2014 University of Guam Research Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Guam, an unincorporated Territory of the United States, is located in the Western Pacific at 13 degrees north latitude and 144.4 degrees east longitude. It is the largest of 16 islands in the Marianas. It is approximately 3,600 miles west- southwest of the Hawaiian Islands and about 1,500 miles due east of Manila, Philippines. Guam's population is approximately 180,000 and increasing. The ethnic background of the island includes: Chamorro (native islanders), Filipinos, Caucasians (including members of the U.S. Armed Forces and their dependents), other islanders (Micronesians and Palauans) and Asians (Koreans, Japanese and Chinese).
The University of Guam, as a member of the 1862 Land Grant institutions, its College of Natural and Applied Sciences (CNAS) facilitates the tripartite functions of the college: research, extension and teaching. The Dean of CNAS serves as Director of the Agriculture Experiment Station, and also as Director of Cooperative Extension Service.

Since 2006 AES has operated as the Western Pacific Tropical Research Center (WPTRC). This new name more accurately reflected the division's broad mission and research priorities. The primary mission of WPTRC is to conduct applied and basic research in agriculture and to protect the natural environment. The Hatch funds and their respective Government of Guam matching funds are used to maintain operations of the Western Pacific Tropical Research Center.
The WPTRC conducts research for the protection of natural environment as well as the development of the island's agriculture and aquaculture. The University of Guam Cooperative Extension Service translates and delivers technical information and conducts informal education programs for farmers, homemakers, families, youth and the community.

Research productivity over the last years was excellent. In 2014, seven full time researcher faculty published 27 refereed journal papers, which placed us among other successful and productive research units. Further significant growth in refereed journal publications as well as substantial increase in successful grant proposals in 2014 was evident. Unfortunately, there were also important setbacks that impacted our productivity. Both our Plant Pathologist and Agriculture Economist retired after 30 years of service and University did not fill these positions yet (over two years). Recent investments related to the military buildup on Guam were put on hold due to US budgetary cuts. Declining island's economy affected University as well. Hiring freezes and permanent elimination of many faculty vacancies have been very challenging. Despite all challenges, recently completed "Good to Great" process evaluating all 70 academic and research programs at the University of Guam placed WPTRC in the group of top 10 programs for the entire University. This recognition will give us access to extra resources and hopefully will restore most if not all of recently lost faculty positions.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	7.5	0.0
Actual	0.0	0.0	23.7	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel

2. Brief Explanation

Because of the small size of WPTRC, review of individual Plans of Work and projects has been conducted mostly by WPTRC administrators (Director and Associate Director). They usually utilize external reviewers as well as their knowledge and experiences to ensure that the planned programs and activities address the critical issues of strategic importance, including those identified by the stakeholders during the development of Strategic Plans. All new research proposals (such as Hatch, McIntire Stennis, Regional Research etc.) are being submitted to WPTRC Associate Director who checks the proposal for completeness and format. There are very few peers at the university with expertise to review research proposals in agriculture fields. Therefore a draft proposal that is ready for review is being submitted to external ad hoc Peer Review Committee. Committee is comprised of three faculty members from other universities who are familiar with the issues addressed by the project. Based on the review, that includes assessment of (1) significance, (2) need, (3) approach, (4) new knowledge to be generated, (5) potential for impact, and (6) potential for success, WPTRC administrators are making decisions regarding allocation of resources.
The crucial issues addressed by WPTRC planned programs fall within the strategic goals of WPTRC adopted by the faculty during Strategic Planning Retreat. It was agreed that all programs must address issues that are relevant to the needs of the region, serve interest of scientific community and are linked to the needs of our stakeholders. Indeed, numerous research projects address environmental issues, integrated plant protection, bio-control as well as serve ethnic needs of local population. Some examples of work performed by WPTRC scientists in 2014 included: working on biological control in pest management systems, food safety education and traditional food modification, plant genetic resources conservation and utilization, carbon sequestration and distribution in eroded soils, eco-physiology of Guam's endemic and indigenous forest species, best management practices for papaya production, production of local seeds and tissue-cultured plants, improvement of vegetable production, shrimp research and economics of aquaculture on Guam soil management practices for agricultural sustainability and environmental quality, integrated pest management of aphids and whiteflies on cucurbits and vegetables, genetic structure of the cycas population in the Mariana Islands, bionomics of the chromolaena gallfly, biological control of cycad aulacaspis scale semiochemical attractants and trapping systems for monitoring and control of invasive scarab beetles in Micronesia, development of sustainable aquaculture on Guam, research on diseases of traditional Pacific island crop plants, development of efficient semiochemical-based control methods for weevil pests, evaluating the influence of ant attendance on natural enemies and their hosts on Cycas micronesica, phytochemicals, biological properties, and safety of tropical and subtropical foods, plants, or herbals, small-scale integrated farming system in an insular urban environment, as well as beneficial and adverse effects of natural, bioactive dietary chemicals on human health and food safety. In addition faculty participated in yearly meetings, exchanged

information and coordinated their multistate activities.
WPTRC (AES) administrators require annual reports to be submitted for all projects. Reports must contain sections called outputs and outcomes. Reported outcomes are categorized as short, medium and long term. Overall, AES projects produce valuable outcomes and impacts for our stakeholders and represent sound investments of our federal funding. WPTRC (AES) faculty scientists have been able to obtain additional, significant funding from extramural federal and non-federal sources to support some of our programs. These types of funding mechanisms indicate that conducted research is appreciated and considered to be trustworthy.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Targeted invitation to traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to selected individuals from general public

Brief explanation.

WPTRC employed several of stakeholder input methods including gathering input from individual farmers, farmers groups and organizations, representatives of the industry and representatives from federal and local agencies. Because of relatively small number of faculty and stakeholders on Guam, it has been a long-lasting practice to invite stakeholders for various functions in the college and give them frequent opportunities to express their needs in informal settings such as personal contact with faculty members. Periodically, stakeholders (farmers, golf course superintendents, owners of nurseries etc.) are invited to the college to make presentations and express their needs and concerns in more formalized manner. Both methods seem to work well and WPTRC administrators plan to continue with this way of providing stakeholders' input. Of particular importance is to generate good understanding (between stakeholders and AES) why issues related to the natural environment receive so much of attention and need stakeholders' support. We plan that our future stakeholders will include producers, consumers, decision-makers, students, alumni, and members of the business community.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Open Listening Sessions
- Other (Guam's stakeholders are well identified)

Brief explanation.

Guam's AES stakeholders are well identified. There are approximately 50 certified/registered farmers and another 200 individuals who supplement their income with some sort of agricultural production. Their participation and input to define agriculture research ranges from substantial (full time farmers) to insignificant. Farmers do not form strong and focused commodity groups. Their associations are rather loose and based on personal contacts, friendships, etc.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Meeting with invited selected individuals from the general public

Brief explanation.

Most WPTRC faculty work closely with stakeholders. These include individual farmers, golf course superintendents, homeowners, school teachers, state legislature and government agencies. Informal and formal input was provided to WPTRC on a regular basis during workshops, open houses, telephone calls, and letters. Several faculty members conducted research on stakeholders' farms. Some faculty and administrators were invited for informal or formal meetings such as for example Guam Soil and Water Conservation District where WPTRC receives an input and feedback from stakeholder groups.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Research Programs
- In the Action Plans
- To Set Priorities

Brief explanation.

Stakeholder input has been used extensively in developing the current WPTRC Strategic Plan. As a result of the received input, WPTRC faculty modify their research plans to improve service and to provide specific opportunities for continued feedback. Information will be disseminated to communities through newsletters, local newspaper coverage, radio and sometimes television programs. Administrators use stakeholders input to prioritize resource allocations. Recommendations from various groups of stakeholders are useful in developing research programs that reach the island community.

Brief Explanation of what you learned from your Stakeholders

Research scientists maintain close contacts with local farmers, landscapers, aquaculture producers, and local environmentalists. Because of the breadth of experience on other islands in the region, UOG-CNAS scientists and extension agents are able to identify, characterize and provide a rational method of management for invasive species, new disease outbreaks and other concerns on Guam. After identifying the challenges, researchers apply for funding for more in depth investigations.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	1195941	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	0	0	727926	0
Actual Matching	0	0	600000	0
Actual All Other	0	0	0	0
Total Actual Expended	0	0	1327926	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	0	0	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Sustain, Protect, and Manage Guam's Natural Environment and Resources.
2	Development and Protection of Guam's Diversified Tropical Plant Systems, and Aquaculture.
3	Food Safety
4	Global Food Security and Hunger
5	Climate Change
6	Sustainable Energy
7	Childhood Obesity

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Sustain, Protect, and Manage Guam's Natural Environment and Resources.

☑ 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			100%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual Paid	0.0	0.0	6.0	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**
0	0	184596	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	152154	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

Techniques such as reduce tillage and conventional till in rotation with sun hemp were developed for soils of southern Guam's and are presently being evaluated for the treatment effect.This project studies no-tillage farming practices for maintaining plant residues on soil surface for controlling erosion. The effect of

plant residue from the no-till plots on infiltration is currently being tested using rainfall simulators. Up-to-date data have been presented at professional conferences, and are continuously collected. Experiments using Vetiver grass for controlling siltation have been conducted and up-to-date results from the experiments are encouraging. It became evident that Vetiver technology will become a practical mitigation technique for controlling sedimentation in Guam and other neighboring islands of Micronesia.
Low level of watering via drip irrigation applied after each application of compost or commercial fertilizers as a management technique was conducted northern Guam in Yigo. Previous studies has shown that an initial low level water application will move the chemical to the stagnant region hence reducing the preferential flow from a major rainfall event that might be followed.

The effect of no-till management and other conservation tillage practices on chemical and physical properties of soils are currently being evaluated at the UOG experiment station in Ija in southern Guam. Numbers of soil parameters are being tested for this purpose.

The effect of land application of composted organic waste for soil quality improvement and agricultural sustainability is currently being evaluated on the calcareous soils of northern Guam. Up-to-date data are being presented before the farmers and local residents during the field demonstrations for educational purposes.

Application of composted organic waste on crop for improvements of soil quality and better yield was studied in Guam and the other islands of Micronesia. Results were published in the journal and conferences.

Watershed Soil Loss Assessment project was initiated and conducted in 2014. Results indicated that Vetiver grass technology is very viable method for reducing soil erosion.

2. Brief description of the target audience

Farmers, landscapers, students, general public, other government agencies

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	43	386	167	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	2	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Conference Presentations

Year	Actual
2014	4

Output #2

Output Measure

- Journal Publications

Year	Actual
2014	2

Output #3

Output Measure

- Newspaper, magazine and other non peer reviewed publications.

Year	Actual
2014	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Action outcomes : Adopt sustainable natural resource management practices. Condition Outcomes: Enhance the economic and environmental sustainability of Guam's agriculture Improve the lives of Guam's citizens through positive human development Learning Outcomes: Aspire to contribute to ecological health and biodiversity Learn about nutrient sources, recycling and delivery methods that are compatible with crop, soil and production systems Learn about water and land interaction, and related water-quality issues

Outcome #1

1. **Outcome Measures**

Action outcomes : Adopt sustainable natural resource management practices. Condition Outcomes: Enhance the economic and environmental sustainability of Guam's agriculture Improve the lives of Guam's citizens through positive human development Learning Outcomes: Aspire to contribute to ecological health and biodiversity Learn about nutrient sources, recycling and delivery methods that are compatible with crop, soil and production systems Learn about water and land interaction, and related water-quality issues

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes

Brief Explanation

Although local economy is slowly increasing, local government appropriations were still low.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Performance of this program was rated high by Guam's stakeholders including farmers, NRCS, students and general public. WPTRC administrators received many positive signals expressing appreciation for excellent conductance of this particular program. WPTRC program was rated as one of the best programs at the University of Guam with additional appropriations promised in coming years.

Key Items of Evaluation

Positive evaluation of this program was based on regional focus and high productivity.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Development and Protection of Guam's Diversified Tropical Plant Systems, and Aquaculture.

☑ 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
202	Plant Genetic Resources			15%	
205	Plant Management Systems			20%	
211	Insects, Mites, and Other Arthropods Affecting Plants			20%	
215	Biological Control of Pests Affecting Plants			15%	
216	Integrated Pest Management Systems			15%	
307	Animal Management Systems			15%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	5.0	0.0
Actual Paid	0.0	0.0	17.0	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**
0	0	523025	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	431109	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

Little fire ant detected on Guam in November 2011 and continued in 2014. Ants have been found infesting forest and residential properties at many sites from Merizo in the south along the western coastal hills to the karst-limestone forest of Yigo in the north. LFA infestations are still quite small but growing. Most of the infestation sites in residential areas cover about 100m2 or less. This suggests that eradication from most if not all sites is still within the realm of possibility if the spread of LFA by humans can be stopped, and if funds can be obtained to purchase chemicals and baits and to hire personnel to apply them periodically over the space of 1 to 2 years. Methods to eradicate and control LFA populations developed by the University of Hawaii-Hilo and the Hawaii Department of Agriculture will be adopted on Guam.

Work on coconut rhinoceros beetle on Guam continued. Field releases of fungal spores into rhino beetle breeding sites were not sufficiently successful. Biocontrol with Rhino specific virus imported from New Zealand brings mixed results.

Studies continued to evaluate production of local seeds and tissue-cultured plants in improvement of vegetable production on Guam.

Research on diseases of traditional Pacific island crop plants continued. More banana cultivars were imported from Pacific countries in tissue culture. Another tissue culture lab was established in collaboration with Guam's Department of Agriculture. Numerous cultivars of taro and yams have been studied.
A small-scale integrated farming system in an insular urban environment research continued. On-farm demonstration of non-circulating hydroponic system showed the potential of leafy greens production using simple hydroponic system in the tropics.
Pomologist studied the complex social life of plants. He noticed that when confronted with a competing plant, some species have been shown that they can recognize if the competitor is a relative. Many plants use that recognition skill to be selfish and compete more strongly for soil resources when confronted by a non-relative, but to exhibit altruism and reduce acquisition of soil resources when confronted by a relative. This study unequivocally demonstrates that particular cycads species possesses the ability to recognize kin. These results can inform cycad conservation decisions including which genotypes to conserve and how to design the planting layout to take advantage of the non-kin incentive to encourage more vigorous root growth.

Production of shrimp at the hatchery was costly, therefore economically questionable. However, there is a great need for broodstock on Guam and exporting it is profitable. A shrimp breeding program at the University of Guam Hatchery maintains clear pedigree lines and minimizes inbreeding for sustainability purposes. This was done by physically tagging, each individual animal. UOG Aquaculturist aimed to develop a panel of useful internal markers, in order to maintain sound shrimp breeding program, and ultimately improve the genetic diversity of shrimp stocks for the aquaculture industry on Guam and the region. The panel of these informative microsatellite markers developed in this study will be optimized and effectively employed in shrimp breeding programs at the hatchery for monitoring genetic diversity and managing the program.
Collection of wild stock of coral groupers, Plectopomus areolatus and health surveillance and disease diagnosis were performed with focus on PCR detection for viral nervous necrosis and iridovirus.
Maintained the breeding of tilapia stocks in support of the local aquaculture farming community and supply the seedlings.

2. Brief description of the target audience

Our target audience are research community, federal and territorial agencies, farmers, landscapers general public etc.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	213	946	827	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	12	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Journal publications

Year	Actual
2014	27

Output #2

Output Measure

- Newspaper, magazine, and other non peer reviewed publications.

Year	Actual
2014	18

Output #3

Output Measure

- Abstracts and conference presentations.

Year	Actual
2014	32

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Action outcomes Adopt healthy lifestyle practices, Adopt independent living practices, Adopt sustainable living practices, Adopt sustainable natural resource management practices, Implement food safety practices at all stages of the food handling system, Improve and expand Integrated Pest Management. Condition Outcomes: Enhance the economic and environmental sustainability of Guam's agriculture and aquaculture. Improve the lives of Guam's citizens through positive human development, healthy lifestyles and nutrition Learning Outcomes Aspire to contribute to ecological health and biodiversity Learn about integrated pest management (IPM) Learn about invasive species Learn about IPM technologies and benefits Learn about new crops and varieties Learn about nutrient sources, recycling and delivery methods that are compatible with crop, soil and production systems Learn about principles of aquaculture resource management Learn about the environmental risks of handling and applying pesticides Learn about the risks of not handling food safely Learn about water and land interaction, and related water-quality issues Learn alternative pest management techniques that minimize pesticide use Learn appropriate food safety practices Learn proper food handling practices Learn sustainable living skills Learn to apply pesticides safely and effectively Learn to identify invasive species

Outcome #1

1. Outcome Measures

Action outcomes Adopt healthy lifestyle practices, Adopt independent living practices, Adopt sustainable living practices, Adopt sustainable natural resource management practices, Implement food safety practices at all stages of the food handling system, Improve and expand Integrated Pest Management. Condition Outcomes: Enhance the economic and environmental sustainability of Guam's agriculture and aquaculture. Improve the lives of Guam's citizens through positive human development, healthy lifestyles and nutrition Learning Outcomes Aspire to contribute to ecological health and biodiversity Learn about integrated pest management (IPM) Learn about invasive species Learn about IPM technologies and benefits Learn about new crops and varieties Learn about nutrient sources, recycling and delivery methods that are compatible with crop, soil and production systems Learn about principles of aquaculture resource management Learn about the environmental risks of handling and applying pesticides Learn about the risks of not handling food safely Learn about water and land interaction, and related water-quality issues Learn alternative pest management techniques that minimize pesticide use Learn appropriate food safety practices Learn proper food handling practices Learn sustainable living skills Learn to apply pesticides safely and effectively Learn to identify invasive species

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants

216	Integrated Pest Management Systems
307	Animal Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Appropriations changes

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Programs are being evaluated by stakeholders and University; and feedback has been positive.

Key Items of Evaluation

Programs were rated as excellent by University of Guam "Good to Great" assessment process

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Food Safety

☐ Reporting on this Program

Reason for not reporting

Work in this area being reported under Extension Activities.

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.5	0.0
Actual Paid	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Volunteer	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct Research Experiments
Workshops/training
Teaching students
Improvements of research facilities

2. Brief description of the target audience

food service
general public
students

3. How was eXtension used?

{No Data Entered}

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: {No Data Entered}

Patents listed
{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	1	1	0

V(F). State Defined Outputs

Output Target

<u>Output #1</u>

Output Measure

- Journal Publications

Year **Actual**

2014	0

Output #2

Output Measure

- Newspaper articles

Year	Actual
2014	0

Output #3

Output Measure

- Presentations

Year	Actual
2014	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Implement food safety practices at all stages of the food handling system
2	Learn proper food handling practices

Outcome #1

1. Outcome Measures

Implement food safety practices at all stages of the food handling system

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

Outcome #2

1. Outcome Measures

Learn proper food handling practices

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Global Food Security and Hunger

☐ Reporting on this Program

Reason for not reporting

Work in this area being reported under Extension Activities.

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	0.0
Actual Paid	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Volunteer	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

no activity

2. Brief description of the target audience

no audience

3. How was eXtension used?

{No Data Entered}

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: {No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- no activity

Year	Actual
2014	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	no activity

Outcome #1

1. Outcome Measures

no activity

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Climate Change

☐ Reporting on this Program

Reason for not reporting

No scientist to address these issues.

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	0.0
Actual Paid	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Volunteer	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

no activity

2. Brief description of the target audience

no activity

3. How was eXtension used?

{No Data Entered}

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: {No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- no activity

Year	Actual
2014	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	no activity

Outcome #1

1. Outcome Measures

no activity

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Sustainable Energy

☐ Reporting on this Program

Reason for not reporting

No scientist to address these issues.

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	0.0
Actual Paid	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Volunteer	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

no activity

2. Brief description of the target audience

no activity

3. How was eXtension used?

{No Data Entered}

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: {No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- no activity

Year	Actual
2014	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	no activity

Outcome #1

1. Outcome Measures

no activity

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Childhood Obesity

☑ 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
703	Nutrition Education and Behavior			25%	
704	Nutrition and Hunger in the Population			25%	
724	Healthy Lifestyle			25%	
802	Human Development and Family Well-Being			20%	
902	Administration of Projects and Programs			5%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	0.0
Actual Paid	0.0	0.0	0.7	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**
0	0	20305	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	16737	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

Although this was not a planned activity, the addition of a new WPTRC faculty member with an interest in child obesity facilitated some preliminary work in the area of child obesity. Primarily, data was collected and analyzed on child obesity prevalence to establish baseline data of the situation on Guam.

2. Brief description of the target audience

The target audiences of the program include: (1) young children, ages 2 to 5 years; (2) school-aged children (elementary through high school level); and (3) families with young children.

3. How was eXtension used?

eXtension was not used in this program

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	4	0

V(F). State Defined Outputs

Output Target

<u>Output #1</u>

Output Measure

- no activity

Year	Actual
2014	0

Output #2

Output Measure

- no activity

Year	Actual
2014	0

Output #3

Output Measure

- # of dissemination of research results and new information

Year	Actual
2014	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	no activity
2	Become informed about the status of child health and obesity on Guam so as to adopt health lifestyle practices and model healthy behaviors for children.

Outcome #1

1. Outcome Measures

no activity

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
902	Administration of Projects and Programs

Outcome #2

1. Outcome Measures

Become informed about the status of child health and obesity on Guam so as to adopt health lifestyle practices and model healthy behaviors for children.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

This program has not been reported before under research. However, with the recent addition of a new faculty within WPTRC who focuses on child obesity, this program has been included in research report.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Program is being evaluated by stakeholders and University and feedback has been positive.

Key Items of Evaluation

WPTRC Programs were rated as excellent by University of Guam "Good to Great" assessment process. Child Obesity Research is a new program for WPTRC. We expect even more positive results in subsequent years.

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
0	Number of children and youth who reported eating more of healthy foods.
Climate Change (Outcome 1, Indicator 4)	
0	Number of new crop varieties, animal breeds, and genotypes whit climate adaptive traits.
Global Food Security and Hunger (Outcome 1, Indicator 4.a)	
0	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
Global Food Security and Hunger (Outcome 2, Indicator 1)	
0	Number of new or improved innovations developed for food enterprises.
Food Safety (Outcome 1, Indicator 1)	
0	Number of viable technologies developed or modified for the detection and
Sustainable Energy (Outcome 3, Indicator 2)	
0	Number of farmers who adopted a dedicated bioenergy crop
Sustainable Energy (Outcome 3, Indicator 4)	
0	Tons of feedstocks delivered.