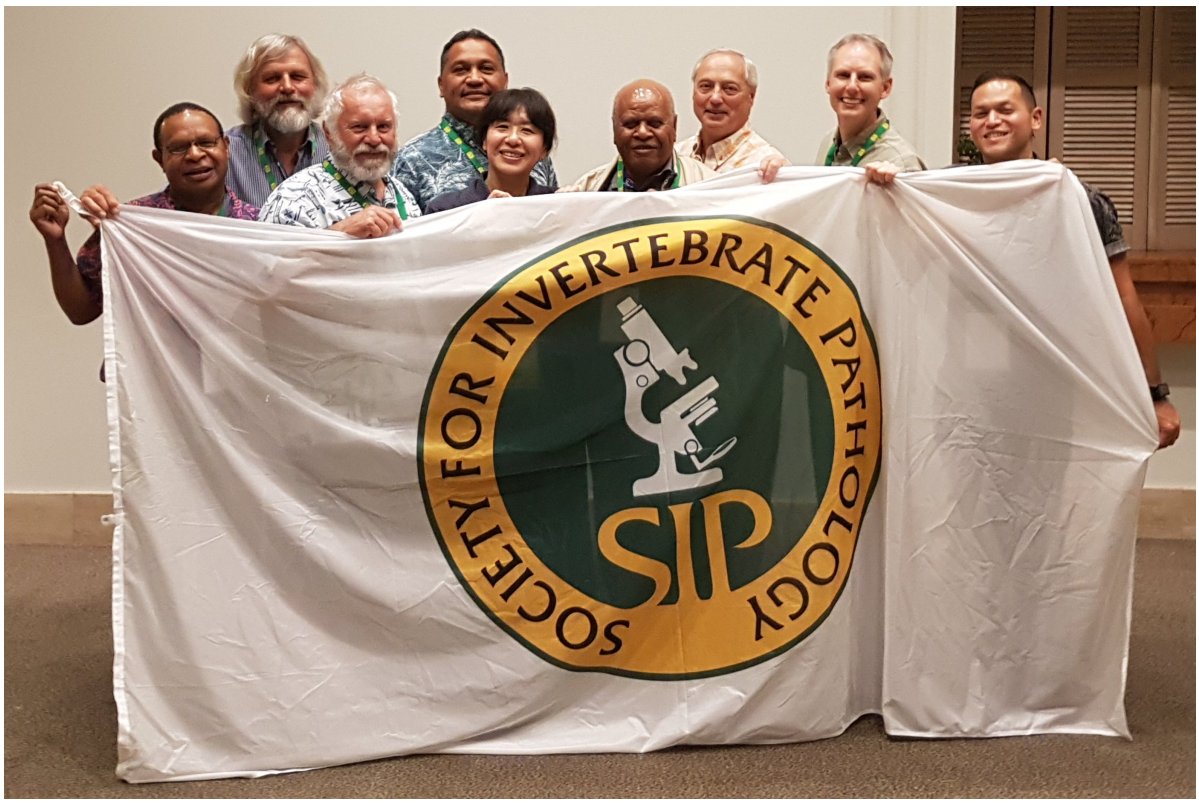
Project Report
FY2018 Extension Core Funds

Aubrey Moore

September 18, 2018



FY 2018 Application for CNAS E&O Core Funding – Brief Plan of Work

Instructions: In order to receive your annual allotment of $4,000 for faculty and $2,000 for Core-funded Extension Associates, you will need to fill out this one-page Plan of Work application and turn it in ***no later than October 26, 2017*** to the E&O Associate Director. This application/plan does not need to be exhaustive, but provide a clear indication what you intend to spend your allocation on over this fiscal year and what you believe is the general impact of that investment. As in the past, changes can be made to expenses as requested, so just try your best to put in what you are thinking of buying – make sure in this plan you project 100% of your allocation. Name the workshop (see below), name the travel, name the equipment, name the supplies, etc, in each spending Expenditure Category. A brief final report on this plan will be due September 19, 2018 before you get next year's allotment.

NOTE: In order to receive your potential allocation, *you must fill out this application* and you are *required to give at least one (1) community level public workshop – CNAS 101* – during this fiscal year (Oct 1, 2017 to Sept 30, 2018). There is no option to not do this if you want this money and there is no partial funding if you don't want to do a public workshop. If this application takes 20-30 minutes fill out, you got access to $4,000 or $2,000 at a great price.

Date of application: 10 / 20 /2017

Your name: Aubrey Moore

[X] Approved by: _____ 11/29/17
Associate Director

Your core funds will go to work in which NIFA area(s) ("X" what really applies):
[ ] Community Development, [ ] Food Safety, [ ] 4-H and Youth Development,
[ ] Childhood Obesity, [X] Plant Health and Pest Management, [ ] Global Food Security and Hunger,
[X] Sustain, Protect, and Manage the Environment and Natural Resources of Guam

Project Calendar: Detail tasks that will be undertaken by you over the next fiscal year (where the funding budgeted below is used). Put in an "X" in the month the activity will take place.

Task	Oct	Nov	Dec	Jan	Feb	Mar	Apl	May	Ju	Jul	Aug	Sep
Required workshop: Bring Your Own Bug				X								
											X	
Final report – Due Sept 19, 2018												X

Projected Budget

Possible Expenditure Categories	Potential Cost	Potential Purchase	Use of Expenditure
102035 - Salary (Tech/Asst)	$	[name the position]	[explain the work]
105010 - Fringe benefits (SS ONLY)	$		
200120 - Off island travel	$4000	Society for Invertebrate Pathology Annual Meeting 2018	To make a presentation on biological control of coconut rhinoceros beetle using Oryctes rhinoceros nudivirus
201005 - Contractual services	$	[name the services]	[explain the value of the services]
201505 - Supplies/materials	$	[name the services]	[explain the value of the services]
202005 - Equipment (< 5K)	$	[name the items]	[explain the use of the purchase]
203015 – Utilities	$	[name the items]	[explain the use of the purchase]
Other	$	[name the items]	[explain the use of the purchase]
Your Total Allocation	$ 4000		

Projected Project Impact
In two to three sentences, describe how the funding you want to receive and purchases you want to make, *will create* an impact on Guam.

My participation in the Society for Invertebrate Pathology Annual Meeting 2018 will allow me to interact with other Pacific based entomologists and invertebrate pathologists who are working on biological control of coconut rhinoceros beetle with Oryctes rhinoceros nudivirus. At this meeting, I will meet with current collaborators from AgResearch New Zealand (Dr. Sean Marshall and Dr. Trevor Jackson) and Tokyo University of Agriculture and Technology (Dr. Madoka Nakai) who are working with me in developing biological control for the Guam biotype of CRB on Pacific islands invaded by this major pest (Guam, Palau, Papua New Guinea, Soloman Islands, Oahu, and Rota). The objective is to establish self-sustaining biocontrol before most of our coconut palms are killed.

Project Report – Due September 15, 2018
In two to three sentences, describe how the funding you received and purchases you made, *created* an impact within the NIFA focus area above.

Report

I attended the International Congress on Invertebrate Pathology and Microbial Control & the 51st Annual Meeting of the Society for Invertebrate Pathology to participate in a symposium at this conference entitled *The challenge of a virus resistant rhinoceros beetle to palm production in the Pacific and prospects for microbial control* organized by Trevor Jackson and Sean Marshall of AgResearch New Zealand and to participate in a meeting to discuss a regional response to *Oryctes rhinoceros* Biotype G which is has invaded Guam, Hawaii, Palau, Papua New Guinea, and the Solomon Islands. CRB-G is a serious threat to coconut production, oil palm production, ornamental palms of value to tourism, and sustainability of island ecosystems in general. Without a Pacific-wide regional control effort, CRB-G will spread throughout the Pacific and beyond.

At the symposium, I made an oral presentation entitled *Attempted microbial control of coconut rhinoceros beetle, Oryctes rhinoceros, Biotype G on Guam using Oryctes rhinoceros nudivirus and Metarhizium majus*. I was also coauthor of a second presentation entitled *Progress with control of a virus resistant coconut rhinoceros beetle* presented by Sean Marshall.

At the meeting, we discussed how to strengthen existing collaboration among partners within Asia and the Pacific who are working on developing an effective response to CRB-G. All present agreed on a free exchange of information and biological samples. Meeting notes are documented in a wiki I developed to facilitate sharing information within the CRB-G action group at http://guaminsects.net/CRBG.

Collaboration among partners working to develop an effective response to CRB-G will be essential to building an effective response. Experts at the meeting agreed that finding an isolate of Oryctes rhinoceros nudivirus which can be used as an effective classical biocontrol agent for CRB-G is the most feasible way to control this pest and a search for new virus isolates must take priority. Dr. Nur Ain Farhah from Malaysia offered to send OrNV isolates from her lab for testing against CRB-G at the University of Guam.

Web Site

I maintain a wiki web site to facilitate collaboration among entomologists working on the CRB-G problem at http://guaminsects.net/CRBG/index.php?title=Welcome_to_the_CRB-G_Wiki. Presentations and discussions at the SIP meeting are documented at http://guaminsects.net/CRBG/index.php?title=SIP_Meeting,_Australia,_2018.

Press Release and Newspaper Articles

For Immediate Release
September 12, 2018
For more information, contact:
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Cooperative Extension & Outreach
University of Guam
Tel: (671) 686-5664

UOG Researchers Participate in Symposium on Coconut Rhinoceros Beetles

Researchers from Cooperative Extension & Outreach at the University of Guam recently participated in a Pacific-wide discussion on a new type of coconut rhinoceros beetle called CRB-G which is killing coconut and oil palms in Guam, Papua New Guinea, Solomon Islands and other islands of the Pacific.

A symposium entitled "The challenge of CRB-G to palm production in the Pacific and prospects for microbial control" featured the University's Aubrey Moore, Jim Grasela, Roland Quitugua, and Ian Iriarte. The discussion took place at the Annual Meeting of the Society for Invertebrate Pathology held on the Gold Coast, Australia in August 2018.

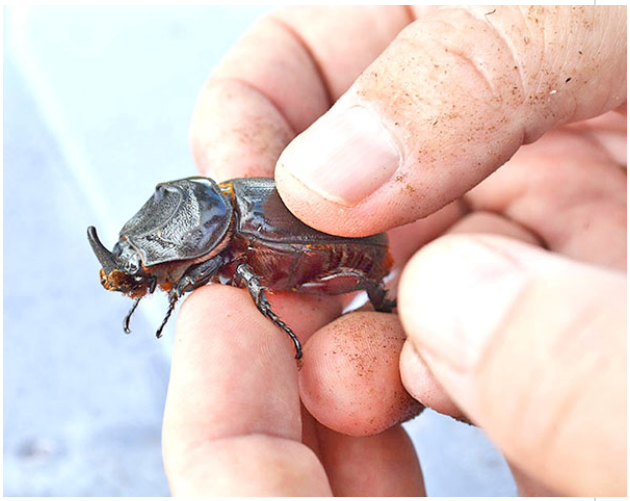
"On Guam, the beetle escaped control following damage caused by Typhoon Dolphin in 2015, which left large numbers of CRB-G breeding sites in the form of piles of decaying vegetation," said Dr. Aubrey Moore, associate professor of entomology. "The control on Guam will only be possible with the introduction of a self-replicating, density-dependent biocontrol agent." Outbreaks of CRB-G are out of control on Guam, Papua New Guinea, and the Solomon Islands, and this problematic biotype is spreading to other islands. Other coconut rhinoceros beetle biotypes can be effectively controlled by introducing a naturally occurring virus which only attacks rhino beetles. Unfortunately, CRB-G is resistant to all available isolates of this virus.

The scientists agreed that the most feasible way to stop CRB-G from killing palms and spreading to other islands is to find a new isolate of the biocontrol virus which attacks CRB-G and will collaborate on the search for this virus.

UOG researchers take part in confab on rhino beetles

By Press Release | Posted on Sep 14 2018

Tag: Aubrey Moore, Guam, Papua New Guinea, UOG



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TODAY'S FRONT PAGE

Green waste could boost rhino beetle population

Manny Cruz, Pacific Daily News Published 12:35 p.m. ChT Sept. 15, 2018

(Photo: PDN file)

The population of the invasive coconut rhinoceros beetle boomed in 2015 because of green waste caused by Typhoon Dolphin.

"(Typhoon) Mangkhut definitely isn't going to make things any better," said Aubrey Moore, an entomologist at the University of Guam. "(Beetle) grubs eat dead vegetation, and there's undoubtedly lots of it now."

More: What to do with green waste after a storm (/story/news/2018/07/10/what-do-green-waste-after-storm/767030002/)

More: Our View: Properly dispose of green waste to prevent invasive species (/story/opinion/editorials/2018/07/08/we-all-must-properly-dispose-green-waste-our-view/766106002/)

Experts predict another boom in the beetle population in about six months unless residents take steps to "sanitize" their property by draping green waste piles in tekken fishing nets, which prevent adult beetles from escaping. Vegetation also be placed in 50-gallon drums housing solar-powered ultraviolet lights, and covered over with tekken netting.

Traps should be placed in open areas away from coconut and other palm trees, to draw rhino beetles away from trees.

Beetle has spread

The control of Guam's unique rhino beetle population is a conversation that now involves multiple Pacific Island nations after being found in locations beyond the Marianas.

The invasive species, now named CRB-G, was first discovered on Guam on Sept. 11, 2007.

"Almost exactly 11 years ago," Moore said. "But it's now been found in Papua New Guinea, Rota, Hawaii and the Solomon Islands."

Moore and his colleagues last month attended a conference in Australia aimed at finding solutions to the beetle infestation. The unique species, he said, is resistant to all of the virus strains that have been tested so far in an effort to kill it.

"Elsewhere in the Pacific they use a virus, but it doesn't work on the ones here because it's genetically different," Moore said. "We think there may be a virus isolate that evolved alongside the CRB-G. But the problem is we don't know exactly where it came from. So, we have to go out and search for it, release it into our environment and control the populations here."

Vigorous invaders

Healthy beetles of the Guam biotype are more vigorous and more successful as invaders being able to survive, transport and establish in new environments, according to Trevor Jackson of AgResearch New Zealand.

"Once established they are extremely damaging and difficult to eradicate or contain," he said.

(Story continues below)

This file photo shows the grub stage of a coconut rhinoceros beetle, a beetle in its pupa stage and an adult rhino beetle. *(Photo: PDN file)*

An outbreak in Palau in the late 1940s resulted in about 50 percent of the coconut palms being killed by beetles throughout the archipelago. All coconut palms were killed off on some of the smaller islands.

Extension agent Roland Quitugua said unless every homeowner on Guam makes an effort to sanitize their properties, the island could see another beetle population boom in about six months.

"If you think things look bad now, wait until six months later," Quitugua said. "Before Typhoon Dolphin, the CRB-G population was steady. Six months later; that's when things really took off, and we're still seeing the effects."

Breeding sites

While green waste in villages is manageable through the use of air curtain burners, which the government has done in the past, the greater threat lies in harder-to-reach areas where dead vegetation can accumulate without interruption.

“These are breeding sites for grubs, which in time will become adults that will go out and attack trees around the island,” Quitugua said. “Our best hope is that we can find a virus to attack the CRB-G in the next year.”

“We need to save our trees,” Moore said.

READ MORE:

Airport aware of former Lotte exec's indictment (https://www.guampdn.com/story/news/2018/09/14/airport-aware-concerned-over-former-lotte-execs-indictment/1300056002/)

Two more charged in Amantes Street video (https://www.guampdn.com/story/news/2018/09/14/jered-reselap-franky-rufes-charged-amantes-street-video/1299585002/)