



ChemicalWatch Factsheet

A Beyond Pesticides/ NCAMP Factsheet

Sulfur

An element of the earth's crust, sulfur dusts have been used as miticides/fungicides for centuries. Today, according to the EPA, 135-190 million pounds are used annually in U.S. agriculture. Since sulfur is a naturally occurring material, and is relatively non-toxic to beneficials, organic and least-toxic gardeners have come to rely on it for the control of mites, mildew, scales, and rots.

Sulfur is a non-metallic, insoluble element that makes up approximately 0.1% of U.S. soils. Sulfur is mined mostly in Texas, Louisiana, and Florida, but can also be recovered from petroleum distillation and from natural gas. There are over 200 registrations for formulations of sulfur pesticides, and at least five basic producers in this country. Sulfur's efficacy as a miticide/fungicide has been found to be dependent on particle size, with particles between 5-200 microns having the highest efficacy. Although traditionally used as a dust, flowable liquid formulations have been developed.

Chronic human exposure to sulfur in mines and refineries has long been known to result in serious respiratory disturbances, including chronic bronchitis and sinus problems. Most agricultural incidents involve skin and eye irritations, but occasional systemic effects and

deformities of the nails have also been reported. EPA's now defunct Pesticide Incident Monitoring System (PIMS) listed 241 poisoning incidents from 1976-1980. A third of those involved premature worker reentry into farm fields. The California Department of Food and Agriculture

nogenic effects, but the study was only one year long. EPA reviewers reported that sulfur was "probably" not mutagenic.

EPA found sulfur to be of low toxicity to bees, aquatic organisms, birds, and fish. The Agency is not requiring submission of residue

chemistry data, given sulfur's ubiquity in the environment, and has also waived environmental fate testing, including aquatic soil and water testing. Soil bacteria convert the insoluble element into sulfate ion, which is water-soluble and can slowly leach into water.

chemicalWATCH Stats:

CAS Registry Number: 7704-34-9

Chemical Class: Inorganic

Uses: Insecticide, Fungicide, and Rodenticide on Food and Feed Crop, Ornamental, Turf, Residential Sites

Toxicity rating: Slightly toxic

Signal Word: Caution

Health Effects: Respiratory problems from chronic exposure in mines and refineries.

Environmental Effects: None expected

(CDFA) reported 302 poisoning incidents in 1980-1981, of which 203 were field worker poisonings. In response, California established a 24-hour waiting period for reentry into treated fields.

EPA reviewed the rather incomplete toxicological data-set on sulfur for a Registration Standard published in December, 1982. In this document, the Agency reviewed a sub-chronic inhalation study in rats, noting loss of body weight, and decreases in blood serum peroxidase, albumin, and sulphydryl content.

An undated, dermal exposure study in mice reported no carci-

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Update, November 2007:

In March 1991, EPA signed the Reregistration Eligibility Decision (RED) for sulfur, allowing all existing sulfur products to be eligible for reregistration. After reviewing the scientific data on sulfur, EPA found no reason to change the major findings made in the 1982 document, "Registration Standard for Pesticide Products Containing Sulfur as the Active Ingredient." All environmental fate requirements were waived in the 1982 document on the grounds

that sulfur is a natural component of the environment. It becomes incorporated into the sulfur cycle when released into the environment and, as far as available data indicate, is practically non-toxic to non-target organisms. In the RED, EPA says that no known risks of oncogenic, teratogenic, or reproductive effects are associated with the use of sulfur. It is moderately toxic (Toxicity Category III) for eye irritation, dermal toxicity, and inhalation hazards. Sulfur is of low acute toxicity (Toxicity Category IV) for oral toxicity and is not a skin irritant.

Sulfur is one of the more commonly used pesticides in the country, being widely applied by both conventional and organic farmers as a fungicide. According to the National Center for Food and Agricultural Policy, about 80 million pounds of sulfur were applied annually in the US in the 1990s (82.9 and 77.9 million lbs. in 1992 and 1997, respectively). In 1997, sulfur ranked behind only petroleum and mineral oils, and it was the most highly used pesticide in 1992 by pounds applied.

***Sulfur chemicalWATCH* Factsheet Bibliography**

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