

Ecologically-based Integrated Pest Management Packages for Food Security Crops in Central Asia

Michigan State University, University of California-Davis, Kansas State University, University of Chicago, ICARDA, AVRDC, CGIAR-PFU, and University of Central Asia

Poster presented by: Dr. Karim Maredia and Ms. Joy Landis, Department of Entomology, Michigan State University, East Lansing, Michigan, U.S.A.

The Central Asia regional IPM Collaborative Research Support (IPM CRSP) Project is developing ecologically-based IPM packages for three key food security crops in Central Asia. The training and capacity building strategy includes conducting in-country and regional workshops as well as farmer and student field schools with local institutions. Furthermore, three Central Asian students are earning graduate degrees at Michigan State University. The project provides networking opportunities for IPM professionals from the region to attend international IPM training with due consideration of gender balance. Scholarship, publications and dissemination of research results through electronic and print media are important outcomes.

Three focus countries: Uzbekistan, Kyrgyzstan, Tajikistan



Collaborators:

- Michigan State University
- University of California-Davis
- Kansas State University
- University of Chicago
- International Center for Agricultural Research in the Dry Areas (ICARDA)
- CGIAR-PFU
- World Vegetable Center (AVRDC)
- Ministry of Agriculture and Water Resources, Uzbekistan
- Institute of Plant Protection, Tashkent, Uzbekistan
- Tashkent State Agrarian University (TSAU), Uzbekistan
- Tajikistan Institute of Zoology
- Tajik Academy of Agricultural Sciences
- Agricultural Training and Advisory Center (ATAS), Tajikistan
- Training, Advisory and Innovation Center (TAIC), Kyrgyzstan
- Kyrgyz Agrarian University
- Kyrgyzstan Ministry of Agriculture, Water Resources and Processing Industry
- Agro-Lead NGO, Kyrgyzstan
- Aga Khan Foundation - Kyrgyzstan
- University of Central Asia

For more information, please,

Visit us at: www.ipm.msu.edu/central-asia-htm

Contact us at:
Karim Maredia, Project Director - kmaredia@msu.edu
Joy N. Landis, Project Communicator - landisj@msu.edu

Wheat IPM Package



Team: Dr. Nurali Saidaov (IPMCRSP Tajikistan Coordinator), Dr. Anwar Jalilov (Institute of Farming, Tajikistan), Dr. Doug Landis (MSU), Dr. Mustapha Bohssini (ICARDA), Dr. Megan Kennelly (KSU), and Ms. Shahlo Safarzoda (MSU graduate student from Tajikistan).

Wheat IPM Package Components

- Use of resistant varieties - Yellow rust resistant wheat "Ormon" variety from ICARDA.
- Introduction of flowering nectar plants (coriander, sweet basil, and marigold) to attract parasites and predators.
- Use of biological control with parasitoids of cereal leaf beetle and Sunn pest.
- Addition of cultural controls to manage Sunn Pest.
- Consideration of planting and harvest dates for maximum results.

Potato IPM Package



Team: Dr. Murat Aitmatov (IPMCRSP Kyrgyzstan Coordinator), Dr. David Douches (MSU), Dr. George Bird (MSU), Dr. Walter Pett (MSU), and Ms. Saltanat Mambetova (MSU graduate student from Kyrgyzstan).

Potato IPM Package Components

- Use of disease-free certified seed to ensure growers have clean, disease-free seed material to plant.
- Use of resistant varieties - Collaborating international and local potato breeders are identifying varieties with the traits best able to resist late blight as well as insect pests and nematodes (*Globodera* spp.).
- Potato seed is being inoculated with the biopesticide *Trichoderma* for biological control of potato fungal pathogens.
- Cultural controls such as mulching in the field to conserve moisture and help with disease control.
- Monitoring for pests. For example, placing yellow sticky traps in the field helps monitor for whiteflies and aphids and assists in control decisions.

Tomato IPM Package



Team: Dr. Barno Tashpulatova (IPMCRSP Uzbekistan Coordinator), Dr. Ravza Mavlyanova (AVRDC World Vegetable Center - Uzbekistan), Dr. Frank Zalom (UC-Davis), Dr. Megan Kennelly (KSU), and Mr. Bahodir Eshchanov (MSU graduate student from Uzbekistan).

Tomato IPM Package Components

- Greenhouse production**
 - Soil or seed treatments with *Trichoderma* spp., *Pseudomonas fluorescens* or *Bacillus subtilis* help control soil borne fungal and bacterial diseases.
 - Grafting on resistant root stock offers Fusarium disease control.
 - Parasitoids are released in the greenhouse to control whiteflies, caterpillar pests and others. *Bacillus subtilis* is a good biological agent because of its stability in CA conditions.
 - Cultural controls such as mulching to conserve moisture and removing disease-infected plants to stop further spread.
 - Monitoring for pests. Yellow sticky traps are placed in production areas to detect white whiteflies and aphids and assist in control decisions. Pheromone traps are used to monitor for tomato fruitworm.
- Open field production**
 - Trichoderma lignorum* are released on the soil before planting to help control soil borne fungal or bacterial diseases.
 - Grafting on resistant root stock offers Fusarium disease control.
 - Encarsia* can be released for biological control of whiteflies, and *Trichogramma* and *Bracon* for biocontrol of fruitworms. Biopesticide options are also available.
 - Cultural controls such as mulching to conserve moisture and removing disease-infected plants to stop spread.
 - Placing yellow sticky traps in the field helps monitor for whiteflies and aphids and assist in control decisions. Pheromone traps can be used to monitor for tomato fruit worm, and blue sticky traps for thrips.



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Cross-cutting Components

Pest Diagnostics

Proper diagnosis of the pest is the foundation of IPM. Current capacity in pest diagnostics in Central Asia is weak, and needs were assessed. Training is being provided through regional pest diagnostics workshops and other resources.

Component Leader: Dr. Sally Miller (OSU)

Virus Diseases

An evaluation of viruses and vectors in the three crops is planned. Local scientists are preparing in-country training programs in virus disease diagnostics and management.

Component Leader: Dr. Naidu Ryapati (WSU)

Gender Equity

Programs and training are structured to ensure participation and leadership by women as they are key contributors to agriculture and play an active role in farming systems. Activities are conducted for assessing the perception and potential impact of new IPM technologies on women, and the advantages or disadvantages they may bring for women.

Component Leaders: Dr. Linda Racioppi (MSU) and Dr. Zahra Jamal (Univ. of Chicago)

Impact Assessment

An assessment is underway to determine the socio-economic impacts of the IPM packages for wheat, potato and tomato crops. A baseline survey is being conducted by the project team.

Component Leaders: Dr. Richard Bernsten (MSU) and Dr. Mywish Maredia (MSU)

IPM Communication and Advocacy

Communication about the project and its activities occurs at many levels including a website, publications, success stories and media contacts. Team members are in contact with USAID Missions in the region as well as local universities, NGOs, and government ministries/organizations with an interest and a role to play in IPM.

Component Leaders: Ms. Joy Landis and Dr. Karim Maredia (MSU); and Ms. Miriam Rich (Virginia Tech)

