

Advancing Reduced-Risk Strategies

The past two decades have seen significant advances in reduced-risk pest management – not only in development of new strategies but in their widespread adoption in farms, businesses, schools and homes. It is an evolution that has had a revolutionary effect on the way we look at pests and pesticides.

Although many might assume that DPR simply regulates pesticides, that is not the case. We have a statutory mandate to encourage the development and implementation of pest management systems that stress

inspiration and courage in pursuing new systems of pest control.” Since then, the award has achieved a standing we could not have imagined in 1994, as recipients now tout it in their brochures, marketing, social media

partnerships with private and nonprofit organizations that promote safer, less toxic strategies tied to DPR’s regulatory priorities to protect air, water and human health. Many projects have become self-sustaining, statewide efforts that permanently change pest management strategies for the better. By 2002, when budgetary cutbacks forced the department to suspend its grant programs, we had given out \$7.2 million in grants and Alliance funding. In 2007, the Alliance program was reinstated and since then, DPR has awarded \$1.94 million to 11 projects.

Recent recipients typify the variety of projects DPR has supported:

- The Healthy Homes Campaign is proving the effectiveness of IPM in several privately owned, multi-unit housing complexes in Los Angeles and will share the results with local public health and housing authorities and media to promote widespread adoption of IPM. IPM strategies in target buildings include educating tenants about sanitation and clutter control; implementation of environmentally friendly cleaning practices in residential units; sealing holes and cracks to prevent pests; and use of pesticides that are less toxic than traditional treatments.
- The University of California’s Bedding and Container Color Plants project is developing IPM strategies for an industry where producers grow many varieties, have short production schedules, and regard aesthetic quality as essential. The project is developing IPM strategies



DPR funded purchase of “smart-spraying” devices (left) for university farm stations to lend to growers. These application rigs reduce pesticide use by turning off nozzles between plants. At right, a farmer checks a device which releases a pheromone attractant that reduces pest populations by confusing insect mating behavior.

biological, mechanical and cultural pest control techniques. Pesticides, used only when necessary, are chosen to ensure the least possible harm to nontarget organisms, public health and the environment. This is often called “integrated pest management,” IPM for short.

Recognizing pioneers

At one time, pest management pioneers received little credit for the financial and other risks they took to find more environmentally friendly ways of fighting pests. In 1994, DPR kicked off its IPM Innovator Awards as a way to provide overdue recognition to those groups and organizations that, as we said at the time, display “skill,

and Web sites. By early 2010, DPR had presented more than 100 IPM Innovator Awards.

Funding advancements

DPR also provides more tangible backing in helping agricultural and nonagricultural groups pursue reduced-risk strategies. In 1996, DPR kicked off its “Innovations in Pest Management” grant project. That first year, more than \$600,000 in small grants went to projects to encourage nontraditional, least-toxic solutions to agricultural and urban pest problems.

The next year, we launched a complementary project of larger “Alliance” grants to develop

to manage pests with less-toxic pesticides and fewer applications. An IPM guide for bedding plants, a pocket guide for pest identification and a Web site is being developed to share the information.

- The IPM Continuing Education for Maintenance Gardeners project is focusing on reducing pesticide runoff into urban creeks in San Luis Obispo County by educating local maintenance gardeners and retail outlets that sell pesticides about IPM practices. The county and its community partners offer free, seasonal IPM workshops at participating retailers that include training on proper pest identification methods and tools, alternatives to chemical pest controls and information about less-toxic pesticides. The workshops, in English and Spanish, complement another county project that offers workshops to prepare participants to take the state licensing exam for maintenance gardeners.
- The city of San Jose will create a pesticide-free park and demonstration gardens at Guadalupe River Park. The demonstration gardens will resemble yards of typical single-family home yards and convey IPM principles through interpretive signs and self-guided tours, brochures, podcasts and cell phone apps. Residents will learn how to replace lawns with drought-tolerant plants that reduce energy and water use as well as provide habitat for birds and beneficial insects.
- The Bay Area Stormwater Management Agencies Association's project will train "IPM Advocates." They, in turn, will educate retail store employees and their customers about IPM strategies that can reduce pesticide use and associated runoff into urban creeks and San Francisco Bay. The project will target pesticides with a known effect on surface water quality in urban and suburban waterways.



MAKING IPM PART OF THE SCHOOL DAY

DPR has a key role in carrying out the Healthy Schools Act, a 2000 law which made integrated pest management (IPM) the preferred way to manage pests in public schools. IPM is a strategy to prevent and treat pest problems using a combination of prevention, monitoring, recordkeeping and control methods. Chemical controls that pose the least possible hazard to human health and the environment are used only after careful monitoring and when nonchemical methods have failed.

DPR staff regularly conduct workshops to train school district IPM coordinators. In turn, these specialists teach school maintenance and operations staff about reduced-risk strategies to control cockroaches, ants, rodents, weeds and other pests. By the end of 2009, DPR had brought training to 739 of the state's 1,039 public school districts, representing about 4.5 million students.

After the Healthy Schools Act was amended to include child day care centers, DPR adapted its school IPM pest fact sheets for use in these settings and created new Web pages just for day care centers. DPR staff also distributed child-care oriented IPM publications in English and Spanish and made presentations to child-care staff, trainers, and pest control professionals.

As part of DPR's commitment to maintaining a dynamic program, we funded a survey by the University of California to ask child care centers what their worst pest problems were and how they deal with them. The survey showed that pest problems and pesticide use are common. Fifty-five percent of the facilities reported using pesticides to control pests. In response to the results, we are tailoring our educational efforts to inform child care center groups and pest control professionals about their responsibilities under the law.

Invasion!

West Nile virus, sudden oak death, killer algae. California is under attack from alien invaders: foreign weeds, insects, animals and diseases. They are feasting on and infesting our agricultural and natural resources. They harm urban and rural landscapes and cause billions of dollars in lost revenue and millions in cleanup costs. These “biological pollutants” damage ecosystems by outcompeting native species for food and water, reducing diversity. They have placed other species at increased risk of extinction.

California, with its varied climate and geography, is an ideal home for many different invasive species. Most arrive as an unintentional byproduct of commerce, tourism or travel. On the average, a new and potentially damaging species invades California every two months.

California’s county agricultural commissioners (CACs) are on the frontlines of this invasion. Among their many duties is “pest exclusion,” detecting the invaders before they can get a foothold. Eradication may be possible early in an invasion or in a restricted area. Once established, counties focus their efforts to limiting spread to uninfested areas.

Here, five county agricultural commissioners share their experiences with these invaders.

Bob Atkins, San Diego County CAC

Diaprepes root weevil (*Diaprepes abbreviatus*, or DRW) was found in Los Angeles, Orange and San Diego Counties in late 2005 and early 2006. It feeds on more than 270 species of plants. In California, it poses the greatest threat to citrus, avocado and ornamental nursery plants.

Funding to eradicate the pest ran out in 2009. By then, the infestation was widespread here in coastal San Diego County. Quarantines that had regulated the movement of crops into and out of DRW-infested areas were revoked in April 2010. DRW is now a pest of limited distribution and is prohibited in commercial nursery stock, meaning that nurseries must make sure their plants are DRW-free before shipping.

In San Diego some citrus groves have lost many trees which tipped over from the loss of their roots. The University of California Cooperative Extension is working on biocontrol and pesticide applications to establish an integrated pest management system against DRW. Research shows promise for several egg parasitic wasps and for nematodes that attack the grubs in the root zone. The pesticide bifenthrin is being used with the nematodes to enhance control in commercial groves and nurseries. The greater problem will likely be for

landscapers and residents who will have difficulty achieving control because neighbors will be unlikely to coordinate their efforts.

John Gardner, San Bernardino CAC

San Bernardino County has borne the brunt of many invasive species. Some have become established, like the Bagrada bug, red imported fire ants and Africanized bees. We have eradicated multiple invasions of Oriental fruit flies, Medflies and Mexican fruit flies with minimal pesticide use or by biological techniques. Despite the disruption to agriculture from temporary quarantines and the inconveniences caused to the public, every invasive species halted before it becomes established reduces the need for increased pesticide use. This results in a tremendous net benefit for the environment and public health.

Dave Whitmer, Napa CAC

European grapevine moth (EGVM, *Lobesia botrana*) was found for the first time in North America in Napa County in fall 2009. (Since then, it has been detected in eight other Northern California counties.) EGVM has the potential to negatively affect the sustainable farming systems we use in Napa County. When first found, swarms of EGVM were seen in some Napa Valley vineyards. Local growers, my staff and the University of California worked hard to bring the moth under control, developing a solid pest management strategy that is least disruptive to beneficial organisms and to sustainable, least-toxic pest management programs. Napa winegrape growers are also very conscious of being good neighbors with the local community and areas surrounding their vineyards. They do not want to see this pest spread further but they also recognize the need to use practices that make good sense environmentally and socially.

Our next step was to involve the local urban/residential grape grower. We asked noncommercial grape growers and county residents to get involved in our “Kick the Moth Out” campaign. Our message is simple. We asked those who do



not plan to use their grapes to remove the fruit from the vines and dispose of it with other yard waste. But if they plan to use the grapes, we encourage them to inspect for EGVM and, if necessary, treat with organic insecticides. These efforts are designed to prevent insipient infestations that could then reinfest commercial vineyards.

Vince Guise, *Contra Costa CAC*

Japanese dodder (*Cuscuta japonica*) is a nonnative parasitic plant that can kill most trees and shrubs. It looks like twisted, yellow-to-orange strands of spaghetti and can grow six inches a day. It forms dense mats that engulf its host plant, robbing it of food and water until it eventually kills the host. Japanese dodder reproduces through dissemination of small fragments of stems. These plant parts can be spread by birds and squirrels that use it as nesting material, and by human activities such as pruning and improper disposal of infested plants. Also, because of perceived medicinal value of the plant, certain cultural groups have intentionally moved or introduced Japanese dodder. Our outreach to these groups has been successful in deterring this practice. This parasitic weed has great potential to damage riparian areas and urban landscaping. Host plants include California live oak, California buckeye, coast redwood, elderberry, willow, ivy, blackberry, apple, plum, acacia, orange, cypress, deodar cedar, pine, Carolina cherry, and others.

Japanese dodder has been found in 14 California counties. Contra Costa CAC staff have removed it from 46 properties in the county since 2006. Most were ornamental landscaped areas at homes. Removal can be quite a task. Infested plants – sometimes including large trees – are removed using chainsaws and hand tools. Infested material is loaded into a lined trailer and secured with heavy plastic sheeting. We then take it to a landfill where it is immediately buried. One infested site with a few small trees and about 100 feet of ivy-covered fence in an industrial area involved three days

of work by up to eight people. After removal, staff will visit these sites often to ensure that this invasive weed has not reestablished itself.

Our staff are trained to look for this as well as other invasive pests. New detections have been discovered through outreach such as newspaper articles, post cards mailed to residents, and from training sessions we have given to landscapers, city workers, pest control operators, Farm Bureau members and Cooperative Extension staff.

Carol Hafner, *Fresno CAC*

Vine mealybug (*Planococcus ficus*) is a perfect example of an invasive pest that became established and caused the kind of significant economic and ecological harm that pests can create when spreading into an environment without natural defenses. By the time discussions began on quarantine measures, vine mealybug had already spread to a level that left its control in the hands of growers vexed with this pest. Vine mealybug is difficult to control because it can exist in hidden locations on the plant above and below ground, which protects it from most foliar insecticides, high summer temperatures, parasitoids and other natural enemies. Because of these factors, the use of pesticides to control and suppress the population of vine mealybug has increased since 1994, as this pest continues to spread. The impact on exports has also been significant. Twelve trading partners have restrictions or prohibitions on host commodities for vine mealybug. They consider this pest a harmful organism and can prohibit entry of commodities into their channels of trade.

According to the University of California Cooperative Extension, there are no prospects for containment or eradication. However, UC has continued massive research efforts to find solutions to control this pest, including mating disruption in wine grape production.

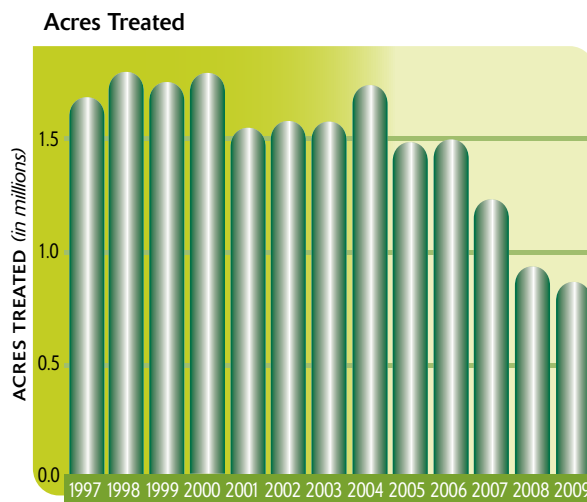
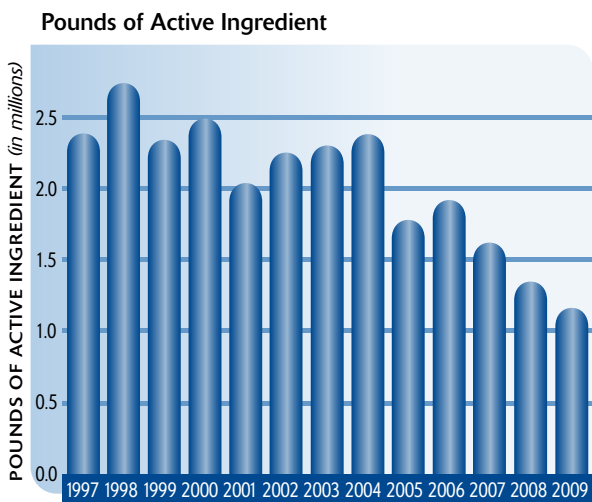
Photos (above from left): European grapevine moth (photo courtesy of Napa CAC); diaprepes root weevil (Keith Weller, USDA Agricultural Research Service, Bugwood.org); Mediterranean fruit fly (USDA Agricultural Research Service Photo Unit, Bugwood.org)

Significant Declines in Higher-Hazard Pesticides

The past five years have seen significant decreases in the use of several categories of higher-hazard pesticides. On these two pages are charts illustrating the declining use of ground water contaminants, pesticides that inhibit cholinesterase (a brain enzyme that helps regulate nerve impulses), pesticides listed by Proposition 65 or the U.S. Environmental Protection Agency as carcinogens and pesticides on the Proposition 65 list of reproductive toxins.

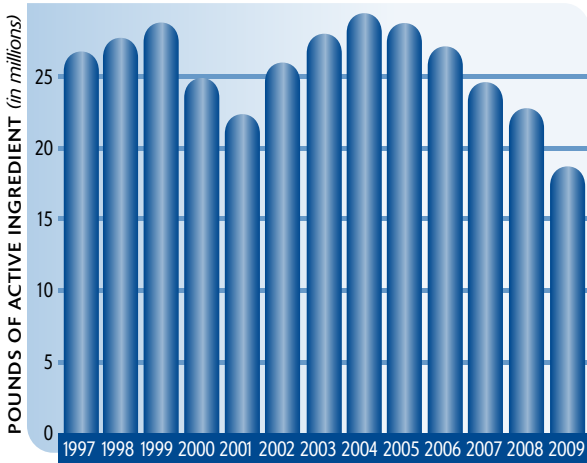
There are a variety of reasons for these trends. Some older pesticides are being replaced by newer, more targeted (and typically less toxic) alternatives. Other, higher-hazard pesticides are subject to increasing restrictions, making them more difficult to use. For example, since 2004 the use of pesticides known to contaminate ground water has declined by more than 50 percent in both acres treated and pounds used. To better protect ground water, in 2004 DPR put into place new restrictions on pesticide use. The new rules focus on areas that DPR computer modeling identified as the most vulnerable to pesticide contamination from leaching and runoff. Previously, restrictions only affected about 300,000 acres in the state. The new – and stricter – use controls apply to about 2.4 million acres. In these areas, applications of pesticides known to contaminate ground water are subject to prohibitions or strict controls designed to prevent the pesticide from reaching ground water.

PESTICIDES FOUND IN GROUND WATER

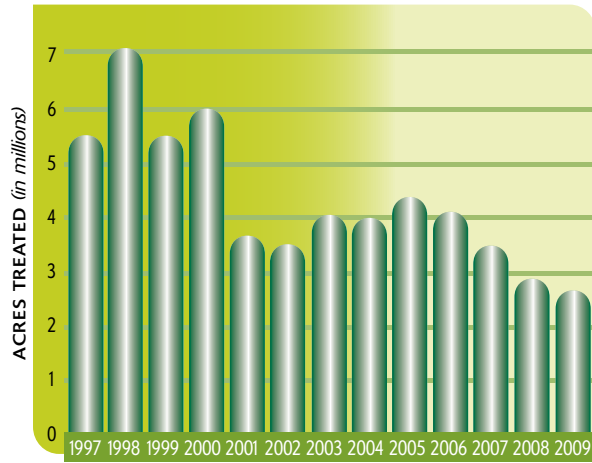


PESTICIDES LISTED BY PROPOSITION 65 OR U.S. EPA AS CARCINOGENS

Pounds of Active Ingredient

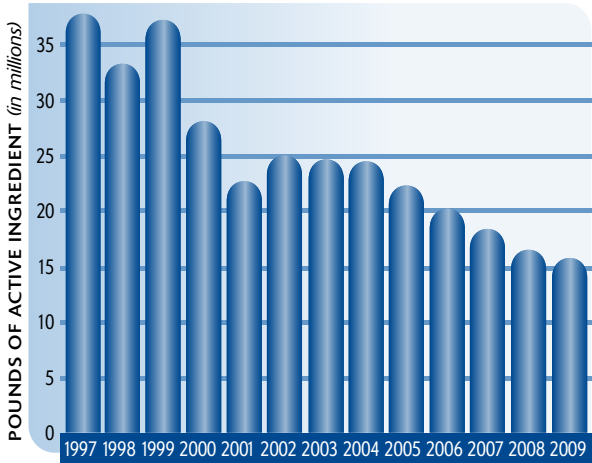


Acres Treated

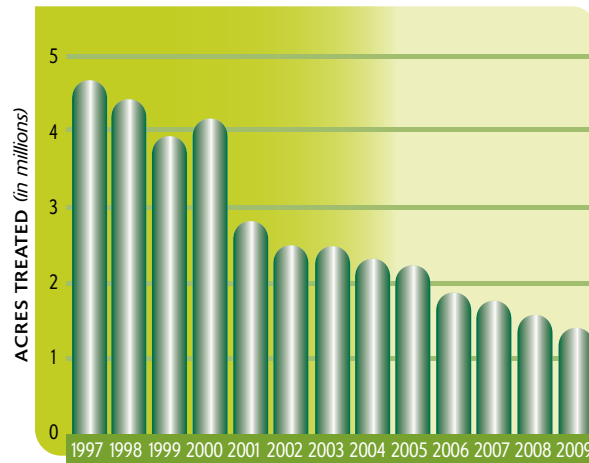


PESTICIDES LISTED BY PROPOSITION 65 AS REPRODUCTIVE TOXINS

Pounds of Active Ingredient

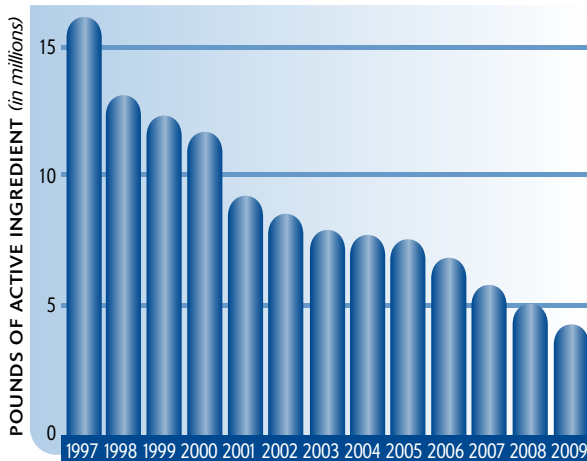


Acres Treated



PESTICIDES THAT INHIBIT CHOLINESTERASE

Pounds of Active Ingredient



Acres Treated

