3-16-88

Shaughnessy No.: 029001

Date Out of EAB: _____

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

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

Thru: Paul F. Schuda, Ph.D., Chief
Exposure Assessment Branch
Hazard Evaluation Division (TS-769C)

Attached, please find the EAB review of...

Reg./File # : 464 -511

Chemical Name: 1,3-Dichloropropene

Type Product : Nematicide/Fungicide/Insecticide/Herbicide

Product Name : Telone II

Company Name : Dow Chemical Company

Purpose : Addendum to a Standard. Review of photodegradation in air study; and, reevaluation of field dissipation/well water monitoring study.

Date Received: 11/6/87 & 11/25/87 Action Code(s): 605

Date Completed: 3/16/88 EAB #(s) : 80103 & 80150

Monitoring study submitted: _____ Total Reviewing Time: _____

Monitoring study voluntarily: ____

Deferrals to: _____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1. CHEMICAL: Common name:

1,3-Dichloropropene

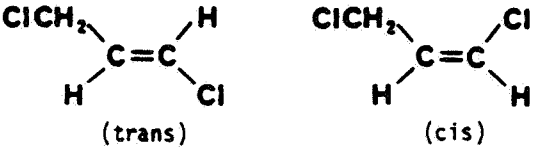
Chemical name:

1,3-Dichloropropene

Trade name(s):

Telone II Soil Fumigant

Structure:



Formulations:

94% Ready to use (RTU)

Physical/Chemical properties:

Molecular formula: $C_3H_4Cl_2$.
Molecular weight: 111.
Physical state: Colorless to straw-colored liquid.
Vapor pressure: 22 mm Hg at 20°C.
Solubility: Water - 0.1%.

2. TEST MATERIAL:

Study 1: Active ingredient.
Study 2: Telone II.

3. STUDY/ACTION TYPE:

Review of photodegradation in air study; re evaluation of field dissipation/well water monitoring studies to satisfy data requirements for 1,3-Dichloropropene Registration Standard.

4. STUDY IDENTIFICATION:

Fontaine, D. and D. Teeter. 1987. Vapor-phase photodegradation of 1,3-dichloropropene. Dow Chemical U.S.A., Ag Chemical R&D Protocol #87083. Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, Missouri, and Dow Chemical U.S.A., Midland, MI; and submitted by Dow Chemical U.S.A., Midland, MI. (40390101)

Oliver, G.R., E.L. Bjerke, and F.C. O'Melia. 1986. Field dissipation study for Telone II soil fumigant. Prepared and submitted by Dow Chemical U.S.A., Midland, MI. Acc. No. 264183.

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5. REVIEWED BY:

Padma Datta, Ph.D.
Chemist
Review Section #3
EAB/HED

Signature:_____

Date:_____

6. APPROVED BY:

Emil Regelman
Supervisory Chemist
Review Section #3
EAB/HED

Signature: _____

Date: _____

7. CONCLUSIONS:

The study on photodegradation in air (§161-4) is acceptable to EAB. This study shows that 1,3-dichloropropene does not degrade in air. (For details, see the individual DER of 3/4/88 prepared by Dynamac).

The additional data provided to remedy the deficiencies of the terrestrial field dissipation/well-water monitoring study (§164-1) are acceptable to EAB. The combined data (See EAB review #70111, 6/12/87, and the individual DER of 3/4/88 prepared by Dynamac) fulfill the data requirements for a terrestrial field soil dissipation study (§164-1).

8. RECOMMENDATIONS:

EAB recommends RD inform the registrant, Dow Chemical Co., that the photodegradation in air study (§161-4) and the terrestrial field soil dissipation study (§164-1) are fulfilled to support registration of 1,3-dichloropropene for terrestrial food crops under 40 CFR §158.130.

9. BACKGROUND:

EAB review #70111, 6/22/87 documented (1) additional study requirements for 1,3-Dichloropropene including photodegradation in air (§161-4) to support registration under 40 CFR §158.130; and, (2) deficiencies in the terrestrial field soil dissipation/well water monitoring study (§164-1). On 10/22/87, Dow Chemical Co. submitted a study for 1,3-dichloropropene on photodegradation in air (§161-4). On 11/28/87, Dow Chemical Co. submitted an addendum in response to the deficiencies documented in the terrestrial field soil dissipation/well water monitoring study.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

See attached review of individual study.

11. COMPLETION OF ONE-LINER:

12. CBI APPENDIX:

All data reviewed here are considered "company confidential" by the registrant and must be treated as such.

DYNAMAC
CORPORATION

1,3-DICHLOROPROPENE ADDENDUM

Final Report

Task 1: Review and Evaluation of Individual Studies

Task 2: Environmental Fate Assessment

Contract No. 68-02-4250

MARCH 4, 1988

Submitted to:
Environmental Protection Agency
Arlington, VA 22202

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

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1,3-DICHLOROPROPENE

Table of Contents

INTRODUCTION

Dichloropropene is a nematicide/fungicide/insecticide/herbicide registered for preplant application to terrestrial food crop (field and vegetable crop and orchard crop) and terrestrial nonfood (nursery stock and tobacco) use sites. Application rates range from 38.3 to 1067.6 lb ai/A. Dichloropropene is formulated as a single active ingredient only as a 94% RTU. In multiple active ingredient formulations, it may be combined with methyl isothiocyanate, chloropicrin, methyl isothiocyanate plus chloropicrin, and methyl bromide. Dichloropropene may be applied prior to planting by chisel injection into a planting hole during backfilling. The specific application technique is determined by use site and equipment availability. Applicators must be certified or under direct supervision of applicators certified to apply dichloropropene.

DATA EVALUATION RECORD

1,3-DICHLOROPROPENE STUDY 1

CHEM 029001 1,3-Dichloropropene

BRANCH EAB

FORMULATION--00 - ACTIVE INGREDIENT

FICHE/MASTER ID 40390101
Fontaine, D. and D. Teeter. 1987. Vapor-phase photodegradation of 1,3-dichloropropene. Dow Chemical U.S.A., Ag Chemical R&D Protocol #87083. Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, Missouri, and Dow Chemical U.S.A., Midland, MI; and submitted by Dow Chemical U.S.A., Midland, MI.

SUBST. CLASS = S.

DIRECT RVW TIME = 4

REVIEWED BY: K. Patten TITLE: Staff Scientist

EDITED BY: W. Higgins W. Higgins TITLE: Staff Scientist

APPROVED BY: W. Spangler W J. Spangler TITLE: Project Manager

ORG: Dynamac Corporation
Rockville, MD
TEL: 468-2500

APPROVED BY: P. Datta
TITLE: Chemist
ORG: EAB/HED/OPP
TEL: 557-9733

SIGNATURE: PPDatta

CONCLUSIONS:

Degradation - Photodegradation in Air

This study is acceptable and fulfills EPA Data Requirements for Registering Pesticides by providing information on the photodegradation of cis- and trans-1,3-dichloropropene in air.

SUMMARY OF DATA BY REVIEWER:

1,3-Dichloropropene (cis and trans, purity >94.8%), at 0.035-0.050 µg/mL, did not degrade in borosilicate glass vials irradiated continuously with a xenon arc lamp at 25 ± 2°C and ambient humidity for 30 days. The xenon arc lamp produced a continuous spectrum of light between 300 and

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750 nm that was approximately half the intensity of spring/summer sunlight at 40°N latitude. After 30 days of irradiation, 95-98% of the applied radioactivity was recovered as 1,3-dichloropropene and no degradates were detected. In the dark control at 30 days posttreatment, 86-92% of the applied was recovered as 1,3-dichloropropene and no degradates were detected.

DISCUSSION:

1. The material balance for the day 30 dark control samples was only 86-92% of the applied; however, the material balance was good for most other sampling intervals. It is possible that there was undetected leakage from the sealed vials. The study authors also stated that they believed that much of the variability in sample recovery was due to the difficulty of trapping 1,3-dichloropropene in a sealed container without loss before the seal was effected.

2. Although the artificial light intensity was half that of sunlight, the samples were irradiated for twice as long as required.

3. The method detection limit was not reported.

4. 1,3-Dichloropropene was condensed from the air onto the flask walls, and then the flask was rinsed and the rinse analyzed for dichloropropene. Air was never analyzed for dichloropropene separately from material which may have been adsorbed to the flask walls throughout the study. Since no degradation occurred, this is not a major problem, but if degradation had occurred, the study would have been unacceptable because it would have been impossible to distinguish photodegradation in air from photodegradation on the sides of the flask.

MATERIALS AND METHODS

RIN 3413-94 1,3-DICHLOROPROPENE REVIEWS
029001

Page_____ is not included in this copy.

Pages 11 through 22 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

____ A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

✓ FIFRA registration data.

____ The document is a duplicate of page(s) _____.

____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

DATA EVALUATION RECORD

1,3-DICHLOROPROPENE STUDY 2

CHEM 029001 1,3-Dichloropropene

BRANCH EAB

FORMULATION--16 - LIQUID - READY TO USE (RTU)

FICHE/MASTER ID 40403301
Oliver, G., E. Bjerke, and F. O'Melia. 1986. Field dissipation study of Telone II soil fumigant (supplementary information). Prepared and submitted by Dow Chemical U.S.A., Midland, MI.

SUBST. CLASS = S.

DIRECT RVW TIME = 1

REVIEWED BY: L. Binari TITLE: Staff Scientist

EDITED BY: K. Patten K. Patten TITLE: Task Leader

APPROVED BY: W. Spangler W. J. Spangler TITLE: Project Manager

ORG: Dynamac Corporation
Rockville, MD
TEL: 468-2500

APPROVED BY: P. Datta
TITLE: Chemist
ORG: EAB/HED/OPP
TEL: 557-9733

SIGNATURE:

CONCLUSIONS:

Field Dissipation - Terrestrial/

Ancilliary Study - Well-Water Monitoring

In a previous review (Dynamac report dated 5/6/87) of a terrestrial field dissipation/well-water monitoring study (Oliver, Acc. No. 264183), it was concluded that this study provided supplemental information, but did not fulfill data requirements because the formulation of the test substance was not specified, the soil was incompletely characterized, and field test data were incomplete.

In response to these deficiencies, the registrant has submitted an addendum to the terrestrial field dissipation/well-water monitoring study. The registrant reported that the formulation and rate of Telone II used in the study were ~94% and ~342 lb 1,3-dichloropropene/A, respectively.

A complete characterization of the soil to a depth of 5.7 meters was also provided (Table 1). In addition, the registrant reported that the slope of the field plot was <2% and provided air and soil temperature data for the entire 1-year study period.

In conclusion, the combined data from the terrestrial field dissipation/well-water monitoring study and the addendum are acceptable and fulfill data requirements by providing information on the dissipation of 1,3-dichloropropene in soil.

SUMMARY OF DATA BY REVIEWER:

Field Dissipation - Terrestrial

1,3-Dichloropropene (Telone II, 94% RTU), applied at 342 lb ai/A, declined from a maximum of 130,000 ppb in the 0.30 to 0.45-m layer of soil immediately after treatment to <10 ppb (detection limit) in any soil layer at 71 days in a field plot of sand soil located in California. The degradate 3-chloroallyl alcohol declined from a maximum of 410 ppb in the 0.66- to 0.81-m layer of soil at 7 days posttreatment to <10 ppb in any soil layer at 71 days.

Ancillary Study - Well-Water Monitoring

1,3-Dichloropropene (Telone II, 94% RTU) was <10 ppb (not detected) between 0 and 170 days posttreatment in water from four wells located in and around a field plot of sand soil treated with 1,3-dichloropropene at 342 lb ai/A. 1,2-Dichloropropane was <10 ppb in water samples except for two samples taken 1 day pre- and posttreatment which were considered to be contaminated.

EXECUTIVE SUMMARY

The following findings are derived from those reviewed studies which have met the requirements of 40 CFR Part 158.130 and the guidance of Subdivision N and were also deemed acceptable.

Photodegradation in air

1,3-Dichloropropene (cis and trans, purity >94.8%), at 0.035-0.050 µg/mL, did not degrade in borosilicate glass vials irradiated continuously with a xenon arc lamp at 25 ± 2°C and ambient humidity for 30 days (Fontaine and Teeter, 40390101). The xenon arc lamp produced a continuous spectrum of light between 300 and 750 nm that was approximately half the intensity of spring/summer sunlight at 40°N latitude. After 30 days of irradiation, 95-98% of the applied radioactivity was recovered as 1,3-dichloropropene and no degradates were detected. In the dark control at 30 days posttreatment, 86-92% of the applied was recovered as 1,3-dichloropropene and no degradates were detected.

Terrestrial field dissipation

1,3-Dichloropropene (Telone II, 94% RTU), applied at 342 lb ai/A, declined from a maximum of 130,000 ppb in the 0.30 to 0.45-m layer of soil immediately after treatment to <10 ppb (detection limit) in any soil layer at 71 days in a field plot of sand soil located in California. The degradate 3-chloroallyl alcohol declined from a maximum of 410 ppb in the 0.66- to 0.81-m layer of soil at 7 days posttreatment to <10 ppb in any soil layer at 71 days.

Well-Water Monitoring (Ancillary Study)

1,3-Dichloropropene (Telone II, 94% RTU) was <10 ppb (not detected) between 0 and 170 days posttreatment in water from four wells located in and around a field plot of sand soil treated with 1,3-dichloropropene at 342 lb ai/A. 1,2-Dichloropropane was <10 ppb in water samples except for two samples taken 1 day pre- and posttreatment which were considered to be contaminated.

RECOMMENDATIONS

Available data are insufficient to fully assess the environmental fate of 1,3-dichloropropene. The submission of data required for full registration on terrestrial food crop and terrestrial nonfood use sites is summarized below:

The following data are required:

Aerobic soil metabolism studies: No data were reviewed for this addendum.

Anaerobic soil metabolism studies: No data were reviewed for this addendum.

Leaching and adsorption/desorption studies: No data were reviewed for this addendum.

Confined accumulation studies on rotational crops: No data were reviewed for this addendum.

Reentry studies: No data were reviewed for this addendum. For each site, the registrant must propose an acceptable reentry interval based upon: 1) tasks that require reentry into treated areas; 2) air concentrations of 1,3-dichloropropene at the time of reentry; and 3) residues of 1,3-dichloropropene in or on soil, if any work task is such that human exposure to the treated soil is likely to occur.

Exposure studies: No data were reviewed for this addendum. Because of the acute inhalation, dermal, and other potential hazards of 1,3-dichloropropene, the Agency requests data for quantitative permeation and breakthrough time on various materials used for protective clothing and equipment (gloves, boots, respirator hoses, face pieces, etc.) for the formulated products(s). If quantitative data are not available, then appropriate permeability studies should be conducted.

The registrants should submit the information to the product manager for review by the Protective Clothing Group (PCWG)/HED. The PCWG will address updating the current label language, once the information has been evaluated.

The following data requirement is partially fulfilled:

Terrestrial field dissipation studies: One study (Oliver et al., 40403301) was reviewed and partially fulfills data requirements by providing information on the terrestrial field dissipation of Telone II (94% RTU; 1,2-dichloropropene) in sand soil in California. Data are required for one additional site.

The following data requirements are fulfilled:

Hydrolysis studies: No data were reviewed for this addendum. Based on previously submitted data, no additional data are required.

Photodegradation in air: One study (Fontaine and Teeter, 40390101) was reviewed and is acceptable. This study fulfills data requirements by providing information on the photodegradation of cis- and trans-1,3-dichloropropene in air.

The following data requirements are deferred or are not required for presently registered uses:

Photodegradation studies in water: No data were reviewed for this addendum; however, no data are required because application is by soil injection and dichloropropene will not be available for aqueous phototransformation.

Photodegradation studies on soil: No data were reviewed for this addendum; however, no data are required because of the method of application and the high volatility.

Anaerobic aquatic metabolism studies: No data were reviewed for this addendum; however, no data are required because 1,3-dichloropropene has no aquatic or aquatic impact uses.

Aerobic aquatic metabolism studies: No data were reviewed for this addendum; however, no data are required because 1,3-dichloropropene has no aquatic or aquatic impact uses.

Laboratory volatility studies: No data were reviewed for this addendum; however, no data are required because of the nature and use of this product.

Field volatility studies: No data were reviewed for this addendum; however, no data are required because of nature and use of this product.

Aquatic field dissipation studies: No data were submitted for this addendum; however, no data are required because 1,3-dichloropropene has no aquatic or aquatic impact use.

Forestry dissipation studies: No data were reviewed for this addendum; however, no data are required because currently 1,3-dichloropropene has no registered forestry uses per se. Use is limited to forest nurseries.

Dissipation studies for combination products and tank mix uses: No data were reviewed; 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 reviewed for this addendum, but all data may be required if the results from the field dissipation/aerobic soil metabolism studies demonstrate that residues do not reach 50% dissipation in soil prior to the recommended subsequent application.

Field accumulation studies on rotational crops: No data were reviewed for this addendum. The data requirement is deferred pending the receipt of an acceptable accumulation study in rotational crops.

Accumulation studies on irrigated crops: No data were reviewed for this addendum; however, no data are required because 1,3-dichloropropene is not intended for aquatic food crop or aquatic nonfood uses, for uses in and around holding ponds used for irrigation purposes, or for uses involving effluents or discharges to water used for crop irrigation.

Field accumulation studies on aquatic nontarget organisms: No data were reviewed for this addendum; however, no data are required because 1,3-dichloropropene has no registered forestry, aquatic noncrop, or aquatic impact uses.

Ancillary studies - Well-Water Monitoring: One study (Oliver et al., 40403301) was reviewed which provides information on the movement of 1,2-dichloropropene into wells adjacent to Telone II-treated fields in California.

Label Restrictions

Pending the submission of crop rotation data, it is suggested that crops other than those with registered dichloropropene uses be restricted from being planted in dichloropropene-treated soil. An interim 24-hour reentry interval is required unless protective clothing is worn.

REFERENCES

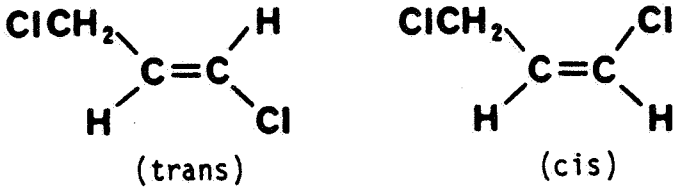
Fontaine, D. and D. Teeter. 1987. Vapor-phase photodegradation of 1,3-dichloropropene. Dow Chemical U.S.A., Ag Chemical R&D Protocol #87083. Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, Missouri, and Dow Chemical U.S.A., Midland, MI; and submitted by Dow Chemical U.S.A., Midland, MI.

Oliver, G., E. Bjerke, and F. O'Melia. 1986. Field dissipation study of Telone II soil fumigant (supplementary information). Prepared and submitted by Dow Chemical U.S.A., Midland, MI.

APPENDIX

STRUCTURE OF 1,3-DICHLOROPROPENE

TELONE II SOIL FUMIGANT



1,3-Dichloropropene