

A History of Pesticide Regulation in California

California has regulated pesticides for more than a century.

Through the legislative process, state lawmakers have established a comprehensive body of law to give California pesticide regulators the tools needed to control pesticide sales and use, and to assess and control potential adverse effects.

The state's first pesticide-related law was passed in 1901 and, since the 1970s, a body of increasingly science-based pesticide law and regulation has come into being. As we begin the second century of pesticide regulation, we build and improve upon these developments.

Today, DPR's mission is: "To protect human health and the environment by regulating pesticide sales and use, and by fostering reduced-risk pest management."

EARLY PESTICIDE REGULATION: FOCUS ON CONSUMER FRAUD

Arsenic, cyanide and other natural poisons have been used for centuries to kill insects and rodents in homes and on farms. In the mid-1800s, farmers found they could use a common, arsenic-containing paint pigment, called Paris green, to kill insects in their fields. Other arsenic-based insecticides followed in the 1880s.

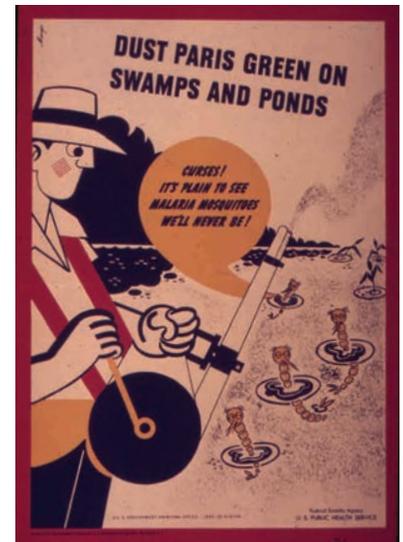
French grape growers accidentally discovered that a combination of hydrated lime and copper sulfate could fight powdery mildew fungus. Since labor for weed removal was cheap and readily available, farmers were not generally interested in using herbicides.

Into the early decades of the 20th century, insecticide and fungicide use was not widespread, and was confined largely to high-value tree fruit crops. Although a few scientists expressed concerns over pesticide residues, arsenic was not considered harmful in the small amounts remaining on sprayed produce. The chemical was used to color paper, candles, artificial flowers, fabrics, toys, plates, carpets and clothing. Little thought was given to the potential hazards of cumulative exposure.

Government regulation of pesticides focused on protecting users from fraud by ensuring product quality. Pesticides and many products of the time, including foods and drugs, were often adulterated or mislabeled. It was not unusual for manufacturers to make extravagant claims for pesticide products that were useless at best and sometimes even destructive to the plants on which they were used.

New York passed the nation's first pesticide law in 1898. California's first law, passed in 1901, was concerned only with preventing consumer fraud in sales of Paris green, the most widely used insecticide. Dealers were required to submit product samples to the University of California (UC) agricultural experiment station with documentation describing brand name, pounds in each package, name and address of manufacturer, and percentage of Paris green. UC analyzed samples and sellers of deficient products were guilty of a misdemeanor. Resulting fines ranged from \$50 to \$200 (\$1,100 to \$4,700 in 2015 dollars).

In 1910, Congress passed the Federal Insecticide Act, a labeling law focused on protecting consumers from ineffective pesticides or deceptive labeling. The statute



Paris green was a popular pesticide in the late 19th and early 20th centuries. The arsenic compound was used to kill rats in Parisian sewers, thus the name.



"The laws previous to 1901 had, as their principal concern, the regulation of the sale of Paris green, as this substance was the first to be made commercially."

— The Workings of the California Insecticide Law (1914)

applied to both insecticides and fungicides, not previously covered by any laws. However, the legislation contained neither a federal registration requirement nor any significant safety standards.

California's parallel legislation, the State Insecticide and Fungicide Act of 1911 (Chapter 653), was also concerned mainly with mislabeling and adulteration but went beyond federal law. It required manufacturers, importers and dealers of insecticides and fungicides to register their products for a \$1 fee with UC, submitting a statement on "the component parts of the substances which they proposed to offer for sale." Proper labeling was required with the product name, manufacturer's name and address, and place of manufacture. The registration application had to be accompanied by a chemical analysis showing "the percentage of each substance claimed to have insecticidal value, the form in which each is present and the materials from which derived, and the percentage of inert ingredients." This was "to enable the user to know the insecticidal value of the material, and also to make the manufacturer more careful as to the composition of his products." This provision was described as the "most radical of any of the requirements, and was the one most seriously objected to by those who wished to oppose the law ... Practically the only serious objections came from the makers of 'secret' remedies who had been profiting by the use of fictitious names."

The statute required UC to analyze all registered pesticides yearly. However, by 1913, the number of registered products grew to about 10,000, making annual analysis impractical. The law was amended that year (Chapter 612) to delete the requirement for yearly analysis. At the same time, lobbying by manufacturers and dealers prompted the California Legislature to delete the mandate for detailed product labeling, requiring instead a "general" statement of the contents. Another 1913 bill (Chapter 211) exempted several classes of products from registration, including household insecticides (for example, flypaper, mothballs and ant poison), sheep dip, lice killer and sulfur. Amendments in 1916 provided for an extra registration fee and for UC to issue certificates of registration.

In 1919, the Legislature created (Statutes of 1919, Chapter 325) the California Department of Agriculture (CDA). Transferred to the new department were duties previously handled by several state boards and commissioners, including those overseeing horticulture, dairy farms, viticulture, cattle protection, produce marketing, and weights and measures.

In 1921, legislation (Chapter 352) brought the county horticultural commissioners (later called county agricultural commissioners) under CDA's "supervision and control." Commissioners had no statutory role in overseeing pesticide use. Their assigned duties included "protection of [agriculture and preventing] the introduction of insects and diseases, or animals, injurious to fruit, fruit trees, vines, bushes or vegetables." Another duty was "standardization of fruits, vegetables, and other plant products," ensuring that fruits and vegetables met minimum quality and labeling standards.

In its first annual report in 1920, CDA said a new law was needed to regulate pesticide manufacture and sale to:

- *Encourage the manufacture and sale of standard and well-tried remedies.*
- *Discourage the sale of poorly compounded or low-grade remedies prepared in a poorly equipped factory, or by the careless manufacturer.*
- *Prohibit the sale of worthless preparations placed on the market either through ignorance or with intent to defraud.*
- *Prohibit the sale of preparations which are injurious to cultivated plants or domestic animals, or are a menace to the public health.*

The Legislature responded by passing the Economic Poison Act of 1921 (Chapter 729). (Economic poison is a synonym used for pesticide. Legislation in the

1990s substituted code references to economic poison with the more commonly understood term pesticide.) It transferred regulatory authority over pesticides from UC to the agriculture department and expanded regulatory authority beyond insecticides and fungicides. A related statute (Chapter 606) allowed the new department to set up a “division of agricultural chemistry” to better carry out its new responsibilities.

A 1921 CDA report called the Economic Poison Act “a novelty in legislation of this type, there being no other law, state or national, regulating the manufacture and sale of rodent poisons and weed poisons.” The legislation gave CDA authority to control not only the manufacture and sale but also the use of pesticides.

The CDA recognized local pesticide enforcement as essential: “The state is a large one,” the department said, “and to attempt to distribute a corps of inspectors large enough to detect fraudulent practices would be a hopeless task ... Arrangements are now being made for the appointment of five or six county horticultural commissioners to act as collaborators in the enforcement of the Economic Poison Act.”

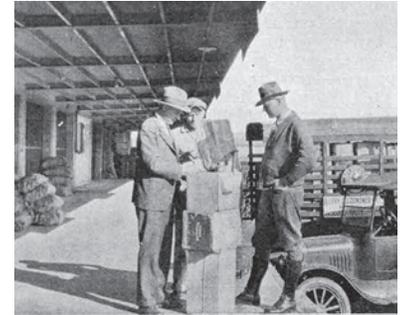
The Economic Poison Act required that applications for pesticide registration submit information on how the product was formulated (but not necessarily its ingredients), and a sample to ensure quality standards. CDA was authorized to cancel or deny registration of products found detrimental to agriculture or public health or “shown to have little or no value for the purpose ... intended.” Throughout the 1920s, CDA used its in-house labs to “test the efficacy of insecticides and fungicides for which it appears extravagant claims have been made.” Evidence gathered was used to file misdemeanor charges against the manufacturer if the product was already registered, or to cancel or refuse registration.

CDA’s authority to deny or cancel registration of pesticides from a manufacturer “attempting to sell fraudulent or worthless insecticides” was upheld in a 1925 appellate court decision, overturning a lower court that had declared the 1921 Economic Poison Act unconstitutional (Gregory v. Hecke).

Although CDA had the authority to refuse to register a pesticide if it was proven ineffective, without accompanying authority to require data to evaluate a product before it was registered, the department was forced to grant registration. The Legislature closed this loophole in 1929 (Chapter 604) when it gave the department authority to require “practical demonstration as may be necessary” to determine that products were effective and were not “generally detrimental or seriously injurious to vegetation.” Although the statutes allowed cancellation based on health or environmental problems, the acknowledged focus of programs of the time was adulteration and misbranding. CDA’s 1934 annual report said its program “affords protection to the consumer as to quality and quantity and to the manufacturer by preventing unfair competition.” Hundreds of product samples were analyzed each year and about 30 percent were routinely found “extensively deficient.” By the 1940s, that percentage had dropped to about 10 percent and deficiencies were attributed more to “irreducible error in manufacturing technique and not to an attempt to defraud.” Modern manufacturing techniques in recent decades have all but eliminated product quality problems.

THE 1920s: FOOD PESTICIDE RESIDUES BECOME A CONCERN

Public concern about pesticide residues on food did not arise until the 1920s. Pesticide use by farmers was increasing, as were reports of illnesses and well-publicized seizures of fruit with high arsenic levels by health officials in major cities. In 1927, CDA began analyzing small quantities of fresh produce for residues. In 1927, the Legislature passed the Chemical Spray Residue Act (Chapter 807) which made it illegal to pack, ship, or sell fruits or vegetables with harmful pesticide



It remains to be seen whether or not the income derived from licenses required by the Economic Poison Law will be sufficient for its full enforcement. It is probably that some support by State appropriation will be needed if the law is to be made effective ...

— 1921 California Department of Agriculture annual report



The 1921 Economic Poisons Act gave the California Department of Agriculture authority to control not only the manufacture and sale but also the use of pesticides.



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 California Department of Agriculture annual report

residues. It also set allowable residue levels (tolerances) that mirrored those set by the federal government that same year. The legislation established monitoring programs designed not only to safeguard the consumer but also to certify California-grown fruit as free of excess residues.

In 1934, the Economic Poison Act was amended to prohibit pesticide sales in anything other than the registrant's container, with "name and percent of every ingredient ... intended for use on or sold for application to any food crop in such a way as to leave a residue deleterious to health must be plainly stated on label." Deleterious residues were defined as residues of arsenic, fluorine and lead, the only chemicals for which the federal government had tolerances established. CDA expanded its monitoring program to sample for these residues.

In the late 1930s and 1940s, pesticide residue sampling expanded to test for newly introduced synthetic organic pesticides like DDT. In 1949, the Spray Residue Act was amended to expand the definition of potentially harmful spray residues to encompass "any pesticide or constituent thereof which on produce is harmful to human health in quantities greater than a maximum amount or permissible tolerances established by rules and regulations of the director."

Today, DPR's residue monitoring program is the largest state program of its kind. It continues to sample fresh produce, taking samples from wholesale and retail outlets, distribution centers, and farmers markets. (See Chapter 7 for more information on DPR's residue monitoring program.)

NEW PESTICIDES PROMPT NEW CONTROLS

By the mid-1930s, a wider variety of pesticides was being used, including pyrethrins, rotenone, zinc sulfate, petroleum oils and the new products of organic chemistry. In addition, as CDA reported in 1944, "chemists (have) synthesized emulsifiers, wetting agents, solvents and similar adjuvants or accessory substances which ... greatly facilitate accomplishment of pest control." That same year, the department expressed concern about the "hazards of new products":

The rapid increase in the use of synthetic organic chemicals illustrates the need for study to provide for intelligent handling of products of this nature. Possible industrial health hazards of new products should be anticipated. Problems constantly arise as to hazards to workers not only in mixing of chemicals but in making field applications. When a chemical is not acutely poisonous, generally little is known as to the extent of its injuriousness. Information should be at hand with regard to insidious chronic poisoning of newly developed materials, as well as to their acute toxicity.

It would be another 40 years before the state's pesticide regulators received legal authority and developed the scientific expertise to begin the task of collecting data and analyzing the potential long-term effects of pesticide exposure. By the late 1940s, farmers were using far less inorganic arsenic-, lead- and fluorine-based compounds. New organic compounds like DDT, 2,4-D and ethyl parathion were revolutionizing agriculture, increasing yields and reducing the need for labor-intensive weed and insect control methods.

The number of registered pesticides continued to grow as manufacturers rushed to market the new products of organic chemistry. In 1925, there were about 1,700 products marketed in California for pest control. In the next 10 years, the total had doubled to about 3,500 products and in 1945, more than 7,100 pesticide products were offered for sale. Eleven years later, there were nearly 12,000 pesticide products on the market.

As of 2016, there were about 13,000 pesticide products registered in California, containing about 1,000 active ingredients, including spray adjuvants. Federally, more than 19,000 products are registered by the U.S. Environmental Protection

Agency (U.S. EPA).

In 1947, Congress responded to the increasing use of pesticides by enacting the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). This law governed the registration, sale, possession and use of pesticides. It required that pesticides distributed in interstate commerce be registered with the U.S. Department of Agriculture (USDA). Like earlier laws, FIFRA was more concerned with product quality and efficacy than with safety. However, the statute declared pesticides “misbranded” if they were harmful to people, animals or vegetation (except weeds) when properly used.

Major defects in the new law soon became clear. The registration process was largely a hollow formality since USDA had no power to refuse registration, even for a chemical considered dangerous. The only way USDA could deal with an unsafe product was to take legal action for misbranding or adulteration, with the burden of proof on the government. Congress did not address this aspect of FIFRA until it changed the law to strengthen regulatory authority in 1964.

In California, regulators had clearer authority. Since the passage of the Economic Poison Act of 1921 and its 1929 amendments, CDA (later, DPR) could cancel or refuse the registration of any pesticide determined to be ineffective, damaging to non-target organisms, or detrimental to public health and safety when properly used. CDA also had authority to cancel or refuse registration to registrants who made false or misleading statements about their products.

FIFRA provided no authority to the federal government to regulate pesticide use in the field. That was not true in California, where state regulators had some authority over use practices since the 1920s. This became important with the dramatic increase in pesticide use in the late 1940s. Growers experimented with the new products, applying them in various ways on a variety of crops, sometimes with inadequate knowledge of their effects or toxicity. Pesticide drift caused damage to nontarget crops and killed livestock and honeybees. Improper applications caused injury and death to workers and others. State regulators realized they needed stronger, more targeted control measures.

Legislation in 1949 put a clear emphasis on safety and led to the state’s first regulations that governed pesticide handling and imposed controls on certain pesticides with the potential to cause injury to people, crops or the environment. Permits were required to possess or use these pesticides. With passage of this statute, regulation of professional applicators moved from the county level to become a responsibility shared by the state and county agricultural commissioners (CACs).

In 1949, state law was amended to expand state labeling requirements to adjuvants. In 1967, legislation gave the CDA clear authority to require registration and oversee the use of adjuvants. Adjuvants (emulsifiers, spreaders, wetting agents and other efficacy enhancers) must be registered as pesticides in California. The federal government does not require registration.

California’s regulations continued to be fine-tuned throughout the 1950s as an increasing number of chemicals were introduced to the market. Detailed regulations were adopted, including buffer zones to protect crops and homes, and restrictions on nozzle sizes, wind speeds and other factors to limit pesticide drift. Also, in 1954, pesticide use reporting in the state was strengthened when state regulators asked for reports on ground application acreage.

California has had limited pesticide use reporting since 1934. County agricultural commissioners (CACs) required agricultural pest control operators to send monthly reports. County requirements varied but many included a statement for each application showing the grower’s name, location, treatment date, crop, acres or other units treated, target pest, type of pesticide used, and the strength and amount of the pesticide applied. The Food Safety Act of 1989 gave the Department of Pesticide Regulation (DPR) clear statutory authority to require full reporting of



Less than five percent of the registrants cause more than 95 percent of the enforcement problems. It is believed that in time uniformly handled regulations not only will outlaw the bad practices of the few but will protect the many from unscrupulous competition and in addition provide a bulwark of consumer confidence throughout the agricultural chemical business.

— 1934 California Department of Agriculture annual report



These are good laws and everyone knows they work. Under them, the department has endeavored to work with vision and does those things that are generally accepted as honestly sound by the best informed persons.

— 1938 California Department of Agriculture annual report

agricultural pesticide use, and DPR adopted regulations for full use reporting in 1990. (For more information on Pesticide Use Reporting, see Chapter 9)

The 1960s forever changed the way society viewed pesticides. Although problems had been apparent for some time—most noticeably, concerns about possible acute health effects and the increasing resistance of some pests to the new products—the signal event was the publication in 1962 of *Silent Spring*. Author Rachel Carson presented compelling arguments that pesticides and other chemicals were being used with little regard for their effect on human health or the environment. *Silent Spring* is widely considered to have sparked the modern environmental movement.

In subsequent years, Congress passed several environmental statutes touching on pesticide regulation to various degrees, including the Clean Water Act, Clean Air Act, Endangered Species Act and Occupational Safety and Health Act. In 1969, Congress passed the National Environmental Policy Act (NEPA), which required federal agencies to consider environmental matters before undertaking new actions. In 1970, Congress created the U.S. EPA to bring cohesion to expanding federal environmental programs. Both the USDA pesticide registration functions and U.S. Food and Drug Administration's tolerance-setting authority were transferred to U.S. EPA.

FUNCTIONAL EQUIVALENCY UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA), passed in 1970, requires state and local agencies to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects. CEQA applies to most projects conducted by a public agency, supported by public funds or which must be permitted, licensed or approved in some way by a public agency.

In 1976, the state Attorney General issued an opinion on the roadside use of herbicides in Mendocino County. The Attorney General determined that when the county issued permits for the use of pesticides, it was a government activity subject to the provisions of CEQA. This meant that CACs throughout the state would have to prepare an environmental impact report (EIR) or a determination of no significant adverse impacts (negative declaration) before approving any of the more than 60,000 restricted material permits issued each year. Similarly, the department would be required to prepare an EIR or negative declaration before issuing any of roughly 11,000 pesticide product registrations each year.

The Legislature immediately placed a moratorium on applying CEQA to the pesticide regulatory program. In 1977, the state formed an Environmental Assessment Team to prepare a “master” (programmatic) EIR covering the use of all registered pesticides throughout the state. After more than a year's work, the team concluded that the regulatory program lacked mechanisms to meet CEQA procedural requirements and that existing processes could not be easily adapted to serve. Also, the team concluded, “the magnitude of the state program prevents any reasonable attempt to consider in a single report all of the information CEQA requires for each pesticide regulatory decision.”

The determination that the program was inadequate to meet the needs of CEQA led to the passage of AB 3765 (Chapter 308, Statutes of 1978). It required CDFA to establish rules and regulations that could be certified by the Secretary of the Resources Agency as the functional equivalent of an EIR or negative declaration. This certification means the agency managing the program does not have to prepare an EIR or negative declaration on each activity it approves. Instead, the certified program has to include guidelines for the evaluation of the department's actions consistent with the department's environmental purpose. The program provides for consultation with other agencies, and public notice and comment.

To gain approval for certified status, CDFA expanded its review of data before registration, changed regulations relating to pesticide registration and evaluation, and set up procedures to ensure public notice of its proposed registration actions and decisions.

Regulations were also added to require CACs, before issuing restricted material permits, to evaluate the proposed application site and to consider feasible alternatives and mitigation measures if significant risk exists. The department also established the Pesticide Registration and Evaluation Committee to create a mechanism for interaction between the department and other state agencies that have responsibility for resources affected by pesticides.

In December 1979, the CDFA pesticide regulatory program was certified by the Resources Agency as functionally equivalent to the EIR requirements of CEQA. Any substantial changes in the certified regulatory program must be submitted to the Secretary of the Resources Agency for review. The Secretary has the authority to decide if the change alters the program so that it no longer meets the qualification for certification.

CREATING A SCIENCE-BASED REGULATORY AGENCY

In 1969 (Chapter 1169) and 1970 (Chapter 1092), California passed landmark legislation that required a “thorough and timely evaluation” of pesticides before registration and gave the California Department of Agriculture (CDA) clearer authority to establish criteria for studies to be submitted by pesticide manufacturers. This legislation also gave the department distinct authority to place restrictions on how pesticides may be used. The CDA was required to begin “an orderly program of continuous evaluation” of pesticides already registered and eliminate from use those posing a danger to the agricultural or nonagricultural environment. (*More information on pesticide registration is in Chapter 3; for continuous evaluation, see Chapter 4.*) In 1972, the CDA hired its first scientists to review data submitted to support registration requests. The department previously had relied on scientists at the University of California and other state agencies.

Legislation in 1972 (Chapter 225) changed the CDA’s name to the California Department of Food and Agriculture (CDFA) and the “Agricultural Code” to “Food and Agricultural Code.” The changes recognized a broader mandate not only to promote and protect agriculture but also protect public health, safety and welfare.

Also in 1972, legislation (Chapter 794) gave CDFA primary responsibility for ensuring “the safe use of pesticides and for safe working conditions for farmworkers, pest control applicators, and other persons handling, storing or applying pesticides, or working in and about pesticide-treated areas.” CDFA was directed to adopt regulations to carry out the mandate, including rules on pesticide handling, pesticide storage, protective clothing, worker entry into treated fields and field posting. The legislation made enforcement of the rules the joint responsibility of CDFA and CACs. The statute made the development of pesticide worker safety regulations the “joint and mutual responsibility” of CDFA and the Department of Health. With the formation of the California Environmental Protection Agency (CalEPA) in 1991, those roles were transferred to DPR and CalEPA’s Office of Environmental Health Hazard Assessment (OEHHA), respectively.

In 1972, Congress overhauled FIFRA to strengthen enforcement and shift its emphasis from labeling and efficacy to protection of human health and the environment. U.S. EPA was given exclusive authority over product labeling (preempting states from requiring their own label language). The law established national standards for certifying restricted-pesticide applicators. It also prohibited states from registering pesticides not registered federally. After California imposed extra data requirements as a condition of pesticide product registration, industry groups sued the state in 1980. They argued FIFRA preempted states from imposing their



The staff of the Bureau consists of the administrative, laboratory, inspection, and sampling forces, who make investigations of suspected violations of law, conduct hearings, draw and analyze official samples of, and observe and report upon, products sold to the public. Farm advisers, county agricultural commissioners, branches of the Department and the University, and other official agencies have cooperated as experts on technical problems.

— 1940 California Department of Agriculture annual report



In the 1970s, a series of laws and regulations bolstered worker protections.

own registration requirements and fees. A federal district court found in favor of the state, ruling there was no federal preemption of state registration requirements. The litigants also tried unsuccessfully to persuade Congress to amend FIFRA to prevent states from requiring data that were different from, or in addition to, data required by U.S. EPA.

In California, pesticide use enforcement and workplace safety provisions expanded in the 1970s. Federal grant money that accompanied the passage of the 1972 FIFRA amendments allowed the department to upgrade its enforcement field offices with added staff. This made possible more training and improved supervision of local pesticide enforcement by CACs. Field inspection procedures were standardized, their scope widened to include all aspects of pesticide use (with an emphasis on worker safety), recordkeeping, storage and disposal. (*For more information on enforcement, see Chapters 1 and 2.*)

Regulations adopted in the 1970s required pesticide handlers to receive safety training, that they be provided protective clothing and equipment, and mandated longer intervals before workers could reenter treated fields. California also became the first state to require handlers to use closed systems when mixing and loading certain highly toxic pesticides into application equipment. The department also established a pesticide illness reporting and investigation system still unique in the nation. (*For more information on DPR's worker safety program, see Chapter 8.*) Each year, a report is issued to the public with a summary of illness data.

In 1977, CDFA recognized the increasing importance of pesticide regulation by elevating the program to division status. From the 1920s through the 1950s, pesticide registration and regulation had been one function of the department's bureau (later division) of chemistry. When the department's chemistry laboratories were consolidated, regulation of both pesticides and fertilizers became the province of the Bureau of Agricultural Chemicals and Feed within the Division of Inspection Services. In 1977, pesticide functions were split off to CDFA's new Division of Pest Management, Environmental Protection and Worker Safety.

With the 1980s came far-reaching legislation that added authority and responsibilities to the regulatory program. CDFA's pesticide expertise encompassed multiple media (air, water, soil, and impacts on human health and wildlife), prompting a 1983 gubernatorial executive order giving the pesticide program primacy over pesticide regulation. This lead role was reinforced by the Legislature, which in passing several legislative mandates, maintained the department's primacy in pesticide safety and enforcement and in evaluating and controlling the environmental effects of pesticides.

Increasing concern about air pollution resulted in the 1983 passage of the Toxic Air Contaminant Act (Chapter 1047, AB 1807) to give state agencies clear authority to control airborne toxins. DPR evaluates pesticides in air and, in cooperation with scientific reviewers, determines potential risks. Pesticides identified as TACs are subject to extra controls. (*See Chapters 4 and 10 for more information on DPR's toxic air contaminant program.*)

In 1984, the Legislature passed the Birth Defect Prevention Act (Chapter 669, SB 950). It requires DPR to collect chronic health effects studies on all pesticides. This increased the responsibilities of the Registration Branch and led to creation of the Medical Toxicology Branch (later renamed the Human Health Assessment Branch), which evaluates toxicological data and prepares risk assessments. California has the only pesticide regulatory program in the country with a large scientific and technical staff that evaluates toxicology, environmental and other data required for pesticide registration, and that conducts comprehensive risk assessments. (*See Chapter 5 for more information on risk characterization and the Birth Defect Prevention Act.*)

The Pesticide Contamination Prevention Act (*Chapter 1298, Statutes of 1985, AB 2021*) focused on mitigating the effects of pesticides in ground water. The law

required the department to set up a database of wells sampled for pesticides, to collect data on the physical properties of pesticides that might lead to ground water contamination, and to control the use of and monitor for these pesticides. (*See Chapter 10 for more information on the ground water monitoring program.*)

The 1980s also marked the continued expansion of the department's pesticide enforcement program. Enforcement Branch staffing was increased and legislation passed to strengthen enforcement authority. AB 1614 (Chapter 943, Statutes of 1985) authorized CACs to levy direct civil penalties for violations of specified provisions relating to pesticides. Later legislation (Chapter 843, Statutes of 1989, AB 1873) gave CDFA (and, later, DPR) authority to levy civil penalties for the sale of unregistered or mislabeled pesticides, and for packing, shipping or selling of produce containing illegal pesticide residues. AB 1142 (Chapter 908, Statutes of 1988) improved the director's authority to seize and destroy a crop treated with a pesticide not registered for that crop.

In 2000, DPR was given authority to levy civil penalties up to \$5,000 per violation for serious cases resulting from high-priority investigations or multi-jurisdictional violations (Chapter 806, SB 1970). Also in 2000, CACs were given the authority to refuse, suspend or revoke restricted materials permits of individuals who ignore fines or lawful orders. In 2002, AB 947 increased the fines CACs could impose to \$5,000 per violation. In 2005, SB 391 became law, allowing DPR and CACs to impose penalties for each person exposed as a result of a violation.

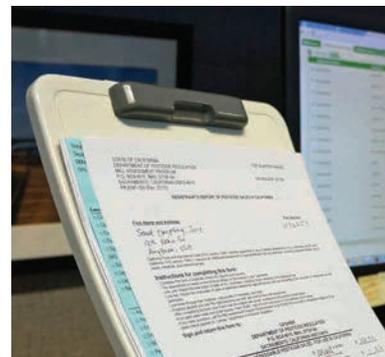
ENSURING STABLE FUNDING

A long-standing policy of CDFA was that the state's General Fund should be used for programs that directly benefited the public or agriculture in general. Programs of direct benefit to an identifiable part of industry were to be supported by special charges or fees. However, these distinctions were seldom easy to decide and quantify as programs grew in responsibility and complexity. In any case, departmental policies did not have the force of law. The governor and the Legislature determined the source and division of funding.

Pesticide and pest control legislation in the early part of the 20th century was sponsored by the regulated industry and focused on preventing fraudulent practices and unfair competition. Activities clearly related to registration and product quality were fully funded by industry fees, which were increased as necessary to keep the programs self-supporting. Public health protection became part of the regulatory program mission in 1927, when the Chemical Spray Residue Act became law and residue testing of fresh produce began. The General Fund provided all or most of the funding for this program until 2003, when the department became funded by special funds.

In 1971, the mill assessment on pesticide sales was enacted (set then at \$0.008 per dollar of pesticide sales) to help support the pesticide regulatory program. Beginning in the 1990s, the Legislature approved a series of increases in the mill assessment and, at the same time, decreased the General Fund support for the department. In the 1989-90 fiscal year, the General Fund comprised two-thirds of the regulatory program budget. By 2000-01, the percentage was reversed, with the DPR Fund funding 69 percent of program costs. Since 2003, the department's budget has been based almost entirely on fees and the mill assessment on pesticide manufacturers' sales. In 2006, the mill assessment was increased to 2.1 cents per dollar of pesticide sales (*for more on DPR's funding, see Chapter 13*).

In 1993, the Legislature passed AB 770 (Chapter 1176) to ensure that all people or businesses that were the first sellers of agricultural pesticides into California—whether a pesticide registrant, broker or dealer—pay the required assessment on their sales. Pesticide dealers already had to be licensed; the bill created a new license category for agricultural pesticide brokers, requiring them to have a DPR



DPR's programs are funded in large part by the "mill," which is an assessment paid by pesticide manufacturers based on sales.



The California Environmental Protection Agency was established in 1991. That same year, DPR was created.



license to conduct business with or within California. The law also made it illegal for anyone to buy a pesticide labeled for agricultural use except from a person licensed as a pest control dealer or broker. The 2005 passage of AB 1011 (Chapter 612) expanded broker licensing to include first sellers of nonagricultural pesticides. (*See Chapter 13 for a more detailed discussion of regulatory funding.*)

PESTICIDE REGULATION BECOMES A CALEPA DEPARTMENT

In 1991, California's environmental authority was unified in a single cabinet-level agency—the California Environmental Protection Agency (CalEPA). This brought the Air Resources Board (ARB), State Water Resources Control Board, and Integrated Waste Management Board (IWMB) under an umbrella agency with the newly created Department of Toxic Substances Control (DTSC) and Office of Environmental Health Hazard Assessment (OEHHA). As part of this reorganization, the pesticide regulation program was removed from CDFA and given departmental status as the Department of Pesticide Regulation within CalEPA. Pesticide-related statutory responsibilities and authorities were transferred to DPR. The pesticide residue laboratory remained with CDFA and local enforcement authority with CACs.

In 2009, legislation transferred the Structural Pest Control Board from the Department of Consumer Affairs (DCA) to DPR. It was transferred back to DCA in 2013, as directed under the Governor's Reorganization Plan No. 2 of 2012. The Structural Pest Control Board licenses businesses and individuals who conduct structural pest control.

CalEPA was created to improve environmental protection by coordinating multimedia issues in a single agency. DPR long had a cross-media program addressing water, air, soil and biological organisms. Other regulatory agencies have jurisdiction and authority over specific media, such as CalEPA's Air Resources Board and State Water Resources Control Board. DPR has entered into formal agreements with these and other agencies to ensure a coordinated and effective approach to pesticide regulation regardless of the media affected. Besides these written agreements, DPR engages in frequent interagency consultations. Such consultations may be program-specific. For example, in the early 1990s DPR worked with DTSC, ARB and the Integrated Waste Management Board to address proper disposal or burning of empty agricultural pesticide bags and containers.

In other instances, the consultation may be more systematic, as with DPR's Pesticide Registration and Evaluation Committee, which brings together representatives of public agencies whose activities or resources may be affected by the use of pesticides. It meets about six times a year to advise DPR on regulatory development and reform initiatives.

By the early 1990s, DPR grew into a fully functional environmental regulator, addressing mandates and needs that had been neglected or underserved. These included legislative mandates imposed in the 1980s—most notably requirements to collect and evaluate health effects and ground water data on pesticides. These mandates—the Birth Defects Prevention Act and Pesticide Contamination Prevention Act—gave DPR the authority to require the data it needed to more thoroughly evaluate the health and environmental effects of the products it registers to guide its regulatory decisions.

DPR also stepped up efforts to carry out its mandate to encourage the development of reduced risk pest management. These efforts included working with school districts across the state to implement reduced-risk pesticide programs utilizing Integrated Pest Management (IPM)—which emphasizes prevention and non-chemical controls—and, in 1998, awarding a consortium of school districts to develop a training curriculum for school IPM and a school pesticide record-keeping system. In 1994, DPR also established its IPM Innovator Award program to recognize individuals and organizations that emphasize pest prevention, favor

least-hazardous pest control, and share their successful strategies with others.

In 1997, DPR's IPM Alliance Grant Program was created to help fund projects that increase implementation and adoption of IPM practices. DPR is one of the few government agencies nationally awarding grants to help develop and demonstrate innovative pest management practices that reduce the risks associated with pesticide use.

DPR IN THE 21ST CENTURY

Since its creation, DPR has significantly strengthened its programs protecting public health and the environment, and has promoted public involvement, outreach and transparency. In addition, DPR has adopted programs to stimulate research and collaboration to develop products or practices to reduce risk in pest management.

In 2001, DPR adopted new regulations that placed restrictions on how the field fumigant methyl bromide could be used to protect both pesticide workers and those near applications. These restrictions included notifications to neighboring properties, limitation on work hours, and application methods. In 2010, additional regulations were adopted to limit the risks to both workers and bystanders from methyl bromide use that included a limit on the amount that could be used monthly in any township.

In 2005 and 2006, DPR launched major initiatives to reduce volatile organic compounds (VOCs) emitted into the air by pesticides that contribute to poor air quality (smog). DPR conducted several reevaluations of nonfumigant pesticides which resulted in pesticide makers reformulating several high-use and high-VOC contributing pesticide products and replacing them with low-VOC contributors. The next year, DPR began the process of developing and adopting regulations to limit the methods used to apply field fumigants to reduce VOC emissions. In early 2008, regulations went into effect that restricted fumigation methods in those areas of the state most impacted by poor air quality. In 2012, DPR adopted regulations to further reduce and control emissions by placing restrictions on certain nonfumigant pesticides in the San Joaquin Valley during the months when air quality is typically the worst.

Another fumigant, sulfuryl fluoride, used primarily to protect structures from termites and related insects, went through a risk assessment and reevaluation process. As a result, in 2013, measures required by regulation for some structural fumigations were made more stringent to protect workers.

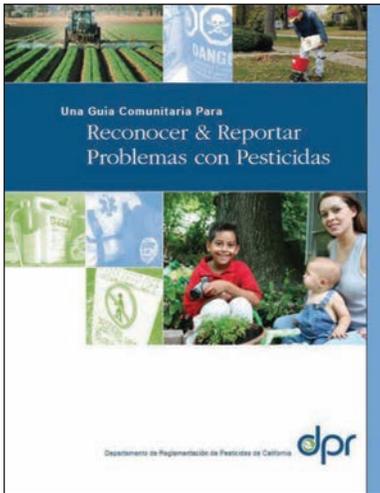
In 2015, based upon a risk assessment that provided an in-depth scientific analysis, and after a series of three community meetings, DPR developed a number of measures restricting the use of the field fumigant chloropicrin to protect the public. The measures are implemented by permit condition and labels requirements, and include increasing the buffer zone around an application, the size of the application, and time when an application can occur.

Beyond protection of human health, several actions were taken to protect the environment. In 2012, DPR adopted regulations that identified 17 pyrethroid pesticides with a high potential to contaminate surface water used in outdoor nonagricultural (structural, residential, institutional, and industrial) settings and that require users to take certain measures to minimize the potential for such contamination. In 2014, DPR passed other regulations to limit the use of certain rodenticides (second generation anticoagulant rodenticides, SGARs) that create a hazard to wildlife that prey on the rodents targeted.

In recent years, DPR has increased both outreach and regulatory efforts to protect those whose job requires them to work with pesticides. DPR employees attend workshops, training sessions, and other events that draw farmworkers,



DPR Worker Health and Safety outreach at the Mexican Consulate in Sacramento.



DPR's *A Community Guide to Recognizing & Reporting Pesticide Problems* is available online at:
www.cdpr.ca.gov/docs/dept/comguide/

In Spanish: http://www.cdpr.ca.gov/docs/dept/comguide/spanish/index_sp.htm

farmers, applicators, and others. Since 2012, to protect workers at risk of pesticide exposure, DPR has produced numerous publications, radio public service announcements, and videos addressing pesticide safety and what to do if a worker is exposed or becomes ill. In 2014, DPR created a bilingual brochure with information on licensing requirements for maintenance gardeners who apply pesticides. Learning that a license is required and qualifying for one will give these individuals information to ensure their safety and the safety of others as they use pesticides in their work. DPR, working with the U.S. EPA, also produced a video series in Spanish, Mixteca and Zapoteca on pesticide safety. The videos are used in training in both agricultural and urban outreach settings. In 2015, DPR also updated its Pesticide Safety Information Series, published in English, Spanish and Punjabi. The series provides information on safety requirements for workers.

DPR has been continuously strengthening regulations to protect persons handling pesticides and working in and about pesticide-treated areas. Regulations in 2008 specified more stringent respiratory protection and, in 2009, improved hazard communication was required. In 2015, existing regulations requiring specific types of protective equipment be used by workers using pesticides were clarified and improved, including requiring protective eyewear and gloves that meet nationally recognized standards. In the same year, additional regulations were adopted to better protect workers mixing pesticides. In 2016, DPR moved forward to align any of its regulations that did not already meet or go beyond the new federal agricultural worker protection standard by the effective date of January 2017.

Communication, access

To bring the public into the regulatory discussion, DPR has been active in communicating and working with the public on pesticide issues. In 2006, as part of CalEPA's Environmental Justice Action Plan, DPR collaborated with a community advisory group to set up a monitoring project in a rural farm community to determine pesticide levels over an extended period. The committee provided input on key elements of the project including its goals and the monitoring sites. Parlier in Fresno County was selected. Besides involving the public for the first time in planning a monitoring project, other aspects of the project broke new ground: DPR released preliminary results and evaluations as the project continued, posting interim reports online and discussing them with the local advisers at public meetings; DPR conducted pesticide air monitoring for over 12 months in a single community; and the project monitored a substantial number of pesticides—40 in all, including pesticide breakdown products. That same year, continuing its efforts to engage the public, DPR launched an automated, toll-free phone line (1-87PestLine) that gives callers their county agricultural commissioner's phone number and then offers to transfer the call.

In 2008, DPR published a 34-page *Community Guide to Recognizing and Reporting Pesticide Problems*. Topics include what to do in a pesticide emergency, a discussion of pesticide drift and odor, and a checklist to record details about a pesticide incident. After the first printing of 5,000 copies ran out, DPR printed several thousand more, including a Spanish-language version. DPR sent the guide to more than 900 community health centers, county health departments and to every public library in the state. It may be downloaded from the DPR website and free copies are available on request.

In addition, since 2012, DPR has continued to build a presence on social media to connect with the public. The department uses Facebook, LinkedIn, Twitter, and YouTube to communicate its mission and achievements and to disseminate training materials in English and Spanish. In 2014, DPR also held a series of four workshops for CACs—"Neighbors at the Edge"—to generate dialog about pesticide use concerns in areas where development abuts agricultural land.

In 2003, DPR launched the web-based California Pesticide Information Portal—CalPIP. CalPIP provides access to pesticide use data that must be reported

by agricultural and structural applicators. It allows the public to search the data pesticide, crop, and location (*see Chapter 9 for more on pesticide use reporting*). Users can then tie this knowledge to information about specific pesticide products using DPR's database of more than 13,000 registered pesticide products including the manufacturer, active ingredient, target pests, sites where the product can be applied, and certain chemical and environmental characteristics.

In 2005, DPR introduced an online tool that gives pesticide users and CACs customized information to protect California's 300-plus endangered and threatened species. The Pesticide Regulation Endangered Species Custom Real-time Internet Bulletin Engine (PRESCRIBE) allows users to check for use-limitations intended to protect sensitive species based on geographical area and pesticides of interest.

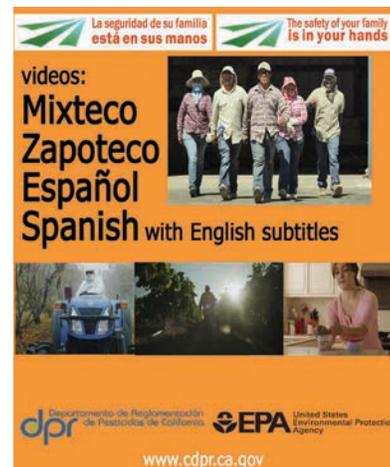
In 2009, DPR introduced a web-based search engine of DPR's database of pesticide-related illnesses and injuries. California Pesticide Illness Query (Cal-PIQ) includes illness and injury data since 1992. Users can request data based on customized variables, including year and county where the incident occurred, whether the use was in agriculture or not, and specific pesticide by toxicity category, active ingredient or intended use.

Other activities

The Healthy Schools Act of 2000 (HSA) mandated DPR to work with schools to implement integrated pest management (IPM) programs that encourage effective pest control with less risk of harm to people and the environment. The HSA required DPR to develop a model program guidebook, resource information, and training program. In 2007, amendments to the HSA expanded DPR's responsibility to include working with daycare centers. DPR actions included developing educational materials, training school district staff, and creating an extensive web-site of information oriented toward school employees. In 2010, DPR extensively updated an earlier booklet, originally created before the HSA and later improved to assist schools in implementing IPM programs. In 2013, DPR developed a Child Care IPM Video Series, with outreach materials and training. In 2014, further amendments to the HSA required any person applying pesticides at a schoolsite to be trained annually. In 2016, DPR began providing online IPM training modules for school and daycare employees, volunteers, and contractors.

DPR has embraced its role to encourage research, innovation, and collaboration to improve pest management systems that achieve acceptable levels of pest control with the least impact on people and the environment. In 2012, DPR and the California Strawberry Commission launched a three-year, \$500,000 research partnership to explore ways to grow strawberries in substances other than soil which are less pest-susceptible. That same year, DPR convened the Nonfumigant Strawberry Production Work Group—a diverse group of scientists and stakeholders—to explore the best way forward to find practical and cost-effective alternatives to soil fumigants used by strawberry growers. In April 2013, the group produced an action plan to guide future research to find production practices to maintain a viable industry without reliance on fumigants. The fiscal year 2013-14 and 2014-15 budgets allocated \$500,000 to award research grants to improve pest management systems with a focus on nonfumigant alternatives in production practices. A legislative augmentation in fiscal year 2014-15 added an additional \$600,000 annually for three years to expand the Pest Management Grant program to support research projects that develop effective alternatives to fumigants.

In 2014, DPR hosted the Soil Health Symposium that assembled experts to explore and gain a better understanding of soil ecology with the view that it could lead to advances in reduced risk practices. DPR has continued its IPM Innovator Award program (now called the IPM Achievement Award) which emphasizes sharing successful production strategies that favor least-hazardous pest control. As of 2015, 149 awards had been given out.



DPR training videos in Spanish, Mixteco and Zapoteco.

Appendix C: A History of Pesticide Regulation in California

Going forward, DPR will continue its broad focus on evaluating and regulating pesticides to protect human health and the environment. It will continue to give special attention to those who work with pesticides and to those communities where they are used. It will actively promote IPM and research to improve pest management for the benefit of all in society.

