

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger: Plant Protection Program

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
211	Insects, Mites, and Other Arthropods Affecting Plants	40%		40%	
213	Weeds Affecting Plants	10%		10%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
215	Biological Control of Pests Affecting Plants	20%		20%	
216	Integrated Pest Management Systems	25%		25%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	5.3	0.0	5.3	0.0
Actual Paid	0.5	0.0	0.5	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
59997	0	7965	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	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

Plant Protection staff will conduct research on biological and other methods of control against invasive weeds, insect pests, mollusks and plant diseases. As an example, the weed, *Mimosa diplotricha* which came to the Northern Mariana islands and became invasive. On the island of Saipan, Tinian and Rota this invasive species has invade the farm land and pastures areas by competing with the space and available foods for the cattle's and competing with the environment. This invasive species weed, can effectively control by the Mechanical/Physical control, Cultural control and the herbicide. The Biological control *Heteropsylla spinulosa* have introduced to control this invasive weed, but no impact yet. Another example is the recently introduced Cuban slug, *Veronicella cubensis*, into the CNMI. It has become established on the island of Rota, has multiplied and has spread throughout most of the farm areas causing extensive damage to many crops. It has become a major agriculture pest and it has also become a threat to other islands in the CNMI where this pest is not present. We intend to continue to apply the best management methods of control and to find its natural enemies to supplement other methods of control. There are many more existing weeds, arthropods and other crop pests and diseases that require continuous application of best management methods. We will continue to improve on these methods and to extend the knowledge to our stakeholders. We will also continue to collect arthropods of economic importance, expand and enhance the economic insect collection, and the general invertebrate collection for reference, for taxonomic studies, and for educational purposes.

2. Brief description of the target audience

Farmers, crop producers and farm helpers, business operators that promote or sell farm products, grade schools, high schools and college students interested in furthering their knowledge in agriculture, adult volunteer leaders (4-H Clubs) and the general public

3. How was eXtension used?

Information from eXtension was used for outreach education, flyers, brochures, and one-on-one extension visits.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Year: 2014
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Research Projects completed on invertebrate pest, such as nematodes, invasive species such as scarlet gourd, melon fly, papaya mealy bug, and Cuban slug).

Year	Actual
2014	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of farmers using Integrated Pest Management to control invasive species
2	Decrease the population of the various invasive species (Cuban Slug, Melon Fly, Sweet potato Weevil, Whiteflies, and nematodes) by certain percentage:
3	Number of clients learning Pesticide Safety

Outcome #1

1. Outcome Measures

Number of farmers using Integrated Pest Management to control invasive species

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Protection our natural resources and the environment is one of the NMC-CREES primary goal and objective to ensure the agriculture production and the environment are well protected from the others invasive species that are threatening our fauna, flora, agriculture production and the environment.

What has been done

The USDA-APHIS CAPS program funded NMC-CREES two year research project on two invasive species of fruit flies, *Bactrocera philippinensis* and *Bactrocera fraunenfeldi*. These two invasive flies are among the major pests listed on the Guam Pest List. Guam categorized these pests are threatening pests for the Marianas Island. The project set a new lead to capture the invasive pest upon arrival. The establishment of the detection surveillance on Saipan and Rota is on-going for early detection and capture of these pest can lead to eradication before they become established.

USDA-APHIS also funded NMC-CREES Biological Control of Siam Weed in the Northern Marianas Island, the purpose of this project for releasing the Bio-control (*Cecidochares connexa*) on the two islands (Tinian and Saipan). The bio-control has been collected on Rota where the bio- control already established and the released have made on Tinian and Saipan.

Results

The plant protection program continued surveillance the invasive species at seaport, airport and farm areas. The team also continued distribute Bio-control agent, *Acythopeus coccinae* and *Cecidochares,connexa* to control invasive plants (*Coccinia grandis*) and *Chromolaena odorata* on the island of Saipan and Tinian. The new grant from USDA-APHIS will enhance the distribution of the bio-agent on the island of Tinian and Saipan.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods 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 #2

1. Outcome Measures

Decrease the population of the various invasive species (Cuban Slug, Melon Fly, Sweet potato Weevil, Whiteflies, and nematodes) by certain percentage:

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The CNMI had a very limited agriculture resources and the invasive pest that have already here causing serious impact to the agriculture production in the CNMI and additional pest can cause major problem to commercial and subsistence farming in the CNMI. The extension regularly visited farmers to educate the farmers and stakeholders to stop smuggle plant to the island for the benefit of the farming community and environment.

What has been done

The CREES extension agent regularly visited farmers to provide technical assistant to identify pests, pest scout and the recommendation to control pests using the IPM methods of control pests.

Results

NMC-CREES collaborated with numerous agencies in the CNMI and Western region on a pest issue, agriculture issue and environment issue. The agencies are CNMI-DLNR, BECQ, Pest net

group, PIDDRS and USDA-APHIS.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods 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 #3

1. Outcome Measures

Number of clients learning Pesticide Safety

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The NMC-CREES Plant Protection Program will continue provide extension service through our clients in regards with pest problems, invasive species through outreach education, training and research.

What has been done

The extension agent given the opportunity to attend the PPQ workshop at the University of Guam and the opportunity to attend the Western Region SHARE workshop training in Guam and PDP professional training on Saipan conducted by University of Guam to enhance the professional development through workshop and training.

Results

Some farmers on Saipan able to get grant from USDA EQUIP Program because of the help

contributed from CREES extension agent through the IPM practices and conservation

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods 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
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The NMC-CREES Plant Protection division was challenged with replacing some FTE's and Program leader. On the island of Rota for example, we lost the Plant Protection Extension agent with cause lack of complete data for CAPS survey on Rota, related work on invasive species and field extension. No agriculture extension on Tinian.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}