5-5-87

Shaughnessy No.: 083601

Date Out of EAB: MAY 5 1987

Signature: _____

To: Hundeman
Product Manager # 21
Registration Division (TS-767)

From: Emil Regelman, Supervisory Chemist
Review Section #3
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

Attached, please find the EAB review of...

Reg./File # : 8340-17

Chemical Name: Triphenyltin hydroxide

Type Product : Fungicide

Product Name : TPTH

Company Name : American Hoechst Corporation

Purpose : Review of Confined Rotation Accumulation Study

Action Code(s): 656

EAB #(s) : 6785

Date Received: 9/2/86

TAIS Code: 64

Date Completed: 4/27/87

Monitoring submitted: _____

Total Reviewing Time: 2.0 days

Monitoring requested: _____

Deferrals to:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

MRID 161670

1/16

1. CHEMICAL: Common name:

Triphenyltin hydroxide

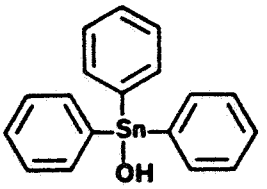
Chemical name:

Triphenyltin hydroxide

Trade name(s):

Du-Ter, Duter, Haitin, Phenostat-H, Suzu H, TPTH, TPTOH, Triple Tin, Tubotin

Structure:



Formulations:

47.5% WP, 19.7% FlC, 40% FlC

Physical/Chemical properties:

Molecular formula: $C_{18}H_{16}OSn$.
Molecular weight: 367.
Physical state: Crystalline.
Melting point: 118-120°C.
Stability: Subject to dehydration at elevated temperatures.
Solubility: Practically insoluble in water; moderately soluble in most organic solvents.

2. TEST MATERIAL:

Active ingredient; [^{14}C]triphenyltin hydroxide.

3. STUDY/ACTION TYPE:

Review/evaluation of a confined accumulation rotation crop study. Response to the Registration Standard.

4. STUDY IDENTIFICATION:

The following study is a new submittal:

Burkle, W. L., U. Rutz, H. Kocher, and H. Becker. 1986. Residues in rotational crops sown 6 months after treatment of the soil at an application rate of 330 g a.i./ha. Report No. CM070/85. Prepared by Hoechst Aktiengesellschaft, Frankfurt, Germany, and submitted by American Hoechst Corporation, Somerville, NJ. Acc. No. 263970.

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5. REVIEWED BY:

John Jordan, Ph.D.
Microbiologist
EAB/HED/OPP

Signature: John Jordan
Date: 5/4/87

6. APPROVED BY:

Emil Regelman
Supervisory Chemist
Review Section #3, EAB/HED/OPP

Signature: E Regelman
Date: MAY 5 1987

7. CONCLUSIONS: The data are not acceptable, because 330g/hectare were applied and 3.6 lb./A is the maximum rotation crop label rate. Study must be repeated. See individual study for additional information.

8. RECOMMENDATIONS: Registrant should be informed of the conclusion, above.

9. BACKGROUND:

A. Introduction

B. Directions for Use

Triphenyltin hydroxide is a nonsystemic, protectant, foliar fungicide registered for use on carrots, pecans, peanuts, potatoes, and sugar beets. Triphenyltin hydroxide is also registered for use on tobacco and as an industrial preservative, but is no longer marketed for these uses. Of the total domestic triphenyltin hydroxide usage, 82% is applied to pecans. Application rates range from 0.09 to the pecan maximum rate of 7.1 lbs. ai/A. There are no multiple active ingredient products containing triphenyltin hydroxide. Single active ingredient formulations of triphenyltin hydroxide consist of 47.5% WP, and 19.7 and 40% FlC. These formulations may be applied using either ground equipment or aircraft. Applicators need not be certified or under the direct supervision of applicators certified to apply triphenyltin hydroxide.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

The study does not meet requirements, because less than maximum rotation crop label rate (3.6 lb/A) was applied. Please refer to the study for further details.

11. COMPLETION OF ONE-LINER: One-liner not completed to date.

12. CBI APPENDIX:

The data reviewed here are considered CBI by the registrant and must be treated as such.

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3-13-87

DYNAMAC CORPORATION

MRID 161670

TRIPHENYLTIN HYDROXIDE ADDENDUM

Final Report

Task 1: Review and Evaluation of Individual Studies

Task 2: Environmental Fate and Exposure Assessment

Contract No. 68-02-4250

MARCH 13, 1987

Submitted to:
Environmental Protection Agency
Arlington, VA 22202

Submitted by:
Dynamac Corporation
The Dynamac Building
11140 Rockville Pike
Rockville, MD 20852

161670

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TRIPHENYLTIN HYDROXIDE

Table of Contents

INTRODUCTION

Triphenyltin hydroxide is a nonsystemic, protectant, foliar fungicide registered for use on carrots, pecans, peanuts, potatoes, and sugar beets. Triphenyltin hydroxide is also registered for use on tobacco and as an industrial preservative, but is no longer marketed for these uses. Of the total domestic triphenyltin hydroxide usage, 82% is applied to pecans. Application rates range from 0.09 to 7.1 lb ai/A. There are no multiple active ingredient products containing triphenyltin hydroxide. Single active ingredient formulations of triphenyltin hydroxide consist of 47.5% WP, and 19.7 and 40% FlC. These formulations may be applied using either ground equipment or aircraft. Applicators need not be certified or under the direct supervision of applicators certified to apply triphenyltin hydroxide.

CASE GS — TRIPHENYLTIN HYDROXIDE STUDY 1 PM —

CHEM 080813 Triphenyltin hydroxide

BRANCH EAB DISC —

FORMULATION 00 - ACTIVE INGREDIENT

FICHE/MASTER ID No MRID 00161670 CONTENT CAT 01

Burkle, W. L., U. Rutz, H. Kocher, and H. Becker. 1986. Residues in rotational crops sown 6 months after treatment of the soil at an application rate of 330 g a.i./ha. Report No. CM070/85. Prepared by Hoechst Aktiengesellschaft, Frankfurt, Germany, and submitted by American Hoechst Corporation, Somerville, NJ. Acc. No. 263970.

SUBST. CLASS = S.

DIRECT RVW TIME = 8 (MH) START-DATE END DATE

REVIEWED BY: W. Higgins
TITLE: Staff Scientist
ORG: Dynamac Corp., Rockville, MD
TEL: 468-2500

APPROVED BY: J. Jordan
TITLE: Microbiologist
ORG: EAB/HED/OPP
TEL: 557-5457

SIGNATURE: J. Jordan DATE: 4/17/87

CONCLUSIONS:

Confined Accumulation - Rotational Crops

1. This study is scientifically valid.

2. [^{14}C]Triphenyltin hydroxide residues (uncharacterized) were 0.04 ppm (TPTH equivalents) in dry dwarf bean hulls and seeds, and 0.009 ppm in fresh spinach leaves, radish bulbs and leaves, and fruits and leaves of dwarf bean plants seeded 190 days after sandy loam soil was treated with [^{14}C]triphenyltin hydroxide at 330 g ai/ha. Radioactivity remained highest in the top 5 cm of the soil throughout the experiment, ranging from 2.60 ppm at day 0 to 0.10 ppm at day 269. Radioactivity was 0.007 ppm in the 5- to 10-cm and 10- to 20-cm layers of the soil at all sampling intervals.

3. This study does not satisfy EPA data requirements, because only 330g/hectare were applied. The maximum label application rate is 7.1 lb/A. (pecans) and 3.6 lb/A (potatoes) Additional crop uptake data are also required,e.g., for carrots and small grain.

MATERIALS AND METHODS:

[^{14}C]Triphenyltin hydroxide (11.6 mg, purity 98%, specific activity 16.2 mCi/g, source unspecified) plus nonlabeled TPTH (11.5 mg, purity 99%, source unspecified) in 13.9 ml acetone were applied evenly in droplets to the surface of a sandy loam soil (23.4% sand, 65.8% silt, 10.8% clay, 1.6% organic matter, pH 7.1, CEC 14.1 meq/100 g) in a stainless steel plant container (1.0 x 0.7 x 0.5 m, length x width x height). After the acetone evaporated, the upper layer of the soil was lightly raked. Thirty days after soil treatment, spinach, radishes, carrots, and wheat were planted in the soil as the first rotation of crops. All of these crops were harvested by day 169 posttreatment. The uppermost layer of the soil was cultivated prior to the planting of the second rotation of crops (spinach, radishes, and dwarf beans) on day 190. Spinach leaves and radish bulbs and leaves were sampled on day 233. Leaves and green fruits of beans were sampled on day 273. Leaves, dried hulls, and dried seeds of beans were sampled on day 296. Soil (0- to 5-, 5- to 10-, and 10- to 20-cm depths) was sampled at intervals up to 296 days posttreatment.

Total radioactivity was determined using LSC following combustion of aliquots of the plant and soil samples. Characterization of residues in the soil was attempted by extracting the soil with methanol:40% hydrobromic acid:water:acetone (2:1:4:8, v:v:v:v), partitioning the resulting extract with methylene chloride, and separating the organic phase by TLC using a toluene:ethyl acetate:acetic acid:water (100:100:2:1, v:v:v:v) solvent system. Quantification of residues was determined using a TLC linear-analyzer.

REPORTED RESULTS:

The highest concentrations of [^{14}C]triphenyltin hydroxide residues in the second rotation (190-day treatment-to-planting interval) crops were found in dry seeds and hulls of dwarf beans (0.04 ppm; Table 1). Characterization of the residues was unsuccessful due to the low concentrations present.

The highest concentrations of radioactivity in the soil samples were always detected in the top 5-cm layer of soil (Table 2). The residues in this layer of soil were identified as being bound, polar, or nonpolar; the majority of the radioactivity was associated with triphenyltin hydroxide at all sampling intervals. (Table 3).

DISCUSSION:

1. Maximum label rate (3.6 lb/A) was not used, and additional crop residue uptake data are required for carrots and small grain. Study must be repeated.

2. Raw data were not provided.

3. No data were provided for the first rotation (30-day treatment-to-planting interval) crops nor for the 365 day interval.

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Table 1. [^{14}C]Triphenyltin hydroxide residues (ppm; equivalents of triphenyltin hydroxide) in crops planted in sandy loam soil 190 days after soil was treated with [^{14}C]triphenyltin hydroxide at 330 g ai/ha.

Crop	Application-to-harvest interval (days)		
	233	273	296
Spinach leaves (fresh)	0.002	--	--
Radish bulbs (fresh)	0.003	--	--
Radish leaves (fresh)	0.001	--	--
Bean fruits (green)	--	0.004	--
Bean leaves (green)	--	0.007	0.009
Bean hulls (dry)	--	--	0.040
Bean seeds (dry)	--	--	0.040

Table 2. Total radioactivity (ppm equivalents of triphenyltin hydroxide) in dry sandy loam soil treated with [^{14}C]triphenyltin hydroxide at 330 g ai/ha.

Sampling interval (days)	Sampling depth (cm)		
	0-5	5-10	10-20
0	2.60[a]	--	--
30	1.40	ND[b]	ND
169	0.03	ND	ND
190	0.01	0.003	ND
217	0.06	0.007	ND
233	0.19	ND	ND
269	0.10	0.002	0.002

[a] Sampling depth of 0-1 cm.

[b] Not detectable; the limit of detection was <0.002 ppm.

Table 3. Composition of [^{14}C]triphenyltin hydroxide residues (% of the recovered) in the top 5 cm of sandy loam soil treated with [^{14}C]triphenyltin hydroxide at 330 g ai/ha.

Component	Sampling interval (days)					
	30	169	190	217	233	269
Bound residues	5	23	28	27	48	31
Polar residues[a]	3	3	1	2	1	2
Nonpolar residues	78	57	42	31	44	43
Triphenyltin hydroxide	73	57	37	31	41	42
Unknown	5	--	5	--	3	1
Total residues (ppm)	1.40	0.03	0.01	0.06	0.19	0.10

[a] Water soluble.

EXECUTIVE SUMMARY

The data summarized here are scientifically valid data that have been reviewed in this report but do not fulfill data requirements unless noted in the Recommendations section of this report.

[^{14}C]Triphenyltin hydroxide residues (uncharacterized) were 0.04 ppm (TPTH equivalents) in dry dwarf bean hulls and seeds, and 0.009 ppm in fresh spinach leaves, radish bulbs and leaves, and fruits and leaves of dwarf bean plants seeded 190 days after sandy loam soil was treated with [^{14}C]triphenyltin hydroxide at 330 g ai/ha. Radioactivity remained highest in the top 5-cm of the soil throughout the experiment, ranging from 2.60 ppm at day 0 to 0.10 ppm at day 269. Radioactivity was 0.007 ppm in the 5- to 10-cm and 10- to 20-cm layers of the soil at all sampling intervals. Maximum label rate is 3.6 lbs/A therefore, the data are not acceptable for satisfying the data requirement.

RECOMMENDATIONS

Available data are insufficient to fully assess the environmental fate of and the exposure of humans and nontarget organisms to triphenyltin hydroxide. The submission of data relevant to registration requirements (Subdivision N) for terrestrial food crop and terrestrial nonfood use sites is summarized below:

Hydrolysis studies: No data were submitted for this addendum; however, based on previously submitted data, all data requirements have been fulfilled.

Photodegradation studies in water: No data were submitted for this addendum, but all data are required.

Photodegradation studies on soil: No data were submitted for this addendum, but all data are required.

Photodegradation studies in air: No data were submitted for this addendum; however, no data are required because of the low vapor pressure of triphenyltin hydroxide.

Aerobic soil metabolism studies: No data were submitted for this addendum, but all data are required.

Anaerobic soil metabolism studies: No data were submitted for this addendum, but all data are required.

Anaerobic aquatic metabolism studies: No data were submitted for this addendum; however, no data are required because triphenyltin hydroxide does not have an aquatic or aquatic impact use.

Aerobic aquatic metabolism studies: No data were submitted for this addendum; however, no data are required because triphenyltin hydroxide does not have an aquatic or aquatic impact use.

Leaching and adsorption/desorption studies: No data were submitted for this addendum; however, based on data submitted for the Triphenyltin hydroxide Standard, a study is needed providing information on the mobility of triphenyl-

tin hydroxide (unaged) in sand and silt loam soils, and the mobility of triphenyltin hydroxide (aged aerobically for 30 days or one half-life) in a sandy loam soil.

Laboratory volatility studies: No data were submitted for this addendum; however, no data are required because of the low vapor pressure of triphenyltin hydroxide.

Field volatility studies: No data were submitted for this addendum; however, no data are required because of the low vapor pressure of triphenyltin hydroxide.

Terrestrial field dissipation studies: No data were submitted for this addendum, but all data are required.

Aquatic field dissipation studies: No data were submitted for this addendum; however, no data are required because triphenyltin hydroxide does not have an aquatic or aquatic impact use.

Forestry dissipation studies: No data were submitted for this addendum; however, no data are required because triphenyltin hydroxide has no forestry use.

Dissipation studies for combination products and tank mix uses: No data were submitted for this addendum; however, no data are required because data requirements for combination products and tank mix uses are currently not being imposed.

Long-term field dissipation studies: No data were submitted for this addendum, but all data may be required if the results from the field dissipation/aerobic soil metabolism studies demonstrate residues do not reach 50% dissipation in soil prior to the recommended subsequent application.

Confined accumulation studies on rotational crops: One study (Burkle, W.L. et al., 1986) does not contribute toward the fulfillment of data requirements, because the application rate was only 330g/hectare. Since the maxi- label rate is 3.6 lb/A, the study is insufficient to establish a rotation interval. If the registrant desires to plant crops at an interval shorter than 190 days, a report must be provided giving data on residue accumulation in crops planted at the desired rotational interval.

Field accumulation studies on rotational crops: No data were submitted for this addendum; however, all data may be required if significant [^{14}C]residues of concern to the agency are detected in the test crops analyzed in the confined accumulation study.

Accumulation studies on irrigated crops: No data were submitted for this addendum; however, no data are required because triphenyltin hydroxide does not have an aquatic food crop or aquatic noncrop use, is not used in and around holding ponds used for irrigation purposes, and has no use involving effluents or discharges to water used for crop irrigation.

Laboratory studies of pesticide accumulation in fish: No data were submitted for this addendum, but all data are required.

Field accumulation studies on aquatic nontarget organisms: No data were submitted for this addendum; however, no data are required because triphenyltin hydroxide currently has no registered forestry, aquatic, or aquatic impact uses.

Reentry studies: No data were submitted for this addendum; however, data are required. A 24-hour interim re-entry interval was imposed until satisfactory dislodgeable residue data are received. (TPTH produced teratagenic effects in laboratory animals at all dose levels tested, and is in Tox category I)

REFERENCES

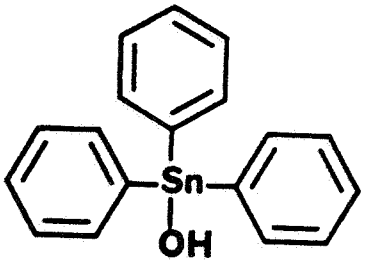
The following study is a new submittal reviewed in this report:

Burkle, W. L., U. Rutz, H. Kocher, and H. Becker. 1986. Residues in rotational crops sown 6 months after treatment of the soil at an application rate of 330 g a.i./ha. Report No. CM070/85. Prepared by Hoechst Aktiengesellschaft, Frankfurt, Germany, and submitted by American Hoechst Corporation, Somerville, NJ. Acc. No. 263970.

APPENDIX

TRIPHENYLTIN HYDROXIDE

DU-TER, DUTER, HAITIN, PHENOSTAT-H
SUZU H, TPTH, TPTOH, TRIPLE TIN,
TUBOTIN



Triphenyltin hydroxide