[CHAPTER 13]

Reducing the Risks of Managing Pests

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 the perspective and policies of pesticide regulatory agencies like the Department of Pesticide Regulation (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 735[1], 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.*" (Italics added.)

Incorporating Pest Management Considerations

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 a pest management strategy. The department's proper role, the strategy concluded, was to encourage the voluntary adoption of reduced-risk practices. A regulatory agency like DPR should not involve itself in education and research, the strategy said, areas where universities excel.

The Pest Management Strategy's goals and objectives were considered and incorporated into DPR's 1997, 2001 and 2008 strategic plans. 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 2008 plan, for example, cited three objectives to carry out the goal:

- Encourage 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 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 carry out strategic plan objectives, the department embarked on several policy and programmatic initiatives.

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

[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.

"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*

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, microbials 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. The two remaining exceptions are products containing new active ingredients and new human health antimicrobials and public health antimicrobials; in 2011, these applications could still be sent concurrently.

In 1994, DPR created its "IPM Innovator" awards to recognize growers and other leaders in alternative pest management practices. Legislation in 1994 (Chapter 545, SB 1752) allowed the department to set up a competitive grants program. In 1996, DPR established its "Innovations in Pest Management" program of small grants, followed in 1997 by a complementary project of larger "Alliance" grants. *(See below for more information on the IPM Innovator and grant programs.)*

We should not encourage spraying ... unless we know just exactly what we are spraying for. Perhaps you do not all agree with this statement because it is a common thing to talk about spraying insurance … but as a general rule the man who sprays with that idea in mind and doesn't know just exactly what he is spraying for, or what he ought to use, is not getting results in his spraying. Spraying requires a knowledge of the pests which are on the trees. It requires a thorough knowledge of insecticides and fungicides, and until we have that knowledge, we can not do spraying that is altogether effective.

— 1922 department annual report

Beginning in the mid-1990s, DPR began using innovative enforcement actions to increase 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 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 perform, besides actions needed to correct the violation. For example, as part of legal settlements for failure to pay mill assessment fees, DPR has allowed registrants to develop pamphlets for consumers that stress pesticide use reduction in and around the home. In another DPR case, besides paying a fine, a company that had violated rules on storage of large chlorine tanks produced brochures describing proper storage and use of chlorine gas. In another instance, DPR worked with manufacturers of copper-based boat paints to produce leaflets explaining less harmful alternatives to these products.

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 11.*)

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 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.

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 4.)* 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.

IPM Innovators Awards

In 1994, DPR presented its first IPM Innovator awards to recognize agricultural and urban organizations showing leadership and creativity in pest management. DPR hosts an annual event to recognize each year's award recipients. By 2011, DPR had presented more than 100 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.

Grant Programs

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 largely involved demonstration, education and outreach. Their focus was on protecting surface and ground water,

"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

"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 US Agriculture,* National Academy of Sciences (2000)

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 by DPR staff with 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 reinstituted Alliance funding and by 2011, DPR had awarded another $2 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.

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 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.
- Develop a model program guidebook that prescribes essential program elements for a district that has adopted a least-hazardous IPM program.
- Set up a school IPM Web site 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.
- Develop 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).

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 Web site 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 Web site 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.

Beginning with the 2006-07 school year, DPR staff developed and published a school IPM recordkeeping 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.

Growing Up Green
CHILD CARE IPM

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

Noncompliance does not necessarily call for additional or more stringent laws, but more often for education as to observance. Education concerning the purpose of law and with the backing of law can be made exceptionally effective because acceptance usually comes with understanding.

— Economic Poisons: California Law and Its Administration (1944)

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 day-long, 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.

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.

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.

Web pages. DPR staff developed the Health and Environmental LookuP Resource (HELPR) Web pages 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 fifth survey was conducted in 2010.

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.

Pesticide use data. Licensed pest-control businesses that apply pesticides on public school sites and at child care centers must report these pesticide applications each year to DPR. In 2011, the department developed a database for these pesticide use records, allowing it to respond to requests for these data from schools and the public.

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.