

2006

HIGHLIGHTS

University of California

Statewide Integrated Pest
Management Program



ANNUAL REPORT

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From the director

Director Roush leaves UC IPM

I write this column with a deep sense of regret. After serving as Director of UC IPM since March 2003, I am leaving UC IPM at the end of November 2006 to return to Australia as Dean of the University of Melbourne's Faculty of Land and Food Resources.



Rick Roush

I want to thank all of the UC IPM staff, UC staff more generally, and all of you who have taken time from your busy days to contact me over the last three and a half years. I have learned a great deal in my time with UC IPM, where the staff are extremely professional and have gone well above the call of duty to make me feel welcome and to enrich my life with new perspectives and excellent advice. It has been a pleasure to

lead UC IPM and develop stronger links with government agencies, environmental groups and agricultural communities to try to meet new challenges in air and water quality. We have also forged new relationships for pest management in urban environments and natural ecosystems. I plan to keep following progress at UC IPM in the future.

UC IPM Advisor Coordinator Pete Goodell will serve as interim director until a permanent director can be recruited.

UC IPM looks to the future

In 2006, UC IPM embarked on two significant efforts aimed at improving the program and moving into the future. ANR's Program Council requested a program review of UC IPM to examine whether it's been meeting its mission, in what ways the program could be improved, and how to grow it.

To get ready for the review, UC IPM engaged an external consulting firm to help conduct a strategic planning effort and asked stakeholders throughout ANR and outside the university to determine the program's strengths, weaknesses, opportunities and threats. The consultants independently obtained comments and criticisms from four focus groups and nearly 40 phone and e-mail interviews, including from within the University, Cooperative Extension, other government agencies, environmental groups, and commodity representatives.

Stakeholders strongly supported the past and current efforts of the UC IPM Program and suggested that the program should move aggressively to address urban pest management and new trends, continue to respond to public policy issues such as air and water quality or biodiversity, and maintain and grow the cadre of IPM practitioners. An assertive new vision for the UC IPM Program was adopted: "Making ecosystem-based integrated pest management the way Californians manage pests." The process identified a need to establish clear strategic priorities based on the nature and scope of the pest management need and the likelihood a solution can be developed and will be adopted. UC IPM expects to invite stakeholders from agriculture and urban pest management to help begin the priority setting process early in 2007.

>>> **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.**

Collective effort produces Asian longhorned beetle information

In 2005, the Asian longhorned beetle (ALB) was found in a warehouse in Sacramento. The pest has the potential to destroy millions of acres of hardwood trees such as elm, maple, boxelder, birch, horse chestnut, poplar, willow, mimosa, and hackberry. Infestations in New York, Illinois, and New Jersey resulted in the removal of thousands of trees and cost state and federal governments in excess of \$168 million.

Government organizations combined resources to develop an electronic slide show, a Web page, and informational flyers on how to detect and report suspected infestations of the ALB.

The Web site, www.wripmc.org/alerts/, is a one-stop resource to educate consumers on how to report and prevent Asian longhorned beetle infestations in California.

The following organizations helped to develop the information: UC IPM; the National Plant Diagnostic Network, Western Region; USDA-APHIS Plant Protection and Quarantine; USDA-Forest Service; California Department of Food and Agriculture; and the Sacramento County Agricultural Commissioner. The USDA-CSREES Integrated Pest Management Centers produced and distributed the Pest Alert.



Adult Asian longhorned beetle.
Photo by Dennis Haugen, USDA-Forest Service.

Citrus thrips add blueberries to their diet

The relatively recent development of heat-tolerant varieties of blueberries has allowed growers to establish a California blueberry industry. However, this industry is now under attack by a new pest, citrus thrips, which has expanded its host range from citrus to become blueberries' number one pest.

In response to this threat, the UC IPM Program has provided funding for a team of UC researchers and cooperators to develop an integrated pest management program for this pest. The team is being coordinated by UC IPM Farm Advisor David Haviland and also includes UC Riverside entomologist and citrus thrips expert Joseph Morse, and blueberry expert and Farm Advisor Manuel Jimenez.

This team is tackling many aspects of IPM for citrus thrips. This includes documentation of the pest's seasonal biology, the development of monitoring programs, evaluations of differences in varietal susceptibility to damage, and chemical controls.

The team is also evaluating nonchemical controls such as the use of high-pressure water and entomopathogenic fungi that can act as parasites of insects and kill or seriously disable them. These latter techniques are being investigated as a way to delay resistance to the relatively few number of pesticides registered for blueberries, but that are being used more than 10 times per season on some fields to combat citrus thrips.



New mission of the UC IPM Program

The UC IPM's mission was derived from language in the originating legislation. The statement was revised in 2006 during the course of strategic planning to reflect changing program priorities.

The mission of the UC IPM Program is to:

- Increase utilization of ecologically based integrated pest management programs
- Provide leadership in IPM including building coalitions and partnerships that link with communities and public agencies
- Increase the predictability and effectiveness of pest management techniques
- Develop science-based pest management programs that are economically and environmentally sustainable, and socially appropriate
- Protect human health and reduce pesticide impact on the environment

Sex and insects are key to pest management

Wind tunnels that simulate a natural plume of air, a moving floor to give the illusion of flying, and insects listening to vibrations to signal courtship behavior are a few research methods entomologists described as part of “Orchard Integrated Pest Management Training” on March 17 in downtown Sacramento.

About 70 UC Cooperative Extension farm advisors and pest control advisors (PCAs) from Yuba City to Visalia came to learn about the latest information on how to reduce the number of insects and the serious crop damage they cause.

The UC Statewide IPM Program sponsored the event, and UC IPM Advisor Carolyn Pickel spearheaded the effort. “I wanted to provide practical information to help field IPM practitioners make better pest management decisions in their daily lives,” she says. “Today, there are fewer farm advisors in the university system, and less applied research fieldwork is being done. We can learn a lot from experiments being done in the laboratory.”



First-generation codling moth larvae bore into a walnut.
Photo by Jack Kelly Clark.

>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

Preventing rabbits from causing serious plant damage

Cottontail rabbits cause extensive damage to ornamental plant nurseries in southern California by eating plants and damaging irrigation lines. With few methods to control the damage, UC IPM Advisor Cheryl Wilen and her field team used sophisticated technology to reduce the impact of rabbits.

Working closely with Pardee Tree Nursery in San Diego County and with funding from the California Department of Food and Agriculture Vertebrate Pest Research Advisory Committee, Wilen used Global Positioning System (GPS) technology to see how nursery practices and the incidence of rabbit damage are related, as well as to monitor the impact of experimental strategies to reduce their damage. The solutions are ingenious.

“California nursery growers report cottontail rabbits as the primary cause of breached irrigation lines and plant damage,” says Wilen. “One large commercial nursery in San Diego County reported more than \$10,000 each year in direct plant loss and nearly \$12,000 annually for repairing irrigation lines.”

It’s illegal to bait cottontail rabbits in California, so growers must look at other options to control them. The team studied nursery characteristics such as irrigation type, container

type, planting density, canopy width and height, and the incidence of rabbit damage. Exclusionary and restricted fencing with and without trapping was then tested in high-damage areas. The team also developed and tested various materials to protect irrigation tubing.

“We determined that trapping is not effective because even when a moderate number of rabbits were trapped, there were still more rabbits entering the area from surrounding areas and causing damage,” says Wilen.

>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

A cottontail rabbit. Photo by Tracy Ellis.



Manipulating weed management practices can reduce herbicide dependency in rice

A University of California, Davis research team has found that different rice establishment methods can keep weeds from developing, reduce herbicide dependency, lower fuel use, and help reduce herbicide-resistant weeds in rice.

California's rice industry produces nearly 2 million tons of rice annually, making it the second largest rice growing state in the nation and contributing nearly \$500 million to the state's economy. For the rural Sacramento Valley communities of Colusa, Butte, Sutter, and Yuba counties, rice is the predominant crop. California's rice is exported to Asia, the Middle East, and Mediterranean markets, and is distributed throughout the United States.

Weed scientist Al Fischer and Jim Hill, UC Cooperative Extension specialist, coordinated the project. "As California rice growers find their herbicide options dwindling because of widespread herbicide resistance in the major weeds of rice, the need for nonchemical means of manipulating weed management practices is imperative," says Fischer. "Both molinate and thiobencarb had been for years the most relevant herbicides for grass control in rice, but due to resistance they no longer control watergrass. Molinate registration will expire by 2008. In addition, rice straw burning restrictions and subsequent increased straw incorporation has increased soil weed seed banks by protecting the seeds from scavengers like birds and rodents."



Barnyardgrass flower head. Photo by Jack Kelly Clark.

>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

Waiting for the dust to settle

Conservation tillage cropping systems in the San Joaquin Valley

Tom Barcellos of T-Bar Dairy/Barcellos Farms in Porterville is a believer in conservation tillage, and it wasn't a hard sell. Barcellos has been named the 2006 Conservation Tillage Farmer Innovator by the UC Agriculture and Natural Resources Conservation Tillage (CT) Workgroup at its annual conference Oct. 19 in Five Points.

Conservation tillage is a process in which growers reduce plowing. In 2001, Barcellos tried conservation tillage on 70 acres of his 1,850-acre farm. This new process drew a lot of interest from neighboring farmers who debated the usefulness of the method.

But, Barcellos was enthusiastic about the results he was seeing. He decided to try 320 acres during the first trial year. "Before using conservation tillage, I had to do a lot more double cropping in the summer. I had five tractors making up to 10 passes through the field. Now, in the summer when I double crop, I use one tractor. I'm saving money on fuel and labor."



Tom Barcellos.
Photo by Jeff Mitchell.

Often farmers using conservation tillage also plant cover crops underneath the main crop or between two different crops to cover and protect the soil. Cover crops have additional benefits according to the species planted. For instance, legumes enrich the soil with nutrients, while plants with strong, deep roots break up compacted soil. In the low-rainfall regime of the San Joaquin Valley, farmers may benefit more from cover cropping in combination with conservation tillage to maintain soil fertility, as opposed to conservation tillage alone.

>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

Helping Chinese farmers step off the pesticide treadmill

Ten years ago, China had plenty of workers to hand weed their farmland, but with fewer young people choosing farming as a profession, the country is looking for quick chemical fixes to their pest management problems. UC IPM Advisor Anil Shrestha visited China to convince them that integrated pest management is by far the better long-term choice.



UC IPM Advisor Anil Shrestha shows Chinese government officials how to identify weeds in Feidong County, south China.

>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

Foreign exploration for the avocado lace bug and its natural enemies

On a foreign exploration trip through seven Caribbean Islands and the Gulf of Mexico last March, Phil Phillips, UC IPM advisor for the Central Coast, and colleague Mark Hoddle, determined that the avocado lace bug is not native to the Caribbean, as previously believed, but to tropical Mexico. This provides a focus for efforts to find the bug's natural enemies for biological control.



Heavy avocado lace bug colony feeding on the underside of an avocado leaf in the Caribbean. Photo by Phil Phillips.

As an exotic pest species, the avocado lace bug was introduced into San Diego about two years ago. The insect prefers avocado and camphor trees and has become established in backyard avocado plantings within residential San Diego, south of Interstate 8. So far, the bug has not invaded the commercial plantings north of the city.

The innate lethargic behavior of ALB, which doesn't try to escape from potential threats by flying, jumping, running, or other rapid movement, suggests that ALB may use a chemical defense strategy to repulse potential natural enemies.

"With the introductions of Persea mite (early 1990s) and avocado thrips (1996) in recent years, the California avocado industry, with a robust production history based on biological control of arthropod pests, is concerned about new pest introductions," says Phillips. "The introduction of new exotic pest species threatens the biological underpinnings of stable IPM programs."

To understand more about the biology, origin, and possible natural enemies of the California population of ALB, the California Avocado Commission funded a foreign exploration trip into the Caribbean, the supposed origin of ALB, and Mexico. Phil Phillips and entomologist Mark Hoddle from UC Riverside traveled through the Caribbean Islands and the Gulf Coast of Mexico over a three-week period in March 2006.

>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

UC IPM takes on Pierce's disease

ANR assigned UC IPM responsibility for the UC Pierce's Disease Research Grants Program late in 2005. Proposal submissions and reviews are coordinated with the CDFA Pierce's disease research program, which shares the goal of finding a solution to this devastating disease of grapevines. For 2006-07, the UC program funded 12 projects for \$1,343,550.



UC IPM COMPETITIVE GRANTS PROGRAM

The UC IPM Program administers a state-funded competitive research grants program, launched in 1979, to develop, promote, and implement IPM programs in California. Summaries of research project reports are online at the UC IPM Web site. The article below highlights a research project funded by this program.

What's up, Doc? Maybe less air pollution

Phil Roberts, in the Nematology Department at UC Riverside, and Joe Nunez, farm advisor for UC Cooperative Extension in Bakersfield, are trying to reduce volatile organic compounds (VOCs) from fumigant use, while providing cheaper and more reliable pest management, by using root-knot nematode resistant carrots as an alternative to fumigation.

Susceptible carrots on the left and nematode-resistant carrots on the right.

Photo by Phil Roberts.



>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

New Projects for 2006-07

Quantifying the impact of *Lygus* on Pima cotton;
a bioinformatics approach

J.A. Rosenheim, Entomology, UC Davis

Impact of *citricola* scale on yield of citrus

E.E. Grafton-Cardwell, Entomology, UC Riverside

Spider mites in California vineyards: temperature tolerance,
impact of pesticides and resistance management

N.J. Mills and K.M. Daane, Environmental Science, Policy, and
Management, UC Berkeley

Side effects of acaricides on predatory mites:

Implications for conservation and augmentative releases

F.G. Zalom, Entomology, UC Davis

Developing pheromone-based strategies for monitoring
mealybugs in nursery and glasshouse crops

J.G. Millar and J. Bethke, Entomology, UC Riverside

Ecology and competitive effect of two horseweed biotypes with
young grapevines and established vineyards

A. Shrestha, UC IPM Program, M.W. Fidelibus, Viticulture and Enology,
UC Davis, and K.J. Hembree, UC Cooperative Extension, Fresno

Control and restoration of riparian communities invaded by giant reed

J.S. Holt, Botany and Plant Sciences, UC Riverside

Development of an IPM Program for citrus thrips in blueberries

D.R. Haviland, UC Cooperative Extension, Kern County, and J.G. Morse,
Entomology, UC Riverside

Improving biological control of California red scale using
augmentative *Aphytis melinus* releases

J.G. Morse, R. Stouthamer, and R. Luck, Entomology, UC Riverside

Importance of *Bracon cushmani* in the suppression of
obliquebanded leafroller

K.M. Daane, Environmental Science, Policy, and Management,
UC Berkeley

UC EXOTIC/INVASIVE PESTS AND DISEASES RESEARCH PROGRAM

The UC Exotic/Invasive Pests and Diseases Research Program (EPDRP) is funded through USDA-CSREES. The review committee approved \$1.8 million for 20 new projects from the 2006-09 USDA grant. Since its inception in 2001, the USDA-supported project has funded more than 100 studies, allocating nearly \$9 million. Summaries of research project reports are online at the UC IPM Web site. One of the research projects funded by EPDRP is featured below.

Scientists create a defense plan against citrus greening threat

Citrus greening is one of the most devastating diseases of citrus in the world, stunting trees and causing small, bitter fruit. With the recent discovery of citrus greening in Florida, an educational effort by a team of scientists to stop the Asian citrus psyllid from becoming established in California is especially timely.

The psyllid is an efficient carrier of the bacterium that causes citrus greening, or "Huanglongbing," because the fruit develops a bitter taste and does not color properly, leading to its name.

Entomologist Beth Grafton-Cardwell from UC Riverside organized a team of researchers from the University of Florida and California Department of Food and Agriculture to develop a brochure, Web site, and slide presentation to educate California citrus growers, the ornamental nursery industry, and regulatory agency staff about Asian citrus psyllid and greening disease.

See the Web site and publication at citrusent.uckac.edu/asian_citrus_psyllid_main.htm

>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

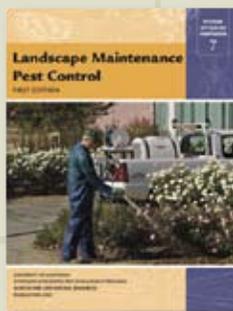
UC IPM—responsive, innovative, adaptable

For the newest advances in pest management, visit the UC IPM Web site for information on how to manage pests in your home and garden, or on the farm.

To order UC IPM manuals and the pesticide compendium series, visit amrcatalog.ucdavis.edu, or call 1-800-994-8849.

New for this year are five valuable publications: *Seasonal Guide to Environmentally Responsible Pest Management Practices in Peaches and Nectarines*; *Landscape Maintenance Pest Control*; *Pesticide Safety: A Reference Manual for Private Applicators* and the Spanish translation *Seguridad en el manejo de pesticidas Manual de referencia para aplicadores privados*; *Integrated Pest Management for Potatoes in the Western United States, second edition*; as well as an updated *Residential, Industrial, and Institutional Pest Control, second edition*.

For more information on these publications, see our Web site at www.ipm.ucdavis.edu.



Survey says UC IPM resources are widely used by master gardeners

Results just in from a survey of UC master gardeners indicate that UC IPM tools are widely used throughout California in programs that extend pest management information to the public. The survey queried master gardener coordinators and others who attended UC IPM-sponsored statewide training in June 2005. About 90 percent of California's master gardener programs were represented.

More than 95 percent log on to the UC IPM Web site to answer the public's questions. Most use the UC IPM Pest Notes on a regular basis and hand out the UC IPM Quick Tips at garden shows, county fairs, plant clinics, and other community programs.

Each of the 36 county master gardener programs participating in the 2005 programs was provided with a set of interactive presentations on environmentally sound pest management solutions for weeds and ants.



Else-Marie Augusti asks Mary Strohl, a master gardener for Yolo County, a gardening question at the Davis Farmer's Market. Photo by Karey Windbiel-Rojas.

>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

UC IPM revamps home and garden Web page

Hundreds of new pests have been added to the Pests in Homes, Gardens, Landscapes, and Turf section of the UC IPM Program Web site at www.ipm.ucdavis.edu. For the first time, users can find pest management information specific to a host plant.

>>> [Read the full article at www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

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 University of California Statewide IPM Program. Edited by Stephanie Klunk; design and production by Marianne Post, Repro Graphics. For more copies, contact ipmig@ucdavis.edu.

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