IPM CRSP Trip Reports

Country(s) Visited: Kenya

Dates of Travel: November 28 – December 8, 2010

Travelers Names and Affiliations: Mark Erbaugh & Sally Miller, OSU; Samuel Kyamanywa, Jenina Karungi, Mildred Ochwo-Ssemakula, & Peter Sseruaji, Uganda; Amon Maerere & Delplhina Mamiro, Tanzania.

Purpose of Trip: The primary purpose of the trip was to hold a workshop with regional co-PIs to define work plans for the Virus Global Theme (VGT) and the IPDN GT that would support Regional East Africa IPM CRSP objectives. A related sub-purpose was to integrate virus diagnostics into IPDN framework to ensure maximum synergy and efficiency.

Sites Visited: Nairobi Kenya; USAID/Nairobi; KARI/NARL; Mwea Research Site

Description of Activities/Observations:

November 28:
2:00 AM: Depart for Detroit

November 29:
8:30 PM: Arrival in Nairobi

November 30:
10:00 AM: Go to KARI Headquarters for meeting with Dr. Joseph Mureithi, Deputy Director, Research & Technology.
Observation: Dr. Mureithi was particularly appreciative of the training provided Mirriam Otipa on passion fruit virus characterization at OSU and had already sent a letter stating his appreciation to OSU/FAES, Dean, Bobby Moser. He let us know that the IPM CRSP project had placed third in a KARI assessment of "best" projects.

3:00 PM: Waiganjo, Mensa, Erbaugh and Miller meet at Boulevard to revise workshop schedule and plan the remainder of the visitation.

7:00 PM: Other collaborators from the region arrive at the hotel.

Minutes of IPM CSP East Africa Regional Program/IPDN/PVD

Attending: Sam Kyamanywa, Mildred Ochwo-Ssemakula, Jenina Karungi, Peter Sseruwaji, (Uganda); Zachary Kinyua, Monicah Waiganjo, Ruth Amata, Miriam Otipa, Mwalimu Menza, Douglas Miano (Kenya); Delphina Mamiro, A. Maerere, Fen Beed (Tanzania) & Mark Erbaugh and Sally Miller (Ohio State).

Wednesday, December 1, 2010
8:45 – Opening of the meeting by Dr. Gicheru, Centre Director, KARI/NARL

Z. Kinyua – Briefs on diagnostics and workshop objectives

Big issue is inadequate capacity for diagnostics in East Africa

Requirements/constraints in diagnostics/identification
1. Equipment outdate/not available
2. Infrastructure and utilities – inconsistent internet connectivity
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5. Policy environment

Synergistic diagnosis and management of plant virus diseases

Objectives of the workshop
1. Outline the context of the intended cooperation between projects
2. Review the prevailing practices of diagnosis and management of plant virus diseases in East Africa
3. Prioritize target virus diseases and appropriate diagnostic procedures for EA
4. Outline selected activities and assign responsibilities for implementation
5. Affirm activities and responsibilities

Sally Miller – IPDN and PVD GTs – common denominators

Mark Erbaugh – IPM CRSP East Africa RP and Global themes
Overview of IPM CRSP Regional Program
-Priority Crops: tomato, passion fruit, coffee, scotch bonnet pepper, onion
-Greater emphasis on developing IPM options for on-farm implementation
-Greater emphasis on monitoring and reporting of indicators
-Greater emphasis on integrating gender analysis into research framework
-Greater emphasis on impact assessment
-Working with global themes

Goals and Objectives of this workshop
1. Overall – Integrate virus GT with IPDN GT framework in support of East Africa IPM CRSP (regional) objectives
2. Refine/develop work plans for Phase II

Sub-objectives for moving forward on work plan development:
Focus on tomato and passion fruit – others possible but resources are limited
Prioritize diseases by priority crops
Prioritize diagnostic tools
Develop SOPs and management options
Develop training plan for scientists/farmer extension

Some things to remember:
-Would like to move from diagnostics to management; from lab to field
-Emphasis on IMPACTS at farm level
-Constraints: Funding is a constraint which is why we need to prioritize.
-Each global theme is regional!! Come through country budgets to the region.
-Each global theme has a regional coordinator + $10,000 from RP/EA

Goal: by end of workshop have draft work plan

General Discussion – Sam Kyamanywa

IPM CRSP is the overarching entity – but historically there were cross-cutting issues such as gender, viruses, diagnostics, impact assessment. These became the global themes for Phase II of IPM CRSP.

Mark E. – In first phase of the IPM CRSP EA RP, cooperation with IPDN was good; however, collaboration with the two virus global themes was erratic and needed to be improved.

Refinement of Workshop Objectives

Objective 1. To prioritize diseases on target crops (tomato, passion fruit. onions. coffee, scotch bonnet)
Objective 2. Review and prioritize diagnostic procedures/tools for diseases and vectors in East Africa
Objective 3. Review and prioritize management practices for plant procedures for diseases in East Africa
Objective 4. Work plan development. To outline selected activities and assign responsibilities for implementation; Training, surveys, capacity assessment

Criteria for Prioritizing Diseases
1. Economic importance; 2. Prevalence; 3. Impact; 4. Ease of management
5. Risk of spread; 6. Rapid return on investment; 7. Ease of identification

Score each 5-1 (5=very high – 1=very low)

Participants were then broken into country groups to rank disease/crop.

Disease Priorities & Diagnostic Options

Crop/disease	Field diagnostic			Laboratory diagnostics				
	Pict-orial	Kit	Fact sheets	Conv.	Serological	Molec-ular	SOP	RANK
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Begomovirus	*	?	*	*		X	*	1
Bacterial wilt		X	*	X	X	X	+	5
TMV/ToMV	*	X	*	*	X	X	*	2
RKN			*	X			*	6
Potyvirus	*	X	*	*	X	X	*	3
Tospovirus	*	X	*	*	X	X	*	4
Passion fruit								
Woodiness complex	*	*	*	+	*	X	*	
Dieback complex/collar rot	X	X	*	X	X (phyto ph)		*	

Brown spot	X		*	X				
Onion								
Purple blotch	*		*	X		*		
Bulb rot/soft rot	*		*	X		*		
Onion virus	*		*	??	??	??		

X – locally available
* Needed
+ In progress
Conventional = indicator plants, isolation/culturing, biochemical tests, microscopy

Dr. Fen Beed (IITA) – Need to have the SOPs before any surveys are done
KEPHIS has done a country-wide survey of TSWV in Kenya
AVRDC surveyed Tanzania for tomato viruses
MU-conducted tomato virus survey

Kinyua – SOPs should be the starting point for other tests/methods/materials that are needed:General SOP for viruses; Developing SOP can be worked into work plan

Organization of diagnostic activities – Define centers for specific diagnostic tests.
-SPS regulations for sample shipment

Criteria to rank diagnostic tools
Ease of application; Cost of Tool; Availability; Accuracy/sensitivity; Reliability

Thursday December 2, 2010

Development of SOPs for selected pathogens and pests/vectors

Prioritize SOPs as a work plan activity

Fen – SOP should include spatially designed survey methods that everyone agrees to/suits all
Sally – SOP should be considered a roadmap for diagnosis of a particular problem
Peter – the purpose of the SOP is to enable diagnosis of plan diseases properly
Douglas – SOP may not affect farmers directly but impact can be indirect
Fen – SOP is for diagnosticians but parts can be extracted for other levels

Priorities for SOP

Tomato viruses
Passion fruit viruses
Ralstonia – adaptation to currently available SOPs (US and Europe)

An SOP is an output; the SOP will be developed and used to make diagnoses; undertake surveys.

How to develop SOPs
1. Committee/individuals identified
Tomato Virus SOP

*Peter Sseruwagi is the coordinator of PVD GT for East Africa (Chair)
Z. Kinyua is coordinator of IPDN GT for East Africa
Douglas Miano
Delphina Mamiro
Jenina Karungi
Monicah Waiganjo
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Sally Miller
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Bob Gilbertson

Passion fruit SOP
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Miriam Otipa
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2. Identify which viruses will be included

3. Assign responsibilities - tasks

Task 1. Develop survey methodology – Fen Beed
Task 2. Format – Kinyua and Peter S.
Task 3. Make assignments

4. Timeline

Year 2 activity

March 1 – draft sections to chair of each group
April 15 – compiled draft finished for each group
May/June – Committees meet to refine SOPs
August 1 – Deadline for complete SOP

Year 3 Activity

Training program – train participants in virus diagnostics using SOPs

Title: *Plant Virus Diagnostics with Case Studies of Tomato and Passion Fruit*
Size of program: two levels 1) scientists (Year 3); 2) extension/farmers (Year 4; use facts sheets and pictorials developed)

Test SOPS

- Look for symptomatic plants in field
- Bring samples to lab
- Run tests
- Identify gaps in capacity

5. Individuals write drafts/sections (see table)

6. Joint meeting to write the SOPs

Webinar

Sally needs to determine the requirements on the receiver side and communicate it to East Africa collaborators/committee

Webinar Committee: Sally Miller
Delphina Mamiro [Fen Beed]
Mildred Ochwo-Ssemakula
Mwalimu Menza

Test one webinar: mealybugs (Muni); a disease also if possible

Cell Phone/SMS Diagnostics

Fact sheets can be sent via phones; but people need to be trained in how to use recommendations

Leaders in communities receive the information
Uganda: Grameen
Tanzania: James Legg (IITA)

Fen – Progression: Start with SOPs – technical diagnostics done right; outreach to farmers via fact sheets and pictorials; 3) improving delivery (Year 4 activity)

Can use SMS to do surveys – train farmer leaders to identify specific pests and diseases and report them in fields when they appear. More cost effective than having scientists go out to fields (Year 4 task within farmer outreach activity).

Year 5

Measure impacts
Lessons learned

Activity – Write Fact Sheets with IPM Recommendations- coordinator Ruth Amata
Writing IPM recommendations for disease and pest management

What are the management recommendations? Which options can be written up now?

Still don't know what the viruses are in Uganda in tomatoes.

Need to contact Bob Gilbertson for virus-resistant seed.

Five management options:

Varieties resistant to viruses (Uganda, Tanzania)
Seed treatment/protection [Tanzania, Uganda (finished sodium hypochlorite treatment)]
Vector management (Uganda – sticky traps, insecticides)
Low tunnels for nursery (Uganda, Kenya)
High tunnels for production (Kenya)
Priorities

Tomato
1. Tomato viruses – Peter S. lead

2. Bacterial wilt tomato– Z. Kinyua lead
3. Tomato RKN – Z. Kinyua lead + Fen, Danny Coyne can help

Passion Fruit
1. Passion fruit viruses – Mildred lead
2. Dieback complex/collar rot – Uganda lead
3. Brown spot - Ruth Amata lead

Onion
1. Purple blotch – Delphina lead
2. Neck rot/soft rot – Delphina lead
3. Downy mildew – Ruth Amata + Delphina lead
3. Onion virus – Douglas lead

Hot pepper – Scotch Bonnet
1. Viruses – Jenina lead
2. Phytophthora blight – Geoffrey Tusiime lead

Fact sheets need to be in the local language appropriate to each area.

Fact sheet	Lead – Ruth Amata coordinator	Target Due Date
Tomato		
Viruses	Peter Sseruwagi	Sep 30 2010
Bacterial wilt	Z. Kinyua	Sep 30 2010
RKN	Z. Kinyua + Fen Beed	Sep 30 2010
Passion fruit		
Viruses	Mildred Ochwo-Ssemakula	Sep 30 2010
Collar rot	Peter Sseruwagi	Sep 30 2010
Brown spot	Ruth Amata	Sep 30 2010
Onion		
Purple blotch	Delphina Mamiro	Sep 30 2010
Neck rot	Delphina Mamiro	Sep 30 2010
Downy mildew	Delphina + Ruth Amata	Sep 30 2010
Virus	Douglas Miano	Sep 30 2010
Scotch bonnet pepper		
Viruses	Jenina Karungi	Sep 30 2010
Phytophthora blight	Geoffrey Tusiime	Sep 30 2010

Template: IITA pub on banana diseases – book – good for farmers; Fen worked Sam Rich (Kampala) on formatting and printing this guide. Would be good to explore this.

Make fact sheet in English first; circulate to region. Pre-test in Year 3; translate where needed.

Friday's Field Survey

Objectives
1. Determine identity of tomato viruses in Mwea and beyond

Douglas Miano will test tomato samples for tospovirus and geminivirus; will test other viruses as well

Miriam will prepare the adsorbent strips since Douglas will be out most of the next two weeks

Do two sets of adsorbent strips for each virus sample

2. Begin tests of efficacy of Xanthomonas strips – tomato

Bacterial spot – run immunostrips if BLS is suspected

- take material back to KARI for isolation
- Sally make adsorbent strips also and take back to Ohio
- Divide up remaining immunostrips for testing in Kenya, TZ and Uganda
    - Test against black rot, BXW, or other Xanthomonas diseases
    - Comparative testing (isolations and/or PCR) done within 2 months

3. Determine identity of passion fruit viruses in Mwea and beyond

Miriam will test passion fruit samples for viruses; will run Potyvirus ELISA; Miriam will prepare the adsorbent strips to assess later

Field Visit to Kirinyaga on Friday, 3rd Dec. 2010
Report Brief by Miriam Otipa and Monicah Waiganjo

Objective: To detect presence of viruses in Passion fruit and tomato (and, if possible, identify) in Kirinyaga region.

The group started off the trip from the hotel at 8.00am to KARI-Thika Research Station where they paid a courtesy call to the Centre Director Dr. Waturu. The group also met Dr Lusike Wasilwa Assistant Director- Horticulture and Industrial Crops at KARI-Thika.

The team then left for Mwea Kirinyaga and made a courtesy call to the Centre Director's office. The following activities were done on each farm

- Determining the incidences and severity of the viruses present at least 30 plants on each farm were sampled
- Collect at least 5 representative symptomatic plants in each field, describe the symptoms on the yellow cards and label card with sample information
- Staple yellow card to bag
- Keep sample as cool as possible
- Take GPS readings of each sampling site
- For every sampled plant a good photography was taken and labeled very well
- Dr Miano to handle tomato samples and Miriam to ensure that he gets the sample
- Miriam Otipa to handle the passion fruit samples

The following were the sampled **Passion fruit farms**

Name of farmer	Sample No.	Symptoms on passionfruit
Silas Mbogo Location: Nyangati	**1.** **2.** **3.** **4.** **5.**	• Mottle fruit malformation crinkling • Mosaic and fruit deformation • Mild malformation • Foliar malformation • Foliar deformation and mosaic
Peter Kasungu Location: Nyangati Village: Kirimara	**1.** **2.** **3.** **4.**	• Chlorosis, mosaics • Wrinkling, leaf vein clearing and distortion • wrinkling vein clering distortion • Leaf mottling and distortion
Charles Njuki Location: Kirimara/ Kirinyaga	**1.** **2.** **3.**	• Yellow venation and discoloration • Leaf distortion, vein clearing, Fruit hardening • Distortion and yellowing and crinkling

The following **two tomato farms** were visited

Name of farmer	Sample No.	Symptoms on tomato plants
Joseph Ndungi Location: Murinduko. Village: Ngucui	**1.** **2.** **3.** **4.**	• Foliar malformation and plant stunting • Several plants wilted • Fungal infections on leaves and fruits • Bacterial spots
Jane Njeri Location: Nyangati Village: Nguraini	**1.** **2.** **3.** **4.**	• Bacterial spots on fruits • Bacterial wilt of plants • Viral infection (Kathuri appearance)

Sample Extraction by Prof Sally Miller and Miriam Otipa

This activity was undertaken on Saturday at the National Agricultural Research Laboratories. 20 samples of tomato and passion fruit samples were extracted. O.53g of LYLI powder was mixed with 9.7ml of water to make 10ml buffer.

1 g of plant tissue was finely ground in 2ml of LYLI buffer and then poured into the beaker. The immunostrips were placed on a card that had been well labeled and 20ul of each extracted sample loaded on the strip and left to air dry. One set of tomato and passion fruit samples were taken by Prof Sally Miller to the USA and the remaining set be analyzed by Miriam and Dr Miano.

December 4: Miller conducts training with Otipa on Molecular diagnostics

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Dieback complex/collar rot	X	X	*	X	X (phyto ph)		*	
Brown spot	X		*	X				
Onion								
Purple blotch	*		*	X		*		
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X – locally available
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Onion		
Purple blotch	Delphina Mamiro	Sep 30 2010
Neck rot	Delphina Mamiro	Sep 30 2010
Downy mildew	Delphina + Ruth Amata	Sep 30 2010
Virus	Douglas Miano	Sep 30 2010
Scotch bonnet pepper		
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December 5: Erbaugh, Miller, Waiganjo and Mensa meet to define survey Kirinyanga grafting and high tunnel survey.

December 6: 10:00 AM: Meeting at USAID Regional Office.

Peter Ewell, Regional USAID Program
Jeff Austin, Sanitary and Phyto-Sanitary Advisor
Hudson Muwamba, Regional Agricultural Program Specialist
Samson Okumu, USAID/Nairobi, bi-lateral mission

Observation: Peter and Austin suggested assembling a budget and scope for proposed virus diagnostics training program to occur in 2012. All expressed appreciation for us letting them know what we are doing in the region.

Training/Meeting 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		
Meeting at Regional USAID office, Nairobi	12/6	4 USAID Regional Office personnel	4		Meeting with Drs. Erbaugh and Miller	EA regional program & IPDN and virus Global Themes
Training: Molecular diagnostics	12/4	Mirriam Otipa		1	Dr. Miller	Molecular Diagnostics
Planning workshop at KARI/NARL	12/1-2	Regional Co-PIs graduate students	8	7	Drs Erbaugh and Miller	Develop workplans for IPDN and Virus Global Theme in support of EA regional IPM CRSP
Field Survey of Diseases	12/3	Farmers & co-PIs	8	6	Dr. Miller	Field sampling technique & outreach to farmers
TC breakout meeting	12/2	Regional & country coordinators meet with site chair	2	2	Led by Erbaugh and Kyamanywa	Discuss Phase II year II workplan implementation. .

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

List of Contacts Made:

Name	Title/Organization	Contact Info (address, phone, email)
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