

Message from the Management Entity

IPM CRSP FY 2012 Annual Report

One dollar spent on integrated pest management (IPM) is one dollar spent on food production, health, nutrition, the environment, biodiversity and, in general, on food security and poverty reduction on a global scale. In December 2012, the President's Council of Advisors on Science and Technology emphasized the need for support for IPM from public funds, as private enterprises often overlook programs that are broad and encompass several areas (*Science*, Dec. 2012). Also, it recommended that management of invasive insects and plants be given top priority in agricultural research.

The IPM CRSP participates in six regions of the “hot, flat, and crowded” developing world, encompassing nearly one-third of the world population. IPM technologies are developed through collaborative research between U.S. and host country scientists and disseminated through demonstrations, field days, farmer field schools, mass media, and other avenues.

The participatory approach adopted by the IPM CRSP has allowed the program to identify crops and pest problems based on the needs of the host countries. In the current phase, the program prepares IPM packages for selected

high value vegetable crops by developing and integrating technologies for problems faced by farmers from the time of planting seeds to the harvesting of a crop. These approaches are multidisciplinary and include measures to address virus, bacterial, and fungal diseases, insect and mite pests, and weeds, all with the aim of finding alternatives to using pesticides. The techniques also address invasive species such as *Parthenium* in East Africa and the papaya mealybug in Asia as well as emerging issues such as the zebra chip disease of potato in Central America, the South American tomato leaf miner in Senegal, and the cassava mealybug in Southeast Asia.

Technologies developed by the program have been validated and disseminated regionally, and now globally, through presentations at regional and international meetings, workshops, and conferences. In 2011–2012, our scientists have participated in prominent international conferences including the 7th International IPM Symposium in Memphis, the 12th International IPM Mesoamerican Conference in Honduras, and the Entomological Society of America's annual meeting in Knoxville. Additionally, the IPM CRSP also organized regional and international workshops on *Trichoderma*,





Pseudomonas, and plant virus diseases. Further, the program works closely with international organizations such as the International Organization for Biological Control and the International Association for Plant Protection Sciences. Human and institutional capacity building activities were addressed by providing long- and short-term training and organizing regional and international training programs.

Virginia Public Radio covered the IPM CRSP Ecuador project. Local radio stations in India, Indonesia, Ecuador, Nepal, and Bangladesh participated in popularizing IPM tactics in their respective countries. Recently, IPM CRSP communicators have been using social media such as Twitter and Facebook to get the word out about the good work that the program is doing.

Analyses of a dozen technologies implemented through the IPM CRSP in different parts of the tropical world have resulted in a benefit of twenty-five dollars for each dollar spent. When all the technologies developed, transferred, and implemented are taken into account, the ratio is closer to \$200 in benefits for each dollar spent. It is estimated that the classical biological control tactics introduced into India to control the papaya mealybug *alone* resulted in a benefit of over \$100 million a year.

Executive Summary

The IPM CRSP has six regional and five cross-cutting projects. It has enhanced regionalization by rotating annual planning meetings among participating countries and increasing regional collaboration in research, training, and communication.



A regional planning meeting for the Latin America and the Caribbean (LAC) project was conducted in Guatemala in May 2012. At that time, the LAC project conducted a symposium for the national, regional, and international projects operating in Guatemala supported by USAID, USDA/FAS, and others. A training workshop on bacterial canker disease was also conducted in collaboration with USDA/FAS. IPM packages have been developed for potato, naranjilla, tree tomato, and blackberry in Ecuador; potato, eggplant, tomato, and sweet potato in Honduras; and tomato, potato, and pepper in Guatemala. The IPM CRSP has been working closely with the ACCESO project (administered by FINTRAC) and has conducted workshops on gender and management of zebra chip disease of potato. At the request of USAID Washington, we no longer work in the Dominican Republic as of this reporting year.

A planning meeting for the East Africa project was conducted in Tanzania. IPM packages are being developed for tomato, pepper, onion, and coffee in Uganda; tomato and passion fruit in Kenya; and tomato, onion, and coffee in Tanzania. The use of *Trichoderma* for the control of soil fungal diseases has been introduced in Kenya. Grafting on resistant rootstock for resistance to bacterial wilt of tomato has been adopted in Uganda and Kenya.

In January 2012, a regional planning meeting for the West Africa project was conducted in Senegal. IPM packages for tomato, potato, and cabbage in Senegal and tomato and cabbage in Ghana are being developed. The host-free period and grafting technologies for the *Tomato yellow leaf curl virus* and bacterial wilt, respectively, have been introduced to Senegal. The recent spread of an invasive pest, the South



American tomato leaf miner *Tuta absoluta*, to Senegal has been reported, and follow-up actions are being taken.

A regional planning meeting for the South Asia project was held in Nepal in February 2012. IPM packages have been developed for tomato, okra, eggplant, onion, cabbage, cauliflower, watermelon, pumpkin, bitter gourd, and snake gourd in India; tomato, eggplant, cucumber, okra, country bean, cabbage, cauliflower, bitter gourd, pointed gourd, and pumpkin in Bangladesh; and tomato, cauliflower, cabbage, cucumber, eggplant, tea, and coffee in Nepal. In July 2011, Tamil Nadu Agricultural University conducted a *Trichoderma* workshop for other participating IPM CRSP countries and hosted a symposium on plant virus diseases. Use of biopesticides, pheromones, grafting, and other technologies has been widely disseminated through farmer meetings and mass media. Classical biological control of papaya mealybug in India has saved the papaya, mulberry, and cassava industries. Technologies developed by public institutions — grafting and the production and sale of *Trichoderma*, *Pseudomonas*, NPV, and pheromones — have been transferred to private industries and NGOs. USAID Missions in Bangladesh and Nepal have been processing associate awards for the IPM CRSP.

The Southeast Asia project conducted its annual planning meeting in Cambodia in October 2012. IPM packages are being developed for tomato, pepper, onion, cauliflower, and potato in Indonesia and for eggplant, tomato, and onion in the Philippines. Cambodia is a recent entry into the IPM CRSP. The use of *Trichoderma* in vegetable production is actively pursued in this country. The USAID Mission is processing an addendum to the existing associate award for



additional activities. Recently introduced invasive species, namely, the cassava mealybug and Asian cycad aulacaspis scale in Indonesia, are being addressed.

USAID/Washington requested we drop Uzbekistan and Kyrgyzstan from the Central Asia project. This means our only project in the region is in Tajikistan, where IPM packages for wheat and potato were developed. In these packages, the use of nectar plants is one of the major components in addition to the use of resistant varieties and biological control.

Cross-cutting projects are active in all regions where the IPM CRSP is working, addressing local and regional problems. IPM CRSP staff are organizing regional and international meetings, workshops, and symposia to study these issues. The USAID biosecurity office has recently approved an Environmental Assessment for the release of the natural enemy *Zygodontia bicolorata* for control of the invasive weed *Parthenium hysterophorus*, which is spreading in East Africa. The impact of the introduction of components of IPM on gender is also being addressed.

In short, the IPM CRSP continues to address the major challenges of the 21st century: food security, gender constraints, health issues, and biodiversity concerns. The development of crop-specific packages has allowed for easier acquisition of new technologies, and a regional approach has ensured a beneficial sharing of new ideas. Through all of its technologies and in every region where it has a presence, the IPM CRSP is working with local scientists and farmers to create a better world.