CASWELL FILE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 6 1987

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Request for inhalation exposure estimates to applicators, mixers/loaders and bystanders (including those in the path of any spray drift) resulting from all uses of triphenyltin hydroxide.

TOX CHEM No. 896E

FROM: John Doherty 11/3/87
Toxicology Branch
Hazard Evaluation Division (TS-769)

TO: Robert Holst, Ph.D.
Branch Chief
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

THRU: Edwin Budd
Section Head
Toxicology Branch
Hazard Evaluation Division (TS-769)

11/3/87

THRU: William Burnam
Deputy Chief
Toxicology Branch
Hazard Evaluation Division (TS-769)

11/3/87

Review of acute and subchronic inhalation studies with triphenyltin hydroxide (TPTH) has indicated that toxicity results at low atmospheric dose levels (for example, the LC_{50} to rats is 60.3 ug/l and 60% deaths result following 3 exposures of 10 ug/l). Toxicology Branch (TB) believes that such low atmospheric levels for toxicity responses strongly suggests that TPTH may pose serious inhalation hazards to applicators, mixers/loaders and bystanders (including persons in the path of the spray drift).

1

B. Use Profile

TPTH is a fungicide registered for use on potatoes, sugar beets, peanuts, pecan trees, and carrots, and is registered for use as a spider mite suppressant on peanuts. TPTH is also registered for use on tobacco, and as an industrial preservative, but is no longer marketed for these two uses. TPTH is currently being tested (under an Experimental Use Permit) as an active ingredient in a marine antifouling paint. As of May 1984 petitions were pending for rice and soybean tolerances.

About 82% of the domestic use of TPTH is on pecans, where it is used to control a number of foliar diseases. TPTH is applied 6 to 10 times annually, on pecan trees, starting at the budbreak stage (pre-pollination) and continuing to just before the shuck split stage at 14 to 21 day intervals. Ground or aerial equipment may be used.

For control of early leafspot and mites on peanuts, TPTH is applied when symptoms of the target infestations occur, usually 25 to 60 days after planting. Applications may continue at 7 to 14 day intervals until 2 to 3 weeks prior to harvest. Overall, 5 to 10 applications may be made per season depending on weather conditions, type and variety of peanuts, amount of irrigation, and other factors. Applications can be made using ground equipment, irrigation systems, or by aerial means.

For control of late blight in potatoes, TPTH is applied up to 10 or 12 times at 5 to 10 day intervals. For control of early blight in the Northwest, 3 to 4 applications may be required on irrigated potatoes. In the Northeast, late-season applications for late blight also control early blight. TPTH is applied to potatoes using ground, aerial, or sprinkler irrigation equipment.

Use on carrots and sugarbeets is minor. On carrots, 1 to 4 applications may be required at 7 to 14 day intervals for adequate disease control. Applications can be made using ground, aerial, or irrigation equipment. In Idaho, 1 to 3 applications may be needed on sugarbeets under furrow irrigation, with more required under sprinkler irrigation.

TPTH formulations include a 47.5% wettable powder, 19.7 and 40% flowable, and 95 and 96% technical solids for industrial use. TPTH is applied with aerial, ground, or sprinkler irrigation equipment at rates of from 1.5 to 12 ounces of active ingredient per acre. The 47.5% wettable formulation is available in water soluble bags that may be added directly to the spray tank.

C. Background

Triphenyltin hydroxide, a member of the organotin family, is commonly referred to by the acronym TPTH. TPTH is also known as fentin hydroxide, (British Standards Institution, International Standards Organization), and as hydroxytriphenyltin. The Chemical Abstracts Service (CAS) number is 76-87-9, and the EPA chemical code number (also known as the Shaughnessy number) is 083601. TPTH is marketed under such names as "Du-ter®", "Duter®", "Haitin®", "Flo-Tin®", "Brestan H®", "Suzu H®", "TPTH", "TPTOH", "Tubotin®", "ENT-28009", "Supertin", and "Triple Tin". At present there are 7 federally registered products containing TPTH as the sole active ingredient, 23 state (24(c)) registrations, and two intrastate registrations. One Experimental Use Permit has been issued for use of TPTH as one of two active ingredients in a marine antifouling paint, under the trade name Rabamarine A/F 1000.

TPTH was first developed for agricultural use by the Thompson-Hayward Agriculture and Nutrition Co., but Thompson-Hayward's interests have been purchased by Uniroyal, Inc. Technical TPTH is manufactured in the United States by M & T Chemicals, and in Amsterdam, Holland by Duphar, Inc. The American Hoechst Co. and Uniroyal are currently seeking rice and/or soybean tolerances.

D. Regulatory Position and Rationale

Based on a review and evaluation of all available data and other relevant information on TPTH, the Agency has made the following determinations:

1. A Special Review of TPTH will be initiated. The Agency will not reregister any current products or register any new uses of TPTH until the special review is completed and the Agency has received a commitment to fulfill all data gaps.

In this regard, TB requests that inhalation exposure estimates be provided for all registered uses of TPTH. Exposure Assessment Branch should specifically evaluate any and all situations where persons may be exposed to TPTH in the atmosphere.

Descriptions of the use patterns and registered products containing TPTH as presented in the Registration Standard are attached for your information.

cc. Lois Rossi, PM #21 Registration Division (TS-767)
Gary Burin, SIS, HED (TS-769)

TRIPHENYLTIN HYDROXIDE c083601

TYPE PESTICIDE: Fungicide
FORMULATIONS: Tech (95%, 96%); WP (47.5%); FlC (0.5625 lb/gal or 5.1%, 1.875 lb/gal or 19.7%, 4 lb/gal or 40%, 4 lb/gal or 40.5%)
GENERAL WARNINGS AND LIMITATIONS:
Dosages are expressed in units of active ingredient.
Livestock tolerances:
0.05 ppm (negligible residue) in the kidney and liver of cattle, goats, hogs, horses and sheep.
Definition(s): MAI - multiple active ingredient, ppm - parts per million.

Site and Pest	Dosages and Formulation	Tolerance, Use, Limitations	
AGRICULTURAL CROPS			
General Warnings and limitations: Do not graze dairy or meat animals in treated areas. Do not add surfactant, spreaders or stickers to sprays. Consult a State Cooperative Agricultural Extension Service regarding timing recommendations. For ground application equipment: Mix with water for a total solution of 10 to 100 gallons per acre. For aerial application: Mix with water for a total solution of 3 to 20 gallons per acre. Sprinkler irrigation application: See specific label instructions and and limitations for this type of use.			
Carrot		0.1 ppm (negligible residue) 14 day preharvest interval through 3.8 ounces per acre for foliar application. Do not use tops as feed for livestock.	/14003AA
Alternaria blight (late blight)	1.9-3.8 oz/A (47.5% WP) (1.875 lb/ gal or 19.7% FlC) (4 lb/gal or 40% FlC) (4 lb/gal or 40.5% FlC)	Foliar application. Use lower rate in protective schedules or when disease is light and increase the rate as disease severity increases. The highest rate is used during high infection periods. Begin application 6 weeks after planting or as soon as first signs of disease appears. Continue at 7 day intervals or as needed for control.	FBASAAX
Cercospora leaf spot			FMBCCBM
Peanut		0.05 ppm (negligible residue) in or on peanuts 0.4 ppm in or on peanut hulls 14 day preharvest interval through 3.8 ounces per acre for foliar application. Do not allow hogs to feed on peanuts in treated fields. Hulls from treated peanuts may be used in feed for livestock. Do not use vines as feed. May be applied by ground equipment, by aircraft or through sprinkler irrigation application.	/28015AA

TRIPHENYLTIN HYDROXIDE

Site and Pest	Dosages and Formulation	Tolerance, Use, Limitations	
Peanut (continued)			
Cercospora leaf spot	2.38-3.8 oz/A (47.5% WP) (4 lb/gal or 40% FlC) (4 lb/gal or 40.5% FlC) or MAI 2.25-3.75 oz/A (0.5625 lb/gal or 5.1% FlC)	Foliar application. Use the lower rate when disease is light, increasing the rate as disease severity increases. Apply for full coverage to foliage. Use lower gallonage in early season when plants are small and increase spray volume as plant size increases. Application should begin approximately 6 weeks after planting, or as first sign of leafspot appears. Spray applications should continue on a 10 to 14 day schedule. or MAI Formulated with sulfur.	FMBCCBM
	2.38-3.8 oz/A (1.875 lb/gal or 19.7% FlC)	Foliar irrigation system application only. Application should begin approximately 6 weeks after planting, or as first sign of leafspot appears. Applications should continue on a 10 to 14 day schedule. Do not mix with emulsifiable concentrate or liquid formulations. See specific label for other instructions and limitations regarding this type of application.	
Pecan		0.05 ppm (negligible residue) Apply through 2.9 pounds per acre for foliar application. Do not apply after shucks have started to open. May be applied in combination with emulsifiable concentrate or wettable powder insecticides.	/03008AA
Brown leaf spot (cercospora) Downy leaf spot (mycosphaerella) Leaf blotch Liver spot (gnomonia) Powdery mildew (microsphaera) Scab (cladosporium) Sooty mold	0.36-0.71 lb/A (47.5% WP) (1.875 lb/gal or 19.7% FlC) (4 lb/gal or 40% FlC) (4 lb/gal or 40.5% FlC)	Delayed dormant and foliar applications. Apply with ground equipment or by aircraft. Make first application at prepollination stage when young leaves are unfolding and second application when small nuts are forming. Repeat at 2 to 4 week intervals as needed. To maintain control, use lower rate for first two applications, or until disease becomes severe, or during dry weather. Use higher rate during wet weather or during severe disease infection periods.	FMBCCBM FMASMCO FCADMCO FMBDGAT FFACMBT FEAJCCV FHAKQBB

TRIPHENYLTIN HYDROXIDE

Site and Pest	Dosages and Formulation	Tolerance, Use, Limitations	
Potato		0.05 ppm (negligible residue) 7 day preharvest interval through 4.75 ounces per acre May be applied in combination with emulsifiable concentrate or wettable powder insecticides, however, before using emulsifiable concentrates it is suggested that the mixture be tested for phytotoxic response under actual use conditions.	/14013AA
Early blight (alternaria) Late blight (phytophthora)	2.38-4.75 oz/A (47.5% WP) (4 lb/gal or 40% FlC) (4 lb/gal or 40.5% FlC)	Foliar application. Begin treatment when weather conditions favor disease development and continue on a 7 day schedule. Full coverage of foliage is necessary for best results.	FBAMAAX FBASPCN
Gray mold (botrytis) Early blight (alternaria) Late blight (phytophthora)	2.85-4.75 oz/A (1.875 lb/gal or 19.7% FlC)	Foliar irrigation system application only. Irrigation systems must be equipped with safety valves or other devices to prevent backsiphoning of pesticide into water source. Any irrigation water treated with this chemical should be held on the treated areas until it is absorbed by the soil. It should not be turned into tail water or fed back into the irrigation system. Apply when weather conditions are favorable for disease development and continue at 7 day intervals.	FHADBAW FBAMAAX FBASPCN
Sugar beet		0.1 ppm (negligible residue) in or on sugar beet roots 14 day preharvest interval through 4.75 ounces per acre. Do not graze dairy or meat animals in the treated areas or feed beet tops to livestock.	/28020AA
Cercospora leaf spot	1.9-4.75 oz/A (47.5% WP) (1.875 lb/gal or 19.7% FlC) (4 lb/gal or 40% FlC) (4 lb/gal or 40.5% FlC)	Foliar application. Apply when leaf spot symptoms appear or when disease occurs in the area and repeat at 10 to 14 day intervals.	FMBCCBM

TRIPHENYLTIN HYDROXIDE

Site and Pest	Dosages and Formulation	Tolerance, Use, Limitations	
Tobacco		N.F. Do not use in combination with emulsifiable concentrate or oil spray formulations.	/26003AA
Brown spot (alternaria)	3.09–4.51 oz/A or 0.193–0.294 lb/A (47.5% WP)	Use limited to Southeastern United States. Foliar application. Apply in 40 to 60 gallons of water per acre. Apply as a full coverage spray beginning immediately after the first priming (harvest) and repeat immediately after each weekly priming.	FMAJAAX

AERIAL AND TANK MIX APPLICATIONS

Aerial Applications

— Refer to Agricultural Crops
Carrots, Peanuts, Pecans, Potato, Sugar beets

EPA Index of Pesticide Chemicals

TRIPHENYLTIN HYDROXIDE

Listing of Registered Pesticide Products by Formulation

95% technical chemical
triphenyltin hydroxide (083601)
047916-00037

96% technical chemical
triphenyltin hydroxide (083601)
037100-00013

47.5% wettable powder
triphenyltin hydroxide (083601)
000400-00160 000400-00161 008340-00015 037100-00012 044215-00074
047916-00034

5.1% (0.5625 lb/gal) flowable concentrate
triphenyltin hydroxide (083601) plus sulfur (077501)
001812-00252

19.7% (1.875 lb/gal) flowable concentrate
triphenyltin hydroxide (083601)
000400-00163

40% (4 lb/gal) flowable concentrate
triphenyltin hydroxide (083601)
001812-00244 045115-00014 047916-00035 049085-00001

40.5% (4 lb/gal) flowable concentrate
triphenyltin hydroxide (083601)
000400-00164

State Label Registrations:

MI Reg. No.
000148-05843

WI Reg. No.
000148-05844

EPA Index of Pesticide Chemicals

TRIPHENYLTIN HYDROXIDE

Appendix B

Listing of Registration Numbers by Site:

Carrots					/014003AA
000400-00160	000400-00161	000400-00163	000400-00164	001812-00244	
008340-00015	037100-00012	044215-00074	045115-00014	047916-00034	
047916-00035	049085-00001				
Peanuts					/28015AA
000400-00160	000400-00161	000400-00163	000400-00164	001812-00244	
001812-00252	008340-00015	037100-00012	044215-00074	045115-00014	
047916-00034	047916-00035				
Pecans					/03008AA
000400-00160	000400-00161	000400-00163	000400-00164	001812-00244	
008340-00015	037100-00012	044215-00074	045115-00014	047916-00034	
047916-00035	049085-00001				
Potato					/14013AA
000400-00160	000400-00161	000400-00163	000400-00164	001812-00244	
008340-00015	037100-00012	044215-00074	045115-00014	047916-00034	
047916-00035	049085-00001				
Sugar beet					/28020AA
000400-00160	000400-00161	000400-00163	000400-00164	001812-00244	
008340-00015	037100-00012	044215-00074	045115-00014	047916-00034	
047916-00035	049085-00001				
Tobacco					/26003AA
008340-00015					