

Air

“We are committed to reducing emissions from pesticide use because there is no acceptable alternative to providing clean air for all Californians.”

PAUL GOSSELIN
DPR CHIEF DEPUTY DIRECTOR

Protecting the air we breathe is one of DPR's highest priorities. We focus not only on preventing health problems that can be caused by pesticide air toxins, but also on reducing pesticide emissions that contribute to air pollution. Many active as well as inert ingredients in pesticide products are volatile organic compounds (VOCs) that contribute to forming ground-level ozone, a major air pollutant in California. (See box, page 24, “What is a VOC?”)

DPR tracks VOC emissions from agricultural and structural pesticide products, and implements measures to reduce them. (Reducing VOC emissions from consumer products is the role of the Air Resources Board.) DPR produces an annual inventory estimating pesticide VOC emissions. To make it more accurate, in 2005 DPR required registrants (companies that make pesticides) to develop data on the VOC content of nearly 800 products. In 2006, DPR moved to cancel nearly 100 products whose registrants failed to provide the data. Most manufacturers responded by sending the information, and others withdrew their products from the market.

DPR used the data to estimate pesticide VOC emissions for 2004. This emission inventory (completed in 2006) showed trends similar to previous years, with

DPR achieving required reductions in pesticide emissions in two of the five geographic areas of concern. In the three remaining areas (San Joaquin Valley, Southeast Desert, Ventura), fumigants and emulsifiable concentrates are the major pesticide VOC sources.

AIR QUALITY INITIATIVE

Moving to set a national benchmark for controlling pesticides in air, DPR in 2006 launched a major initiative to improve California's air quality.

Our goal is twofold: reduce air toxins and smog-producing emissions from pesticides.

Thousands of different pesticide products are used at farms, homes and businesses throughout the state, so the challenge of developing control strategies for pesticides in air is formidable.

California has a head start over the rest of the country. Other states are just beginning to identify the pesticide products that contribute most to air quality problems. In collaboration with the ARB, DPR finished that work years ago. We are now taking on the harder task of reducing those emissions without unnecessary hardship to the industries that rely on the chemicals.

The job is difficult, challenging, and turning my hair gray, but I enjoy it because I work with great scientists and great friends.

RANDY SEGAWA



Randy Segawa

Environmental Monitoring Branch

Randy, like many DPR employees, has been with the Department almost all his professional career (in Randy's case, 26 years). He supervises our air and ground water programs, with a focus on monitoring and mitigation of health and environmental impacts. These programs provide scientific support for key DPR regulatory areas, including fumigants, drift, environmental justice, and pesticides in drinking water. Randy leads a DPR team developing regulations to reduce volatile organic compounds from fumigants and was project manager for DPR's Environmental Justice Project in the Fresno County community of Parlier.

DPR's air quality initiative focuses on:

- Reformulating high-emission products.
- Reducing fumigant emissions.
- Developing strategic pest management partnerships.
- Promoting cleaner technologies.

REFORMULATING HIGH-EMISSION PRODUCTS

In non-fumigant pesticides, solvents used to formulate the product are the primary source of VOCs. In 2005, DPR required registrants to present plans to reformulate more than 700 non-fumigant products (chiefly emulsifiable concentrates) that contain VOC solvents. These liquid products contribute about 35 percent of the pesticide VOCs in the San Joaquin Valley. By mid-2007, DPR expects to have completed its VOC reformulation review and start the regulatory clock on removing any remaining high-VOC products from the market.

REGULATIONS TO REDUCE FUMIGANT EMISSIONS

Fumigant pesticides (like methyl bromide and metam-sodium) are applied to or injected into soil. These

gaseous compounds represent about one-fourth of the pounds of pesticides used in agriculture and contribute more than half of the VOCs emitted by pesticide applications.

Fumigant pesticides cannot be reformulated to reduce VOCs because the gaseous active ingredient is itself the volatile compound. So the focus is on reducing how often or how much is applied, or requiring low-emission application methods. By the end of 2007, DPR will put into effect regulations more strictly controlling fumigant use, strengthening what are already the toughest fumigant rules in the country.

STRATEGIC PARTNERSHIPS WITH INDUSTRY

Many California agricultural organizations are already working to reduce VOC emissions. DPR is working with these and other progressive industry groups to develop alternatives to problematic pesticides.

For example, the California Fresh Carrot Advisory Board is funding research aimed at reducing fumigant use. Fumigants protect carrots from damaging diseases and nematodes. Research targets include alternative fumigation methods and carrot varieties resistant to disease and nematodes.

Another industry leader is the California Strawberry Commission, recognized by U.S. EPA for funding more than \$10 million in research on reducing methyl bromide emissions and use, more than any other agricultural group in the world. The Commission has shared research results internationally with other industries.

CLEANER TECHNOLOGIES

In precision agriculture, information management tools and other new technologies are used to assess and understand variations within a planted field. Farming practices can then be adjusted to take into account the real needs of the crop. DPR is promoting these new, environmental friendly technologies, such as:

- Equipment designed to improve application efficiency and reduce waste.
- Variable-rate technologies that adjust the rate of application according to variations in field conditions.
- Remote sensing and mapping technologies that can reduce pesticide use by guiding variable-rate application.

For example, in 2006, DPR helped fund use of several target-sensing “smart sprayers” that turn off application nozzles between plants. With guidance from university scientists, this technology is being used to find the best way to use it to reduce VOC emissions, drift, and pesticide use.

Another VOC research project, led by the University of California with added resources from DPR, the U.S. Department of Agriculture (USDA) and the Strawberry Commission, is focusing on how fumigation methods can be modified to reduce VOC emissions. DPR also provides technical advice and oversight for several VOC research projects being funded by the ARB and USDA.

DPR is funding research into insecticides with low-VOC potential. For example, UC Kearney Agricultural Center is evaluating the effectiveness of about 75 alternative pesticides in cotton, alfalfa and dry beans.

In May 2007, DPR and other organizations sponsored a pesticide VOC research symposium to coordinate research activities and discuss research needs. Topics included emission inventory research, reducing emissions

from fumigants and from emulsifiable concentrates, pest management practices and technology that reduces VOC emissions, and economics.

REDUCING AIR TOXINS

Under the Toxic Air Contaminant (TAC) program, DPR evaluates pesticides in air and, in cooperation with scientific reviewers, determines potential risks. If we identify a pesticide as a TAC, we work with air districts and others to decide if stricter use controls are needed.

In 2005, DPR completed a risk assessment for the insecticide methidathion. The TAC Scientific Review Panel approved the methidathion document in early 2007, and DPR is listing methidathion as a toxic air contaminant. In 2006, DPR completed the risk assessment for the fumigant sulfuryl fluoride and in May 2007, we listed it as a toxic air contaminant. Next we will be evaluating the need for added controls.

The ARB conducts pesticide monitoring to help DPR evaluate potential TACs. The monitoring also helps determine the need for or effectiveness of measures to reduce potential risks posed by these pesticides. In 2005 and 2006, the ARB monitored for acro-

WHAT IS A VOC?

VOCs, or volatile organic compounds, contribute to the formation of smog. VOCs come from various sources, including vehicle emissions. Many pesticide active and inert ingredients are VOCs. The federal Clean Air Act requires California to track and reduce VOCs by specified amounts in areas of the state with the dirtiest air, including the San Joaquin Valley.

lein, 1,3-dichloropropene, and methyl bromide and, in 2006, for sodium tetrathiocarbonate. Results will help us decide if we should continue with the next steps in evaluating and controlling them as toxic air contaminants.

ADDED CONTROLS FOR MITC

In 2006, DPR began developing risk reduction measures for methyl isothiocyanate (MITC), already listed as a TAC. MITC is a breakdown product of several pesticides used to fumigate soil before planting of crops. The most widely used compounds are metam-sodium and metam-potassium.

MITC can pose a significant health hazard and has caused several illness incidents. DPR worked with other agencies to develop new ways to reduce risks from short-term exposures that might occur near applications with pesticides that emit MITC. DPR is holding workshops in mid-2007 to get public comment to help fine-tune the restrictions.

DPR plans statewide regulations for MITC-generating pesticides in 2008. But to get control measures in place by fall 2007, DPR will issue them first as permit conditions. MITC-generating

pesticides are restricted materials and require a permit from the County Agricultural Commissioner (CAC) before they can be used. For certain restricted materials, DPR develops control measures that CACs can add to permits. DPR will send suggested MITC permit conditions to CACs for permits that will be issued for the fall and winter of 2007. The new controls will focus on the most widely used application methods.

COMMUNITY AIR MONITORING

In more than two decades of air monitoring, DPR had never concentrated its resources on sampling for many pesticides, in a single community, for a year. We did that in 2006 with a pilot project in Parlier, a farming community southeast of Fresno. Our full report, to be released by early 2008, will detail the findings and risk evaluation. Key points:

- With the ARB, DPR monitored 40 pesticides and breakdown products over 12 months. DPR took samples at three sites, three days a week. The ARB monitored every six days at one site. All monitoring was at Parlier schools.

- Of the 23 pesticides or breakdown products detected, 17 are assumed to be present because of their use as pesticides. (Some chemicals used as pesticides also have major non-pesticidal sources, such as vehicle exhaust.)
- DPR used screening levels to assist in preliminary review of detections. Only the insecticide diazinon exceeded its screening level.
- Chlorpyrifos was detected in many samples. None was above the screening level.
- Because of the findings, DPR added diazinon to its list of pesticides given high priority for risk assessment. In addition, chlorpyrifos, already undergoing risk assessment, was placed on a more accelerated track.
- No pesticides were detected over the subchronic screening levels. Several pesticides were detected multiple days at multiple sites.

DPR is evaluating the feasibility of conducting more projects of this type or setting up a monitoring network in communities throughout the Central Valley.

