

## IPM CRSP Trip Report

**Countries Visited:** Senegal and Mali

**Dates of Travel:** March 12 to March 26, 2011

**Travelers Names and Affiliations:** R. Muniappan, IPM CRSP, OIRED, Virginia Tech; Larry Vaughan, IPM CRSP, OIRED, Virginia Tech; Doug Pfeiffer, Dept of Entomology, Virginia Tech; and Robert Gilbertson, Dept of Plant Pathology, University of California – Davis.

**Purpose of Trip:** To review West Africa regional program in Senegal and Mali.

**Sites Visited:** Senegal: Dakar, Thies, St. Louis, Mali: Bamako, Baguineda, Niono, and Segou.

**Description of Activities:** I left Blacksburg on March 12<sup>th</sup> and reached Dakar, Senegal around 10.00 pm on March 13<sup>th</sup>. I met with Larry Vaughan at the airport and Doug Pfeiffer at the hotel.

March 14<sup>th</sup> - 9.00 am, Larry, Doug and I visited USAID mission and met with Aminata Badiane, Ag/NRM Specialist, USAID, Emile Coly, Director of Research, ISRA Horticulture Center (CDH), ISRA, Mour Gueye, Associate Director, ANCAR. Larry briefed Aminata on status of close out procedures of the fruit fly associate award and progress made on AFSI associate award. Bacterial wilt of tomato was mentioned as a growing threat in Senegal.

11.55 am – Larry, Doug, Emile and I met with Alioune Fall, Scientific Director, ISRA and briefed him the activities of West Africa regional program and AFSI in Senegal.

1.30 pm – Met with Dieynaba Sall, Entomologist, ISRA who works on cabbage insects.

March 15<sup>th</sup> – We visited CDH, ISRA. In the yard, we found spiraling whitefly on papaya, *Orthezia* sp. on *Acalypha* sp., *Hibiscus* sp., and *Citrus* sp. In a field near DEV, we found tomatoes were severely damaged by *Helicoverpa armigera*. Also, a few leaf mines were found on leaves. In DPV, Kemo Badji, showed us his culture of *Bemisia tabaci* and *Bactrocera invadens*, and host preference studies on *B. tabaci*.

At Bayakh, we visited cabbage, potato, onion and other fields. Pests found were:

Crop	Pest	Status
Cabbage	<i>Plutella xylostella</i>	Severe infestation
	<i>Helicoverpa armigera</i>	Few
	<i>Spodoptera lituralis</i>	Few
	<i>Hellula undalis</i>	5% crop loss
	Aphids	Heavy infestation

	Black spot – <i>Xanthomonas</i> sp.	Heavy infestation
Okra	<i>H. armigera</i>	Few
	<i>Liriomyza</i> sp	Few
Potato	Early blight – <i>Alternaria solani</i>	Severe
	Pyralid caterpillars	Few
Cashew	Whitefly – <i>Aleurodicus dispersus</i>	Few
Pepper	Leaf spot disease	minor
	<i>Helicoverpa armigera</i>	Few
Tomato	Yellow leaf curl virus	Few
Onion	Purple blotch	minor
Cassava	Cassava mosaic	---
	Spider mites	---

March 16<sup>th</sup> – Place: Mboro.

Cabbage seedlings were heavily infested with diamondback moth.

Place: Potou, Region of Lauga

Crop	Pest	Status
Onion	No pest problem	
Cabbage	<i>P. xylostella</i>	Severe infestation
Cabbage	<i>Liriomyza</i> sp.	Light infestation
Cabbage	<i>Hellula undalis</i>	22% heads were damaged
Wild bitter melon	Fruit fly ( <i>Bactrocera cucurbitae</i> ?)	Few
Tomato (young transplants)	Early blight	--
Tomato (older volunteer plants)	Tomato leaf curl Mali virus	--
Tomato	<i>H. armigera</i>	Few

March 17<sup>th</sup> – Visited ISRA station at St. Louis and found *Hibiscus* sp. plants were infested with whiteflies.

At Dagana met with Mr. Abdoulaye Diene, President of tomato Committee. His major concern was recent finding of bacterial wilt disease in some farms in Dagana region. Later we visited tomato fields infected with bacterial wilt.

### Recommendations:

1. Use of seedling trays and sterile media for raising seedlings.
2. Setting up seedling trays on a bench or a flat form to avoid direct contact with soil.
3. Thorough cleaning of equipment such as tractors when used in bacterial wilt infected fields.
4. Crop rotation.
5. Grafting on resistant varieties.
6. Use of resistant varieties.
7. Good sanitation – removal and burning of volunteer crop plants and solanaceous weeds.
8. Conducting training workshops to farmers on nursery operation and grafting of seedlings.

March 18<sup>th</sup>: Traveled from St. Louis to Dakar and at 4.00 pm Gilbertson, Sall, Kane and I met with Emile Coly and debriefed him of our trip activities.

### Recommendations:

1. West Africa project to procure some entomological supplies to Dr. Sall.
2. CDH, ISRA to make available a vehicle at least once in two weeks for Dr. Sall, Mr. Kane and possibly another scientist to visit cabbage, tomato and potato farms to implement and monitor IPM CRSP West Africa project activities.

March 19<sup>th</sup>: Visited *Direction de la Protection des Vegetaux* (DPV) and met with Lamine Senghor, head of Plant Pathology laboratory and Kemo Badji, head of Entomology laboratory. Later we visited fields.

Place – Notto Gouye Diama:

Crop	Pest	Status
Cabbage	<i>P. xylostella</i>	Heavy infestation
	<i>H. undalis</i>	Few
Weed	<i>Bemisia tabaci</i>	Heavy infestation on a few plants
Eggplant	<i>Tetranychus</i> sp.	Light to medium infestation
	Aphids	Light infestation
	Whitefly	Light infestation
Tomato	<i>H. armigera</i>	Few
	Tomato leaf curl virus	Light infestation

Place: Keur-Lemou

Crop	Pest	Status
Tomato	<i>Fusarium</i> wilt	Few
	<i>Alternaria</i>	Few
	Tomato leaf curl Mali virus	Light infestation
	Leafminer	Few
Citrus	Scale insects	Light

Place: Fass Boye

Crop	Pest	Status
Tomato	<i>Rhizoctonia</i>	
African eggplant	<i>Cercospora</i> leaf spot	Heavy infection
Potato	<i>Alternaria</i>	

Place: REVA farm at Daiov Ndoeye (Ministry of Agriculture Project)

Crop	Pest	Status
African eggplant	Aphids	Medium infestation
	<i>Polyphagotarsonemus latus</i>	Heavy infestation
	<i>Tetranychus</i> sp.	Heavy infestation
	Whitefly	----
	<i>Septoria</i> leaf spot	----
Potato	Early blight	Heavy infection
Eggplant	<i>P. latus</i>	Heavy infestation
	Aphids	Medium infestation

	Whitefly	Medium infestation
Weeds	<i>Cenchrus echinatus</i>	Heavy infestation
	<i>Eleusine indica</i>	Heavy infestation
	<i>Amaranthus</i> sp.	Medium infestation

March 20<sup>th</sup>: Morning – Processed insect samples  
 Afternoon – Traveled to Bamako

March 21<sup>st</sup>: 8.30 am. Visited IER at Sotuba and met with Madame Gamby and her staff.

Crop	Pest	Status
Tomato	<i>B. tabaci</i>	Medium infestation
	<i>Liriomyza</i> sp.	Heavy infestation
	Virus disease	Few plants
<i>Zizyphus</i> sp.	Lycaenid butterfly larvae	Heavy infestation
	Whitefly	Heavy infestation

11.30 am. Met with Dr. Abdoulaye Hamadne, Director of IER/Sotuba and briefed him about our trip. He mentioned that plant protection is one of the major activities of IER and also emphasized the need for capacity building.

1.00 pm. We visited farms at Baguinada.

Crop	Pest	Status
Tomato	<i>Liriomyza</i> sp.	Few
	<i>H. armigera</i>	Few
Cabbage	Aphids	Heavy infestation
	<i>P. xylostella</i>	Heavy infestation
	<i>H. undalis</i>	Medium infestation
Weeds	<i>Ageratum conizoides</i>	Common
	<i>Physalis</i> sp.	Common
	<i>Commolina</i> sp.	Common
	<i>Cleome</i> sp.	Common
	<i>Amaranthus</i> sp.	Common
	<i>Sida</i> sp.	Common
	<i>Mimosa diplotricha</i>	A large infestation was on the side of the field

There is a lab being built at the IER compound for rearing and release of *Trichogramma* sp. in cotton fields. IPM CRSP West Africa project should examine the possibility of developing collaboration in utilizing this parasitoid for control of *Helcoverpa armigera* in tomato and cabbage fields.

Along the canal of the Niger River several patches of tickets of *Mimosa pigra* were observed.

### Recommendation:

Both *M. diplotricha* and *M. pigra* are known invasive weeds. *Mimosa diplotricha* occupies cultivated and vacant lands and *M. pigra* invades marshy places.

Unless proper remedial measures are implemented to control these two weeds, it is likely they will be posing serious economic and environmental damage Mali.

Other invasive weed observed along the irrigation channels were water hyacinth, water lettuce and water fern.

March 22<sup>nd</sup> – Travel to Segou.

Place: Segou.

Crop	Pest	Status
Papaya	Tetranychid mites	Heavy infestation
African eggplant	<i>P. latus</i>	Heavy infestation
	Mealybug	Light infestation
	<i>Liriomyza</i> sp.	Light infestation
	Leafhopper	Light infestation
	Downy mildew	Medium infection
Cycad	<i>Aonidiella orientalis</i>	Heavy infestation
Coconut	<i>Aonidiella orientalis</i>	Light infestation
Plumeria	<i>Aonidiella orientalis</i>	Light infestation
Onion	<i>Thrips tabaci</i>	Medium infestation
Okra	<i>Nisotra uniformis</i>	Light infestation
Potato	<i>P. latus</i>	Heavy infestation
Beans	<i>Tetranychus</i> sp.	Heavy infestation
Eggplants	<i>Tetranychus</i> sp.	Heavy infestation
Okra	Powdery mildew	Heavy infection
	Leaf miner	Few
Guava	<i>Ceroplastes rusci</i>	One specimen found
	<i>Ferrisia virgata</i>	Light infestation

March 23<sup>rd</sup> – Niono

Visited women's cooperative that shreds, dries, and packages onions for the market.

Met with Amadou Kodio, Director of the Regional IER Center at Niono and explained to him of our activities.

Crop	Pest	Status
Okra	Aphids	Heavy infestation
Tomato	<i>H. armigera</i>	Few
Onion	<i>Thrips tabaci</i>	Medium infestation
Cabbage	<i>H. armigera</i>	Few
	<i>Trichoplusia ni</i>	Few

Place: Nango Sahel

Crop	Pest	Status
Okra	<i>H. armigera</i>	Few
	Leafminer	Few

Place: Koulamba Weré

Crop	Pest	Status
Okra	Shoot and fruit borer, <i>Earias diplaga</i>	Few

Place: Moussa Were.

Crop	Pest	Status
Tomato	<i>Sclerotium rolfsii</i> on tomato roots	Minor problem
	<i>H. armigera</i>	Few
Cabbage	<i>H. armigera</i>	Few

Mr. Bourema Coulibaly's field.

Crop	Pest	Status
Cucumber	Aphids	Heavy infestation
	Melon fly damage to fruits	Heavy
Cabbage	Aphids	Moderate infestation
	<i>S. lituralis</i>	Few
	<i>H. armigera</i>	Few
	<i>P. xylostella</i>	Few

Some fields with rice ratoon crop showed symptoms of white tip nematode damage. Rice grains were collected for examination under a microscope and no nematodes were found.

March 24<sup>th</sup>.

8.00 am. Processed samples collected.

10.30 am Visited Malaria laboratory at the Hospital to use a microscope to examine rice seeds for white-tip nematode, *Aphelenchoides besseyi*.

11.30 am. Hotel Independence.

Crop	Pest	Status
<i>Ixora</i> sp	Scales	Moderate infestation
<i>Acalypha</i> sp.	<i>Ferrisia virgata</i>	Heavy infestation
Plumeria	Mealybug	Few

3.00 pm. Return trip from Segou to Bamako.

Crop	Pest	Status
Cassava	African cassava mosaic virus	
	<i>B. tabaci</i>	Few

March 25<sup>th</sup>.

8.00 am. Visited WASA office and met with Dr. Ram Shetty and Dr. Youssouf Traore.

According to Shetty, the local seed company Faso Kaba is the main distributor of vegetable seed in Mali. Foreign companies that supply seeds are: Badar of Tunisia, Technisem of France, East-West Seeds of Thailand, IndoAmerican and Adventa of India.

WASA is involved in infrastructure development of seed labs, Training agro-dealers, regional policy development, variety registration, and assisting in quarantine regulations pertaining to seeds.

11.00 am visited IER and used their microscope to examine white-tip nematode in rice. No nematode was found in the seeds examined. A further examination additional samples is needed for deriving at a conclusion.

Left the hotel at about 8.00 pm for the return journey to Blacksburg.

## List of contacts made:

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