United States
Environmental Protection
Agency

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

EPA Pesticide Fact Sheet

Name of Chemical: FONOFOS
Reason for Issuance: COMPLIANCE DATE FOR RESTRICTED USE
Date Issued: Feb. 1, 1985
Fact Sheet Number: 22.1

1. Description of chemical

Generic name: O-ethyl S-phenyl ethylphosphonodithioate
Common name: Fonofos
Trade name: Dyfonate
EPA Shaughnessy code: 041701
Chemical abstracts service (CAS) number: 944-22-9
Year of initial registration: 1967
Pesticide type: Insecticide
Chemical family: organophosphate
U.S. and foreign producers: Stauffer Chemical Co.

2. Use patterns and formulations

Fonofos is a soil applied insecticide used primarily on corn (95%). It is used also on various vegetable crops, ornamentals, home lawns and home vegetable gardens and commercial turf. Fonofos is applied mainly with ground equipment. Aerial applications are made to hybrid seed corn. Application rates vary from 1-4 lbs./acre. The usual carrier is water.

3. Science Findings

Fonofos is a yellow liquid with a mercaptan-like odor. The boiling point is 212°F (100°C) and the melting point is -32°C at 0.3mm H Fonofos is almost insoluble in water and miscible in common organic solvents.

Toxicology characteristics:

Technical fonofos is highly toxic based on acute oral, dermal, eye and inhalation effects.

Results of toxicological studies on fonofos are as follows:

-Oral LD_{50}, ranges from 3.16-18.5 mg/kg
-Dermal LD_{50}, ranges from 121-359 mg/kg
-Primary Eye Irritation, negative to 0.01 ml; 0/6 dead
-Inhalation LC_{50}, 0.9 mg/L (male and female combined)
-3 generation reproduction rat, reproductive and fetotoxic NOEL= 31.6 ppm (highest dose tested)
-2 year dog feeding study - NOEL, ChE and non-cholinergic= 8 ppm; LEL, ChE and non-cholinergic= 60 ppm

Available data are insufficient to fully assess the toxicological properties of fonofos. Data gaps must be filled in areas of neurotoxicity, subchronic and chronic toxicity, oncogenicity and mutagenicity before a total risk assessment can be made.

Physiological and Biochemical Behavioral Characteristics:

Fonofos is not absorbed by foliage and is not translocated in the plant body. It is a cholinesterase inhibitor and accumulates in carrots.

Environmental Characteristics:

Fonofos is immobile in sandy loom and silt loam soils. It is mobile in quartz sand. It decomposes in aerobic soils by microbes i 4-8 weeks. Fonofos is non-volitile from soil but volatile from water. It degrades in aerobic soils with a half like of 3-16 weeks. Fonofos is moderately persistent.

Ecological Characteristics:

Fonofos is moderately to highly toxic to birds and highly toxic to freshwater fish and salt water organisms.

Simulated avian field studies indicate granular treatments of fonofos may result in some mortality, as well as brain AChE inhibition, but that effects are not likely to diminish wildlife resources.

See under Data Gaps for additional data requirements.

Tolerance assessments:

Tolerances are established for residues of the insecticide O-ethyl S-phenyl ethylphosphonodithioate, including its oxygen analog O-ethyl S-phenyl ethylphosphonothioate, in or on raw agricultural commodities as follows (40 CFR 180.221):

0.5 part per million in or on asparagus.
0.1 part per million (negligible residue) in or on bean forage, bean vine hay, fresh corn including sweet corn (kernels plus cob with husk removed), corn grain (including popcorn), corn forage or fodder (including sweet corn, field corn, and popcorn), fruiting vegetables, leafy vegetables, mint (peppermint, spearmint, peppermint hay, and spearmint hay), pea forage, pea vine hay, peanuts, peanut forage, peanut hay, peanut

hulls, root crop vegetables, seed and pod vegetables, sorghum (grain, fodder, and forage), soybean forage, soybean hay, strawberries, sugar beet tops, and sugarcane.

4. Summary of Regulatory Position and Rationale:

The Agency has determined that certain formulations of fonofos warrant classification as restricted use pesticides. These include all emulsifiable concentrates 44% or greater and the 20% granular formulation. All products of these types which are released for shipment after September 1, 1985 must be labeled for restricted use. All products of these types which are in channels of trade after September 1, 1986 must be labeled for restricted use.

A 24 hour interim reentry interval has been established for all uses of fonofos including the home lawn and home vegetable garden use.

Gloves and shoes must be worn when applying fonofos.

5. Summary of Major Data Gaps *

- Delayed neurotoxicity - hen
- 90 day rodent feeding study
- 90 day neurotoxicity study - hen/mammal
- Chronic toxicity study-rodent
- Oncogenicity study
- Teratogencity study - 1 species
- Gene mutation study
- Chromosomal aberration study
- Reentry Data
- Acute LC_{50} - freshwater invertebrates
- Fish early life cycle stage and aquatic invertebrate lifecycle studies
- Residue data in:
  - root and tuber vegetables
  - leaves of root and tuber vegetables
  - fruiting vegetables (except curcubits)
  - cereal grains
  - forage, fodder and straw of cereal grains
  - miscellaneous crops (asparagus, peanuts, sugarcane and tobacco)
- Poultry feeding study and ruminant feeding study
- Photodegradation in water, soil and air
- Hydrolysis study
- Metabolism study in anaerobic soil

- Mobility studies (leaching and adsorption/desorption, volatilty lab, and volatility field)
- Soil dissipation study
- Accumulation studies - rotational crops and fish

*All major data gaps are to be filled by March 31, 1987.

6. Contact person at EPA (Name, address, and telephone number)

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