

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Plant System

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
204	Plant Product Quality and Utility (Preharvest)	9%			
205	Plant Management Systems	8%			
211	Insects, Mites, and Other Arthropods Affecting Plants	7%			
212	Pathogens and Nematodes Affecting Plants	7%			
213	Weeds Affecting Plants	7%			
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%			
216	Integrated Pest Management Systems	8%			
401	Structures, Facilities, and General Purpose Farm Supplies	7%			
402	Engineering Systems and Equipment	5%			
403	Waste Disposal, Recycling, and Reuse	7%			
405	Drainage and Irrigation Systems and Facilities	8%			
601	Economics of Agricultural Production and Farm Management	5%			
602	Business Management, Finance, and Taxation	5%			
604	Marketing and Distribution Practices	7%			
610	Domestic Policy Analysis	5%			
	Total	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	35.6	0.0	0.0	0.0
Actual	30.3	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
1275968	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
637984	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

- Conducted trainings on good agricultural practices in production, postharvest, IPM and value added, drainage, irrigation, waste management systems and improved structures training, pesticides application, economics
 - Together with the Puerto Rico Agricultural Experiment Station, conducted trainings in IPM, citrus greening management, Bacterial citrus Black Spot, among others
 - Visits and guidance to farmers
 - Conducted farmers' meetings
 - Collaborated with local government agencies (Departments of Agriculture and Environmental and Natural Resources) and USDA (NRCS, FSA and others)
 - Prepared cultivation practices, IPM, irrigation, drainage, waste systems and packinghouse plans.
 - Prepared product quality and structure improvement plans
 - Distributed publications
 - Prepared publications on crop production, postharvest, IPM, irrigation, waste systems, improvement of structures, economics practices, and application of pesticides
 - Together with the Puerto Rico Department of Agriculture and Agricultural Experiment Station conducted a project to increase the production and quality of crops (citrus, coffee, plantain, vegetables, starchy crops, limes and pineapple)
 - Conducted research projects with the Agricultural Experiment Station, Department of Agriculture, and private agricultural entrepreneurs in pineapple and citrus fertilizer programs, citrus greening foliar nutritional and citrus rootstock programs in AE Station facilities and on-site at the farms

2. Brief description of the target audience

The majority of the Plant Systems planned program's target audience consists of farmers, government and Department of Agriculture professionals, county agents, USDA professionals (NRCS, APHIS and FSA), packinghouse companies, product distributors, researchers of the Agricultural Experiment Station and professionals from the private sector.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	23000	25000	1000	500
Actual	32879	21647	4699	372

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	0	
Actual	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of persons trained on plant management, products quality, value-added, pesticide use, IPM, pesticide application, and commercial pesticide application.

Year	Target	Actual
2010	12500	14150

Output #2

Output Measure

- Number of workshops and meetings offered.

Year	Target	Actual
2010	100	883

Output #3

Output Measure

- Number of collaborations established to improve engineering and biological systems infrastructure.

Year	Target	Actual
2010	100	97

Output #4

Output Measure

- Number of waste management systems designed.

Year	Target	Actual
2010	50	79

Output #5

Output Measure

- Number of plans and specifications for model structures completed and distributed.

Year	Target	Actual
2010	50	78

Output #6

Output Measure

- Number of demonstration facilities established.

Year	Target	Actual
2010	2	1

Output #7

Output Measure

- Number of trainings, courses and seminars offered.

Year	Target	Actual
2010	20	113

Output #8

Output Measure

- Number of farms and agricultural entrepreneurs trained.

Year	Target	Actual
-------------	---------------	---------------

2010 300 347

Output #9

Output Measure

- Number of clients that participated in workshops on structures, waste management systems, and drainage and irrigation systems.

Year	Target	Actual
2010	800	1285

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of farmers that adopted one or more recommended practices of the plant management systems in crop commodities.
2	Number of farmers that increased production in crop commodities.
3	Number of farmers that increased the quality in crop commodities.
4	Number of farmers that adopted new value-added practices in crop commodities.
5	Number of farmers that increased their income after having adopted one or more practices of plant management systems and/or product quality.
6	Number of persons that acquired knowledge after completing a training program in integrated pest management.
7	Number of persons that adopted one or more techniques after completing an integrated pest management program.
8	Number of persons that reduced the use of pesticides after completing an integrated pest management program.
9	Number of persons that established an IPM program after completing a training program.
10	Number of farmers that acquired knowledge after completing a training program in pesticide application.
11	Number of farmers that acquired knowledge after completing a training program in integrated pest management.
12	Number of clients that increased their knowledge about improvements to increase the efficiency of structures (new and existing) and compliance with regulations.
13	Number of clients that increased their knowledge about appropriate systems for waste management in their projects.
14	Number of clients that increased their knowledge about drainage or irrigation facilities.
15	Number of clients that adopted one or more of the recommended practices to increase the efficiency of their structures and comply with all permits.
16	Number of clients that adopted one or more practices to improve their drainage or irrigation facilities.
17	Number of farmers that improved their structures (new and existing) and/or comply with permits.

18	Number of waste management systems improved (new or existing).
19	Number of drainage or irrigation facilities improved.
20	Number of farmers that increased their production as a result of improving their structures.
21	Number of farmers that increased their production as a result of improving their waste management systems.
22	Number of farmers that increased their production as a result of improving their drainage or irrigation facilities.
23	Number of farmers and agricultural entrepreneurs that adopted one or more economic practices.
24	Number of farmers and agricultural entrepreneurs that utilize economic tools to take effective economic decisions to improve their business.

Outcome #1

1. Outcome Measures

Number of farmers that adopted one or more recommended practices of the plant management systems in crop commodities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2800	5484

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Farmers in Puerto Rico face problems with product quality and the poor use of adequate crop cultivation practices. The rising pesticide costs and growing public concerns about pesticide residues in food and the contamination of surface and groundwater supplies, have forced farmers to try to reduce their reliance on chemicals to control pests and diseases. The presence of diseases and pests in crops, economic problems, the need for better waste management systems for plantain, bananas, pineapple, citrus, tropical fruits, starchy crops, and coffee production, and losses due to the Broca insect required the intervention of PRAES agricultural agents and

specialists to orient farmers on better management practices to control diseases and improve production.

What has been done

Farmers were oriented in the better management practices to solve the problems in their farms and increase the marketing of their products. PRAES agents offered trainings, visits and orientations to farmers, including the distribution of educational material.

Results

As a result of the training programs by PRAES agents and farm visits, 5,484 farmers adopted one or more of the recommended practices of the plant management systems' crop commodities, better cultivation, economics, better management practices, insect and disease control, and plant nutrition programs to produce more and better products that can be marketed at better prices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems
403	Waste Disposal, Recycling, and Reuse
405	Drainage and Irrigation Systems and Facilities
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices

Outcome #2

1. Outcome Measures

Number of farmers that increased production in crop commodities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	840

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Problems with maintaining product quality and the poor use of adequate crop cultivation practices together with diseases in crops affected crop production. There was a need for better harvest and management practices, improvement of structures and irrigations systems to help farmers improve and increase production.

What has been done

PRAES agents and specialists, together with the Agriculture Experiment Station researchers, oriented farmers on correct production and harvest practices. The farmers were trained and oriented on IPM program, new liquid and slow release fertilizer programs, insects and diseases control, and harvest management. They also received farm orientation visits and educational material on the subject matter.

Results

With the help of Extension Agents, 840 farmers increased their production in different crop commodities. In the case of citrus farmers they changed their hand harvesting practices in madarin oranges to cutting with scissors, reducing harvest loss in 6%. Farmers that adopted a sigatoka control program and the use of soluble fertilizer increased the marketing of plantain in about 5%. Coffee farmers with broca insect control traps and programs increased production in 9% compared with last year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems
401	Structures, Facilities, and General Purpose Farm Supplies
405	Drainage and Irrigation Systems and Facilities
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

Outcome #3

1. Outcome Measures

Number of farmers that increased the quality in crop commodities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1000	1999

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As in crop production, crop quality is affected by the presence of insects and diseases, as well as by poor management practices. In Puerto Rico the quality of plantain and bananas y is affected by sigatoka disease and coffee by the Broca insect. Poor postharvest practices can cause serious damage to crops and affect their quality. An example of this is the Serrallos packinghouse, mango exporter to the USA and Europe, where much of the fruits were damaged during transport by loss of pulp (hollows in the pulp of the mango pulp). The loss was 7 to 10% of the boxes shipped.

What has been done

PRAES agents carried out an aggressive promotion plan on control of crop disease and better management practices for better external quality of the product. The plan included training meetings and educational material on the subject matter. In the case of the Serrallos packinghouse, the PRAES specialist in fruits, the local county agent, and Agricultural Experimental Station researcher worked together to correct the problem.

Results

The promotion plan on control of insects and crop diseases and better management practices resulted in improved quality of their crop commodities for 1999 farmers. The Serrallos packinghouse eliminated its problem 100%by leaving the harvested mango one day so that it could lose the heat of the field and then passed through the packing line and hot water treatment. This resulted in an increase in income (10%), approximately \$15,000 to 25,000 dollars were recovered.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
604	Marketing and Distribution Practices

Outcome #4

1. Outcome Measures

Number of farmers that adopted new value-added practices in crop commodities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	200	226

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

An increase in production and quality of the crops required that the farmers adopt more value-added to their products in order to be able to compete in the market and have alternative ways of selling their products.

What has been done

Farmers were oriented on the best practices to increase the value of the production like packing of the products in the farm, attractive labeling and boxes to promote the commodities, and processing part of the production in ready-to-cook-and-prepare products.

Results

Two hundred and twenty-six (226) farmers adopted the recommended practices. The Citrus Mountain Producers' Association increased their sales and income 30% (\$840,000) by selling their peeled oranges to the Public School Food Program. The peeled orange were packed in boxes and refrigerated reducing injury to the fruit during harvest.

A hot peppers grower developed a hot sauce, with the orientation of Puerto Rico Agricultural Extension Service agents and Agricultural Experiment Station researchers. He increased his income in \$40,000.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
401	Structures, Facilities, and General Purpose Farm Supplies

- 402 Engineering Systems and Equipment
- 403 Waste Disposal, Recycling, and Reuse
- 601 Economics of Agricultural Production and Farm Management
- 604 Marketing and Distribution Practices

Outcome #5

1. Outcome Measures

Number of farmers that increased their income after having adopted one or more practices of plant management systems and/or product quality.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	450	1395

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
401	Structures, Facilities, and General Purpose Farm Supplies
403	Waste Disposal, Recycling, and Reuse
405	Drainage and Irrigation Systems and Facilities
601	Economics of Agricultural Production and Farm Management

602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices

Outcome #6

1. Outcome Measures

Number of persons that acquired knowledge after completing a training program in integrated pest management.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1500	1984

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Puerto Rico's reduced economy has alerted farmers to the benefits of reducing their reliance on chemicals to control pests and diseases and are now more willing to adopt the IPM approach to reduce the native impacts associated with pest control.

What has been done

The PRAES county agent and specialist, together with Agricultural Experiment Station personnel, offered trainings, conferences and workshops on IPM programs to farmers who also participated in field days in IPM. Farmers were oriented on the importance of having a good IPM program to control many new diseases and pests that increase the cost of pest control.

Results

One thousand nine hundred and eighty-four (1984) farmers acquired knowledge on IPM after completing an IPM program, 831 farmers adopted one or more of the IPM techniques and 639 farmers reduced pesticide use. Five hundred and ninety-four (594) farmers established and IPM after completing a training program and becoming more aware and conscientious of the harmful effects of pesticides on environmental health.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

- 213 Weeds Affecting Plants
- 214 Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 Integrated Pest Management Systems

Outcome #7

1. Outcome Measures

Number of persons that adopted one or more techniques after completing an integrated pest management program.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1000	831

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Number of persons that reduced the use of pesticides after completing an integrated pest management program.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	300	639

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

Number of persons that established an IPM program after completing a training program.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	300	594

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #10

1. Outcome Measures

Number of farmers that acquired knowledge after completing a training program in pesticide application.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1900	1513

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

- 213 Weeds Affecting Plants
- 214 Vertebrates, Mollusks, and Other Pests Affecting Plants

Outcome #11

1. Outcome Measures

Number of farmers that acquired knowledge after completing a training program in integrated pest management.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1900	1984

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This indicator is repeated, so it will be eliminated.

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #12

1. Outcome Measures

Number of clients that increased their knowledge about improvements to increase the efficiency of structures (new and existing) and compliance with regulations.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	300	400

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse

Outcome #13

1. Outcome Measures

Number of clients that increased their knowledge about appropriate systems for waste management in their projects.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	300	506

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #14

1. Outcome Measures

Number of clients that increased their knowledge about drainage or irrigation facilities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	345

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities

Outcome #15

1. Outcome Measures

Number of clients that adopted one or more of the recommended practices to increase the efficiency of their structures and comply with all permits.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	80	114

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies

Outcome #16

1. Outcome Measures

Number of clients that adopted one or more practices to improve their drainage or irrigation facilities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	300	67

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities

Outcome #17

1. Outcome Measures

Number of farmers that improved their structures (new and existing) and/or comply with permits.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	122

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies

Outcome #18

1. Outcome Measures

Number of waste management systems improved (new or existing).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	79

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #19

1. Outcome Measures

Number of drainage or irrigation facilities improved.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	16

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities

Outcome #20

1. Outcome Measures

Number of farmers that increased their production as a result of improving their structures.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	30	44

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies

Outcome #21

1. Outcome Measures

Number of farmers that increased their production as a result of improving their waste management systems.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	45	44

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #22

1. Outcome Measures

Number of farmers that increased their production as a result of improving their drainage or irrigation facilities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	51

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities

Outcome #23

1. Outcome Measures

Number of farmers and agricultural entrepreneurs that adopted one or more economic practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	400	572

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
610	Domestic Policy Analysis

Outcome #24

1. Outcome Measures

Number of farmers and agricultural entrepreneurs that utilize economic tools to take effective economic decisions to improve their business.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	400	469

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
610	Domestic Policy Analysis

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
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The economic situation of the USA and Puerto Rican governments was a very important factor for the outcomes of crop production. Many government State agricultural programs were stopped during 2010. This situation affected many farmers and coffee buyers. Crop production was also affected by pests in coffee fruits, diseases in plantain and banana plantations and the citrus greening insect vector greening diseases. Puerto Rico's record breaking rains during 2010 (the heaviest in recorded history) also had a negative impact on production.

In areas where there was an increase in outcomes PRAES worked jointly with Puerto Rico Agriculture Experiment Station researchers to convey the importance and benefits of applying better management practices and IPM.

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- Case Study
- Other (Surveys)

Evaluation Results

Key Items of Evaluation