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Pyrethroids get more scrutiny

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FRESNO – New research concludes that pyrethroid pesticides, which previously have been shown to injure aquatic life, need more scrutiny based on the compounds' ability to concentrate in mud and other sediment.

University of California-Berkeley researchers conducted a study to determine the harmful effects of this class of pesticides on aquatic organisms. They found that the trend toward using newer compounds can be more toxic to aquatic life, the study in the April issue of *Environmental Toxicology and Chemistry* said.

In California, 360 metric tons of pyrethroid pesticides are used annually, as growers moved from organophosphate compounds which have undergone closer regulation from state and federal officials.

In Clovis, Perry Klassen, executive director of the Coalition for Urban-Renewal Environmental Stewardship, noted that pesticide manufacturers have recently joined with state water officials to provide more farmer education for pyrethroids.

The program is jointly sponsored by Bayer CropScience and Syngenta Crop Protection, said Klassen.

The group is working on grower publications outlining Best Management Practices for the products, said Klassen, whose group is funded by industry. The first publication, for orchards, has been finished, and a second one for field and row crops is being prepared, he added.

Funding will also add pyrethroids to BMP runoff studies for diazinon and chlorpyrifos

in the Sacramento and San Joaquin valleys, according to CURES.

Farm use of pyrethroids is highest in the Salinas Valley region of Monterey County, the Imperial Valley region, the Feather River region of the Sacramento Valley, and several areas of the San Joaquin Valley, according to the state Department of Environmental Protection,

Peaking in 1993, pyrethroid use in the state's agricultural system declined in the 1990s but has shown a 25 percent increase in the past few years, the academic report said. Of the five pyrethroids used in 1993, permethrin accounted for 60 percent.

By 2002, the number of pyrethroid compounds in use doubled to 10, while permethrin declined to 45 percent of the total. Newer compounds were found to be 20 times more toxic than permethrin, according to the new study.

The team of researchers studied six pyrethroids in three sediments taken from California's Central Valley, where two-thirds of the state's cropland is found. Study results showed acute toxicity and growth impairment in the amphipod *Hyaella azteca*, described as "a sensitive test species."

Animal weight was roughly 38 percent below that of a control group when exposed to pyrethroid levels that were one-third to one-half of the lethal concentration, the study said.

"Little research exists on the use and toxicity of pyrethroids and their prevalence in sediments despite the finding that sediments are likely the primary reservoir for environmental residues – not the dissolved phase as in previous

studies," the new report stated.

With increasing use of pyrethroids in agriculture, residences and commercial pest control, further study of sediment-associated residues is necessary to determine their ecological impact, according to authors Erin Amweg, Donald Weston and Nicole Ureda of the Department of Integrative Biology at UC-Berkeley.

Pyrethroid insecticides are applied throughout the eight-county region of the San Joaquin Valley (Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare counties) on a variety of crops, including nuts, fruits, corn, cotton and alfalfa. Over 110,000 pounds of pyrethroid active ingredients were applied in 2002 throughout the entire Valley, according to DPR.

Organophosphates such as Lorsban, Lock-On, Imidan and Malathion are a class of fairly water-soluble pesticides that have been available for decades, experts say. The more newly developed pyrethroids – such as Warrior and Baythroid – are not water-soluble and tend to bind to soil particles, according to the new study.

Almond growers have relied on organophosphate and pyrethroid insecticides to control the crop's key pests, San Jose Scale, peach twig borer and navel orange worm, according to the California Almond Board.

About 6,000 growers in California produce three-quarters of the world's almonds on an estimated 530,000 bearing acres that extend from Chico to Bakersfield, according to the board.

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