

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Plant Health and Pest Management

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	10%			
205	Plant Management Systems	10%			
211	Insects, Mites, and Other Arthropods Affecting Plants	10%			
212	Pathogens and Nematodes Affecting Plants	10%			
213	Weeds Affecting Plants	5%			
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%			
215	Biological Control of Pests Affecting Plants	10%			
216	Integrated Pest Management Systems	40%			
	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	3.0	0.0	0.0	0.0
Actual	3.3	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
200642	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
66313	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
61166	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The University of Guam Cooperative Extension Service's Plant Health and Pest Management group performed educational outreach to local farmers, homeowners, nurseries, landscapers and golf course superintendents and their crews, students, government agencies, and the general public by providing space, equipment, and expertise for publications, courses and workshops. The group gave advice and instruction in the areas of pesticide application, Integrated Pest Management (IPM) strategies, plant propagation, insect identification, weed identification, plant disease identification, soil nutrition and fertilizers, and grafting through trainings, workshops, brochures, fact sheets, television, radio, and one-on-one interventions. The group also provided plant disease diagnostics for the island through the Cooperative Extension Service's Plant Health Clinic.

The Plant Health and Pest Management group sponsored a three day training and workshop for Guam's Agriculture Professionals to build agriculture professionals' understanding and assessment of soil nutrient levels in relation to plant health and disease suppression. Instructors from the University of Guam and the University of Florida provided the training. Professionals were from the Guam Department of Agriculture, Guam Natural Resource Conservation Service, University of Guam Cooperative Extension Services, and the University of Guam Agriculture Experiment Station. Trainees were given instruction in identifying nutrient deficiencies in a classroom environment and in a field environment where plots of tomato, eggplant, pepper, and cucumber were grown under low and normal fertilizer levels. Also, trainees were given instruction in field test equipment for analyzing soil nutrients and plant tissue. A pretest was given to the trainees prior to instruction and a post test was given after instruction. Ninety-two percent of the trainees showed an increase in knowledge, with the average test score increasing by sixteen percent. The trainees then held a half day workshop for the islands farmers and the general public at the field plot site where they gave interactive instruction on soil and plant nutrients and plant disease suppression.

The Plant Health and Pest Management group continued its research and outreach education on Guam's dying Ironwood trees. The decline of Guam's Ironwood trees were first noticed on farms around Guam where the trees were used as windbreaks for farmer's crops and the needles from the trees used for mulch around plants. Statistical analysis of data collected show that a complex of biotic and abiotic factors are responsible for the decline. Posters, brochures, and interactive displays are being used at workshops to inform the public about the decline and to teach proper tree care techniques to keep the decline from spreading.

The Plant Health and Pest Management group also continued to work on the eradication and control

of the Coconut Rhinoceros Beetle, which feed on coconut trees and can sometimes cause the tree to die. This year a bio-control agent, a virus, was brought into Guam to be used against the beetle. This virus has been used successfully in Samoa, Fiji, Tonga, Palau, and other Pacific islands. The beetle is symbolic of many invasive species on small islands. Their impact is often severe because there are no natural enemies such as predators, parasites, or diseases to control their population growth. Educational outreach through workshops and training on the Coconut Rhinoceros Beetle and invasive species in general have been ongoing for the past few years. Local residents who pass a course in identifying and reporting invasive species are given a certificate and licensed as "First Detectors."

2. Brief description of the target audience

The target audience includes local farmers, homeowners, nurseries, landscapers, golf course superintendents and their crews, students, government agencies, and the general public

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	350	450	145	445
Actual	4500	11000	1475	600

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	0	0	
Actual	2	6	8

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of research papers

Year	Target	Actual
2010	1	10

Output #2

Output Measure

- # of research citations

Year	Target	Actual
2010	5	55

Output #3

Output Measure

- # of extension fact sheets or articles

Year	Target	Actual
2010	3	6

Output #4

Output Measure

- # of workshops/trainings/classes

Year	Target	Actual
2010	10	28

Output #5

Output Measure

- # of brochures

Year	Target	Actual
2010	4	7

Output #6

Output Measure

- # of research or new technology reports

Year	Target	Actual
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2010 3 31

Output #7

Output Measure

- # of one-on-one interventions

Year	Target	Actual
2010	185	3550

Output #8

Output Measure

- # of surveys

Year	Target	Actual
2010	2	7

Output #9

Output Measure

- # of focus groups

Year	Target	Actual
2010	1	1

Output #10

Output Measure

- # of news media activities (TV and radio)

Year	Target	Actual
2010	1	17

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	% of participants gaining skills in identification of insects and related pests
2	% of participants gaining skills in identification of plant diseases
3	% of participants gaining skills in identification of weeds
4	% of participants gaining knowledge about pesticides and their application
5	% of participants reducing indiscriminate use of chemical pesticides
6	% of participants adopting some established IPM practices

Outcome #1

1. Outcome Measures

% of participants gaining skills in identification of insects and related pests

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	85	76

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Local farmers, homeowners, nurseries, landscapers and golf course superintendents and their crews, students, teachers, government agencies and the general public. Identification is essential in determining the difference between beneficial insects and insect pests, and to insure that proper management practices for IPM and pesticide application are employed. These practices lead to improved plant health and crop yield, and reduce negative impacts on human and wildlife health and the environment.

What has been done

PSEP/PAT training workshops which included insect identification were held for: Basic Core; Turf and Ornamentals (Category 3); Industrial, Structural and Health related Pest Control (Category 7); and Commercial Agricultural Plant Pest Control (Category 1a).

Results

Seventy-six percent of participants passed EPA licensing tests, which required the ability to identify insects and related pests, following PSEP/PAT training workshops for: Basic Core; Turf and Ornamentals (Category 3); Industrial, Structural and Health related Pest Control (Category 7); and Commercial Agricultural Plant Pest Control (Category 1a).

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

% of participants gaining skills in identification of plant diseases

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	85	81

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Local farmers, homeowners, nurseries, landscapers and golf course superintendents and their crews, teachers, students, government agencies and the general public. Plant disease identification of biotic and abiotic caused plant diseases are essential to insure that proper management practices for IPM and pesticide application are employed. These practices lead to improved plant health and crop yield, and reduce negative impacts on human and wildlife health and the environment.

What has been done

PSEP/PAT training workshops which included identification of biotic and abiotic caused plant diseases were held for: Basic Core; Turf and Ornamentals (Category 3); and Commercial Agricultural Plant Pest Control (Category 1a). Also, Guam Agricultural professionals from NRCS, Department of Agriculture, CES, and AES were given training in soil and plant nutrition in regard to disease suppression.

Results

Eighty-one percent of participants passed EPA licensing tests, which required the ability to identify biotic and abiotic caused plant diseases, following PSEP/PAT training workshops for: Basic Core; Turf and Ornamentals (Category 3); and Commercial Agricultural Plant Pest Control (Category 1a). Also, ninety-two percent of Guam Agricultural professionals from NRCS, Department of Agriculture, CES, and AES passed testing on soil and plant nutrition and plant disease.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

% of participants gaining skills in identification of weeds

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	85	74

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Local farmers, homeowners, nurseries, landscapers and golf course superintendents and their crews, teachers, students, government agencies and the general public. Identification of specific weeds is essential to insure that proper management practices for IPM and pesticide application are employed. These practices lead to improved plant health and crop yield, and reduce negative impacts on human and wildlife health and the environment.

What has been done

PSEP/PAT training workshops which included identification of specific weeds were held for: Basic Core; Turf and Ornamentals (Category 3); and Commercial Agricultural Plant Pest Control (Category 1a).

Results

Seventy-four of participants passed the EPA licensing tests, which required the ability to identify specific weeds, following PSEP/PAT training workshops for: Basic Core; Turf and Ornamentals (Category 3); and Commercial Agricultural Plant Pest Control (Category 1a).

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
213	Weeds Affecting Plants

216 Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

% of participants gaining knowledge about pesticides and their application

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	85	76

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Local farmers, homeowners, nurseries, landscapers and golf course superintendents and their crews, teachers, students, government agencies and the general public. Knowledge of pesticides and their application is crucial for the health and safety of the applicator, consumers of produce, the health of humans and wildlife, and the environment.

What has been done

The PSEP/PAT Basic Core training workshop was held which included specific training in pesticides and their application.

Results

Seventy-six percent of participants passed the Basic Core test following training in pesticide use and application.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
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 #5

1. Outcome Measures

% of participants reducing indiscriminate use of chemical pesticides

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	76

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Local farmers, homeowners, nurseries, landscapers and golf course superintendents and their crews, teachers, students, government agencies and the general public. Correct application in this area leads to improved plant health and crop yield, savings on pesticide purchases, and reduces negative impacts on human and wildlife health and the environment.

What has been done

PSEP/PAT Basic Core training workshop was conducted. Training in the indiscriminate use of chemical pesticides was included in the training workshop.

Results

Seventy-six percent of participants indicated use of knowledge by reducing indiscriminate use of chemical pesticides.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
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
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

% of participants adopting some established IPM practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	76

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Local farmers, homeowners, nurseries, landscapers and golf course superintendents and their crews, teachers, students, government agencies and the general public. Correct application of IPM practices leads to improved plant health and crop yield, and reduces negative impacts on human and wildlife health and the environment.

What has been done

The PSEP/PAT Basic Core training workshops was conducted. Training in IPM practices was included in the workshop.

Results

Seventy-six percent of participants indicated adopting established insect and pesticide management practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
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
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.)
- Economy
- Competing Public priorities

Brief Explanation

Guam's horticulture and agricultural activities are constantly being reshaped by the availability of imports, frequency of damaging typhoons, number of tourists and proliferation of exotic pests and diseases. Guam's agricultural land is being replaced with housing, golf courses, hotels, parks, and landscaping. With each shift in land use new pests, diseases and weed problems arise. Typhoons have a major impact on the outcome of our program because of its impact on plants, pests, insect and insect-like pests, diseases, weeds, biological control agents, and cultural practices. Immediately after a typhoon, client concerns shift from garden and farm production to home and farm clean up and restoration. After a typhoon, several months often pass before home gardens and farms are back into productions. Extension services such as the operation of a diagnostic center depends heavily on personnel and support staff for daily operations. When cutbacks occur, adjustments must be made in program delivery to keep the center's doors open.

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- Comparisons between program participants (individuals, group, organizations) and non-participants

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}