

Reducing the Risks of Managing Pests



Our goal in agriculture should be the production of high-quality food and fiber at low cost and with minimal deleterious effects on humans or the environment.

We will have to use the best combination of available technologies ... integrated into ecologically balanced programs.

— ***The Future Role of Pesticides in U.S. Agriculture, National Academy of Sciences (2000)***

In the latter part of the 20th century, California saw significant advances in reduced-risk pest management and its widespread adoption on farms, and in businesses, schools and homes. This evolution affected both the practices of pesticide users and policies of pesticide regulatory agencies like the DPR. It highlighted DPR's broad statutory mandate "to encourage the development and implementation of pest management systems, stressing application of biological and cultural pest management techniques with selective pesticides when necessary to achieve acceptable levels of control with the least possible harm to the public health, nontarget organisms, and the environment" (Chapter 735¹, Statutes of 1972). This mandate's importance is shown by its prominence in DPR's mission statement "to protect human health and the environment by regulating pesticide sales and use and by fostering reduced-risk pest management."

In 1993, regulatory analyst Charles Benbrook recommended that DPR reorient its programs toward risk-driven priorities: getting lower-risk products registered more quickly and focusing regulatory controls on higher-risk products and activities. DPR had contracted with Benbrook to evaluate DPR's registration program. Among other recommendations in his report, *Challenge and Change: A Progressive Approach to Pesticide Regulation in California*, Benbrook urged the department to use its regulatory powers to increase the adoption of biologically based pest management programs.

In 1994, based on a year of discussions with staff and stakeholders, the department completed its Pest Management Strategy. The department's proper role, the strategy concluded, was to encourage the voluntary adoption of reduced-risk practices.

The strategy's goals and objectives were considered and incorporated into DPR's strategic plans². While the other goals in each plan differed to some degree, every plan included advancing reduced-risk pest management as a department goal. The department's 2013 plan, for example, cited three objectives to carry out the goal:

- Encourage and support research and development of reduced-risk pest management practices and technologies.
- Promote adoption of reduced-risk pest management systems and practices.
- Provide policy, scientific and technical leadership and collaboration at local, state, national, and international forums to further advance reduced-risk pest management systems.

To achieve what *Challenge and Change* and the Pest Management Strategy envisioned, and to carry out strategic plan objectives, the department has embarked on several policy and programmatic initiatives.

¹ Appendix A lists this and other statutes noted in this chapter and shows the related code section it amended or added. Statutes and related code sections deleted or superseded by later legislation have been omitted.

² DPR Strategic Plans 1997, 2001, 2008 and 2013.

EASING REGISTRATION OF “LOW-RISK” PESTICIDES

In 1993, DPR began accepting applications for registration of products containing new microbial and biochemical active ingredients concurrently with their application to the U.S. Environmental Protection Agency (U.S. EPA). Before that time, all pesticides had to be registered with U.S. EPA before a registration application could be submitted to DPR. The next year, “to encourage the use of pesticides that are expected to pose reduced risk compared to alternative pesticides,” DPR began accepting concurrent applications for products containing new active ingredients classified by U.S. EPA as “reduced risk.” In 1996, DPR expanded the type of applications it would accept concurrently to include products containing biochemicals, microbes and U.S. EPA-designated reduced-risk active ingredients already in other California-registered products.

In 1998, with passage of SB 464 (Statutes of 1997, Chapter 428), DPR also began accepting new human health antimicrobials and public health antimicrobials concurrently. Because of budgetary constraints, between 2002 and 2005 DPR suspended some programs to accept concurrent registration applications. DPR did not accept reduced-risk pesticides, including biopesticides, concurrently.

In 2006, DPR began accepting applications for registration of any pesticide containing a new active ingredient concurrently with U.S. EPA. In 2016, these applications could still be sent concurrently.

IPM ACHIEVEMENT AWARDS

In 1994, DPR created its IPM Innovator Award to recognize growers and other leaders in alternative pest management practices.

DPR hosts an annual event to recognize each year’s award recipients. Awardees over the years have ranged from vineyards, farms, nurseries, and industry researchers and commissions to municipalities, schools, pest management companies, task forces and conservation groups. By 2016, DPR had presented 149 IPM Innovator awards.

An IPM Innovator typically has a history showing its approach is economically viable, uses a pest management system to reduce the risks posed by traditional pest management practices, and documents its system so others can learn and apply it. An IPM Innovator’s organizational structure may be formal, such as a commodity advisory board, a resource conservation district or a school district, or less formal, such as a community organization that promotes reduced-risk pest management.

An IPM Innovator also displays a willingness to share information with others. Many IPM Innovators have training and educational programs to work with participants to encourage the sharing of ideas and information. Their outreach programs identify potential new participants and encourage them to join.

In 2016, the IPM award's scope was changed, as was the name. The new IPM Achievement Awards recognize agricultural and nonagricultural groups, organizations, companies or schools for their achievements in IPM and reduced-risk pest management. The expanded IPM award program includes a variety of accomplishments in areas of innovation, education and outreach, and leadership in promoting IPM practices. The new awards program include a wider possibility of award winners and more-diverse IPM practitioners.

SUPPLEMENTAL ENVIRONMENTAL PROJECTS

Beginning in the mid-1990s, DPR began using innovative enforcement actions to encourage the appropriate use of pesticides, including the adoption of IPM. To settle an enforcement action, individuals or companies typically must pay penalties and take actions needed to eliminate noncompliance. In suitable instances, DPR



Four Winds Growers, a dwarf-citrus pioneer which adopted special greenhouse technology to deflect disease-carrying Asian citrus psyllids, was among 2015's IPM Innovator Award winners.



There is too little acknowledgment of the years of work it takes to establish an effective and economically viable IPM program. We thought it was time for that overdue recognition. The systems DPR recognized today embody the spirit of innovation that we want to encourage. They are models for others to follow.

— DPR 1994 news release announcing the first IPM Innovator Awards

may waive part of the penalty and allow the violator to perform a “Supplemental Environmental Project” (SEP).

SEPs are environmentally beneficial projects that a violator voluntarily agrees to undertake in settlement of the action and to offset a portion of the penalty. For example, DPR agreed to offset part of a penalty for selling unregistered pesticides when a violator agreed to develop pamphlets for consumers that stress the appropriate and safe use of pesticides in and around the home to reduce environmental impacts. In another DPR case, besides paying a fine, a company that had violated rules for the registration and storage of large chlorine tanks agreed to produce brochures describing proper storage and use of chlorine gas and distribute them to industry trade group members. In another instance, DPR worked with manufacturers of copper-based boat paints to produce leaflets to be placed in stores explaining alternatives to these products that were less harmful to water quality.

In 2015, the Legislature passed AB 1071 adding section 71118 to the Public Resources Code that requires each board, department, and office within CalEPA to establish a policy for SEPs that focuses on benefitting disadvantaged environmental justice communities. The law specifies that the policy include a process to solicit potential projects and requires the posting of available projects on the CalEPA website. The policy complying with this legislation can be found at http://www.cdpr.ca.gov/docs/enforce/enfornds/sep_policy/policy.pdf.

PESTICIDE USE REPORTING

Information on pesticide use trends is critical to identifying the success or failure of efforts to promote reduced-risk pest management. It also helps researchers identify emerging challenges and avenues to solutions and provides insight to help regulators make environmentally and economically sound policy decisions. To provide this data, beginning with the 1997 annual pesticide use report, DPR scientists have presented their review and analysis of changes in pesticide use for about a dozen crops, selected based on their pesticide use or planted acreage. (*For more information on pesticide use reporting, see Chapter 9.*)

GRANT PROGRAMS

Legislation in 1994 (Chapter 545, SB 1752) allowed the department to set up a competitive grants program. In 1996, DPR began its “Innovations in Pest Management” grant program. 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, DPR launched a complementary project of larger Pest Management Alliance grants. They focused on developing partnerships with private and nonprofit organizations to “help agricultural commodity, non-agricultural, urban, and other groups address important pest management issues on a regional or statewide scale.”

The department designed the Alliance program to promote the implementation of new practices on a wider scale than was taking place. By creating partnerships with commodity groups and urban organizations, DPR aimed for extensive, sector-wide projects with broad application in pest management to achieve measurable reduction in the risk from pesticides. The grants also provided an opportunity for staff to better understand pest management challenges for the affected commodity. This can help DPR make more informed regulatory decisions.

When the Alliance program began, DPR’s approach was to first award a small Innovations grant to localized projects. The goal was to help groups take research results and move them into the field through applied research and demonstration that, if successful, could be funded for broad geographic implementation with an Alliance grant. DPR originally oriented the Alliance program to involve groups, state- or industry-wide, and target important regulatory concerns associated with pest management.

By the end of the 1990s, Alliance projects included demonstration, education and outreach. Their focus was on protecting surface and ground water, finding alternatives to high-toxicity pesticides and reducing worker exposure in agricultural and urban settings. At the time, grant recipients began with a DPR-funded pest management evaluation the first year, which allowed them to apply for full Alliance funding the following year. Recipients had to provide matching funds or in-kind services equal to each year's grant.

By 2002, when budgetary cutbacks forced the department to suspend its grant programs, DPR had given out \$7.2 million in Innovation and Alliance grants. That same year, under contract to DPR, the Center for Agricultural Partnerships (CAP) completed an evaluation of the Alliance program procedures, data management and outcomes. CAP praised the Alliance program, calling it "unique" in the nation. "Valuable new information on pest management alternatives has been generated," CAP reported. "DPR has provided an opportunity for commodity groups to increase awareness of alternative pest management practices and to leverage funding to accomplish work more rapidly and on a wider scale."

CAP recommended several changes to improve DPR oversight of projects, including more clarity in requests for proposals and greater interaction with DPR staff on the projects. Pointing out that "achieving sustainable reductions in pesticide risks requires the commercial adoption of effective pest management practices," the report recommended DPR require Alliance recipients to demonstrate and document both qualitative and quantitative, physical changes resulting from their projects.

In 2007, the Legislature reinstated Alliance funding, and by 2015 DPR had awarded another \$3.4 million in Alliance grants. In restarting the program, DPR eliminated the pest management evaluation and the need for matching funds from Alliance recipients. Staff rewrote the requests for proposals to provide more direction on priority areas and to ensure that proposals included baselines against which to measure intended outcomes and the methodology for doing so. As defined in 2011, an Alliance is a collaborative team that may include commodity group representatives, growers, university researchers, urban or industry representatives, landscape professionals, conservation agencies and sustainability certification programs. Alliance grant projects must provide evidence that adoption is taking place by the end of the grant period. Research may be a minor part of the overall project, but DPR will not fund Alliance grant projects that focus on research.

In 2012 the Legislature expanded DPR's grant program to include funding for research projects that develop effective alternatives to fumigants and other pesticides that pose undue risks to public health and the environment, and encourage collaborations with the industry to identify realistic solutions to the emerging impacts of regulations especially to the use of fumigants in the field. Grant recipients may include public and private entities such as accredited institutions of higher learning, commodity boards, licensed pest control businesses, nonprofit organizations, and urban pest managers of institutional buildings. As of 2016, DPR had awarded \$4.26 million in research grants. Projects must be designed to increase implementation and adoption of proven, effective IPM practices that reduce pesticide risks to human health and the environment.

Since the grant programs began, DPR's Pest Management Advisory Committee has had a statutory duty to review the proposals and make recommendations on funding.

IPM TRAINING

In 1999, DPR adopted regulations requiring prospective pest control advisers (PCAs) to take more college courses related to IPM. The new rules went into effect in 2002. Because students were having difficulty finding classes matching the detailed requirements in the new regulations, in 2007 DPR amended the rules to



Integrated pest management (IPM): 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.

— University of California
Statewide IPM Program



IPM training for school employees in Redding in 2016.

provide more flexibility in achieving some of the academic requirements. At least one course stressing IPM is still required, however, and applicants need an extensive knowledge of IPM to pass the PCA exam.

IPM IN SCHOOLS AND CHILD CARE FACILITIES

In 1993, DPR staff began working with public school districts across the state to help them set up reduced-risk pesticide programs. In 1994, DPR sent each school district a 43-page booklet designed to help school officials examine and improve their pest management practices and set up IPM programs. In 1996, DPR completed a survey about pest management practices, policies and programs. It found that school districts throughout the state were developing and adopting innovative ways to manage weeds, insects, rodents and other pests. However, DPR also found that technical, institutional or economic constraints were significant obstacles. In response, DPR scientists moderated several urban IPM workshops, which led to helping three school districts with their IPM programs: Fontana, Pajaro Valley and Los Angeles Unified. DPR also recognized several school districts with IPM Innovator awards for their pioneering work in finding reduced-risk solutions to school pest problems.

Between 1998 and 2000, DPR awarded \$170,000 in Alliance funding to several school districts to develop model school IPM programs and resources for district administrators. For the 2000-01 fiscal year, the Legislature appropriated \$634,000 for DPR to establish a statewide voluntary program for school IPM. In 2000, the Legislature also passed the Healthy Schools Act (HSA, AB 2260, Chapter 718). It was prompted by concern about the risk to children from potential exposure to pesticides. It encouraged the voluntary adoption of IPM by public K-12 schools and public child care centers.

The HSA required DPR to help public K-12 school districts comply with the law and to promote and facilitate the adoption of school IPM programs for districts that voluntarily choose to do so. The department was required to:

- Develop criteria for identifying least-hazardous pest management practices and encourage their adoption as part of a school IPM program.
- Create a model program guidebook that prescribes essential program elements for a district that has adopted a least-hazardous IPM program.
- Develop a school IPM website as a comprehensive directory of resources describing and promoting least-hazardous practices at schools. The site also had to provide the public with information about public health and environmental effects of pesticides.
- Make school-site pesticide use reporting forms. The HSA requires pest control businesses that apply pesticides in schools to submit annual reports to DPR of those applications.

The HSA was amended in 2005 (AB 405, Chapter 566) to prohibit canceled or suspended pesticides, or those given conditional registration by DPR, from being used on school sites. A 2006 amendment (AB 2865, Chapter 865) expanded HSA requirements to private child care centers (but not family day care homes). In 2014, the HSA was again amended (SB 1405, Chapter 848) to require school sites to develop an IPM plan and report pesticide use by school employees, and for anyone applying pesticides on school sites to be trained in IPM and the safe use of pesticides in relation to the unique nature of school site and children's health. Three one-hour online courses are available to school custodians, child care providers, licensed pesticide applicators and others.

IPM programs for both schools and child care centers

DPR began its statewide school IPM program in 2000 and the child care IPM

program in 2007. The school IPM program consists of statewide IPM training for district staff, IPM-focused educational publications and a website for school IPM. “Growing Up Green,” DPR’s child care IPM program, also includes IPM training for child-care providers, educational materials specific to the child-care setting and a website for child-care providers, parents and pest management professionals.

DPR’s School IPM staff sends regular e-mail notices to school staff about topics such as DPR-produced school IPM calendars, upcoming workshops, back-to-school IPM reminders, how to evaluate contractors and pest-specific information.

IPM materials

In 2011, DPR released the third edition of its *School IPM Guidebook*. A reference tool for school IPM coordinators for adopting IPM programs in their districts, it includes guidance on:

- Adopting an IPM policy.
- Identifying and monitoring pest populations and damage.
- Setting up a community-based school district advisory committee.
- Contracting for IPM services.
- Establishing a community-based, right-to-know standard for notification and posting of pesticide applications.
- Recordkeeping and program review.

In 2008, DPR awarded a three-year Alliance grant to the University of California (UC) San Francisco Childcare Health Program, UC Berkeley and the UC Statewide IPM program to develop an IPM toolkit for child care centers. The toolkit includes an IPM curriculum, pest fact sheets, posters and an IPM checklist. It is available online as well as in a print version.

The School IPM program developed and distributed pest-specific school IPM fact sheets on ants, cockroaches and rodents. The Child Care IPM program adapted and distributed those fact sheets for use by child care providers.

DPR staff develop and publish a school IPM record keeping calendar. Sent to school districts and child care centers each year, it is designed as a planning tool for managing major pests of school buildings and grounds. It reminds school maintenance and operations staff of pest management procedures by month to help integrate pest management with other school maintenance. It also provides a way to record monitoring results and management practices.

IPM training

Each year, DPR conducts about six training sessions for school district IPM coordinators and other staff responsible for pest management, such as administrators, maintenance and operations directors, facilities directors, groundskeepers and custodians. These daylong, hands-on workshops are presented statewide and offer an opportunity to learn about both structural and landscape IPM practices in a school setting. By 2011, the department had conducted 38 workshops for 1,245 IPM coordinators from 741 of the state’s 1,047 school districts. Recently, specialized workshops on turf weed and gopher management have been added to expand the knowledge of those who need more in-depth training.

DPR, in cooperation with the UC Statewide IPM Program, also developed four interactive school IPM training DVDs. They supplement the training workshops by providing IPM coordinators with an added tool to train personnel in their districts. In 2013, a seven part video series on integrated pest management in child care centers was produced. These succinct segments offer applied ways



Under Food and Agricultural Code section 13183, DPR is directed to promote the voluntary adoption of integrated pest management (IPM) programs for school sites and child care facilities and to facilitate adoption of these practices by creating educational and informational materials on IPM for the child care setting.

— *DPR School IPM Guidebook*



A Pest Management Advisory Committee meeting in 2015.

for child care centers to transition into using IPM. In 2014, the Integrated Pest Management for Schools video series was produced. These entertaining, English and Spanish short videos contain practical integrated pest management tips from experts. Topics covered in this video series include pest prevention in school buildings; inspecting and monitoring for pests; and IPM for ants, cockroaches, gophers, and turf grass weeds.

Child care providers receive IPM training through presentations DPR staff members make at six to eight child care conferences each year. Providers also receive information and training from Department of Social Services (DSS) licensing staff. DPR trains DSS staff so they can in turn conduct training in IPM practices.

Webpages

DPR staff developed the Health and Environmental Lookup Resource (HELPR) webpages to provide information in a user-friendly format about human health and environmental effects of pesticide use in schools. Starting with a specific pest, users can read the appropriate management recommendations from the Pest Notes series produced by UC Statewide IPM. Another page summarizes toxicological and exposure data for management tactics mentioned in the Pest Note.

Pest management surveys

Beginning in 2001, DPR surveyed the state's school districts on their implementation of the Healthy Schools Act. The survey was also designed to measure adoption of IPM policies, programs and practices and to identify barriers to IPM adoption. The surveys, which DPR conducts every three years, measure changes compared with previous surveys and relate demographic and geographic factors to survey responses.

The surveys have helped DPR improve its training and written materials. Based on survey results, DPR focused its attention on resources of most interest to school staff: preventing pest problems, IPM practices, pest management practices at other schools, and lists of alternative, IPM-friendly products and tools. The first pest management survey of child care centers was conducted in 2008 in association with UC Berkeley's Center for Children's Environmental Health. Information gathered helped guide DPR's Child Care IPM program in developing presentations, training materials and effective avenues to distribute them. A follow-up survey in 2013 showed changes on pest management and Healthy Schools Act compliance since the baseline survey. It also described regional differences that DPR uses to help target its outreach efforts.

PEST MANAGEMENT ADVISORY COMMITTEE

DPR, in cooperation with the California Department of Food and Agriculture (CDFA), established the Pest Management Advisory Committee (PMAC) in 1992 "to help find alternative crop protection strategies which can reduce the environmental problems associated with pesticide use." In announcing the committee, the department said, "The future of crop protection is being driven in part by the public's strong desire to reduce risks associated with pesticide exposure. The private sector and government agencies must join together for a broad-based, systematic approach toward the use of less disruptive pest management methods." Legislation in 1994 (Chapter 545, SB 1752) formally recognized the PMAC in law and gave it the task of evaluating applications for DPR grants and making funding recommendations to the Director.

The DPR Director chairs the committee and the CDFA Secretary is vice chair. Under regulation, the PMAC includes representatives of the University of California, California State Universities, U.S. EPA and the county agricultural

commissioners. There are also 24 at-large members appointed by DPR based on their expertise and diversity of perspectives, and representing various categories of external stakeholders. There are six representatives from agricultural production; five from academia and public foundations; four representing registrants and trade associations; four from environmental and public interest groups; one from a farm labor organization; two from nonagricultural pesticide user groups; one representing the public and consumer advocacy; and one representing pest control advisers.

OTHER MEASURES

DPR's mission is to prevent or reduce the harmful effects of pesticide use. In doing so, its regulatory programs also can advance the use of lower-toxicity pesticides. For example, DPR's evaluation of certain agricultural insecticides used on fruit and nut trees during the dormant season found that runoff into streams and rivers compromised water quality.

In the late 1990s, DPR and commodity organizations began a project to encourage voluntary adoption of alternative pest management practices. Although insecticide use decreased, it was not enough to reduce water quality problems. In 2006, DPR adopted regulations to restrict the use of dormant-season insecticides shown to cause problems, resulting in a further decrease in use of these toxic pesticides.

DPR launched its Air Quality Initiative in 2006 as a comprehensive effort to improve air quality related to pesticide use. One goal was to promote more environmentally friendly and efficient technologies that reduce pesticide use and associated drift. DPR has funded research into application equipment that delivers pesticides more precisely to the target and remote-sensing technologies that can reduce pesticide use by mapping the most heavily infested areas of a field (*For more information on the Air Quality Initiative, see Chapter 10*).

In 2010, DPR published a conservation management guide to help farmers find ways to reduce emissions of volatile organic compounds (VOC) that contribute to formation of smog. The guide encourages greater use of IPM programs that can decrease pesticide use and in doing so, VOC emissions. Staff also created online calculators that can estimate emissions from both fumigant and nonfumigant pesticides. This allows farmers to compare emissions from different products and methods of application.



DPR's Conservation Management Practices Guide is available on the department's website: www.cdpr.ca.gov/docs/emon/vocs/vocproj/reducing_voc_emissions.pdf