United States
Environmental Protection
Agency

Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-766C)
Washington, DC 20460

540/FS-88-085

EPA Pesticide Fact Sheet

Name of Chemical: SULFOTEPP
Reason for Issuance: REGISTRATION STANDARD
Date Issued: SEP 30
Fact Sheet Number: 185

1. DESCRIPTION OF CHEMICAL

Chemical Name: O,O,O',O'-tetraethyl dithiopyrophosphate (International Union for Pure and Applied Chemistry)

ANSI Common Name: Not applicable

Other Common Names: Sulfotep (British Standards Institution and International Organization for Standardization); tetraethyl thiodiphosphate (9th Collective Index); tetraethyl thiopyrophosphate (8th Collective Index); thiodiphosphoric acid tetraethyl ester; sulfotepp (Entomological Society of America)

Principal Trade Names: Bladafume; Dithio; Dithione; Plantfume

EPA Pesticide Chemical (Shaughnessy) Number: 079501

Chemical Abstracts Service (CAS) Number: 3689-24-5

Year of Initial Registration: 1951

Pesticide Type(s): Insecticide/acaricide

Chemical Family: Organophosphate

U.S. Registrants: Centerchem, Inc.; Fuller Systems, Inc.; Plant Products Corp.

2. USE PATTERNS AND FORMULATIONS

Registered uses: Greenhouse ornamentals (non-food crop)

Predominant uses: Azaleas, carnations, chrysanthemums, geraniums, roses, snapdragons

Pests controlled: Aphids, spider mites, whiteflies, mealybugs, scales, thrips

Types of Formulations: Ready-to-use liquid; impregnated materials

Types and Method of Application: Fogging with liquid spray, smoking with impregnated materials

Application Rates: 1.75 fl. oz. 4.5%/5,000 ft^3 (liquid fog); 1.75 oz. 15%/5,000 ft^3 (smoke generator)

3. SCIENCE FINDINGS

Chemical Characteristics

Physical state: liquid

Color: pale yellow

Odor: Unknown

Molecular Weight & Formula: 322.3, $C_8H_{20}O_5P_2S_2$

Boiling Point: 136-139°C at 2 mm Hg

Vapor Pressure: 1.7×10^{-4} mm Hg or 22.6 mPa at 20°C

Specific Gravity: 1.196 d25/4°C, where 25°C refers to temperature at which density (d) of sulfotepp measured and 4°C temperature at which density of H_2O measured

Solubility in various solvents: 25 mg/l water at room temperature; completely miscible with chloromethane and most organic solvents

Toxicology Characteristics

Acute Oral: Data gap. An acute oral LD_{50} study in the rat is required.

Acute Dermal: Data gap. An acute dermal LD_{50} study in the rabbit is required.

Acute Inhalation: Data gap. An acute inhalation LC_{50} study in the rat is required.

Primary Dermal Irritation: Data gap. A primary dermal study in the rabbit is required.

Primary Eye Irritation: Data gap. A primary eye study in the rabbit is required.

Dermal Sensitization: Data gap. A study in the guinea pig is required.

Delayed Neurotoxicity: Data gap. An acute study in the hen is required.

Major Routes of Exposure: Not well understood. Inhalation of fumes and dermal exposure to treated ornamentals.

Subchronic Toxicity: Data gaps. A 21-day dermal study in the rabbit is required. A 90-day inhalation study is required.
Note: The 90-day feeding studies in rodent and non-rodent are not required for the registered use patterns.

Oncogenicity: Not required for the registered use patterns.

Chronic feeding: Not required for the registered use patterns.

Metabolism: Not required for the registered use patterns.

Reproduction: Not required for the registered use patterns.

Teratogenicity: Data gap. A study in either a rodent or non-rodent is required.

Mutagenicity: Data gaps. The gene mutation (Ames Test) and the chromosomal aberration studies are required, as is the test for other mechanisms of mutagenicity.

Physiological and Biochemical Characteristics

Mechanism of Pesticidal Action: Neurotoxin

Metabolism and Persistence in Plants and Animals: Metabolism not understood; short residual period on plant foliage.

Environmental Characteristics: There are no available environmental fate studies on sulfotepp. Therefore, groundwater contamination potential cannot be assessed at this time. Because of toxicological concerns on the acute hazards (see above), an interim 11-hour minimum reentry interval and 2 hours of ventilation are being imposed for the uses of sulfotepp until adequate data have been submitted and evaluated. The following list summarizes the environmental fate data requirements for sulfotepp.

Degradation Studies: Data gaps. Laboratory studies on hydrolysis and photodegradation in air are required.

Metabolism Studies: Data gap. A laboratory study on aerobic soil metabolism is required.

Mobility Studies: Data gaps. Laboratory studies on adsorption/-desorption (batch equilibrium study preferred) and volatility are required. A field volatility study is reserved until the results of laboratory studies are known.

Reentry Protection: Data gap. An inhalation exposure study is required. The registrant is required to propose acceptable reentry labeling based upon airborne residue levels measured after observing the proposed label conditions, on estimated human exposure to those residues, and on toxicity of sulfotepp. Because of the highly acutely toxic nature of sulfotepp, no actual human inhalation exposure monitoring data should be gathered.

Ecological Characteristics: No data are available for any terrestrial species. The available data indicate that sulfotepp is "highly toxic" to the rainbow trout and bluegill sunfish. No data are available on effects on freshwater invertebrates. The following list summarizes the ecological effects data requirements for sulfotepp.

Avian acute toxicity: Data gap. A single-dose LD_{50} study in the bobwhite quail is required.

Avian dietary toxicity: Data gap. A subacute dietary LC_{50} study in the bobwhite quail is required.

Freshwater fish acute toxicity: Rainbow trout: LC_{50} = 1.0 (0.8-1.3) ppm; bluegill sunfish: LC_{50} = 0.36 (0.27-0.46) ppm. Available fish studies only partially fulfill the requirements, but may be upgraded if additional data concerning the studies are available and are submitted.

Marine fish acute toxicity: Not required for the registered use patterns.

Freshwater invertebrate toxicity: Data gap. An acute LC_{50} study on aquatic invertebrates is required.

Marine invertebrate toxicity: Not required for the registered use patterns.

4. TOLERANCE ASSESSMENT

There are no approved tolerances for residues of sulfotepp and no uses on food crops. Therefore, a tolerance assessment is not required.

5. SUMMARY OF REGULATORY POSITIONS

- Sulfotepp is not a candidate for Special Review at this time.

- Sulfotepp meets the criteria for restricted use classification because of highly acute inhalation toxicity to humans.

- Groundwater contamination concerns for sulfotepp cannot be assessed until basic environmental fate data requirements are met.

- An interim reentry interval based on standards proposed in Title 40, Code of Federal Regulations, Part 170, Subpart F, Special Standards for Workers in Greenhouses, Section 66, is being imposed

for the uses of sulfotepp pending submission and evaluation of data on exposure to airborne residues.

- Protective clothing requirements are being imposed as labeling amendments for all registered sulfotepp products.

6. LABELING REQUIREMENTS

Statements applicable to all products:

GENERAL WARNINGS AND LIMITATIONS: Sulfotepp is classified as a RESTRICTED USE PESTICIDE by Title 40, Code of Federal Regulations, Part 162, Section 31, on the basis of its acute inhalation hazard to humans.

Statements for Manufacturing-Use Products:

ENVIRONMENTAL HAZARDS:
This pesticide is toxic to fish. Do not discharge effluent containing this product directly into lakes, streams, ponds, estuaries, oceans, wetlands or public waters unless this product is specifically identified and addressed in a NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the Environmental Protection Agency.

Statements for End-Use Products:

General Warnings and Limitations:

Worker Protection Statement: WEAR THE FOLLOWING PROTECTIVE CLOTHING DURING LOADING, APPLICATION, EQUIPMENT REPAIR, EQUIPMENT CLEANING, EARLY REENTRY TO TREATED AREAS, AND DISPOSAL OF THE PESTICIDE. Wear a protective suit of one or two pieces that covers all parts of the body except the head, hands, and feet. Wear chemical-resistant gloves and chemical-resistant shoes, shoe coverings, or boots. Wear goggles and a pesticide respirator approved by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA) at all times during application and early reentry to treated areas.

Reentry Statement: Reentry after applying is restricted until one of the following intervals has elapsed:

(1) Two hours of ventilation using fans or other mechanical ventilation systems.

(2) Four hours of ventilation using vents, windows or other passive ventilation systems.

(3) Eleven hours with no ventilation, followed by one hour of mechanical ventilation.

(4) Eleven hours with no ventilation, followed by two hours of passive ventilation.

If necessary to reenter the greenhouse for any reason during the specified intervals after application, protective clothing described in the Worker Protection Statement must be worn. All greenhouses must be posted during the exposure period and until safe to reenter.

Disposal Statement: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. In addition, interested parties may call the RCRA/Superfund Hotline toll free (1-800-424-9346) for information on Resource Conservation and Recovery Act requirements.

7. SUMMARY OF DATA GAPS

Toxicology All the acute toxicity studies are required, including the acute delayed neurotoxicity study in the hen. The subchronic feeding studies in the rodent and nonrodent are not required due to lack of oral exposure in the registered use patterns. The 21-day dermal and 90-day inhalation studies are required. The 90-day neurotoxicity study is reserved depending upon the results from the acute delayed neurotoxicity study. A teratology study in one species is required and all the mutagenicity studies are required.

Environmental Fate/Exposure The laboratory degradation studies on hydrolysis and photodegradation in air are required. The aerobic soil metabolism study is required. The laboratory mobility studies on adsorption/desorption (for which the batch equilibrium study is preferred) and volatility are required. The field volatility study is reserved pending results from the laboratory studies. The reentry protection study on inhalation exposure is required, but there is to be no actual monitoring of human inhalation exposure.

Fish and Wildlife An avian single-dose acute oral LD_{50} study and a subacute dietary LC_{50} study using the bobwhite quail are required. Additional data are required on the freshwater fish toxicity study already submitted. A study on the acute LC_{50} to aquatic invertebrates is required.

Product Chemistry All the applicable data on product identity, analysis and certification of product ingredients, and physical and chemical properties are required.

8. CONTACT PERSON AT EPA

William H. Miller
Product Manager 16
Insecticide-Rodenticide Branch
Registration Division (TS-767C)
Office of Pesticide Programs
Environmental Protection Agency
401 M St., SW
Washington, D.C. 20460

Office location and phone number:

Room 211, Crystal Mall #2
1921 Jefferson Davis Highway
Arlington, VA
(703) 557-2600

9. DISCLAIMER: The information in this Pesticide Fact Sheet is a summary only and may not be used to satisfy data requirements for pesticide registration and reregistration. The complete Registration Standard for the pesticide may be obtained from the contact person listed above.

EPA

U.S. Environmental Protection Agency
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