V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Plant Health and Pest Management

☑ 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
102	Soil, Plant, Water, Nutrient Relationships	5%			
205	Plant Management Systems	10%			
211	Insects, Mites, and Other Arthropods Affecting Plants	10%			
212	Pathogens and Nematodes Affecting Plants	15%			
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 FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	2.5	0.0	0.0	0.0
Actual Paid Professional	3.6	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**
267959	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
142617	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
90677	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 (PHPM) group performed educational outreach to the public sector (farmers, homeowners, and students), private sector (crews and managers of plant nurseries, landscape companies, and golf courses), and government agencies (Department of Agriculture, EPA, and Parks and Recreation). Outreach included direct contact with clients through trainings, workshops and one-on-one interventions as the result of site and office visits and phone calls. Indirect contact included trainings, workshop focus groups, television and radio programing, and publications for the general audience (manuals, brochures, and fact sheets) and for the scientific audience (proceedings, abstracts, journal articles). Subject areas covered included pesticide application, Integrated Pest Management (IPM) strategies, plant propagation, insect identification, weed identification, plant disease identification, soil nutrition and fertilizers, invasive species, and grafting. The group also provided plant disease diagnostics and insect identification for the island through the Cooperative Extension Service's Plant Health Clinic (plant disease and entomology laboratories).

Three Integrated Pest Management (IPM) strategic planning sessions were held during the year. There were a total of 127 stakeholders representing three agricultural groups (commercial producers, residential gardeners, and governmental agencies). Goals of the sessions were to strengthen multi-directional flow of IPM information among these groups and to position the Guam IPM program for future competitive funding that address each particular groups needs. Results achieved from three strategic planning sessions included the identification of strengths and weaknesses of the current UOG-IPM program and recommendations for future funding. Specific recommendations for IPM funding included workshops and training sessions, the development of an IPM and agricultural service directory, crop/variety trials, and financial support for subject experts. To improve communications between agencies, it was suggested that an educational task force be established. Possible functions of the task force will be to map areas of pests and their impacts on the island environment. It was also recommended that some of these funds be used to support the current diagnostics services to insure a quick turn around on identifications of pests, weeds, and plant diseases. As a result of the findings of the three strategic planning sessions and the successful grant submission, the University of Guam Cooperative Extension Service's Plant Health and Pest Management (PHPM) groupwas awarded a three-year $75,000 NIFA EIPM-CS Coordination grant for Guam.

Members of the PHPM group continued to service Guam and other Micronesian islands by identifying insect pests and recommending methods for mitigating the damage they cause. Much of the time was spent doing project management for the Guam Coconut Rhinoceros Beetle project which is funded by multiple grants from USDA-APHIS, US Forest Service, and the Guam legislature. During 2013, focus of

the Rhino project has transitioned from an objective of eradication to development of an integrated pest management approach, which will minimize damage. Applied research resulted in traps which are 13 times more attractive for adult rhino beetles than standard pheromone traps.

2. Brief description of the target audience

The target audience for this program includes local farmers, homeowners, nurseries, landscapers and golf course superintendents and their crews, teachers, school children, and government agencies.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	5690	15330	1018	1400

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

Patent Applications Submitted

Year: 2013

Actual: 1

Patents listed

Devices and methods for detecting pests

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	4	5	9

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of research papers

Year	Actual
2013	4

Output #2

Output Measure

- # of research citations

Year	Actual
2013	94

Output #3

Output Measure

- # of extension fact sheets or articles

Year	Actual
2013	10

Output #4

Output Measure

- # of workshops/trainings/classes

Year	Actual
2013	29

Output #5

Output Measure

- # of brochures

Year	Actual
2013	4

Output #6

Output Measure

- # of research or new technology reports

Year	Actual
2013	24

Output #7

Output Measure

- # of one-on-one interventions

Year	Actual
2013	2290

Output #8

Output Measure

- # of surveys

Year	Actual
2013	26

Output #9

Output Measure

- # of focus groups

Year	Actual
2013	3

Output #10

Output Measure

- # of news media activities (TV and radio)

Year	Actual
2013	6

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	Actual
2013	71

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
A Pesticide Safety Education Program (PSEP) Basic Core pesticide training workshop was conducted by the CES Plant Health group during the year. Identification of insects and related pests were major components of these trainings.

Results
Seventy one percent of participants passed EPA licensing tests for the Basic Core.

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	Actual
2013	71

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 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
A Pesticide Safety Education Program (PSEP) Basic Core pesticide training workshop was conducted by the CES Plant Health group during the year. Identification of plant diseases were major components of these trainings.

Results
Seventy one percent of participants passed EPA licensing tests for the Basic Core.

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	Actual
2013	71

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
A Pesticide Safety Education Program (PSEP) Basic Core pesticide training workshop was conducted by the CES Plant Health group during the year. Identification of weed pests were major components of these trainings.

Results
Seventy one percent of participants passed EPA licensing tests for the Basic Core.

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	Actual
2013	71

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
A Pesticide Safety Education Program (PSEP) Basic Core pesticide training workshop was conducted by the CES Plant Health group during the year. Pesticides and pesticide application were major components of these trainings.

Results
Seventy one percent of participants passed EPA licensing tests for the Basic Core.

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

Outcome #5

1. **Outcome Measures**

% of participants reducing indiscriminate use of chemical pesticides

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

% of participants adopting some established IPM practices

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Government Regulations

Brief Explanation

Outcomes five and six were not measured due to appropriations to EPA being cut for the Pesticide Safety Education Program (PSEP). Previously, EPA subcontracted the training and testing to the University of Guam Cooperative Extension Services. While the training (education) for PSEP is still performed by Cooperative Extension as a community service, the testing is now performed and under the purview of EPA. These two outcomes (survey questions) were on Cooperative Extension tests but are not included in the current EPA tests. It is hoped that next year, these survey questions will be asked during training.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation results were a combined grade of ninety six percent.

Key Items of Evaluation

Evaluation is based on internal review of the Plant Health and Pest Management group, stakeholder input, and pre/post testing.