

FEATURE ARTICLE



PESTICIDE DRIFT CONTINUES UNABATED IN CALIFORNIA REGULATORS OFFER INADEQUATE SOLUTIONS

By Susan Kegley, Margaret Reeves & Anne Katten

LUCY HUIZAR'S CHILDREN WERE playing soccer outside one evening in Earlimart, California in November 1999, when an acrid, rotten-egg smell filtered into her house. After calling her children inside, she noticed the smell getting worse. She felt nauseous and her eyes were stinging. Her son Jaime was having trouble breathing. A sheriff knocked at the door and told them to evacuate the neighborhood. A local potato grower was fumigating his 160-acre potato field with metam sodium, and something had gone horribly wrong. A cloud of pesticide fumes was wafting over an entire neighborhood in this Central Valley farming town.

One hundred and fifty people were forced out of their homes. Fire fighters

decontaminated the affected residents by forcing them to strip naked in public and hosing them down with water. Thirty people went to the local hospital emergency room, but many more did not go because they could not afford it. Almost two years later, many of the people exposed to the toxic cloud still have problems breathing.

This incident is indicative of one of the most significant problems with pesticides; the chemicals do not stay where they are applied. Spray droplets are blown downwind during applications, chemicals evaporate off of leaf and soil surfaces and drift away in the breeze, and even pesticide-coated soil particles create toxic dust clouds. Nearly every pesticide application results in some amount of drift, and under certain wind and temperature conditions, up to 80% of the applied pesticide never reaches the target crop.¹

AGRICULTURAL COMMUNITIES MOST AFFECTED

Approximately 80% of all pesticides used in California are used in agriculture.² The off-site movement of agricultural pesticides causes economic damage to both organic and conventional farms and affects farm workers and other community members.

Farm workers are frequently at risk from pesticide poisonings caused by drift. While it is illegal to spray a field while workers are

present, there is no such prohibition against spraying fields adjacent to one with workers present. In addition, farm workers often live on or near farms sprayed with pesticides. Not only are homes subject to spray drift, but when pesticides drift inside, they tend to persist longer because they are not degraded by the sun, water and soil organisms. Pesticides in the home cause additional risks to women (who have the primary responsibility for house cleaning) and for young children who have greater contact with household dust when they crawl on the floor and put things in their mouths.³ Furthermore, pesticide drift and residues from contaminated soil tracked

into homes often adds additional pesticide burden to that already brought in on contaminated clothing or shoes.

Between 1991 and 1996 California's Department of Pesticide Regulation (DPR) reported nearly

4,000 cases of agricultural pesticide poisoning. Approximately 44% of those cases were caused by drift.⁴ Drift exposures were reported for both individuals as well as for groups of workers.⁵

Organic farmers face a particularly difficult situation when toxic pesticides drift onto their land. To become a certified organic farm in California requires three years during which non-approved pesticides cannot be applied to the land. Rigorous inspections are conducted to ensure compliance and certification can be denied if use of non-approved pesticides is detected. When pesticides drift onto organic farms, farmers may be required to have their produce checked by a laboratory. If residues exceed 5% of the allowable level, the crops cannot be labeled organic.

In addition to exposure of agricultural workers and their families, drift exposure occurs in areas where population growth is rapid, and new housing developments are built next to farmlands. Ventura County in southern California is one such location. Many urban Los Angeles residents seeking respite from the city have moved to bucolic Ventura County, home to lemon groves and strawberry fields.

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Grocery Chain Trader Joe's Drops Gene-Altered Food

A year-long campaign to push Trader Joe's to drop its use of genetically engineered (GE) ingredients in its store brand products ended November 14th, 2001 as the mainstream grocery chain announced it would do just that, "effective immediately." According to the company statement, "...we will work with any new vendor to produce private label products for Trader Joe's without genetically engineered ingredients. Our goal for existing private label products is to have all such products reformulated, if necessary, and certified within one year." Eighty-five percent of the products sold at Trader Joe's stores will be affected by this policy change as they carry the company name brand. The company says the change is the result of "talking with our customers," and finding that "it is clear...that if given the opportunity, the majority of our customers would prefer to have products made without genetically engineered ingredients." During an exit strategy discussion with a Greenpeace representative, a Trader Joe's spokesperson acknowledged that 90 to 95 percent of customers said they wanted the chain to stop using genetically engineered ingredients.

Source: Greenpeace

Lynda Uvari and her family moved to Ventura in 1991. She was first charmed by the landscape. Then she started getting sick frequently and noticed foul smells and helicopters, tractors and airplanes spraying week after week. She worried about sending her children to a school that is located across from a lemon grove. Several of the county's schools are surrounded on three sides by strawberry fields, a crop with intensive pesticide use. Complaints by neighbors went unheeded by the County Agricultural Commissioner, until one day last November, a cloud of chlorpyrifos (Lorsban), an organophosphorus insecticide, drifted onto the school grounds from a lemon orchard across the street. Dozens of students and teachers complained of dizziness, headaches and nausea following the early Wednesday morning application of the insecticide. The grower made a second application on Saturday that also drifted on the school. Various samples taken throughout the campus proved positive for organophosphates, including the kindergarten room (located only 45 feet from the lemon grove) and desks and play areas that are hundreds of yards from the grove. Ironically, just a few weeks earlier, the US Environmental Protection Agency announced a ban on most household uses of chlorpyrifos (Lorsban) because of long-term risks to children.⁶

Ecosystems suffer as well, as several studies in California have shown. Valerie Connor, a scientist at the California State Water Quality Control Board measured the concentration of diazinon, an organophosphorus insecticide, in rainwater during the winter season when dormant orchards are sprayed in California. She found levels of the pesticide that exceeded the lethal dose for *Daphnia*, a small invertebrate used to test the toxicity of natural waters. The same pesticide was found in high concentrations in frogs in the Sierra Nevada Mountains 50 miles from agricultural areas, and has been linked to the decline in their numbers.⁷

SOIL FUMIGANTS POSE THE GREATEST RISK

In California, the fumigant pesticides are particularly problematic because of the large amounts used in growing the spe-

cialty fruits, nuts, and vegetables the state is famous for. Fumigants are typically injected into the soil or applied with irrigation water in a "chemigation" process, the method the Earlimart potato farmer was using when residents of the town were poisoned. These pesticides are most prone to drift because they are gases or form gases on contact with the soil. As such, these pesticides travel freely wherever the wind blows. They are also used at very high application rates, 100–400 pounds per acre, much higher than the more typical application rates of many pesticides of one to five pounds per acre.

The most widely used fumigant pesticides in California agriculture are metam sodium, methyl bromide, Telone (1,3-dichloropropene), chloropicrin and sodium tetrathio-carbonate. In urban structural fumigations, sulfuryl fluoride and, less frequently, methyl bromide are used. Because methyl bromide is also an ozone-depleting chemical, it is scheduled for worldwide phase-out in 2015 under the Montreal Protocol. Unfortunately, the fumigant pesticides are also among the most toxic and are categorized as highly acutely toxic (U.S. EPA Category I), neurotoxins, reproductive or developmental toxicants, and/or carcinogenic.

Methyl bromide has been the source of many farmer/neighbor conflicts in California over the last 15 years. The Environmental Working Group published a study in 2000 showing the location of schools relative to methyl bromide applications.⁸ The report listed 455 public schools within a mile and a half of fields treated with at least 100 pounds of methyl bromide. Ventura County, where Lynda Uvari lives,

is a methyl bromide hot spot, with over two million pounds of methyl bromide applied in a 100 square mile area in 1999.

After many years of delay, the California DPR has finally started to conduct air monitoring for methyl bromide. The results are sobering. Two regions of the state were sampled for methyl bromide concentrations in the air. Levels of the fumigant exceeded the state's own long-term (sub-chronic) exposure limit of 1 ppb (parts per billion) over eight weeks for children, and 2 ppb over eight weeks for adults at five of the 12 monitoring stations.

With real data finally in hand, DPR now had the ammunition it needed to severely restrict use of this highly toxic chemical. The state initially pledged to have additional controls in place by summer 2001 and conducted an analysis to correlate methyl bromide use with air monitoring results. This analysis showed that in order to keep exposures below the sub-chronic exposure limit, no more than 20,000 pounds per month should be

applied in any given township (a 36 square mile area). Then DPR suddenly reversed course, stated that limiting monthly use was unworkable and that they would wait and see whether a new set of regulations



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(passed in early 2001) would be effective in reducing levels of methyl bromide in air. Unfortunately, since these new rules were never designed to address long-term exposures, it is questionable whether this approach will be effective in protecting human health.

URBAN COMMUNITIES ALSO AT RISK

Pesticide drift is not solely a problem related to agricultural pesticide applications. Many urban residents are exposed when neighbors apply pesticides to their homes and yards, yet regulators are often loathe to interfere. Steve Tvedten, of Get Set Non-Toxic Pest Control observes, "If one were to spray purple paint all over the sidewalks and neighbor's fences, there would be a police action against you. Toxic chemicals are unseen but do more damage than paint and no one says a thing."

Samantha McCarthy, an attorney who founded Better Urban Green Strategies (BUGS) in Davis, California, lives in a suburban neighborhood in Davis and has been trying to protect her family from exposure to pesticides. This is a difficult task, considering that many of her neighbors have monthly contracts with exterminators to spray their homes and yards. When she sees the exterminator's truck, Samantha keeps a close eye on the activity and has frequently documented violations of pesticide regulations. Unfortunately, her requests to applicators and neighbors to avoid spraying on windy days and to eliminate spraying of fencelines typically go unheeded. Even though her local County Agricultural Commissioner's office is very responsive to her calls, few fines have been issued for violations.

In early July of this year, Samantha had had enough. She videotaped the next pest control application to a home in her neighborhood. The applicator sprayed the neighbor's fence and even the public sidewalk, with the pressure propelling a cloud of spray mist into the neighbor's yard. Even the local County Agricultural Commissioner's office was appalled at the flagrant violations of safety protocols documented in the video. And yet, this application was

not the worst Samantha had observed, merely an average one.

The members of BUGS and several other communities in California are now working for neighbor notification requirements similar to those mandated by a New York state law passed in 2000. The experience of Fairfax, a small town in northern California, gives some indication of what California communities might be up against if they wish to enact neighbor notification ordinances. Fairfax passed such an ordinance in March, 2000, but was immediately confronted with a letter from Paul Helliker, Director of the Department of Pesticide Regulation, calling for the town to repeal the ordinance within 60 days or face action by the state attorney general.



DPR said that California's existing pesticide regulations do not permit communities to regulate pesticide use, only the state. The attorney who crafted the legislation, Frank Egger, disagrees. He said the ordinance was carefully written to ensure it did not violate the state code. The town council members announced their intention to defend the ordinance.

PRESENT REGULATIONS DO NOT PROTECT PUBLIC HEALTH

The public typically thinks that government regulations are sufficient to protect them and their families from health hazards associated with pesticide drift. However, protection strategies based on risk assessment (the current method of regulating pesticides in the U.S.) can only be implemented if we know something about: 1.) the health effects caused by the pesticide when it is inhaled, and 2.) the typical concentrations people might be exposed to when the pesticide is used.

A cursory glance at the available data shows some gaping holes in both toxicity information and knowledge of exposure levels under actual conditions of use. Most toxicity testing is conducted by feeding the pesticide to test animals and observing the effects. Very little data are available on toxicity by inhalation, an exposure pathway that bypasses the digestive system's powerful enzymes that help break down pesticides before they are circulated to all parts of the body. Even less information is available on the typical concentrations of pesticides in air during and after applications. Air monitoring is expensive and can only be done by trained professionals with the proper equipment. Over the last 15 years, California's Air Resources Board (acting under the Toxic Air Contaminant Act) has collected pesticide monitoring data on only about 40 pesticides. With over 900 registered pesticide active ingredients in use in California, it will be a long time before the data gaps are filled. In the meantime, we are on uncharted ground with almost no knowledge of actual exposures.

In spite of these gaps in our understanding, laws and regulations are promulgated and defended as if we had complete knowledge. Alternatively, they are written in vague enough language that such information appears unnecessary. Current California regulations only direct applicators to use "reasonable care" to prevent drift from contaminating fieldworkers and other bystanders or damaging nearby property. Specific safeguards such as buffer zones are not employed except in the case of a few pesticides. Federal Worker Protection Standard regulations prohibit contamination of workers not involved in an application but do not specify any buffer zones. Air monitoring and use of specific numerical toxicity standards for comparison, as for the methyl bromide case mentioned above, is a relatively new approach that has only been used for a few pesticides. While this method has potential for reducing drift, it is expensive and is not yet included as a routine technique for regulating drift.

In the spring of 2001, California began holding public meetings to propose and discuss new drift regulations. Unfortunately, the state's initial approach focuses

on details such as droplet size, nozzle angles, minimum and maximum allowable wind speeds and other technical specifications, most of which would be extremely difficult to enforce. Even if they could be enforced, such restrictions are unlikely to result in much reduction in drift. The proposed regulations also only apply to liquid spray pesticides, and only to drift that occurs during the actual application, thereby limiting any exposure reduction potential even further.

THE IMMEDIATE SOLUTION: BETTER DRIFT REGULATIONS

The most obvious and effective means of preventing drift is to ban the use of the most drift-prone spray technologies (such as aerial applications) and the most highly toxic pesticides—nerve toxins, acute toxins, carcinogens, reproductive or developmental toxins, endocrine disruptors, and known drinking water contaminants, and reduce the use of all toxic pesticides.

However, until the most toxic pesticides are banned, there are several key strategies that are necessary to create drift regulations that better protect public health and the environment:

- The focus should be on the fumigant pesticides as the highest priority for regulatory action.
- Reductions in pesticide use should be the first strategy considered to reduce drift, with emphasis on the highest toxicity pesticides.
- Regulations should be designed to be easily enforceable and should prevent all off-site movement of pesticides. The goal of these regulations should be to protect all people, including the most sensitive populations (such as asthmatic children) and most sensitive sites (such as organic crops) from damage to their economic health and well-being.
- Generous buffer zones should be used in both rural and urban settings to protect workers in adjacent fields and in labor camps, neighboring organic farms, and residents of neighboring homes, apartments, schools, etc. within a specified radius of the spray area.

- Regulations should be designed to take into account the fact that humans make mistakes and do not always follow the laws, and that equipment is not always calibrated correctly.
- Notification of all people likely to be impacted by pesticide applications in both agricultural and urban settings should be required, and bans on the spraying of property lines and fences should be implemented.

THE ULTIMATE SOLUTION

A safer, long-term solution would be implementation of widespread state-supported efforts to help farmers and urban residents adopt more sustainable pest-control methods. In urban settings, this means providing education in least-toxic integrated pest management techniques for residents and prohibiting the use of toxic pesticides in these settings. In agriculture, the use of fumigants should be banned altogether and only a few least-toxic pesticides should be permitted. Organic farmers have successfully used such methods for years in California and around the world. Unfortunately, the state has been slow to recognize these innovations and provide the research and outreach support needed to help additional farmers adopt sustainable farming methods. Instead, agricultural outreach continues to focus on promotion of conventional, chemical-intensive farming methods.⁹ So, when one dangerous pesticide (like methyl bromide) is finally banned or severely restricted, farmers generally choose to replace it with another toxic chemical (like metam sodium or Telone). Alternatively, in places like Ventura County where a housing development project will pay exorbitant prices for an acre of prime farmland, some farmers are simply choosing to sell their land.

In support of farmers around the state, Pesticide Action Network North America (PANNA) is working with a coalition of sustainable agriculture groups to ensure government funding for research and education in sustainable agriculture. Last year, this coalition succeeded in passing new state legislation that will direct resources to

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California Pesticide Use Declines for Second Year in a Row

NEW PESTICIDE USE REPORTING DATA for 2000 released by the California Department of Pesticide Regulation (DPR), shows a substantial decrease in many categories of reported pesticide use. Pesticide dependency continues to be a serious problem in California, with 22.9 million pounds of carcinogenic pesticides used across the state in 2000, or about three-quarters of a pound per Californian.

There has been a continuing decrease in use of cholinesterase-inhibiting pesticides, a category of nerve toxins. Two main factors are responsible for this decline.

First, implementation of the U.S. Food Quality Protection Act has removed some of these pesticides from use. Many growers are actively looking for less hazardous alternatives. Second, concerns over surface water contamination have brought government and various groups together to find ways to control pests that do not require neurotoxic pesticides.


Some pesticide use is increasing. Regulatory action to control exposures is weak or missing altogether. Groundwater contaminating pesticides increased, as did the number of acres treated. Proposed regulations exist that would create Ground Water Protection Areas across the state, yet after two years of waiting DPR has not taken any action to finalize these regulations.

Use of fumigants also remains a problem. The high toxicity of these drifting gaseous pesticides combined with their very high application rates (100–400 lbs./acre) make these pesticides among the most hazardous used in California. Soil fumigants metam sodium and methyl bromide declined substantially—by 4 million pounds and 5 million pounds, respectively. Methyl bromide use is the lowest it has been since full pesticide use reporting began in 1990; however, only the complete ban now scheduled for 2005 can fully protect Californians from the toxic fumigant.

Increased use of substitute fumigant pesticides—including Telone (1,3-dichloropropene), chloropicrin, and metam potassium—suggests that some growers are reaching for equally hazardous replacement chemicals rather than developing more sustainable and less toxic alternatives.

Sources: PANNA, Californians for Pesticide Reform, DPR

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these activities once funding is available. The coalition is now working with state government and University of California officials to assure the necessary funding to support this Biological Agriculture Initiative. At the same time, PANNA continues to help build marketing alternatives and consumer support for environmentally sound and socially just sustainable agriculture throughout the state and nationally. 

NOTES

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All photos USDA



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Organic Gem is a cold processed, enzymatically digested fresh fish fertilizer produced from the pacific dogfish at our plant in Delta, B.C. When applied to the soil, OG performs as a natural bio-stimulant, with the enzymes biologically unlocking nutrients contained in the soil. Because the natural oils and collagens have not been removed, our fertilizer does not leech out into the local water table, but remains in the soil providing a time-release effect. In addition to being a root-feeder, OG is suitable as a foliar spray and compost starter.

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