conducting exploratory surveys for natural enemies. Studies on *R. ferrugineus* were continued in Aruba and Curacao with efforts being targeted on development of trapping methods. Studies to generate data on, surveillance, monitoring, biology, ecology and management two new pest threats, *T. absoluta* and *A. grandis* were initiated in Panama. Other research focused on two invasive weeds which have become established in Florida, tropical soda apple (TSA), *Solanum viarum* and hydrilla, *Hydrilla verticillata*. With regard to TSA, studies were conducted to determine if previous feeding by Tortoise beetle, *Gratiana boliviana* a biological control agent used against the weed had adverse effects to beet army worm and thrips, resulting in reduced oviposition preference for induced foliage, and decreased performance and survival on induced foliage. A final survey to assess the status of hydrilla was conducted on the upper 1.5 miles of the river of the Wacissa Springs Group. A subjective scale of 0-3 was used with 0 indicating hydrilla undetected and 3 completely choked. Cultures of hydrilla were also established in the laboratory from Wacissa Big Blue Spring, Wacissa #2 and Garner Spring. Additionally, laboratory colonies of the stem mining midge, *Cricotopus lebetis* (Diptera: Chironomidae) were also established.

Rural Development and Statewide Goat Research: The rural development research program is focused on providing science based research information to rural communities as well as limited resource citizens of urban communities in collaboration with community based as well as faith based organizations. During 2011, the program was focused on community development, asset building, hunger, homelessness and climate change. In addition, an environmental education and asset curriculum was developed in collaboration with community based organizations and university personnel. This curriculum may be used across the life span to develop a community driven process of preserving the environment and acquiring assets. Participants in these meetings were able to see how the decisions they made impacted other areas in their county. Each of the programs/activities provided opportunities in those targeted audiences to improve their acquisition of services and or facilitate their engagement with their respective audiences.

Bioenergy Research: During 2011, the Bioenergy Research Program carried out integrated activities that linked closely with both extension and teaching. In particular, the group focused its activities in two strategic areas: 1) Biofuels, and 2) Bio-products. The research activities focused on: feedstock development, conversion processes and system integration. These three enabling activities are critical to the development of newly emerging national industries for biofuels and bio-products. The feedstock development work focused on agroforestry evaluation of fast growing tree species. Activities under conversion processes were directed at understanding microbial hydrolysis mechanisms. System integration activities focused on growing algae in waste water. The potential for positive state and national impact is tremendous, as Florida has the abundant biomass resources. By using waste water to grow algae and agroforestry techniques for feedstock development, a biomass initiative will spawn a brand new industry in Florida. Small farmers could generate new incomes by using thousands of acres now largely considered wastelands. In addition, technologies developed at CAFS can be transferred to our industrial partners for commercialization, which will be a significant boost towards energy independence. In addition to the research activities, the program also provided opportunities for experiential training for both undergraduate and graduate students. In addition, two biofuels conferences were held on the FAMU campus in 2011. These outreach priorities were geared toward farmers, landowners, processors, stake holders, advocacy groups and consumers. Priorities included enhancing public familiarity and exposure to bio-based industries and sustainability concepts to create more informed producers and consumers.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	3.1	0.0	23.0
Actual	0.0	0.0	0.0	24.0

II. Merit Review Process

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

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

2. Brief Explanation

In order to ensure maintenance of a high quality and accountability of its research program, FAMU has implemented a revised process for the review and monitoring of research projects funded under the Evans-Allen program. Project ideas are developed from the bottom up, with ideas being generated by individual or groups of faculty in response to stakeholder needs. Center Advisory Councils play an important role in identifying priorities. Project ideas fall within the priority areas identified in the university's strategic plans. Additionally, the project ideas are also linked to priority areas for USDA and/or the state of Florida. Full proposals are developed by faculty/unit leader teams and once completed these are subjected to a peer review process. The main objective of the process is to assure quality, scientific merit, feasibility and impact of the proposed research. The review process proceeds through a series of steps. First, a

preliminary review of the proposed research is made by the Research Director and discussions are held with the Principal Investigators regarding the relevance and the impact of the research on stakeholders. This is followed by a comprehensive review by three or more subject matter specialists including at least one external reviewer. The internal reviewers are drawn from among CAFS faculty while external reviewers may be drawn from among 1890 and 1862 scientists, CARET representatives, commodity associations, extension workers and other stakeholders. Comments or suggestions made for improvement of the proposal are then incorporated into the revised proposal.

Planned programs are monitored through annual evaluation which will include review by Center Advisory Councils as appropriate. The five year POW modified every year to ensure it continues to meet the requirements and the needs of the program. During 2011, planned programs were reviewed by the different Center Advisory Councils. In addition, the programs were discussed with different stakeholder groups such as the Florida Viticulture Advisory Council Meeting and at the annual meetings of the Florida Grape Growers Association.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey specifically with non-traditional groups
- Survey of selected individuals from the general public
- Other (Contact traditional under -served clientele)

Brief explanation.

Given the wide scope of FAMU's stakeholders, a broad based approach was taken to solicit their input through planned events, unscheduled activities and personal contacts. The primary links with stakeholder groups were maintained through specific research programs/centers. Thus, each of the three main research centers maintained an active Advisory Council, which typically comprised of representatives of key stakeholder groups. Thus the Advisory Council of the Center for Viticulture and Small Fruits comprises representatives from commodity groups such as the Florida Grape Growers Association, North Florida/Georgia Chestnut Growers Association and the Florida Viticulture Advisory Council. Other representatives come from private industry including wineries and processed fruit manufacturers as well as state agencies and other collaborators. For the Center for Water and Air Quality, the Council is made up of representatives from water management districts as well as federal and state agencies. The Advisory Council of the Center for Biological Control includes representatives from Florida Farm Bureau, Florida Nursery Growers Association, several federal including USDA ARS and USDA APHIS, and state agencies (Florida Department of Agriculture and Consumer Services and Florida Fish and Wildlife Commission), FAMU Extension, University of Florida and Pest Management Industry. Advisory Councils generally met at least once during the year, which provided an important formal mechanism for provision of inputs from stakeholders. Other planned events included field days, growers meetings, and listening sessions several of which were held during the year. To ensure participation by a wide range of stakeholders,

such events were widely promoted through various media. Both traditional and nontraditional stakeholders were encouraged to participate in the planning process. In addition program newsletters were mailed to stakeholders and direct contact was made through the mail, email or telephone.

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

Brief explanation.

The linkage between the research program and FAMU's extension and teaching programs continues to be critical in this process. Different approaches were used to identify individuals and groups who represent FAMU's stakeholder base. This included a review of census data and specific consultations with state agencies, commodity associations/groups, farm bureau, county extension agents, CARET representatives, nonprofit public advocacy groups, and environmental organizations who were requested 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. Input from stakeholders is solicited through a variety of ways, including direct consultation, participation in advisory committees, surveys and listening sessions.

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.

Stakeholder input was collected continuously through informal and formal consultations. This included on and off campus meetings with various farmer and commodity groups. These activities were coordinated with FAMU's extension program in order to avoid duplication and ensure maximum synergy. For instance, meetings with the Florida Grape Growers were held on the

campus where research results were presented and stakeholder input was requested. Input was also solicited through stakeholder representation in specific center/program Advisory Councils. Surveys were also conducted with both traditional and non-traditional stakeholder groups. Information was also gleaned from various published reports.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

Stakeholder input was used in overall program assessment, planning and resource allocation. Thus the input was used determining the direction and emphasis of the entire research program including modifying existing projects, but also in identifying new issues that needed to be addressed and hiring of new staff. The input was also factored in the development/revision of center/program strategic plans, and thus guided the development of extra mural grants and other complimentary activities.

Brief Explanation of what you learned from your Stakeholders

Inputs from stakeholders confirmed that the following issues were still of critical concern: 1) development of small farmer specialty crops such as grapes, small fruits and vegetables 2) water quality and quantity, 3) invasive alien species and biosecurity, 4) rural development and development of small ruminant production, 5) development of bioenergy opportunities especially for small farming systems, 6) climate change as a cross cutting issue, and 7) adolescent and childhood obesity.

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	2080800

2. Totaled Actual dollars from Planned Programs Inputs				
Extension			Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	0	0	0	1524072
Actual Matching	0	0	0	1524072
Actual All Other	0	0	0	1040708
Total Actual Expended	0	0	0	4088852

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

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Viticulture and Small Fruit Research (Global Food Security and Hunger)
2	Preserving Water Quality of North Florida Watersheds (Climate Change)
3	Strategic Research for the Management of Invasive Pest Species (Global Food Security and
4	Rural Development and Statewide Goat Research (Global Food Security and Hunger)
5	Bioenergy Research (Sustainable Energy)
6	Public Health Entomology, Research and Education (Climate Change)

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Viticulture and Small Fruit Research (Global Food Security and Hunger)

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 FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	1.0	0.0	6.0
Actual Paid Professional	0.0	0.0	0.0	13.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	271450
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	271450
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	1040708

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Viticulture and Small Fruit Research Program conducted a wide range of viticulture research to address industry needs and concerns, and provided services to help stakeholders in the industry. The program also conducted research on non-traditional small fruits, including chestnuts, for North Florida. Faculty were involved in statewide extension and outreach activities as well as in teaching and training graduate and undergraduate students. Activities under the research program focused on the following areas:

- Development of new and improved grape cultivars for Florida.
- Screening for fruit rot, downy mildew and crown gall diseases in muscadine grapes
- Evaluation of germplasm for disease resistance in Florida hybrid bunch grapes.
- Identification of best management practices for Florida grapes and small fruits.
- Identification of important viticulture genetic markers.
- Identification of proteins and metabolites relating to disease tolerance and important physiological functions of grapes.
- Identification of constraints in sugar metabolism in muscadine grapes
- Evaluation of gene expressions and differential to determine disease tolerance in muscadine and Florida hybrid bunch grapes.
- Evaluation of the effects of water stress/drought on biochemical and molecular changes in grapes.
- Evaluation of triploids and tetraploids for development of seedless muscadine grapes.
- Development of disease and virus free explants of muscadine and bunch grapes for the clean vine project.
- Invitroevaluation of strains of subepidermal cells of muscadine pericarp for use as a source of flavonoid compounds.
- Development of new value-added products from grapes and small fruits.
- Evaluation of non-traditional small fruits, blackberries and raspberries for North Florida.
- Evaluation of chestnuts for North Florida.

In addition faculty were involved in several extension and outreach activities including the following:

- Student training, community service and youth development.
- Seminars and workshops for grape growers and general public.
- Grape Growers Field Day
- Grape Harvest Festival
- Technical advice and services to grape growers, processors and small farmers.

2. Brief description of the target audience

The primary stakeholders and target audience are: Grape growers and processors in Florida and neighboring states, grape nurseries, small minority farmers and chestnut growers in Florida and neighboring states, and graduate and undergraduate students working in viticulture and small fruits. The secondary stakeholders and target audience included: hobbyists and homeowners with grapes and small fruits, home winemakers and Florida nurseries.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3000	3000	200	300

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

Year: 2011
 Actual: 3

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	8	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Hybrid seedlings from breeding program.

Year	Actual
2011	1500

Output #2

Output Measure

- Advanced hybrid selection.

Year	Actual
2011	73

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Continued industry growth - increased in new vineyards and wine production in the state.
2	Release of new cultivars (change in knowledge).
3	Release of new cultivars (change in action).
4	Release of new cultivars (change in condition).
5	Public and stakeholder participation at workshops, field days, seminars and harvest festival (change in action).
6	Public and stakeholder participation at workshops, field days, seminars and harvest festival (change in condition).

Outcome #1

1. Outcome Measures

Continued industry growth - increased in new vineyards and wine production in the state.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Florida grape and wine industry including: growers, wineries and consumers.

What has been done

New knowledge on vineyard management, value-added products, and small fruit management was generated. The breeding program has progressed satisfactorily and several advanced lines are being evaluated in preparation for release in the near future. Several important genetic markers, genes, proteins and metabolites were identified and these will greatly facilitate the breeding and biotechnology programs. A patent application on the production of in-vitro strains of sub-epidermal cells of muscadine grapevine pericarp for use as a source of flavonoid compounds is pending. Research on value-added products has resulted in the submission of three patent applications for the production of nutraceuticals.

Results

New vineyards increased by 10 acres. In 2011 there were 16 Florida Farm Wineries which produced about 400,000 gallons of wine in 2011. More people are interested in Florida grapes and wines as reflected by increased attendance in workshops, field days and the grape harvest festival.

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

Release of new cultivars (change in knowledge).

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Release of new cultivars (change in action).

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Release of new cultivars (change in condition).

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Public and stakeholder participation at workshops, field days, seminars and harvest festival (change in action).

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Grape growers and processors, and small fruit growers who are directly impacted by FAMU's viticulture and small fruit program.

What has been done

New knowledge on vineyard management, value-added products, and small fruit management was shared with stakeholders and thus leading to increased productivity and farm income through extension and outreach activities.

Results

- Greater public awareness of Florida grapes, wines and non-traditional small fruits. Increased sale of Florida wines.
- Increased faculty productivity in research output and grant procurement.
- Greater graduate student interest in viticulture and small fruit research.
- FAMU as the leader in warm climate grape (muscadine and Florida bunch hybrid) research.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems

Outcome #6

1. Outcome Measures

Public and stakeholder participation at workshops, field days, seminars and harvest festival (change in condition).

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The current regulation requires that the sale of Florida wines be conducted through a licensed distributor. This requirement restricts the ability of Florida wineries, particularly the small wineries, to market their wines directly to consumers except on-premise sales. Small wineries are often unable to pay for the services of distributors. The sale of

Florida wines through the internet is also restricted and appears to have a negative impact on small wineries.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The evaluation results indicated that the program achieved satisfactory progress towards meeting the goals in the plan of work. Program faculty have been very productive in terms of publishing their research in reputable journals and participating in relevant scientific meetings. They have also been successful in procuring external grants from various agencies to further support the program.

The breeding program continued to evaluate several advanced lines that are being prepared for release in the near future. Several important genetic markers, genes, proteins and metabolites were identified and these are expected to greatly facilitate the breeding and biotechnology efforts. A patent application on the production of in-vitro strains of sub-epidermal cells of muscadine grapevine pericarp for use as a source of flavonoid compounds is pending. Research on value-added products yielded encouraging results as evidenced by the submission of three patent applications for the production of nutraceuticals.

The small fruit program continued to evaluate non-traditional small fruits, including raspberries and blackberries. The results from these evaluations will be used to make appropriate recommendations for small and limited resource farmers.

Extension and outreach activities have been very successful and effective. Stakeholder and public participation in events such as workshops, grape field days, IPM field day, seminars and grape harvest festival has been high.

Key Items of Evaluation

N/A

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Preserving Water Quality of North Florida Watersheds (Climate Change)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships				35%
111	Conservation and Efficient Use of Water				35%
133	Pollution Prevention and Mitigation				30%
	Total				100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	5.0
Actual Paid Professional	0.0	0.0	0.0	5.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	566868
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	566868
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 Apalachicola River Basin is the major watershed in northwest Florida. The watershed is

confronted with several water quality and quantity issues. Major among them are: land-clearing, changes in land use/land cover, urban and agricultural growth, prolonged droughts or intense rains and several point and non-point sources of pollution. Accelerated human activities in the region have caused increase in soil erosion, nutrient loss from cultivated fields and decline of aquatic ecosystems. Furthermore, the Apalachicola River Basin is vulnerable due to diminishing in-stream flow, resulting from rapid urban growth in its headwaters in North Georgia. Hence, there is a need to develop a plan to mitigate such water quality and quantity problems and understand the long-term consequences of any further deterioration of agricultural landscapes in the watershed. The planned program is preparing an inventory of land use/land cover changes in the Apalachicola River Basin and collect soil erosion and nutrient loss data on selected sites under irrigated and non-irrigated conditions. Also, two major streams in the basin are being monitored for changes in aquatic insect and to see how it relates to the quality of water within the streams.

The results of soil erosion study indicate that random deployment of the mesh sheet to collect displaced soil is as good as the regular grid pattern deployment. We also verified that 2-m, 16-mesh/plot design is as effective as the 2-m, 49 mesh/plot design. These results implies that with the new version of the mesh sheet method, we can save up to 75% of the labor and cost in field experiment comparing to that of the old version. Preliminary data analysis of the 2010-2011 results shows that 70 tons, 219 tons and 26 tons of soil were moved and re-deposited on the top slope (2.4 ha), mid slope (4.1 ha) and bottom slope (1.2 ha), respectively, during the May-August peanut growing season. The corresponding soil loss from the 7.7 ha slopes was only 1.3 tons. The field data collected in the Sweetwater Creek and Wilson Mill Creek show the diversity and the richness/abundance of freshwater aquatic insects. Mayfly (Ephemeroptera), stonefly (Plecoptera) and caddisfly (Trichoptera) were found to be significantly higher in the Sweetwater Creek than that of Wilson Creek.

2. Brief description of the target audience

The target audience for the program include: crop producers in the Apalachicola River Watershed, soil and water conservation organizations and personnel, extension workers, and small and limited resources farmers within the basin.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	75	90	40	50

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

Patent Applications Submitted

Year: 2011

Actual: 1

Patents listed

Multiple Elemental System Thermal Analysis (MESTA)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	2	2	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Inventory of land use/land cover patterns in the Apalachicola River Basin.

Year	Actual
2011	2

Output #2

Output Measure

- Data on soil erosion and nutrient loss under irrigated and non irrigated conditions.

Year	Actual
2011	3

Output #3

Output Measure

- Baseline aquatic insects data on two major water streams in the basin.

Year	Actual
2011	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Information on changing land-use patterns in the Apalachicola River Watershed.
2	Comparison of soil erosion measurements by the Mesh-bag method and the simulation results of RUSLE (the Universal Soil Loss Equation).
3	Identification of best management practices for efficient management of soil, water and nutrients.
4	Improvements of stream ecosystems.
5	Database on soil erosion and nutrient runoff under different soil moisture and crop conditions.

Outcome #1

1. Outcome Measures

Information on changing land-use patterns in the Apalachicola River Watershed.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Apalachicola River Basin is a part of the greater Apalachicola-Chattahoochee- Flint Basin comprising almost 20, sq miles spread in three states: Georgia, Alabama and Florida. The water demands have dramatically increased in the watershed due to: growing population around Atlanta, increase in irrigation acreage in mid-Georgia and marine and fisheries needs in Florida. An inventory of land use pattern will assist the decision makers in maintaining water sustainability in the region. Agriculture being the major user of the water resources, it is imperative that we understand and plan for the future needs and how they will be met.

What has been done

We are collecting land-use data generated by various state agencies within the tri-state area and identifying the information gaps. Also developing GIS-based data information to look at the land use/land -cover changes.

Results

Land-use/land-cover maps have been developed for the Apalachicola Watershed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

Outcome #2

1. Outcome Measures

Comparison of soil erosion measurements by the Mesh-bag method and the simulation results of RUSLE (the Universal Soil Loss Equation).

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Identification of best management practices for efficient management of soil, water and nutrients.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Improvements of stream ecosystems.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Database on soil erosion and nutrient runoff under different soil moisture and crop conditions.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The results of this study will generate quality field erosion data, which is valuable in developing scientific conservation policy and helpful to decision makers and farmers, because quality field soil erosion data is needed for reliable soil erosion models. Such models are the basis for soil and water conservation evaluations. A true field soil erosion data is of interest to farmers because they can judge for themselves the effects of a particular conservation practice.

What has been done

We surveyed and generated detailed landscape micro topographic (contour) map of the 163 acre Mears Farm in Marianna, Florida (peanut and cotton rotation). We conducted experiments using mesh bags and mesh sheets to study the redistribution of eroded soil and associated nutrient loss during rain events. Soil loss and soil redistribution amounts were calculated.

Results

We have generated detailed micro topographic maps of the study areas. According to the topo maps, we classified the areas in four erosion classes. The background information is critical to the mesh-bag method.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Over the 2011, the fields under study received 20-30% less rainfall. The crop residues left after harvesting of the peanut crop were minimal.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Our results show that the mesh-bag as well as the mesh sheet method may be successfully deployed to study soil erosion under varying field conditions. The data generated through this study will be helpful in developing large-scale models and provide verification and calibration of the current erosion models. The biological monitoring employed in this study may be effectively used in developing watershed protection and ecosystem management strategies.

Key Items of Evaluation

The mesh-bag method to estimate soil erosion under irrigated and non-irrigated conditions provides valuable information regarding the redistribution of top soil.

The EPT (Ephemeroptera, Plecoptera, Trichoptera) Aquatic Index may be used to determine the water quality status of freshwater streams in a watershed.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Strategic Research for the Management of Invasive Pest Species (Global Food Security and Hunger)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
135	Aquatic and Terrestrial Wildlife				25%
211	Insects, Mites, and Other Arthropods Affecting Plants				25%
215	Biological Control of Pests Affecting Plants				25%
216	Integrated Pest Management Systems				25%
	Total				100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	4.0
Actual Paid Professional	0.0	0.0	0.0	4.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	366266
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	366266
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

Offshore research: Offshore research on five high risk species (Planococcus minor, Planococcus lilacinus, Rhyncophorus ferrugineus, Oxycarenus hyalinipennis, Tuta absoluta, and Anastrepha grandis) was carried out or initiated in Trinidad, Dominican Republic, Curacao and Aruba, Kenya, and Panama with a view to generate data on biology, ecology, surveillance and control. These pests are listed as high priority threats by USDA APHIS. Research activities were conducted in collaboration with several international partners.

Onshore research: Tropical soda apple (TSA): Studies were conducted to determine if previous feeding by Tortoise beetle, Gratiana boliviana a biological control agent of Tropical Soda apple (a serious invasive weed) had adverse effects to beet army worm and thrips, resulting in reduced oviposition, preference for induced foliage and decreased performance and survival on induced foliage.

Biological control of Hydrilla verticillata: A final survey of the upper 1.5 miles of the river of the Wacissa Springs Group was conducted by research boat. A subjective scale of 0-3 was used with 0 indicating hydrilla undetected and 3 completely choked. Cultures of hydrilla were established in the lab from Wacissa Big Blue Spring, Wacissa #2 and Garner Spring. Lab colonies of the stem mining midge, Cricotopus lebetis (Diptera: Chironomidae) were also established.

Benefits and risks of biological control: Studies on the effectiveness of risk communication activities during the permitting process for entomophagous biological control agents were completed. Additionally, data on classical and fortuitous biological control were collected which will be used to populate existing or new databases. It is anticipated that once completed, these data will allow testing on hypothesis relating to safety issues.

2. Brief description of the target audience

The target audiences include: federal and state biosecurity agencies, farmers, extension workers and pest management specialists. For instance the audiences for the TSA work includes Florida's ranchers and government agencies. The hydrilla activities target fishermen and general public who use the aquatic resources for recreation, water resource managers and private industry such as bottled water enterprises. The work on offshore pests is aimed at safeguarding both small and large food, and ornamental growers, the nursery industry and government agencies.

3. How was eXtension used?

N/A

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	200	500	50	1500

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

Year: 2011
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	3	6	9

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Electronic identification keys/tools/resources developed.

Year	Actual
2011	2

Output #2

Output Measure

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

Year	Actual
2011	6

Output #3

Output Measure

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

Year	Actual
2011	2

Output #4

Output Measure

- Target biological control agents introduced and established against specific insect pest or weed targets.
 Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Undergraduate and graduate students trained through mentorship and involvement in research programs.

Year	Actual
2011	22

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Digital identification keys/tools/resources for the identification of invasive species utilized.
2	More effective strategies for the identification, prevention or management of invasive species.
3	Integrated pest management approaches adopted by farmers leading to greater profitability.
4	The introduction and spread of IAS minimized.
5	More effective management of aquatic weeds in first order springs.
6	Trade between the US and partners is safer through implementation of strategies to mitigate the introduction of invasive insect pests and weeds.
7	Well trained undergraduates and graduates contribute to the effective management of native and non-native pests

Outcome #1

1. Outcome Measures

Digital identification keys/tools/resources for the identification of invasive species utilized.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

More effective strategies for the identification, prevention or management of invasive species.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Florida faces a disproportionate risk from invasive pests which are a major threat to agriculture and the environment. Farmers, the general public, ornamental industry, and various state and federal agencies involved in efforts to mitigate the threats of invasive pests are concerned with these threats.

What has been done

Offshore studies are being conducted to generate knowledge that is critical for the development of mitigation measures against several pest threats. Studies on the red palm weevil (RPW), *Rhynchophorus ferrugineus*, in Curacao focused on development of optimal methods for operating pheromone traps and acoustically assessing infestations in individual trees.

Results

Bucket traps with pheromone lures and a molasses food-bait mixture captured RPW adults reliably for about eight days. A portable, user-friendly acoustic sensor system enabled identification of larvae in individual infested trees through the use of signal processing analyses that screened out bird and wind noise. This information will assist future efforts to monitor, control, or eradicate RPW on Curacao and nearby islands and the United States, should the pest gain entry.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Integrated pest management approaches adopted by farmers leading to greater profitability.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

The introduction and spread of IAS minimized.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

More effective management of aquatic weeds in first order springs.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Hydrilla, is a noxious weed is considered the second most important aquatic weed world-wide behind water hyacinth. Many of Florida's springs and first order streams are infested. As a result, the ecosystem has degraded, and the spring and river's ecological and recreational value has

diminished. Public education on the risk of spread of hydrilla to non-infested bodies of water and methods to mitigate the risk are needed. A range of stakeholders including: fisherman, canoeists, kayakers, boaters, swimmers, scuba divers, water resource managers, private industry etc. are affected.

What has been done

A web site was established to disseminate knowledge to these groups. An awareness campaign has been mounted using brochures and other paraphernalia such as, hats, and rulers.

Results

The web site is active and is providing knowledge to these groups. Public awareness materials have also been disseminated to stakeholders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

Trade between the US and partners is safer through implementation of strategies to mitigate the introduction of invasive insect pests and weeds.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Well trained undergraduates and graduates contribute to the effective management of native and non-native pests

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Federal and state agencies and the private industry need new graduates with a background in agriculture and related fields to fill critical positions. Due to the threats posed by invasive species and especially arthropods and weeds, professionals are required to undertake research and regulatory functions in various agencies.

What has been done

A central component of our work on invasive species is to train both graduate and undergraduate students to undertake such careers. These students are involved in experiential activities as part of the program or undertake their graduate research on program priority targets.

Results

During FY2011, the program graduated two Ph.D., one M.S. and two B.S. students.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Public Policy changes

Brief Explanation

Hydrilla: Public policy delayed construction of an educational kiosk at a county park. Part of that was due to drought resulting in the temporary relocation of a boat ramp which was the site allocated for the kiosk.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The overall implementation of the research program in the Center for Biological Control was evaluated by the Center Advisory Council in April 26, 2011 and found to be progressing satisfactorily.

Red palm weevil: Methods available for monitoring adults with traps and acoustically assessing larval infestation in trees in the warm, dry but humid Curacao environment, considering also some special challenges of urban conditions, such as increased traffic

noise or unwanted human curiosity that could negatively affect monitoring success were evaluated. Bucket traps baited with 4-methyl-5-nonanol/ 4-methyl-5-nonanone pheromone lure, ethyl acetate and a molasses - ethylene glycol mixture captured RPW adults at consistent rates for ca. 7 d, but the rates of capture were reduced for the 9th to 14th d of a two-week sampling period. The weevils were observed to escape rapidly from dry traps but not liquid-containing traps. A portable, user-friendly acoustic sensor system enabled identification of larvae in individual infested trees through the use of signal processing analyses that screened out bird and wind noise. This information gained about liquid baits and acoustic differences between background noise and RPW-produced sounds can assist future efforts to monitor, control, or eradicate RPW in Curacao as well as other urban landscapes. This information will be useful should the pest become introduced into the United States.

Hydrilla: The upper 1.5 miles of the Wacissa River was evaluated for hydrilla infestations around 18 springs in a preliminary and final survey. The springs were rated for severity of infestation prior to establishment of biological control agents. Certain springs were selected for establishment of biological control agents with corresponding springs for control sites. These springs will continue to be evaluated during and after this project. Key components include the establishment and efficacy of biological control agents.

Key Items of Evaluation

Red palm Weevil: The red palm weevil is a major threat to the United States. Knowledge from this program will be beneficial to prevention/management programs. This is particularly relevant given the current concerns about the possible introduction of this pest in California.

Hydrilla: This study will not only evaluate the efficacy of biological control agents for the control and or management of the invasive aquatic weed in the Wacissa Springs and Wacissa River, it is also providing experiential learning opportunities and is the basis of master's student thesis and Ph.D. dissertation for minority students.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Rural Development and Statewide Goat Research (Global Food Security and Hunger)

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				50%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities				50%
	Total				100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	4.0
Actual Paid Professional	0.0	0.0	0.0	1.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	150004
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	150004
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 following activities were undertaken during the implementation of the planned program: Research and demonstration studies and needs surveys, field days, visitations to farmers, experimental studies, training of students, workshops and conferences.

2. Brief description of the target audience

The target audience consisted of grass roots community based organizations, faith based organizations and youth in rural communities as well as minority and low wealth urban neighborhoods.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	150	200	75	150

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

Patent Applications Submitted

Year: 2011
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	3	1	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Increase in economic returns to small farmers.

Year	Actual
2011	8

Output #2

Output Measure

- Increase in producer participation.
Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of publications.

Year	Actual
2011	4

Output #4

Output Measure

- Submit articles to eXtension.
Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Undergraduates and graduates trained.
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Adoption of sustainable production practices for goat producers.
2	Improved quality of life for producers.
3	Increased economic returns for small farmers.
4	Well trained undergraduate and graduate students contributing to agricultural production.

Outcome #1

1. Outcome Measures

Adoption of sustainable production practices for goat producers.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Improved quality of life for producers.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Increased economic returns for small farmers.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Well trained undergraduate and graduate students contributing to agricultural production.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The programs/activities provided opportunities in those targeted audiences to improve their acquisition of services and or facilitate their engagement with their respective audiences. It is expected that the results will show neighborhood change over a five year period. Policy makers at the local, State and federal level may use the results to demonstrate neighborhood economic change. The program activities also provided an opportunity for grass roots community based organizations and universities to be engaged in the planning as well a data collection phase of a proposed federal black belt initiative.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Bioenergy Research (Sustainable Energy)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
125	Agroforestry				25%
206	Basic Plant Biology				25%
601	Economics of Agricultural Production and Farm Management				25%
903	Communication, Education, and Information Delivery				25%
	Total				100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	1.0
Actual Paid Professional	0.0	0.0	0.0	1.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	169484
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	169484
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

Program activities were undertaken in several areas:

- a. Development of hybrid hardwood tree species, such as sweetgum, eucalyptus and other regionally-appropriate energy crops.
- b. Implementation of a sustainable approach to feedstock production including: social, economic and environmental aspects of the bioenergy production chain.
- c. Development of biological and chemical conversion technologies which will accept a diverse range of feedstocks.
- d. Promotion of small business development to create jobs and build wealth in rural areas.
- e. Training of the next generation of green workers.

2. Brief description of the target audience

The target audience still remains our main stakeholders, the limited resources land-owners and the students. The general public will also participate in some of the surveys and activities promoting biofuels in the state.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1000	500	500	3000

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	6	6

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- 1. Graduates 2. Publications 3. Workshops
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of faculty and students presenting their research findings at scientific conferences

Year	Actual
2011	6

Output #3

Output Measure

- Enhancement of research capacity at FAMU measured as number of grants submitted to state, federal and private agencies.

Year	Actual
2011	10

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	1. Produce graduates in the agricultural sciences 2. Produce graduates with adequate knowledge in bioenergy 3. Establish demonstration projects at the research farm in Quincy, FL
2	Small scale farmers adopt viable bioenergy production activities.

Outcome #1

1. Outcome Measures

1. Produce graduates in the agricultural sciences 2. Produce graduates with adequate knowledge in bioenergy 3. Establish demonstration projects at the research farm in Quincy, FL

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The sharing of information and ideas among scientists is vital to the advancement of the bioenergy field as is the training of students to fill critical careers in the field.

What has been done

Several manuscripts have been published. The FAMU BioEnergy group also held several workshops/conferences. At least six students are undertaking various kinds of training under the program.

Results

Six peer reviewed publications were published and in addition, three workshop/conference activities were held. 1) Biofuels workshop at the Crescent Moon Organic Farm in Sopchoppy, Florida; Biofuels Symposium held on October 10-12, 2011, on the FAMU campus. The theme of the Conference was, "training the next generation of green workers." 3) Regional bioenergy summit held on the FAMU campus on February 18-19, 2011. The theme of this summit was: "embracing our tradition of partnership summit - 1890 land grants and HBCUs reconnecting with local communities to develop a green agenda?". Two B.S., three MS and two PhDs students are currently performing research in biofuels related area.

4. Associated Knowledge Areas

KA Code	Knowledge Area
206	Basic Plant Biology
903	Communication, Education, and Information Delivery

Outcome #2

1. Outcome Measures

Small scale farmers adopt viable bioenergy production activities.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Small scale farmers and land owners in the region are constantly looking for additional sources of income, and the development of a strong bioenergy industry has the potential to provide rural employment, education and a platform for wealth building in rural America.

What has been done

The program is developing Camelina varieties adapted to the environmental conditions of the region. This feedstock has been successfully used in biofuels development in the Central Plains. In addition, the program is working with small farmers to implement the widespread use of small bioreactors capable of converting used cooking oils into biodiesel. This biofuel has been used to run farm equipment and to provide additional income to small scale limited resource farmers.

Results

Several farmers in Sopchoppy, North Florida have access to a small bioreactor that can convert used cooking oil into biodiesel. Workshops have been organized on a regular basis to provide know-how and other skills in biodiesel processing to stakeholders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
125	Agroforestry
601	Economics of Agricultural Production and Farm Management
903	Communication, Education, and Information Delivery

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes

Brief Explanation

Although the program was able to demonstrate tremendous accomplishments during the year, it was clear that recruitment of a laboratory technician to support to activities would enhance the program output. Additionally there is need for a full-time field worker to help run field experiments.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Two B.S., three MS and two PhDs students are currently performing research in biofuels related area. Six manuscripts were published in peer-reviewed journals with international circulation.

Two major bioenergy conferences were held on FAMU campus. In addition several workshops were held on the Sopchoppy Farm where limited landowners were provided with the necessary know-how to convert used cooking oil into biodiesel. Information generated from the program was shared with the general public. In addition, two small biofuels grants from agencies other than USDA were secured to further support the program.

Key Items of Evaluation

Scope of students training opportunities.

Scientific publications.

Dissemination and outreach activities through conferences and workshops.

Efforts to secure additional program support through development of other grants proposals.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Public Health Entomology, Research and Education (Climate Change)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
721	Insects and Other Pests Affecting Humans				100%
	Total				100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	2.1	0.0	3.0
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	0
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

Due to budgetary constraints, The Public Health Entomology, Research and Education Center was closed down and all activities were therefore terminated. Furthermore during 2011, this program was not funded.

2. Brief description of the target audience

Mosquito/arthropod control agencies; federal/state environmental and public health land management agencies; cooperative extension service; elementary and secondary teachers at public/private schools; home schoolers; citizens and tourists.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	1	5	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research projects that involve target-specific, effective pesticide application of public health arthropods with less environmental impact.
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Track client usage (number of persons/site visits) of extension-based online

resources/informational materials/training workshops regarding biology and control of public health arthropods.

Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Track number of students and teachers provided experiential learning activities with regard to biology and control of public health arthropods.
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase in number of research projects that involve target-specific, effective pesticide application of public health arthropods with less environmental impact.
2	Client usage (number of persons/site visits) of extension-based online resources/informational materials/training workshops regarding biology and control of public health arthropods increases.

Outcome #1

1. Outcome Measures

Increase in number of research projects that involve target-specific, effective pesticide application of public health arthropods with less environmental impact.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Client usage (number of persons/site visits) of extension-based online resources/informational materials/training workshops regarding biology and control of public health arthropods increases.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Due to major funding shortfalls from the state budget, the Center for Public Health Entomology, Research and Education Center and its programs were closed down.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

N/A

Key Items of Evaluation

N/A