FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

WELCOME

Greetings, IPM Innovation Lab (IPM IL) friends and colleagues! This season has been full of travel and breakthroughs: we assessed farmer progress in Bangladesh, Nepal, and Cambodia; we rang in Women's History Month with publications in *Food Tank* and *Entomology Today*; we continued work on managing the destructive fall armyworm, and more. Read on to get the latest on IPM IL's most recent work building food security around the world.

IPM INNOVATION LAB
Feed the Future Innovation Lab for Integrated Pest Management

VIRGINIA TECH

USAID
FROM THE AMERICAN PEOPLE

What's New?

PROJECT UPDATES

Farmers assess a pheromone trap.

Vegetable Crops and Mango IPM in Asia: In Nepal, efforts by the IPM IL helped decrease crop loss from the tomato pest *Tuta absoluta* by 35% and at least 153,000 farmer families have purchased IPM supplies. In Cambodia, IPM IL is collaborating with Feed the Future Cambodia Harvest II to commercialize IPM products such as *Trichoderma*. In Bangladesh, trials are being conducted on IPM technologies including Bt eggplant, fruit bagging, biological control of mango hopper, and more. A survey in Bangladesh revealed that sales of synthetic pesticides are declining and IPM product sales are increasing.

IPM for Exportable Fruit Crops in Vietnam: For the first time, the U.S. is importing mangoes from Vietnam. The process took nearly ten years from first

applying for the license and resulted from advocacy efforts from many groups including IPM IL collaborator, Southern Horticultural Research Institute (SOFRI). SOFRI is continuing to use fruit bagging to protect dragon fruit, longan, and mango from pests and to reduce the use of pesticides.

Ecologically-based Participatory IPM Packages for Rice in Cambodia (EPIC): In Cambodia, the Women and Gender in International Development team is conducting evaluations assessing the gendered dimensions of IPM dissemination and application. Initial results suggest application of recommended rodent management practices in rice fields directly impacts mens' and women's responsibilities. For example, when following recommended practices, especially when ceasing to use electric fences, women are more active in setting traps and collecting trapped rats.

Modeling for Biodiversity and Climate Change: The IPM IL team in Nepal continues to track the spread of invasive weeds such as *Parthenium,* which is projected to spread more rapidly as temperatures rise due to climate change. Among Nepal's bio-diverse and variable terrain, the team also projected a decrease of land availability of two vital crops, finger millet and buckwheat, and is gathering information on local communities' perceptions of climate change.

Invasive Species Modeling for South American Tomato Leafminer and Groundnut Leafminer: The spread of the

tomato pest *Tuta absoluta* is currently being tracked. Analysis of the pest's historical invasion records suggests that it can quickly expand its range through domestic city-to-city vegetable trade. The IPM IL team has assessed there is a strong chance that within 5-7 years *Tuta absoluta* will invade all major vegetable growing areas of Mainland Southeast Asia if no steps are taken to mitigate its spread. The team is also working to correctly identify the identity of the groundnut leafminer in India and Africa in order to model its spread as well.

Vegetable Crops IPM in East Africa: The IPM IL team is continuing to use the cellphone App WhatsApp to successfully connect farmers and crop experts for the exchange of information on emerging crop pests and diseases. Workshops on vegetable viruses continue to be conducted throughout East Africa as well as workshops on identification and diagnostics of key diseases and pests.

Rice, Maize, and Chickpea IPM for East Africa: In February, IPM IL and collaborators from the International Centre of Insect Physiology and Ecology (*icipe*) conducted a fall armyworm workshop that trained participants from Ethiopia, Kenya, Tanzania, South Sudan, and the Ivory Coast on the biological control of the pest that has caused billions of dollars in Africa, and now Asia. This season, numerous publications have come out of this project including one on the most recent occurrence of *Telenomus remus*, a natural enemy in Africa that could be used against the fall armyworm.

Biological Control of the Invasive Weed

Parthenium hysterophorus in East Africa: Participants in Ethiopia, Kenya, and Uganda are being trained on the production of the leaf-feeding beetle *Zygogramma bicolorata* and the stem-boring weevil *Listronatus setosipennis* to release against the invasive weed *Parthenium*. The team has been especially proactive in generating quality *Parthenium* stock to rear the natural enemies and learn best practices for selecting sites for their release.

Recent Activities

WHAT'S KEEPING THE MANAGEMENT TEAM BUSY

(left to right) David Tinsley, Morgan Griffith, Amer Fayad, Muni Muniappan

- With a $50,000 award from Virginia Tech's Vice President of Outreach and International Affairs Guru Ghosh, the Office of Economic Development conducted research on the economic benefits of two IPM technologies that improve plant health and farmer livelihoods, cocopith and *Trichoderma*. A formal document is

being prepared to share the research findings.

- IPM IL attended the Women and Gender in Development Conference hosted by the Women and Gender in International Development team at Virginia Tech. In attendance were researchers, students, and practitioners (including USAID's Bureau for Food Security Senior Gender Adviser Krista Jacobs) from around the world to discuss the nexus between gender and development.
- The IPM IL team attended the Horticulture Research for Development Conference in Washington, D.C. in March to hear from university researchers, practitioners, and government leaders about recent innovation and horticulture research findings. On this trip, IPM IL also met with Virginia Tech's Federal Legislative Liaison David Tinsley and U.S. Congressional Representative Morgan Griffith.
- Amer Fayad taught a guest lecture for John McDowell's graduate Translational Plant Science course at Virginia Tech. He covered subjects including Bt eggplant, current debates within agricultural development, the use of the "fighting fungus" *Trichoderma* against plant disease, and more, while students gained insight into his expertise on applying IPM solutions in the developing world.

Latest Publications

IPM IL IN THE NEWS

Celebrating Women in Science: Eight Women Breaking Ground in Agriculture, *Food Tank*

A Dangerous Pest is on its Way, *Spotlight Magazine*

Virginia Tech taps into text message services to assist farmers in developing countries, *VT News*

Continued...

Gender Research in IPM: Women's Empowerment as a Key to Unlocking Food Security, *Entomology Today*

Program Prepares Farming Communities in Nepal for Impacts of a Changing Climate, *VT News*

Knowledge Management: Online and Offline Tools for Global Success, *Agrilinks*

Stakeholders Meeting in Nepal to Develop Action Plan Against the Fall Armyworm, *IAPPS Newsletter*

Success Stories

PEOPLE AND PROJECTS ACHIEVING GREAT THINGS

Agri-business Blooms out of IPM Innovation Lab Partnership

Fighting Fruit Flies: Bangladesh Uses Common Materials against a Common Pest

A Partnership Celebrated: Former IPM Innovation Lab Collaborator Continues to Make Agricultural Strides Across Uganda

Videos

WATCH OUR WORK

Biological Control of the Millet Head Miner: Preparing for the Release of Natural Enemies

Virginia Tech Proposes IPM with an Emphasis on Biocontrol to Manage the Fall Armyworm

Looking Ahead

WHAT'S NEXT?

Malick Ba (left) from ICRISAT and Ibrahim Baoua (right) from University of Maradi in Niger assess pearl millet head miner damage.

- In collaboration with IPM IL, *icipe* will create a training manual on the biological control of the invasive fall armyworm.
- IPM IL will attend the Innovation Lab Council meeting in May 2019 in Ethiopia.
- Muni Muniappan will travel to Vietnam to conduct a workshop on the tomato pest *Tuta absoluta* and to India to participate in a workshop on the fall armyworm.

Buzz-worthy News

ELSEWHERE IN SCIENCE

Muni Muniappan (left) and Peter Malusi (right) from *icipe* assess fall armyworm damage in Africa.

Pretty Sly for a Whitefly, *The Atlantic*: One of the world's worst agricultural pests corrupts the alarm signals of plants, disarming those that otherwise might prepare for an assault.

Insect Biological Control Shields Tropical Forests, *Science Daily*: An international team has just revealed how on-farm biological control can slow the pace of tropical deforestation and avert biodiversity loss on a macro-scale.

Preparing for Invasive Pests Before They Arrive, *Undark*: With increased globalization and climate change, more countries are preparing for the inevitable arrival of crop-destroying scourges from abroad.