Shaughnessy No.: 029001

Date Out of EAB: MAY 6 1988

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

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

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 the Standard: Review of soil column study.

Date Received: 3/15/88 Action Code(s): 606

Date Completed: 5/6/88 EAB #(s) : 80533

Monitoring study submitted: ____ Total Reviewing Time: 2 days

Monitoring study voluntarily: ____

Deferrals to: ____ Ecological Effects Branch

____ Residue Chemistry Branch

____ Toxicology Branch

1. CHEMICAL: Common name:

1,3-Dichloropropene

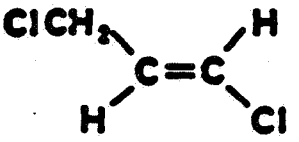
Chemical name:

1,3-Dichloropropene

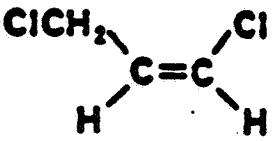
Trade name(s):

Telone II Soil Fumigant

Structure:



(trans)



(cis)

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:

[^{14}C]-1,3-dichloropropene

3. STUDY/ACTION TYPE:

Review of a column leaching study to satisfy data requirements for the 1,3-Dichloropropene Registration Standard.

4. STUDY IDENTIFICATION:

Peterson, J.R., H.A. Moye, Malagodi, and R. Weintraub. 1988. Soil column leaching study of 1,3-dichloropropene. Laboratory Project ID GHC2018. Prepared by Pesticide Research Laboratory, Gainesville, FL, and Dow Chemical U.S.A., Midland, MI. Submitted by Dow Chemical U.S.A., Midland, MI. MRID # 40538901

2

5. REVIEWED BY:

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

Signature: PR Datta

Date: 5/6/88

6. APPROVED BY:

Emil Regelman
Supervisory Chemist
Review Section #3
EAB/HED

Signature: E Regelman

Date: MAY 6 1988

7. CONCLUSIONS:

EAB accepts the results of the Soil Column Leaching Study of 1,3-dichloropropene conducted in accordance with the protocol approved by the Agency on 9/17/87. The data submitted by Dow Chemical Company provided information on the mobility of unaged [^{14}C]-1,3-dichloropropene ([^{14}C]-1,3-D) in four soils (column leaching in sand, loamy sand, and two clay soils). Dow Chemical Company intends to repeat the aged soil column study because of inconsistent results and insufficient per cent recovery of [^{14}C]-1,3-D. The submitted data (on unaged 1,3-D) partially fulfill the data requirement for Leaching and adsorption-/desorption (§163-1) under 40 CFR §158.130.

8. RECOMMENDATIONS:

EAB recommends RD inform the registrant, Dow Chemical Co., that the data requirement for leaching and adsorption/desorption (§163-1) is partially fulfilled to support continued registration of 1,3-dichloropropene for terrestrial food crops under 40 CFR §158.130. Data from the repeated aged soil column study will be needed to complete the data requirement for the soil column leaching study. EAB's Ground Water Team prefers the batch equilibrium study on adsorption/desorption of [^{14}C]-1,3-dichloropropene in lieu of a column leaching study to fulfill the data requirements.

9. BACKGROUND:

On 3/4/88 Dow Chemical Company submitted the data from the soil column study of unaged [^{14}C]-1,3-dichloropropene only. Dow Chemical encountered difficulties with the aged soil column portion of the study and intends to repeat the experiment. This soil column study of [^{14}C]-1,3-dichloropropene was conducted jointly by the Pesticide Research Laboratory of the University of Florida and the Agricultural Chemistry R&D Laboratory of Dow Chemical U.S.A under an EAB-approved protocol (For details, refer to EAB review #70599, 9/17/87).

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

See attached DER of individual study by Dynamac.

11. COMPLETION OF ONE-LINER:

N/A.

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

APRIL 28, 1988

Submitted to:
Environmental Protection Agency
Arlington, VA 22202

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

5

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 40538901
Peterson, J.R., H.A. Moye, M.H. Malagodi, and R. Weintraub. 1988. Soil column leaching study of 1,3-dichloropropene. Laboratory Project ID GH-C2018. Prepared by Pesticide Research Laboratory, Gainesville, FL, and Dow Chemical U.S.A., Midland, MI. Submitted by Dow Chemical U.S.A., Midland, MI.

SUBST. CLASS = S

DIRECT RVW TIME = 5

REVIEWED BY: J. Harlin TITLE: Staff Scientist

EDITED BY: K. Patten TITLE: Task Leader

APPROVED BY: W. 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: PR Datta 5/5/88

CONCLUSIONS:

Mobility - Leaching and Adsorption/Desorption

This study is acceptable and partially fulfills EPA Data Requirements for Registering Pesticides by providing information on the mobility (column leaching) of unaged [^{14}C]1,3-dichloropropene in sand, loamy sand, and two clay soils. A study is needed to determine the mobility of aged 1,3-dichloropropene in soil.

SUMMARY OF DATA BY REVIEWER:

[^{14}C]1,3-Dichloropropene was mobile in duplicate columns (30-40 cm height) of sand, loamy sand, and a Florida clay soil leached with $\geq$25 inches of

calcium chloride solution; 1.92-4.60% of the applied radioactivity remained in the soil columns and 69.5-83.9% was in the leachates. Radioactivity tended to remain near the top of the columns. [^{14}C]1,3-Dichloropropene residues were very mobile in duplicate Hawaii clay soil columns; 15.9-22.5% of the applied radioactivity remained in the soil and 58.7-65.5% was in the leachates. Radioactivity remaining in the soil was evenly distributed throughout the column. Average maximum K_d values were 0.23 for loamy sand, 0.32 for sand, and 0.42 and 1.09 for two clay soils. Average maximum K_{oc} values were 20 for sand, 25 for loamy sand, and 41 and 42 for two clay soils. No degradates were detected (GLC analysis) in extracts of the leached soil columns.

DISCUSSION:

Material balances for the four soils ranged from 76.6 to 88%, based on average recoveries. The study authors attributed losses in radioactivity to volatilization of 1,3-dichloropropene. Attempts were made to minimize such losses, including the use of a closed system to deliver eluent to each soil column and to collect each eluent fraction passing through the columns. In addition, the division of the leached soil columns and centrifugation during the soil extraction process were performed at reduced temperature.

MATERIALS AND METHODS

MATERIALS AND METHODS:

Four soils (sand, loamy sand, and two clay; Table 1) were air-dried, sieved (2 mm), and packed into glass chromatograph columns (500 mm x 25 mm) to a height of 30-40 cm. The columns were saturated with calcium chloride solution and allowed to drain by gravity. [^{14}C]1,3-Dichloropropene (radiochemical purity 97.8%, specific activity 1.9 mCi/mMol, Dow Chemical Co.) was added to the top of each soil column at 4.11 mg/mL. Each column was leached with at least 25 inches of calcium chloride solution at a flow rate of 1 mL/minute. The column leachate was collected in six equal fractions of 50 mL. Following draining, the soil columns were divided into six sections (5-7 cm) and stored frozen until analysis.

Aliquots of the leachate were analyzed for total radioactivity by LSC. A portion of the frozen soil was brought to room temperature, then extracted with a 30% methanol solution. Aliquots of the resulting supernatant were analyzed for total radioactivity by LSC. The remaining frozen soil was brought to room temperature and each soil section was extracted three times with a 30% methanol solution. The supernatants from the second and third extractions were combined and aliquots were analyzed for total radioactivity using LSC. Additional aliquots of the combined supernatants were transferred to culture tubes, hexane was added, and the tubes were vortexed. A portion of the hexane fraction was analyzed by GLC with electron capture detection. A sample of the soil remaining in the bottom of the centrifuge tube was placed on filter paper in a Buchner funnel, then rinsed with methanol; the extracted soil was analyzed by LSC following combustion.