

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

**Program # 6**

**1. Name of the Planned Program**

Plant Biotechnology

**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			40%	
204	Plant Product Quality and Utility (Preharvest)			30%	
206	Basic Plant Biology			30%	
	<b>Total</b>			100%	

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

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.5	0.0
Actual	0.0	0.0	1.5	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	23462	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	26274	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

- Conduct research project



2010

1

1

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of local farmers growing micro-propagated sweet potato, cassava and hybrid papaya

## **Outcome #1**

### **1. Outcome Measures**

Number of local farmers growing micro-propagated sweet potato, cassava and hybrid papaya

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

- 1862 Research

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	2	3

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

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

Stakeholders have noticed production of sweet potatoes was declining with time and sorrel was seasonal. Early bearing papayas lacked red color which is a preference throughout the Caribbean.

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

Sweet potatoes were collected from local farmer in 18 locations throughout the island of St Croix and screened for five common sweet potato viruses with ELISA. Micropropagated 28 virus-free sweet potato lines obtained from the USDA Germplasm Repository, since only one to three microcuttings were received. Micropropagation was necessary to increase plants to 150 for field trials. Studied systems for long term storage of in vitro virus free sweet stock through sucrose concentration modification. Screened papaya plants for three viruses using ELISA. Papayas samples were collected from four local stakeholders and the AES papaya germplasm collection. Made crosses between papaya to incorporate red color into Caribbean lines.

#### **Results**

ELISA tests indicated that sweet potatoes from the local growers were infected with 2 to 5 common sweet potato viruses. Sweet potatoes lines varied between lines for micropropagation efficiency and growth in vitro. Reducing the sucrose level from 30 g/L to 1 or 3 g/L controlled the rate of sweet potato growth in vitro but also kept them alive. Sweet potatoes were able to survive for one year without subculture on the reduced sucrose medium. After one year, explants from these long term stored in vitro sweet potato plants grew normally when put back onto 30 g/L sucrose containing tissue culture medium. Hybrid papayas have been developed with disease tolerance, good size and a red flesh color.

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

<b>KA Code</b>	<b>Knowledge Area</b>
201	Plant Genome, Genetics, and Genetic Mechanisms
204	Plant Product Quality and Utility (Preharvest)
206	Basic Plant Biology

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

##### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Other (Federal certification of transgenics)

##### **Brief Explanation**

Hurricanes and extended rains that caused flooding resulted in the papaya plot to be excessively wet and resulted in the plants becoming infected with phytophthora which destroyed the plants. Papaya is sensitive to waterlogged soils.

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

##### **1. Evaluation Studies Planned**

- Retrospective (post program)
- Other (Informal discussions)

#### **Evaluation Results**

Stakeholders were surprised to discover that their sweet potatoes vines, which they have had for years were so infected with virus. They are eager to obtain the virus free material when it becomes available. The stakeholders have come to AES to buy papaya seeds in the small quantities that they need to grow in their small plots. Stakeholder have been satisfied with the papaya variety selections and are returning each year for fresh seed.

##### **Key Items of Evaluation**

Key evaluation items were rate of growth, height to first flower and first fruit, fruit set and quality for papaya. Plants were selected for tolerance to viruses.