

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

**Program # 1**

**1. Name of the Planned Program**

Global Food Security and Hunger - Viticulture and Small Fruits Research

Reporting on this Program

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

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms				25%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants				25%
205	Plant Management Systems				50%
	<b>Total</b>				100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	6.0
Actual Paid Professional	0.0	0.0	0.0	10.0
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	794090
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	397045
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 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 hybrid selections for superior characteristics in muscadines and Florida Hybrids Bunch grapes.
- Investigating the mechanism of host resistance of downy mildew.
- 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 an characterization of leaf proteins in Vitis species to improve their photosynthetic efficiency and sugar content and composition.
- Determining the relationship between sucrose content and invertase activity in muscadine grapes.
- Characterization of berry proteome to identify proteins associated with disease tolerance and nutraceutical properties of muscadine grapes.
- Determining the synthetic and accumulation patterns of nutraceutical compounds in developing and ripening muscadine grapes.
- Metagenomics study of muscadine grape berry to isolate and characterize berry micro flora beneficial to human health.
- 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.
- Evaluation of non-traditional small fruits, blackberries and raspberries for North Florida.
- Evaluation of chestnuts for North Florida.
- Evaluation of IPM strategies on vegetables.

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 rural communities, chestnut growers 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 used to reach out to our target audience to help them in their farming operations by providing new knowledge and information on problem solving and new opportunities in farming. Extension was also used to promote the various events that were organized by the Center.

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

##### 1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3250	1500	220	210

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

###### Patent Applications Submitted

Year: 2012

Actual: 4

###### Patents listed

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

###### Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	7	7

#### V(F). State Defined Outputs

##### Output Target

##### Output #1

###### Output Measure

- Hybrid seedlings from breeding program.

Year	Actual
2012	1506

**Output #2**

**Output Measure**

- Advanced hybrid selection.

<b>Year</b>	<b>Actual</b>
2012	18

**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**

<b>Year</b>	<b>Actual</b>
2012	35000

### **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 four patent applications for the production of nutraceuticals.

#### **Results**

New vineyard acreage increased by 16 acres. In 2012 there were 16 Florida Farm Wineries which produced about 435,000 gallons of wine in 2012, an increased of about 35,000 gallons. 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**

<b>KA Code</b>	<b>Knowledge Area</b>
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**

<b>Year</b>	<b>Actual</b>
2012	3500

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

**Issue (Who cares and Why)**

Grape growers, processors, small fruit growers and local rural communities were directly impacted by FAMU's viticulture and small fruit program.

**What has been done**

New knowledge on vineyard management, value-added products, small fruit management, and vegetable production using Integrated Pest Management techniques were shared with stakeholders and thus leading to increased industry growth, productivity and farm income through extension and outreach activities.

**Results**

- &#9679; Greater public awareness of Florida grapes, wines and non-traditional small fruits.
- &#9679; Increased production and sale of Florida wines.
- &#9679; Increased faculty productivity in research output and grant procurement.
- &#9679; Increased production of vegetables by local and rural communities.
- &#9679; Greater graduate student interest in viticulture and small fruit research.
- &#9679; FAMU as the leader in warm climate grape (muscadine and Florida bunch hybrid) research.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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 (Three tier system). This requirement restricts the ability of Florida wineries, particularly the small wineries, to market their wines to retail stores. Small wineries are often unable to pay for the services of distributors or distributors are not interested in promoting Florida wines because of the relatively low market volume. The sale of non-Florida wines presents a formidable challenge to the local wine industry.

## **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. However, several cosmetic products incorporating the sub-epidermal cells have been developed and are under evaluation. Research on value-added products yielded encouraging results as evidenced by the submission of four 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**