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%	
215	Biological Control of Pests Affecting Plants	40%		40%	
216	Integrated Pest Management Systems	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	4.3	0.0	5.3	0.0
Actual Paid Professional	1.0	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**
75905	0	8114	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

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The USDA / APHIS CAPS funded project "Arthropod Survey" involves the surveillance of two invasive species of fruit flies the Bactrocera philippinensis and Bactrocera franuenfeldi. The objective of the project is to set up surveillance monitoring stations at the port of entry and agriculture areas on Saipan and Rota. The strategy is to use attractant pheromone lures in the traps to capture these pest upon arrival to CNMI because early detection can lead to non-introduction of the invasive species or possible eradication.

Plant Protection program is battling against invasive weeds, insect pests, mollusks and plant diseases. As an example, the weed, Mimosa diplotricha was accidently introduced to the Northern Mariana islands and thereafter became invasive. This invasive weed has invaded the farm land and pastures areas by competing with the space and available foods for the cattle's and competing with the environment. The Biological control Heteropsylla spinulosa was introduced to Saipan from Palau to control this invasive weed. The surveillance of the invasive species shows the reduction of the Memosa diplotricha on Saipan.

Another example is the recently introduced Cuban slug, Veronicella cubensis. 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?

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	300	1000	0	0

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

Patent Applications Submitted

Year: 2013

Actual: 1

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	1	0

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
2013	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
2013	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Protection our natural resources and environment is one of NMC- CREES goal or mission to ensure the agriculture production and environment are well protected from the invasive species that are threatening the agriculture production on island and the environment. The plant protection have educate the farmers the save use of pesticides by introducing the new methods of control pest which Integrated Pest Management (IPM). The pesticides is the last resort to control pests.

What has been done
The USDA-APHIS CAPS program awarded CREES one year research project and still continue for another year. The project set a new lead idea to capture the invasive pest upon arrival. This project is significant because they provide funding to CREES to surveillance of the invasive species that are threading the CNMI.

Results
The Plant Protection Program continued to distribute the Biological control agent (Acythopeus coccinae) of Scarlet gourd (Coccinia grandis) throughout the island of Saipan Tinian and Gall fly the bio agent Cecidochare connexa on the island of Saipan to control the invasive weed (Chromolaena odorata.. 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
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 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The CNMI has very limited agriculture resources and the invasive pests that are already present are seriously impacting the agriculture production in the CNMI. Any additional pests can cause major problem to the already fragile commercial and subsistence farming in the CNMI.

What has been done
Extension agents scout for insects and other invasive species and gave educated farmers on how to identify and deal with insect pest through the use of appropriate Integrated Pest Management methods. Additionally, extension agents educated farmers and stakeholders on the negative effects of smuggling non-native plants into the islands.

Results
NMC-CREES collaborated with numbers of agencies in the CNMI Guam, Hawaii and Mainland or Western Region on pest issues, agriculture issues and environmental issues. The DLNR, DEQ Pest Net group, PIDDRS help for pest identification and USDA-APHIS provide funding for surveillance of invasive pest species and pest identification. Quantifying invasive species increases or decreases is on-going. Around 80% of farmers reported being able to identify pests post-education from extension agents.

4. Associated Knowledge Areas

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

Not Reporting on this Outcome Measure

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.)
- Other (Lack of personnel)

Brief Explanation

Our Plant Protection Program was challenged with no FTE program leader on Saipan and no Staff for the Plant Protection on Rota site and Tinian site.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Although methods to control invasive species and pests have been implemented, eradicating the aforementioned continues to be a daunting task. However, through programming efforts, farmers have been better able to control inasive pests, insects, and plants with the resources that they have access to.

Key Items of Evaluation

Plant protection remains an important program due to the fragile agriculture industry coupled with the challenges of invasive pests, insects, and plants. Regional collaboration and access to scientists plays a key role in moving towards the eradication of invasive species.