



2007

# HIGHLIGHTS

University of California  
Statewide Integrated  
Pest Management Program



ANNUAL REPORT

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## From the director

I am privileged to have served as the Interim Director for UC IPM for the past 12 months. The search is under way to find a replacement for Director Rick Roush, who left UC IPM to take the post of Dean of University of Melbourne, Agriculture and Food Resources, in Australia. We appreciated Rick's dedication and service and wish him the best in his new position.



Peter B. Goodell

During the past year, the program completed its strategic plan for the next five years (see page 3). The plan was developed as part of a program review required of all ANR statewide programs. The plan gives us a roadmap to help us to prioritize our resources to provide the best IPM research, extension, and outreach to Californians.

Our vision statement is simple: Making ecosystem-based integrated pest management the way Californians manage pests.

Results of a review of the UC IPM Program in late 2006 were commendable. The Review Team consisted of IPM experts from California, New York, and Wisconsin, and included land grant university representatives and members from the private sector and public agencies. They praised UC IPM as the "Gold Standard" for IPM worldwide, and they said that California should be proud of the quality of the program and the extraordinary dedication of its members.

Along with the good news, the Review Team noted that some areas needed improvement. They noticed a lack of research and extension in urban and community IPM. The team felt that with the large urban population in California, we were missing an opportunity to provide IPM to a big audience. In response, we developed a plan and are dedicating resources to reach this group (see page 3).

We also restructured staff reporting and approved three associate directors (see box, below).

Another strength the Review Team noted was that the research grants program helps keep California agriculture competitive. In recent years, funding has decreased, limiting the number of IPM research projects. Despite this, UC IPM secured funding for grants to support field trials that demonstrate and compare IPM practices.

Finally, our extension outreach was recognized as a key component to our success. The IPM advisors continue to serve as an integral part of applied research, critical extension, and essential linkages, within and outside of ANR's pest management program.

As Interim Director, my message from UC IPM to our clientele throughout ANR and California has been "How can UC IPM help you achieve better pest management?"

Thank you for your interest and support of this unique resource.

As a result of the review of UC IPM and its new strategic plan, the following changes have been made.

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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: Brown rot on almond petals. Photo by Jack Kelly Clark; Snapdragon. Photo by Cheryl Reynolds; Powdery mildew on Thompson's grapes. Photo by Jack Kelly Clark; Tomato production. Photo by Gene Miyao; Canal. Photo by Jack Kelly Clark.



## UC IPM unveils strategic plan

UC IPM finalized its new strategic plan in 2007. The plan will enhance the program's ability to respond to emerging pest management issues.

Developed in consultation with internal and external stakeholders, the plan presents UC IPM's vision, mission, strategic goals, and strategies.

### Vision:

***Making ecosystem-based integrated pest management the way Californians manage pests.***

### Mission:

- 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 impact of pest management practices on human health and the environment

### Strategic goals:

- Develop strategic research and outreach agenda
- Increase new adoption approaches
- Enhance IPM capacity within UC
- Promote widespread IPM use
- Provide statewide leadership
- Support organizational effectiveness

**Strategic approach:** The approach is a three-step planning process including:

- 1. Priority Setting Based on Impact**, an inventory of issues in urban, agricultural, and natural systems prioritized to reflect the nature and scope of the current and projected pest management need.
- 2. Strategy Assessment**, factors to address the priority areas identified during the priority setting process:
  - a. likelihood that research will yield an effective IPM solution
  - b. likelihood that clients will adopt the solution
  - c. capacity of UC IPM to address the need
- 3. Strategy Development**, short- and long-term strategies to address high priority issues. Considerable progress has been made in 2007.

An internal restructuring has already improved efficiency and communication. Development of a priority-setting process and review of existing activities is well under way, further evidence of our commitment to implementing the strategic plan.



UC Davis campus. Photo by Jack Kelly Clark.

## UC IPM creates new urban and community IPM program

UC IPM is widening its focus to provide more help for urban and community audiences while continuing to deliver resources and products that improve agricultural integrated pest management.

Gearing up for her new role as Associate Director for Urban and Community IPM, Mary Louise Flint is planning an urban and community IPM team meeting early in 2008.

In addition to Flint, key members of the team include south coast IPM Advisor Cheryl Wilen and Urban IPM Educator Karey Windbiel-Rojas. UC IPM will also be coordinating closely with ANR faculty and Cooperative Extension specialists and advisors already serving these audiences to build programs and prioritize research and extension needs that amplify UC's existing strengths.

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

## UC offers information about light brown apple moth

When the light brown apple moth appeared in California in early 2007, the UC IPM Program produced a new brochure to answer the public's questions about this troublesome pest.

Written by nine UC scientists and reviewed by experts from across the U.S. and from Australia and New Zealand, the publication was developed quickly to fill the immediate need for information by UC Cooperative Extension county staff and their clientele.



Light brown apple moth larva. Photo by D. Williams.

Because the larvae eat more than 250 plant species, including grapes and other key crops, state and federal governments began an eradication campaign. The pest had never before been found in North America until it was identified in the San Francisco Bay area in February.

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

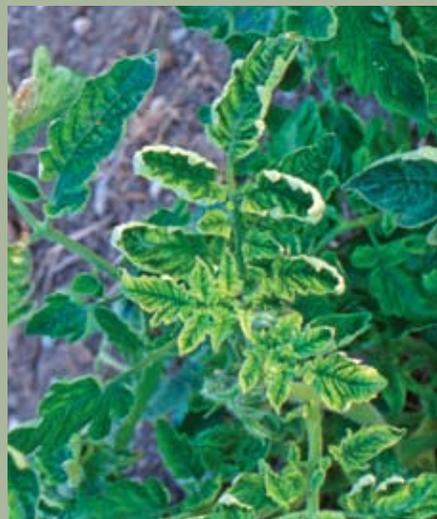
## New viruses

UC IPM has produced two new brochures to help growers identify tomato yellow leaf curl virus and cucurbit yellow stunting disorder.

In March 2007, the virus that causes tomato yellow leaf curl popped up in greenhouse tomatoes being grown by a high school science class in Imperial County. Because this disease is new to California and potentially devastating for tomato production, agencies have produced an informational brochure to help curtail its spread.

A PDF file of the brochure can be downloaded from the UC IPM Web site, as well as a pest management guideline on tomato yellow leaf curl.

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



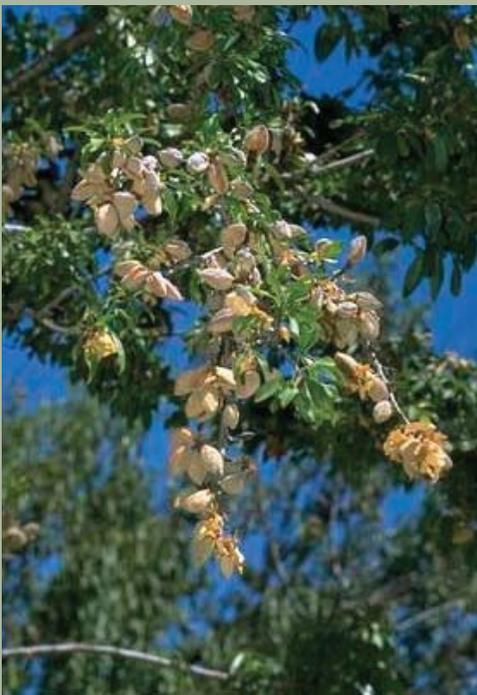
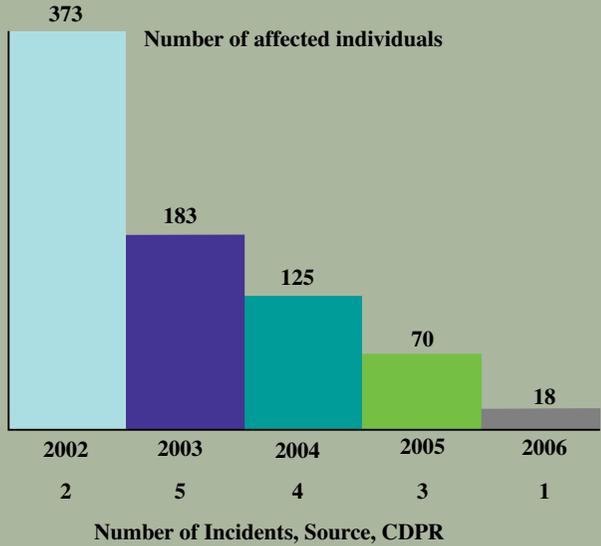
Tomato yellow leaf curl symptoms. Photo by Robert Gilbertson.

# Pesticide drift exposure shifts downward in Kern County

After a string of pesticide drift incidents in 2002 and 2003 affected more than 500 people, UC IPM Advisor David Haviland teamed up with the Kern County Agricultural Commissioner's office to reverse this trend, and they did.

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

Figure 1. Kern County pesticide drift incidents and numbers of individuals affected.



After harvest, nuts remain on fruiting wood killed by hull rot fungi. Photo by Jack Kelly Clark.

## IPM Innovator Award

The California Department of Pesticide Regulation (DPR) has awarded two IPM Innovator awards to programs involving UC IPM staff—The Almond Pest Management Alliance and its publication of a *Seasonal Guide to Environmentally Responsible Pest Management Practices in Almonds* and The Healthy Garden-Healthy Home Program.

The Almond Pest Management Alliance (PMA), with its publication of a *Seasonal Guide to Environmentally Responsible Pest Management Practices in Almonds*, has earned an IPM Innovator Award from DPR for 2007.

Since 1994, DPR has given out more than 100 Integrated Pest Management Innovator awards to honor California organizations that emphasize pest prevention, favor least-hazardous pest control, and share their successful strategies with others.

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

## 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.



Adult *Leptomastix dactylopii*, a parasite of citrus mealybug. Photo by Jack Kelly Clark.

# New demonstration grants program for UC IPM

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

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

Projects are expected to provide essential resources to Cooperative Extension advisors and specialists to strengthen the link between research and outreach. For 2007–08, the program funded seven projects. From improving adoption of IPM practices in nut crops to using silicon to reduce pesticide use in bedding plant operations, the research promotes IPM methods.

The following is a brief synopsis about researchers who are implementing silicon use in plants.

## Scientists study silicon use in plants



*Geranium. Photo by Cheryl Reynolds.*

Building on studies that show adding silicon to plants can enhance their resistance to pests and increase their growth, UC scientists are testing the research at four California sites, and, in turn, hope to reduce pesticide use.

With funding from the UC Statewide Integrated Pest Management Program, UCCE Floriculture and Nursery Farm advisors Julie Newman, Ventura and Santa Barbara counties, and James Bethke, San Diego County, along with UC IPM Advisor Cheryl Wilen will add a silicon nutritional amendment to fertilizer mix to increase bedding plant resistance to arthropod and disease pests in Davis, San Diego, Orange, and Ventura counties in the spring.

In previous studies, UC Davis Entomologist Michael Parrella found that when the concentration of silicon in a plant's leaves reaches 0.4 percent, leafminer populations can be reduced in chrysanthemums. Parrella will work with the county advisors to implement the silicon demonstrations and interpret the results.

Bedding plant growers are a fast growing segment of horticulture in California and the United States. Revenue for nursery, greenhouse, and floriculture crops in California exceeded more than \$3.8 billion in 2006.

Typical plants in this category are begonias, geraniums, impatiens, New Guinea impatiens, marigolds, pansys/violas, and petunias.

## 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. For 2007-08, the program funded six new projects, but there are no funds for new projects in 2008-09, and no call for proposals will be issued.

New IPM projects for 2007-2008 are:

**Development and implementation of a sustainable management program for vine mealybug.**

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

**Pheromone mating disruption programs for codling moth in walnuts: Developing and optimizing hand applied meso-emitters.**

S. C. Welter, Insect Biology, UC Berkeley

**Screening and evaluating for nonhost or inhibitory plants to control *Colletotrichum acutatum* in strawberry nurseries in California.**

W. D. Gubler, Plant Pathology, UC Davis

**Utilization of a native *mycophagous coccinellid* as an indication and decision support device to manage grape powdery mildew in a commercial vineyard.**

M. P. Parrella, Entomology, UC Davis  
W. D. Gubler, Plant Pathology, UC Davis

**Ecologically based sustainable approaches to understand and control tomato spotted wilt virus in California.**

B.W. Falk and R.M. Davis, Plant Pathology, UC Davis  
M. Le Strange, UCCE Tulare Co.  
F. G. Zalom, Entomology, UC Davis

**Life history and refined management of cucumber beetles in cucurbits.**

L. D. Godfrey, Entomology, UC Davis

>Summaries of research project reports are online at the [UC IPM Web site](#).

## Changes ahead for research grants programs

Due to funding reductions, the UC Exotic/Invasive Pests and Diseases Research Program (EPDRP) is ending, and the UC Pierce's Disease Research Grants Program was able to fund only four new projects in 2007-08.

Both programs have been funded through a Special Research Grant from USDA. These grants were part of the earmarks that Congress removed from the 2006-07 budget and included the funds that would have been used to fund new grants over the next three years.

UC ANR has requested new funding for the Pierce's disease grants program, but the exotic pest program is expected to end when the currently funded projects are completed. A symposium to highlight the work supported by the exotic pest program from 2001 to 2008 is planned for fall 2008.

Summaries of project reports from the exotic pest program are online at the UC IPM Web site. Find summaries of Pierce's disease projects on the CDFA Web site at [http://www.cdfa.ca.gov/pdcp/Research\\_Symposium\\_Index.html](http://www.cdfa.ca.gov/pdcp/Research_Symposium_Index.html).

## UC scientists find answers about Sahara mustard's spread with funding from EPDRP

Sahara mustard's sweep into Death Valley National Park and other southwestern deserts has caught the attention of UC scientists and California land managers.

Sahara mustard is a member of the mustard family and native to North Africa, the Middle East, and southern Europe. It has spread to the southwestern United States, including southern Nevada, and has invaded native Mojave Desert shrublands.

The mustard's seed is spread when dry plants break off and tumble in the wind. Animals and humans also spread it when it becomes wet and sticky. The drought-tolerant mustard thrives in sandy soils of beaches, dunes, and roadsides. It threatens native desert vegetation by using soil moisture and mineral nutrients needed by native plants.

*"We found that not only does Sahara mustard grow and reproduce more quickly than native plants, but it also tends to survive and reproduce at a higher rate."*

*Robin Marushia*

Plant physiologist Jodie Holt and PhD student Robin Marushia from UC Riverside designed a field experiment to track Sahara mustard and compare its growth, survival, reproduction, and dominance against the same measurements in the native plant community.

*"We found that not only does Sahara mustard grow and reproduce more quickly than native plants, but it also tends to survive and reproduce at a higher rate,"* says Marushia. *"These*

*results are important for land management because it suggests that there could be a short window of time between native plant and Sahara mustard growth when we could selectively control Sahara mustard. Our results indicate that it invades areas that are rich with native annual wildflowers, and land managers can target these areas first with prevention and control efforts."*

*"Sahara mustard appears to exhibit an escape strategy that allows it to thrive in the Mojave Desert environment,"* says Holt. *"In experiments, Sahara mustard grows rapidly under a wide range of environmental conditions. Early, rapid, plentiful growth may allow it to take over resources and gain an early competitive edge over native annuals that have more precise germination requirements."*

Results are being used to test control strategies for Sahara mustard and identify areas most susceptible to invasion and on which to focus control.



*Native annual desert pincushion, Chaenactis stevioides, surrounded by Sahara mustard seedlings. Photo by Robin Marushia.*



IPM Kiosk. Photo By Karey Windbiel-Rojas.

## IPM kiosk is new problem-solving tool for home gardeners

In April 2007, UC IPM unveiled a new, easy-to-use educational tool for consumer audiences—the IPM Kiosk. The kiosk is a stand-alone, touch-screen computer that home gardeners can use to solve pest problems using environmentally friendly practices.

About 50 common home and garden pests, plus tips on alternatives to pesticides and gardening practices to prevent runoff, are included on the kiosks, and more content will be added over time. Users can find a pest by category or diagnose

a problem and print information to take home. The kiosk includes information screens, photos, and narrated videos.

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

## UC IPM launches online training program for retail employees

Home gardeners buying pesticides often turn to store clerks to give them information about pesticides and IPM. A new, free, online training course on the UC IPM Web site will soon provide retail employees the background they need to provide good answers.

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

## UC IPM offers newest information on pest management

For the latest information on how to manage pests in your home and garden, or on the farm, visit the UC IPM Web site. Pages are updated throughout the year and in 2007 included five new Quick Tips cards, 11 new (such as *Soropsis* spiders and coyote) and 10 revised Pest Notes, and 17 revised Pest Management Guidelines.

Also new this year are these books:

*IPM for Avocado* (see [ucanr.org/ipm-avocado](http://ucanr.org/ipm-avocado)); Spanish version of the second edition of *Pesticide Safety: A Reference Manual for Private Applicators* (*Seguridad en el manejo de pesticidas: Manual de referencia para aplicadores privados*); and *Landscape Maintenance Pest Control*, Volume 7 in the *Pesticide Application Compendium*. See [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu) for more information.

## UC IPM offers year-round guidance for crops

California growers can now follow year-round IPM programs to manage pests in 16 crops. Annual checklists, posted on the Web and available as paper copies from county Cooperative Extension offices, promote pest management activities that are important during each crop season.

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

**Parts of a pesticide label**

ACTIVE INGREDIENTS:	
Pyrethrin	0.02%
Permethrin Butoxide, Technical	0.25%
Clarified Hydrophobic Extract of Neem Oil	0.30%
<b>OTHER INGREDIENTS</b>	<b>99.38%</b>
<b>Total</b>	<b>100.00%</b>

**KEEP OUT OF REACH OF CHILDREN**  
**CAUTION** See Back for Additional Precautionary Statements.  
Net Contents 24 FL. OZ. (710 ml)

**Active ingredient**

- Toxic material that kills the pest
- Use to identify the pesticide
- The same active ingredients are often sold under various trade names
- Use it to research toxicity

## 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 Repro Graphics. For more copies, contact [ipmig@ucdavis.edu](mailto:ipmig@ucdavis.edu).

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