

Ecologically-based Farmer Participatory IPM for S. E. Asia Clemson University



Principal Investigator:

Mike Hammig – (Ag. Economics/IPM)

Co-Principal Investigators:

Merle Shepard – (Entomologist/IPM/Biocontrol)

Gerry Carner – (Entomologist/Insect Pathology/IPM)

Eric Benson- Extension Entomologist/IPM

Guido Schabel- Plant Pathologist/IPM



USAID
FROM THE AMERICAN PEOPLE



 **VirginiaTech**
Invent the Future

Host Country Collaborators

- Aunu Rauf – **Bogor Agricultural University**, Bogor, Indonesia
- Dan Sembel, **Sam Ratulangi University**, Manado, N. Sulawesi, Indonesia
- Widyastama Cahyana, **FIELD Indonesia**, Padang, West Sumatra
- Aurora Baltazar – **University of the Philippines- Los Banos**, Philippines
- Hermina Rapusas – **Philippine Rice Research Institute**, Munoz, Nueva Ecija, Philippines
- Chou Chythyryth, Heng Chhun Hy – **General Directorate of Agriculture, Ministry of Agriculture, Forestry and Fisheries**, Phnom Penh, Cambodia

Host Country Collaborators (new associate awards)

- Indonesia Coffee and Cocoa Institute, Jember, East Java, Indonesia; Indonesia Vegetable Research Institute, Limbang, West Java, Indonesia
- FIELD/AVRDC – Arief Lukman Hakim, Malang, East Java and Bali



Scale 1:32,000,000 at 5°N
Mercator Projection

0 500 Kilometers

Clemson team visited University of Sam Ratulangi,
Manado, N. Sulawesi, July 17 – 20, 2011

FIELD Indonesia, West Sumatra – July 20 – 23.

Bogor Agricultural University, Bogor, West Java July 24 –
27.

PhilRice, Munoz, Nueva Ecija – July 27 – 30. (Carner and
Shepard)

Indonesia Coffee and Cocoa Research Institute – Jember,
East Java. July 27 – 31. (Hammig and Schabel)

Workshop in Los Banos, Philippines. July 31 – August 4,
2011.



Annual Workshop Accomplishments and Plans for 2012



Hosted by the University of the Philippines
at
Los Banos
Aug. 2 – 3, 2011

Diagnostic Workshop – Aug. 4, 2011



USAID
FROM THE AMERICAN PEOPLE



 **VirginiaTech**
Invent the Future



IPM Tactics for Vegetable Crops in Indonesia



Bogor Agricultural University



USAID
FROM THE AMERICAN PEOPLE



 **VirginiaTech**
Invent the Future



Farmer production of *Trichoderma* in Puncak, W. Java (IPB collaborators). Farmer produces and sells to other farmers.

Activities:

Trichoderma being tested on several crops. Club root on Broccoli is drastically reduced using *Trichoderma* in Farmer Participatory trials. 84% club root in normal farmer practice, only 4% in *Trichoderma*-treated plots. Other trials include tomato, chilies.

Distribution of *Trichoderma* to farmers and training. Farmer to farmer training.

Testing materials for SeNPV protection from breakdown by sunlight.

Extracts of yambean, coconut carcoal and boric acid protect SeNPV

Bacillus and *Pseudomonas* on bacterial wilt of tomato: Control 65% of plants infected, only 30% when treated with antagonistic bacteria.



Papaya mealybug,
Paracoccus marginatus

Origin: Mexico

2008 found in Indonesia and
2010 in Cambodia, Philippines
and Thailand

Determine distribution and natural enemies of PMB. Clemson/FIELD found this pest in W. Sumatra on July 21, 2008.

Monitoring and determining distribution of invasive species:

Giant Whitefly

Papaya mealybug

Solenopsis mealybug

Casava mealybug

Determining natural enemies of invasive species.
Colleagues at IPB found *Neozygites* fungus.



Bogor Agricultural University's Mobile Plant Clinic. Supporting diagnoses of plant diseases to support IPM activities.



Small-scale commercial preparation of *Trichoderma*, insect viruses, (SeNPV and SINPV) and botanical extracts for insect control.





With ICCRI: Cocoa pod borer and vascular streak dye-back on cocoa, economics of pod sleeving and effects of sleeving on pod diseases; natural enemies (particularly insect pathogens) of coffee berry borer (CBB) on coffee



IPM Tactics for Vegetable Crops in the West and North Sumatra



FIELD Indonesia, Padang, West Sumatra



USAID
FROM THE AMERICAN PEOPLE



 **VirginiaTech**
Invent the Future



Organic farmer meeting. Over 300 attendees. West Sumatra, July 21 – 23, 2011.



West Sumatra is the only province where government certifies organic farmers.





IPM Tactics for Vegetable Crops in the Philippines



PhilRice, Munoz
Neuva Ecija



USAID
FROM THE AMERICAN PEOPLE



 **VirginiaTech**
Invent the Future

PhilRice

- IPM Training – 26 farmer field schools were conducted with a total of 956 participants
- 34 Specialized training sessions were conducted on mass production of VAM and *Trichoderma* – 980 participants
- Dramatic results were obtained with the use of VAM to control bacterial wilt
- Impact assessment – 160% increase in income when farmers use VAM and *Trichoderma* for vegetable production in rice-based systems
- 174 farmers were trained in the production of *Spodoptera litura* and *S. exigua* NPV
- A new strain of *Paecilomyces* has been isolated that is effective against whiteflies. It is being field tested



IPM Tactics for Vegetable Crops in the Cambodia



**General Directorate of Agriculture
Ministry of Agriculture, Forestry and Fisheries
Phnom Penh, Cambodia**



USAID
FROM THE AMERICAN PEOPLE



VirginiaTech
Invent the Future



Cambodia

First full year of activities. Focus on locally-adapted strains of *Trichoderma* in Chilies. Sequential plantings of cabbage to increase populations of *Cotesia plutellae*, a parasitoid of diamondback moth, introduced by AVRDC. Continue to find ways to collaborate with HARVEST, a new project in Cambodia run by Fintrac. Focus on three provinces: Siem Reap, Kandal and Kampong Cham



Cambodia

Collecting and evaluating the role of earwigs in reducing damage by diamondback moth in Chinese cabbage in Cambodia. Also, evaluating *Trichoderma* at this site.

Insecticide use impacts of IPM FFS: Evidence from onion farmers in the Philippines

Collaborators: Rod Rejesus (NCSU) and Chito Yorobe (UPLB)

Study based on interviews of 200 onion growers from Nueva Ecija province

- Half the group with onion FFS experience in 2004 and 2007-09
- Half from villages with similar characteristics and dependence on onion as a major crop but distant from villages where FFS had been conducted

Statistical issues due to potential biases with the data were addressed

Conclusions showed that FFS trained farmers had significantly lower pesticide expenditures (~US\$115) than non-FFS trained farmers

Yorobe, Jr., J.M., et al. Insecticide use impacts of Integrated Pest Management (IPM) Farmer Field Schools: Evidence from onion farmers in the Philippines. *Agr. Syst.* (2011).

GLOBAL THEME ACTIVITIES IN SOUTHEAST ASIA

GENDER KNOWLEDGE AND APPLICATION

Gender Roles in Productive-Paid Activities

Activities	Done By			
	Adult Women	Girls	Adult Men	Boys
Preparing land for cultivation			V	
Weeding grass	V	V		
Working at factories		V	V	
Working at strawberry farm	V	V	V	V
Making Trychoderma			V	
Working at animal husbandry			V	
Sowing (for somebody else)	V	V		
Washing clothes (for somebody else)	V	V		
Driving			V	V

Adobe Connect is highly interactive and allows collaborators to:

- Participate in meetings
- Attend Classes/Seminars
- Show PowerPoints
- Make Presentations
- Tested in the Philippines at Annual Workshop

New website at Clemson for S. E. Asia CRSP Project



Pest Diagnostics

Continue to monitor and identify insect pests and diseases from fruits and vegetable crops. Workshop on Diagnostics held on Aug. 4, 2011 at UPLB, Los Banos, Philippines.

Just finished workshop on accomplishments and plans for next year in Los Banos, Philippines, Aug. 2 – 3 and Diagnostics Workshop, Aug. 4, 2011. Gerry Carner gave a presentation on identification and use of insect pathogens, M. Shepard presented “Invasive Insect Species”

Workshop in Cambodia, planned for next year, 2012.

IPM Workshop in N. Sulawesi, 2013

International Conference entitled “Biodiversity and IPM: Working Together for a Sustainable Future” held after the workshop in Manado, N. Sulawesi

New Associate Award (USAID Mission/Jakarta) for IPM activities with the Indonesian Vegetable Research Institute (IVEGRI), Lembang, W. Java and the Indonesia Coffee and Cocoa Research Institute (ICCRI), Jember, East Java.

Visited both Institutes this year and initiated discussion on focus areas.

Activities with IVEGRI – to be identified (new Director General). Representatives from both Institutes attended the recent workshop in the Philippines.

An additional associate award (USAID/Jakarta Mission) will support expanded activities for collaboration with AVRDC in West Java and Bali.