

IPM CRSP Trip Report

Country(s) Visited: Honduras

Dates of Travel: November 20-26, 2010

Travelers Names and Affiliations: Sue Tolin, Virginia Tech; Judith Brown, University of Arizona.

Purpose of Trip: To participate in the workshop “Introduction to Integrated Management of virus and virus-like Diseases of Horticultural Crops”. This workshop had originally been planned for July 2009. This workshop was an activity primarily of the Global Theme on Plant Virus Diseases, and was conducted jointly with the IPM CRSP Latin American and Caribbean (LAC) Regional Project.

Sites Visited: Comayagua – Golf Club and Conference Center. La Lima - FHIA

Description of Activities/Observations:

Arrival in San Pedro Sula Nov. 20 – S. Tolin, J. Brown, Luis Salazar from Lima, Peru, who was funded for travel to the workshop by Agdia, Inc., a collaborator of the Global Theme on Viruses.

Travel to Comayagua on Nov. 21 – Tolin with J. Melgar; Brown with H. Espinoza; Salazar with M. Rivera.

The workshop began Nov. 22, Monday morning, and followed the attached schedule, with some modifications for time overruns and discussion of the presentations. Arrangements were made by the Department of Plant Protection, FHIA, and led by M. Rivera. Three presenters were from Zamorano, two from FHIA, two from the MCA-H/EDA (Millennium Challenge Account-Honduras/Entrenamiento y Desarrollo de Agricultores) project managed by FINTRAC, and two from the IPM CRSP Global Theme on Viruses. One speaker was the LAC representative from Agdia, Inc. who had provided a letter of support for the Global Theme. Simultaneous translation was provided for all presentations. In addition to the speakers, there were 95 participants who were mostly from Honduras. Individual participants included 25 extension and research personal from FHIA or Zamorano-PROMIPAC (IPM Program in Central America), funded by the Swiss International Aid Agency), 23 persons from local seed and chemical products distributors, and 47 persons were from FINTRAC/MCA-H/EDA. The participants were from San Pedro Sula, Puerto Cortés y La Lima, Cortés; La Ceiba, Atlántida; La Esperanza, Intibucá; Copán Ruinas y Corquín, Copán; Tegucigalpa, Francisco Morazán; Comayagua; San Francisco del Valle, Ocotepeque; Danlí, El Paraíso y El Progreso, Yoro, all locations across Honduras. In addition, 5 persons attended from Nicaragua and 5 persons from El Salvador.

The registration packet for participants included the program, biodata of the speakers, a list of courses, seminars and other training activities conducted by FHIA in 2010, a CD with information and publications of MCA-H/EPA, and a copy of the 97-page book “Guía

para el reconocimiento y manejo de virosis en cultivos hortícolas”. This excellent 2007 publication, edited by H. Argüello, L. Lastres, A. Rueda, and M. Rivera, is published by Zamorano Academic Press. Its preparation and publication is credited jointly to PROMIPAC, COSUDE, US AID and the IPM CRSP, FHIA, Zamorano, and MCA-H/EDA.

At lunchtime M. Rivera, J. Melgar, J. Diaz, and J. Brown discussed results of this years analysis and developed a ‘next steps’ plan for the virus sweet potato project. It was discussed that a small grafting facility could be built at the FHIA field station (J. Diaz) to grow *Ipomea setosa*, a susceptible indicator plant for at least some viruses known to infect sweet potato. At this facility, symptomatic sweet potato would be grafted onto *I.setosa* to establish an *in planta* culture of virus, thus increasing the virus titer and aiding in detection and identification efforts. This activity is also needed to archive field-collected viruses in fresh leaf tissue. Samples from these plants will then be subjected to serological and molecular analysis toward diagnostic probe development for routine diagnosis. L. Salazar also contributed to this plan, utilizing his previous work with sweetpotato viruses at CIP in Peru. Separately, discussions were held between M. Roca Doyle and J. Brown regarding the need to have a positive control for the TYLCV testing by PCR to be done at Zamorano using specific primers provided by the Brown lab. A plan was made for the AZ lab to isolate total DNA from infected plants and sent it to Zamorano (as an ethanol precipitate) to use as a positive control.

Travel November 23 to return to San Pedro Sula - J. Brown with H. Espinoza and S. Tolin with J. Melgar. Brown and Tolin discussed the workshop and virus global theme activities that evening. Brown returned on November 24. M. Rivera took L. Salazar to visit Zamorano on November 23, returned to San Pedro Sula November 24, and to Peru November 25. S. Tolin and L. Salazar met the evening of November 24 to discuss his experiences.

On November 25, S. Tolin visited FHIA in La Lima and discussed the workshop and future plans with M. Rivera, J. Melgar, and H. Espinoza, and returned on November 26.

Tolin also visited the newly completed laboratory for the production of fungi for biocontrol of spittlebug in sugar cane. This facility “Centro de Producción de Agentes de Control Biologico para la Agricultura” (CEPACBA) was dedicated July 15, 2010. Production of *Metarhizium anisopliae* on rice grains had begun, in order to produce spores for sale to sugar cane producers to control spittlebug without chemicals. The project was partially funded by The Coca Cola Company.

Training Activities Conducted

Program type (workshop, seminar, field day, short course, etc.)	Date	Audience	Number of Participants		Training Provider (US university, host country institution, etc.)	Training Objective
			Men	Women		
Workshop	22-23 Nov 2010	Participants	89	8	FHIA, Zamorano, Virginia Tech, Univ Arizona, Agdia Inc., FINTRAC	See attached Purpose and Program
		Lecturers	5	4		

Suggestions, Recommendations, and/or Follow-up Items:

The workshop was viewed quite positive very instructive by more than 90% of the participants. Additions commonly mentioned were (a) the convenience of explaining the cause of physical (symptoms) and physiological changes observed in virus diseased plants, and (b) to devote time in the field to review what is observed in the crops (symptomatology).

The content of this workshop could be used as a model in different countries and regions of the IPM CRSP. It was valuable to have speakers from within the host country, as well regions. Because of the large number of in-country participants and the capacity of the site, participants were not sought other than from Nicaragua and El Salvador. Guatemala was invited.

As an addition to the materials handed out at the meeting, the following week all of the PowerPoint presentations were reproduced on a CD which was to be distributed to all participants. This was funded by FINTRAC's MCA/H-EDA project.

List of Contacts Made:

Name	Title/Organization	Contact Info (address, phone, email)
Mauricio Rivera	FHIA – La Lima	
José Melgar	FHIA – La Lima	
Hernán Espinoza	FHIA – La Lima	
Javier Díaz	FHIA - Comayagua	
Maria Mercedes Roca	Zamorano	
Luis Salazar	Scientific Research Director, LAC Agdia, Inc.	Lima, Peru lsalazar@agdia.com

Workshop

Introduction to Integrated Management of Virus Diseases of Horticultural Crops

An activity of the Honduras IPM CRSP program, financed by US AID and implemented through the “Global Theme on International Plant Virus Disease Network” (IPN-IPVDN) and the “Regional Project on Science for Agricultural Growth in Latin America and the Caribbean” (IPM LAC).

Organizers and collaborators: U. of Arizona, Virginia Tech, FHIA, MCA-EDA, Zamorano, and AGDIA

I. PURPOSE:

To transfer to field extension workers practice-oriented (and some theoretical), up-to-date information on management of virus diseases, focused on their nature/biology, dissemination, transmission, epidemiological aspects, e.g., influence of weather, genotypic differences, cultural practices, and other factors. At the end, participants should be able to understand the rationale of and knowingly apply the recommended management measures to combat viruses.

The course is structured in two parts, namely:

1. **BASIC PRINCIPLES OF PLANT VIROLOGY.** Their importance, nature, and characteristics of the viruses and virus diseases of major relevance to their management.
2. **MANAGEMENT OF VIRUS DISEASES IN CROPS.** Strategies and management practices used in the open field and protected environments before, during and after the cultivation cycle.

II. DATES AND SITE

November 22-23, 2010 (Monday and Tuesday).
Golf Club Hotel, Comayagua Honduras, C. A.

III. TARGET AUDIENCE AND CROPS OF INTEREST

A. The audience will be field extension workers of the projects EDA-MCA and USAID-RED that have been executed in Honduras by FINTRAC (the most important provider of assistance to small vegetable growers in Honduras), field extension workers of the development agencies/projects World Vision, FUNDER, FHIA, CARE, Global Village (Aldea Global) and PROMIPAC/Zamorano, staff representing relevant seed companies and local distributors of other agricultural inputs, and staff of the local government and regional official institutions involved in crop protection.

B. The crops that the extension workers most frequently deal with, from most to least important, are: tomatoes, peppers, cucumbers, squash and eggplant.

IV. PROGRAM

Day 1: Monday 22 November

- 8:00 - 9:00 am** Registration: Responsible: Communications-FHIA
- 9:00 - 9:10 am** Inauguration of the Workshop. Responsible: J. Mauricio Rivera, FHIA

SECTION A: THE BASIC PRINCIPLES OF PLANT VIROLOGY

- 9:15 - 10:00 am** **Viruses: importance, biology, physiological/physical effects in plants, classification, and ecological niches.** Lecturer: Sue Tolin, Virginia Tech. **10:00 - 10:20 am** Coffee break.
- 10:20 - 10:50 am** **Other organisms that provoke symptoms and damages in plants similar to viruses.**
1. Viroids. Lecturer: S. Tolin.
 2. Phytoplasmas. Lecturer: Maria M. Roca, Zamorano.
 3. *Candidatus* Liberibacter and similar organisms. Lecturer: Judith Brown, U. Arizona.
- 10:50 - 12:10 pm** **Dissemination and transmission of viruses and similar phytopathogens.**
1. Non-insect transmission: mechanical, seed, soil, water and nematodes. Lecturer: S. Tolin.
 2. Non-persistent transmission by aphids. Lecturer: S. Tolin.
 3. Persistent and semi-persistent transmission: the case of whiteflies, thrips, leafhoppers, mealybugs, and mites. Lecturer: J. Brown, U. Arizona.
- 12:10 - 1:30 pm** Lunch break
- 1:30 - 1:40 pm** **Video on non-persistent transmission of Papaya Ring Spot Virus (Potyvirus) by the green peach aphid.** Presenter: Hernán Espinoza, Entomologist, FHIA.
- 1:40 - 2:25 pm** **Biology, morphology and habits of insect vectors of virus relevant for occurrence and management of viral diseases.** Lecturer: H. Espinoza.
- 2:25 - 3:05 pm** **Emergent viral pathogens in the Solanaceae (tomatoes) and Cucurbitaceae.** Lecturer: J. Brown.
- 3:05 - 3:35 pm** **Status of the knowledge in Honduras of viruses that occur on vegetables and their vectors.** Lecturer: M. M. Roca.
- 3:35 - 3:55 pm** Coffee break.

SECTION B:	MANAGEMENT OF VIRAL DISEASES OF CROPS
3: 55 - 4:40 pm	Diagnosis as the starting step to effective virus management. Lecturer: Luis Salazar, Virologist, Agdia. Importance, means and procedures available and their advantages or limitations (cost, accessibility, availability, reliability, etc.), what to expect from the institutions involved in diagnostic work, how to interpret results, etc.
4:40 - 6:00 pm	Cultural control practices I. Their range, nature of effect, limitations and opportunity of their utilization for management of viral diseases. 1. Cultural practices 1: Field pre-plant environment. Lecturer: Lorena Lastres, Entomologist MCA-EDA. 2. Cultural practices 2: Field post-plant environment. Lecturer: Alfredo Rueda, Entomologist, Zamorano.

Day 2: Tuesday 23 November

8:00 - 9:00 am	Cultural control practices II. 3. Cultural practices: greenhouse Lecturer: J. Brown. 4. Case study: Experiences in cultural field management of TEV/aphids in peppers in Jamaica. Lecturer: S. Tolin.
9:00 - 9:45 am	Chemical control of vectors for virus disease management. Lecturer: Ricardo Lardizabal, Horticulture Specialist, MCA-EDA. Nature/classes of available products, their effects, opportunity/environments, efficacy of their use for control of viral diseases.
9:45 - 10:05 am	Coffee break.
10:05 - 11:00 am	Biological control of vectors. Lecturer: Rogelio Trabanino, Entomologist, Zamorano. Nature/classes of available products, their effects, opportunity/environments for utilization, efficacy of their use for control of viral diseases.
11:00 - 11:30 am	Integration of genetic resistance, mulching and other cultural practices for virus management. Lecturer: J. C. Melgar, FHIA. Discussion of results of local trial and of research reported in the literature.
11:30 - 12:00 am	Status of viruses in sweetpotato and potato in America. Lecturer: Luis Salazar, Agdia.
12:00 - 1:20 pm	Lunch break.
1:20 - 2:30 pm	Review of management of virus diseases in the tropics and sub-tropics. Lecturer: L. Salazar.
2:15 - 3:15 pm	Closing questions/answers, handing out diplomas of participation, adjourn. Moderator: M. Rivera.