UC IPM

ANNUAL REPORT

2008

HIGHLIGHTS

University of California
Statewide Integrated
Pest Management Program

From the director

Challenges and Changes in 2008

It is again a privilege to introduce these impressive highlights of UC IPM's accomplishments during the past year. The challenges facing the Statewide IPM Program are large, looming, and daunting, just as they are for the entire UC Division of Agriculture and Natural Resources (ANR).

Peter B. Goodell

UC IPM continues to make progress in fulfilling its mission within the context of changes suggested by the 2006 program review. Urban and community IPM is expanding into new areas under the direction of Mary Louise Flint. ANR supplied new funding for a demonstration grants program, providing new opportunities for local program implementation. In addition, more year-round IPM programs to help growers navigate pest management guidelines and support USDA-NRCS programs have been developed. Pest management alliances are enhancing our partnerships with agencies and organizations.

In 2008, two IPM advisors separated from UC IPM. Phil Phillips retired after more than 30 years of service, and Anil Shrestha has moved on to California State University, Fresno to pursue a teaching career. However, we were able to add Roger Baldwin as IPM advisor for wildlife management at Kearney Agricultural Center. In addition, Tunyalee Martin joined the staff at Davis in the key role of content supervisor.

The search for a permanent director continues. A campus search committee identified and interviewed an excellent pool of candidates. Follow-up interviews were held, but at the time this article is being written, no decision has been made.

These are challenging times, but also times of opportunity. The Statewide IPM Program is fortunate to have a dedicated staff to meet these challenges and provide products and activities that ensure IPM is delivered to the citizens of California. We also appreciate our public and private partners in this effort.

It has been an honor and privilege to have served as interim director for the past year, and I look forward to serving the new director.

What is IPM?

Integrated pest management (IPM) is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

Look for the Annual Report link on the UC IPM home page to read the full text of these articles, plus more on UC IPM activities.

CREDITS: Use a monitoring form to keep track of winter weed populations. Photo by Larry L. Strand. / Cracked fruit on citrus tree, a source of *Penicillium* sp. Photo by David Rosen. / Green lacewings are predatory insects and help with pest control in almond orchards. Photo by Jack Kelly Clark. / San Jose scale on pears. Photo by Jack Kelly Clark.

Progress:
Review and Planning Update

UC IPM increases activity in natural resources pest management

by Jim Stapleton, coordinator for natural resources IPM

The UC IPM Strategic Plan recognizes the need to increase activity in the natural resources pest management arena, and we have begun to expand in this area.

Initially, our primary product will be a set of Web links to online UC IPM and other ANR or government resources that relate to IPM in natural environments. The goal is to create a centralized information resource similar to the ones for agriculture and urban IPM, and focus on education and prevention.

Pest management needs in natural areas are diverse and widespread. The focus is typically on invasive species and habitat restoration. UC IPM has been involved in natural resources pest management research for several years through the UC Exotic/Invasive Pests and Diseases Research Program. However, there has been no organized outreach to accompany the research.

➥ *Read the article at www.ipm.ucdavis.edu*

New process refines agricultural IPM resources and outreach methods

by Carolyn Pickel, associate director for agricultural IPM

The associate director for agricultural IPM is responsible for planning, coordinating, and integrating outreach, research, publications, and Web materials for agriculture. A key element is the concept of IPM "crop teams."

Crop teams provide better communication between IPM editors and farm advisors and specialists working with agricultural audiences. These teams, led by an academic expert, meet around revisions of pest management guidelines and development of year-round IPM programs.

During this process, the teams also identify research and outreach needs in addition to updating and supplying new information for the PMGs. As needed, we have brought in pest control advisors and out-of-state experts to replace retired field and crop experts in reviewing PMG content.

➥ *Read the article at www.ipm.ucdavis.edu*

Reaching our strategic goals for urban and community clientele

by Mary Louise Flint, associate director for urban and community IPM

In 2007, UC IPM created the associate director for urban and community IPM position to better focus efforts on urban and residential pest management audiences. During the past year, the program has consulted with user groups and experts, reviewed issues, brainstormed priorities, and initiated or refocused projects to help make "ecosystem-based integrated pest management THE way Californians manage pests."

During our first year, we have been building alliances to synergize limited resources in these areas. We established an advisory committee of urban pest management experts within UC to guide us in priority setting. This group has met twice and in October cosponsored a program on urban pest management issues at the UC ANR Pest Management Coordinating Conference that brought together people from across the state to start a UC ANR urban and community IPM working group.

➥ *Read the article at www.ipm.ucdavis.edu*

The minute pirate bug is a commercially available predator to help control western flower thrips. Minute pirate bugs can live on many different kinds of foods such as aphids, mites, and small caterpillars. Here, a minute pirate bug is attacking an aphid. Photo by Jack Kelly Clark.

UC IPM in Action

Cracking nut insect problems

Scientists from several UC Cooperative Extension offices, UC campuses, and the USDA San Joaquin Valley Agricultural Sciences Center are nearing the end of the first year of a five-year USDA grant to gain control of navel orangeworm in almonds, pistachios, and walnuts in the Central Valley. By comparing traditional pest management practices to more environmentally friendly methods, researchers hope to improve monitoring and treatment for the moth over a wide range of conditions and nut varieties.

This collaborative effort is examining how harvest timing, orchard sanitation, mummy load (nuts that remain on the ground or in the trees after harvest), and navel orangeworm development influence the risk of pest damage when cultural controls and mating disruption are used to control this pest.

Navel orangeworm is a primary pest of several California tree crops, but especially nuts. When its eggs hatch, the larvae crawl around searching for a crack in the nut's hull to burrow into and feed on the kernel.

Scientists are conducting this study at test sites in Arbuckle, Colusa, Durham, Manteca, Sutter, and Woodland. They are using standardized grower practices in some of the sites to validate an existing risk assessment model for navel orangeworm. IPM Advisor Carolyn Pickel, UCCE, Sutter-Yuba counties, and Steve Welter, entomologist, UC Berkeley, monitor walnut and almond orchards for navel orangeworm using pheromone "puffers" and compare them with orchards not using this method.

➥ *Read the article at www.ipm.ucdavis.edu*

Puffer technology breathes life into codling moth control in walnuts

Hal Crain has opened up the gate of his 200-acre walnut orchard to scientists to test the efficacy of a mating disruption practice as a way to reduce the number of insecticide sprays he uses to control codling moth. Crain is concerned that codling moth sprays lead to more expensive miticide sprays. With the increased cost of diesel to run a sprayer, less spraying will save him money.

Crain Orchards in the Sacramento Valley represent 8,000 acres of walnuts. If the use of "puffers," or pressurized aerosol cans that dispense pheromones, can reduce insecticide sprays, using the technique on all the acreage could make a big impact. Sex attractants called pheromones are chemicals that female moths give off to attract males for mating. The attractants confuse males so that they can not find the real females, thereby reducing the codling moth population.

UC IPM Advisor Carolyn Pickel said, "Regulation of the primary pesticides used to contain codling moth will increase in California because they are harmful to air and water quality. Puffers could potentially reduce the use of insecticides to control codling moth by 75 percent, depending on codling moth pressure.

➥ *Read the article at www.ipm.ucdavis.edu*

UC IPM advisor keeps pests at bay—and out of the bay—in Port of San Diego

UC IPM has cast its net wide to encourage others to consider integrated pest management as the preferred method of controlling pests in an effort to reduce pesticide use.

Aerial view of the Port of San Diego. Photo courtesy of Port of San Diego, All rights reserved.

The Port of San Diego oversees San Diego Bay and the surrounding tidelands, and a primary role is to serve as an environmental steward. One of the Port's concerns is pesticide use, a source of water pollution in the bay. Pesticides and fertilizers can be transported from parks and yards to the storm-drain system and eventually into creeks, lagoons, bays, and the ocean.

One way that the Port is working to prevent water pollution in San Diego Bay is through an IPM program. Since 1997, UC IPM Advisor Cheryl Wilen, UCCE, South Coast, has served on the Port of San Diego's IPM Task Force to oversee the implementation of this program.

➥ ***Read the article at www.ipm.ucdavis.edu***

UC IPM photographs go global

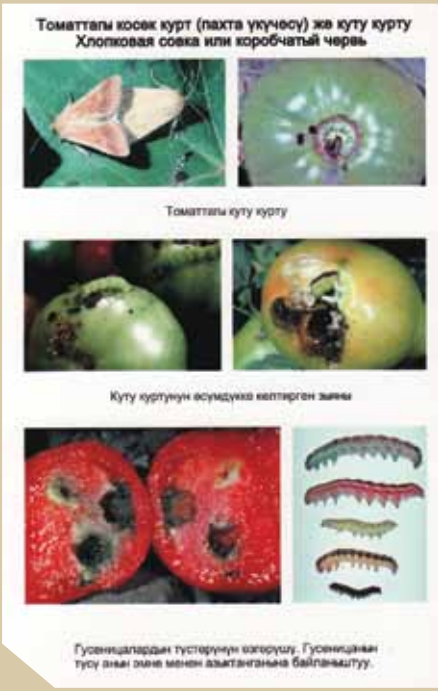
Photographs from the UC IPM's media library are supporting farmer education in Central Asia thanks to the efforts of UC Davis entomologist Frank Zalom.

While participating in a four-year project to implement IPM in Central Asia, a Swiss agency involved in the project suggested that they develop "IPM pocketbooks" for growers, to be translated into the republic's native language. The pocketbooks would contain technical information about crops and high-quality photographs.

"Of course, the UC IPM photographs are a tremendous resource, and their value immediately came to mind as a source to help in this effort," said Zalom, who served as director of the UC Statewide IPM Program from 1987 to 2001 before returning to the UC Davis entomology department to conduct research.

➥ ***Read the article at www.ipm.ucdavis.edu***

Several of Jack Kelly Clark's photographs of tomato fruitworm appear in an "IPM pocketbook" for tomatoes from Kyrgyzstan, a republic in Central Asia.



UC IPM Advisor Walt Bentley works with Fresno growers to establish demonstration orchards that showcase locally effective IPM Best Management Practices to control pests using the latest research and pest control materials.

Cooperative Extension IPM Demonstration Grants Program

Strengthening the link between research and outreach

With funding from UC ANR, UC IPM established a new competitive grants program in 2007 to fund demonstrations of integrated pest management research in the field.

The purpose of the Extension IPM Demonstration Grants Program is to demonstrate IPM practices and promote implementation of IPM in production agriculture, residential and urban areas, and natural areas. The primary focus is to increase adoption of IPM practices.

Funding for projects is available to all UC Cooperative Extension advisors and specialists. Members of the Agricultural Experiment Station are encouraged to partner with UCCE advisors or specialists for projects that demonstrate their research. See "grants programs" on the Web site for summaries of projects and information on future requests for proposals.

In its first year, the program sponsored nine projects. One is featured below. An RFP for the 2009 program will be released in January 2009.

Demonstration Garden promotes best IPM practices

In Calaveras County, home of the California Gold Rush, gardeners have hit pay dirt when it comes to finding out about environmentally friendly gardening and IPM practices.

Under the direction of Calaveras County's UC Cooperative Extension (UCCE) Director Ken Churches and Master Gardener Program Coordinator Karen Riley, Master Gardeners have developed a Demonstration Garden project featuring up-to-date information and hands-on workshops to increase the use and acceptance of IPM strategies.

To educate visitors about least-toxic solutions for pest problems, giant versions of the UC Statewide IPM Program's Quick Tip cards have been installed throughout the garden. Quick Tips are handy reference cards about specific home, garden, and landscape pests or pest management topics distributed by UC Master Gardener programs throughout the state.

➥ *Read the article at www.ipm.ucdavis.edu*

UCCE Calaveras County Master Gardener Program Coordinator Karen Riley shows Quick Tips and the IPM kiosk to visitors at the Demonstration Garden.

CE IPM Demonstration Grants Program 2007–2008

New residential IPM approaches to manage codling moth • Application of IPM practices to Trinity County's heritage and backyard orchards • Demonstration Garden promotes best IPM practices • Improved adoption of IPM by nut crop PCAs and growers in the lower San Joaquin Valley • Area-wide "puffer" demonstration in Tehama County • Demonstration of house fly IPM at commercial dairies • Demonstrating the use of silicon and other IPM practices to reduce pesticide applications in bedding plant operations • Management of corn leafhopper and corn stunt disease in corn • Demonstration of efficacy of postharvest ethephon in the suppression of overwintering codling moth in pears

UC Exotic/Invasive Pests and Diseases Research Program

Predatory mite, Neoseiulus californicus. *Photo by Beth Grafton-Cardwell.*

Due to funding reductions, the UC Exotic/Invasive Pests and Diseases Research Program has ended. The program was funded through a Special Research Grant from USDA.

Summaries of project reports from the program are online at the UC IPM Web site.

The following highlights one of the research projects supported by the program.

Know your natural enemy

UC researchers have found that the species of predatory mites that predominate can vary quite a bit between and within crops. With the aid of a new taxonomic key, the job of identifying which mite species is the most common in a crop can improve the chances of having a successful biological control program.

Predatory mites feed on other mites and small insects such as thrips and are known to be important natural enemies in many crops including subtropical trees, stone fruits, nuts, vines, berries, and field crops. They are most common when their prey is most common. For citrus and avocados, they are commonly seen in the spring and fall; for vines and stone fruits, they also are easily found during the early summer and fall.

"Predatory mites are one of the most successful commercially available biological control agents," explained entomologist Beth Grafton-Cardwell, lead scientist for the project funded by the UC Exotic/Invasive Pests and Diseases Research Program. "However, there are many species, and they can have different feeding habits. The more specialized predatory mite species tend to exert greater control of pests than the more general feeders, because they are focused on one prey species."

Grafton-Cardwell, IPM specialist and research entomologist, said, "During 2005 to 2007, we identified the species of predatory mites collected in 11 major agricultural crops and developed a classification key to recognize them. Trained personnel can use the key to determine which species of predatory mite is most common in a crop, and this can assist with pest management decisions."

➥ *Read the article at www.ipm.ucdavis.edu*

UC IPM Competitive Grants Program

The UC IPM Program administers a state-funded competitive research grants program to develop, promote, and implement IPM programs in California. No new projects were approved in 2008-09, although continuing funding was given to six projects begun in 2007-08. Because of the declining state budget situation, no request for proposals is expected to be issued in 2008-09 for 2009-10 funding.

Summaries of grants are online at the UC IPM Web site.

Extending IPM to urban audiences

This year, UC IPM has continued to expand and create a variety of products including free online training for retail employees, Quick Tip pest cards, UC IPM kiosks, a 3-minute home and garden Web page video tour, and educational materials about safe ant management for school and building employees and landscape professionals.

Reaching urban audiences with science-based information about how to manage pests is a key goal of the urban and community IPM program. Urban audiences are diverse, often requiring different content or delivery methods. UC IPM resources help consumers, Master Gardeners, retail garden center employees, landscapers, park and recreation employees, and public agency professionals to tackle pest problems wisely, without harming the environment.

➥ *Read the article at www.ipm.ucdavis.edu*

Pest management guidelines now updated more frequently

UC IPM has initiated a new review and revision process for its Pest Management Guidelines (PMGs) that increases calls for updates to annually. The change was made to make sure new research results and changes to pesticide registrations are routinely incorporated, allowing UC IPM to offer the public more timely information about pest management.

PMGs are available for 43 crops or crop groups that describe the best management practices on how to manage pests. New PMGs for pomegranate and eggplant are also under development.

Most PMGs contain sections on invertebrates, plant diseases, nematodes, and weeds. A few have new sections on vertebrate pests.

UC ANR authors will conduct complete revisions of PMGs every 5 years.

UC IPM produces study guide for new DPR field fumigation licensing requirement

In response to concerns about air quality problems resulting from volatile organic compounds, California Department of Pesticide Regulation has established a new licensing category for field fumigation applicators. This new requirement goes into effect in January 2009. UC IPM has prepared a study guide for applicators who are studying for the licensing exam

➥ *Read the article at www.ipm.ucdavis.edu*

Resource Roundup

New resources and updates from UC IPM in 2008 are:

- Integrated Pest Management for Strawberries manual (print)
- Field fumigation study guide (PDF online)
- Pest Management Guidelines—revisions to 18 crops, plus a new year-round IPM program for table grapes (online)
- Pest Notes—9 revised and 5 new (soil solarization, nettles, squash bugs, woody weed invaders, and Spanish version of Pesticides: Safe and Effective Use) (online)
- IPM for pests of flowers—pests of 32 common landscape flowers (online)
- Quick Tips—5 new (mosquitoes, peach leaf curl, powdery mildew, spider mites, and thrips), plus 7 new Spanish translations (online)
- Training courses—Introduction to Pesticides for Retail Employees (online); IPM for Schools (DVD)
- WaterTox: Water-related Risks of Pesticides—database of potential pesticide hazards due to loss of a pesticide by leaching or runoff from a selected soil type (online)
- About UC IPM—updated information about the UC IPM Program (online)

About the UC IPM Program

The University of California Statewide IPM Program was established in 1979 to develop and promote the use of integrated, ecologically sound pest management programs in California. It sponsors activities throughout California.

UC IPM Highlights is an annual publication of the UC Statewide IPM Program. Edited by Stephanie Klunk; design and production by Repro Graphics. For more copies, contact ipmgrants@ucdavis.edu.