

Pyrethroids in Central Valley stream sediments toxic to bottom-dwellers

Recent evidence shows that pyrethroids, used increasingly as substitutes for organophosphate insecticides (see page 11), accumulate in creek sediments in some locations at levels toxic to freshwater bottom dwellers.

Except in the immediate vicinity of their application, pyrethroids have been considered safe for fish and other organisms that live in the water, but their effect on sediment-dwelling organisms has not been studied, says UC Berkeley biologist Donald Weston.

Weston and colleagues collected 71 sediment samples from rivers, creeks, sloughs and drainage ditches in the Central Valley and exposed amphipods and midge larvae to the sediments. These two organisms are used by the U.S. Environmental Protection Agency (EPA) as indicators of the health of freshwater sediment. Of the sediment samples, 20% killed amphipods at an elevated rate relative to controls and had concentrations of pyrethroids high enough to explain the deaths. The study appeared in the journal *Environmental Science & Technology* in May (Vol. 38, No. 10).

"We have no data on the effects of the pyrethroids on resident species," Weston says. "Such effects are very difficult to show, although that is an area in which we are working. However, the test species we used are nationally recognized surrogates for resident aquatic life, and their mortality indicates effect on the resident organisms should be considered."

Pyrethroid use in California has risen due to increased regulation of organophosphates, which pose health threats to workers and cause toxic runoff. Agricultural pyrethroid use in California jumped 25% from 1999 to 2002, although, according to Weston, the increase is only half the picture since it does not take into account the fact that growers are gradually switching to pyrethroids with greater toxicity. About 500,000 pounds of pyrethroids were used in 2002 for nonagricultural uses such as structural and pest control, and landscape maintenance, while more than 250,000 pounds were applied to California farm fields on crops such as cotton, fruit and nut orchards, lettuce, alfalfa and rice.

Despite this increased use, environmental monitoring tends to focus on water sampling, under the assumption that sediment-bound chemicals like pyrethroids are unavailable. The current study shows that is likely to be untrue.

Weston advocates best management practices to reduce the aquatic impacts of pyrethroids. For instance, practices that reduce soil erosion would greatly reduce the offsite transport of pyrethroids. "In this case, the interests of environmentalists and farmers are the same," he says. — Editors



Donald Weston/UC Berkeley

A pipe discharges field runoff into Orestimba Creek near Modesto. Sediment from this creek was found to be toxic to shrimplike bottom-dwellers called amphipods, most likely because of high levels of pyrethroids.

State announces new methyl bromide use rules; phase-out delayed

In late November 2004, the California Department of Pesticide Regulation (DPR) announced new regulations limiting the levels of methyl bromide that may remain in the air for several weeks, the first such subchronic "seasonal exposure" rules in the nation. The rules impose buffer zones and advance notification for field fumigations, as well as other restrictions (see page 41).

Methyl bromide — a toxic fumigant injected into the soil to kill insects, weeds and diseases — is used widely by American tomato and strawberry farmers, as well as in food processing and storage.

The new regulations give the DPR and county agricultural commissioners the authority to ensure that ambient air concentrations of methyl bromide do not exceed an average daily nonoccupational exposure of 9 parts per billion (ppb) in a calendar month. In 2001, DPR implemented regulations limiting short-term (24-hour) exposures to methyl bromide in the air to no more than 210 ppb. While maintaining that short-term standard, the seasonal (4-to-8-week) standard of 9 ppb addresses average daily exposures for children or other individuals deemed most sensitive.

DPR pesticide-use reports show that methyl bromide applications in California have fallen from more than 15 million pounds in 1999 to 6.5 million pounds in 2002. Factors contributing to the decline include DPR restrictions, research on less-toxic alternatives, and reductions mandated by the federal Clean Air Act and the Montreal Protocol, a global treaty regulating ozone-depleting substances that is gradually phasing out most uses of methyl bromide.

Also in late November, Montreal Protocol negotiators meeting in Prague extended the United States' "critical use" exemption for methyl bromide for 1 year, but said the country must cut its use in 2006. (The Bush administration had secured the exemption on the grounds that viable alternatives to methyl bromide are lacking.) The exemption amounts to a 2.5% increase in allowed usage for 2005, most of which will



◀ On Nov. 2, voters in Marin County, left, approved a measure banning the planting of genetically modified crops. Similar measures in three other counties failed.

go to California strawberry growers.

"The national adjustment announced for methyl bromide use does not affect California restrictions on the fumigant, which are the toughest in the nation," DPR spokesperson Glenn Brank says. "We do not expect any significant increases in use given DPR's limitations on methyl bromide."

For more information, go to: www.cdpr.ca.gov/docs/legbills/recntadop.htm (DPR) or <http://www.undp.org/seed/eap/montreal/> (Montreal Protocol) — Editors

Three of four county anti-GMO measures fail

Measures on the November 2004 ballot to ban the growing of genetically engineered crops failed in three of four California counties, most notably Butte, a major rice-growing area that was seen as an important test case (see "California voters assess anti-GMO initiatives," October-December 2004, page 182). While opponents are claiming victory, supporters are downplaying the outcome as a short-term setback.

"It could go either way," says UC Cooperative Extension biotechnology specialist Peggy Lemaux. "It's too early to tell, we'll have to see what happens in the coming year."

Butte County's measure lost 61% to 39%, San Luis Obispo's lost 59% to 41%, and Humboldt's lost 72% to 28%. In contrast, Marin County's measure passed 61% to 39%, making it the third California county along with Mendocino and Trinity to ban genetically modified organisms (GMOs).

Mendocino County set a precedent in March 2004 by becoming the first county nationwide to pass an anti-GMO measure. However, this was seen as largely symbolic because, unlike Butte County, Mendocino County is not a major agricultural area. Furthermore, while the opponents of Mendocino County's measure were funded largely by the biotech industry, the opponents of Butte County's

measure were funded largely by farming interests. "People in the county were deciding their own fate, not being influenced by industry outside the county," Lemaux says.

Anti-GMO supporters say they will try again in San Luis Obispo and Humboldt counties. According to published news reports, in Humboldt County supporters ended up opposing the November measure due to flaws in the wording. As in Mendocino County, the authors of Humboldt County's measure made the mistake of defining DNA as a protein. Moreover, the Humboldt measure could have been interpreted as violating both the state and federal constitutions by, for example, denying offenders the right to a jury trial, according to Humboldt County district attorney Paul Gallegos (in a Sept. 8, 2004, *Eureka Reporter* article).

Although the Humboldt County measure failed, one of the cities in this county has already jumped into the mix. On Nov. 17, 2004, Arcata's city council unanimously voted to adopt an anti-GMO ordinance, making it the only city in California with such a ban.

In addition, anti-GMO measures are in the works in 12 more counties in the state, according to an assessment on the UC DANR Statewide Biotechnology Workgroup Web site (based on information from the Organic Consumers Association Web site). They are Alameda, Lake, Napa, Nevada, Placer, Sacramento, San Francisco, Santa Barbara, Santa Cruz, Solano, Sonoma and Yolo. Of these, only Sonoma County is likely to have an anti-GMO measure on the ballot by spring 2005, and this will be a special election that has not yet been scheduled, says Ryan Zinn, national campaigns coordinator of the San Francisco-based Organic Consumers Association, which is spearheading the anti-GMO movement in California and elsewhere in the country.

"The overall strategy in California will likely not change, at least in the near term," Zinn says. "Down the road, we will likely set our sights on statewide legislation. But we are several years away."

In contrast, on Nov. 30, the Fresno County Board of Supervisors passed a resolution supporting the use of biotechnology in agriculture. Fresno is one of nine Central Valley counties where significant amounts of genetically engineered crops are grown, particularly cotton. The resolution was passed at the request of the Fresno County Farm Bureau and concludes with the statement: "The County of Fresno will make every effort to preserve the choice of using biotechnology in its county and encourage the establishment of a state or national biotechnology policy." — Robin Meadows