UNDATED

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

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

SUBJECT: Factors affecting the volatilization of 1,3-dichloropropene from soil resulting from the injection of Telone II into soil.

TO: Jan Auerbach, Chief
Special Review Branch
Special Review and Reregistration Division

Curt Lunchick, Acting Section Head
Chemical Review Section
Non-Dietary Exposure Branch/HED

FROM: Henry Nelson, Ph.D., Acting Section Head
Chemical Review Section #3
Environmental Fate and Groundwater Branch/EFED

THRU: Hank Jacoby, Chief Hank Jacoby
Environmental Fate and Groundwater Branch
Environmental Fate and Effects Division/OPP

This is EFGWB's response to the September 20, 1990 memorandum from J. Auerbach to H. Jacoby requesting information on factors affecting the volatilization of 1,3-dichloropropene from soils. The available information is insufficient to fully assess the affect of various soil and meteorological parameters on the volatilization of 1,3-dichloropropene.

The following general comments are based upon Glotfelty and Schomberg (Chapter 8 in Reactions and Movement of Organic Chemicals in Soils. Sawhney and Brown, editors. SSSA Special Publication Number 22, 1989.) and upon Thomas (Chapter 16 in Handbook of Chemical Estimation Methods. Lyman etal., editors. Mc-Graw-Hill, 1982). In general, the volatilization rates of neutral organics such as 1,3-dichloropropene from soil increase with decreasing soil organic content, increasing temperature, and increasing wind speed. In general, the extreme drying of soils (which occurs during periods of drought) will greatly decrease actual rates of vapor phase volatilization, but will increase the amount of dust borne pesticide in the air. Conversely, the addition of moisture to dry soils will generally increase volatilization rates, but only to a certain point beyond which additional moisture may have little effect or may start to decrease volatilization rates. The effect of changes in soil

muck soil (OC = 74%)
Sandy loam soil = OC = 1.6%
loamy sand soil = OC = 0.9%

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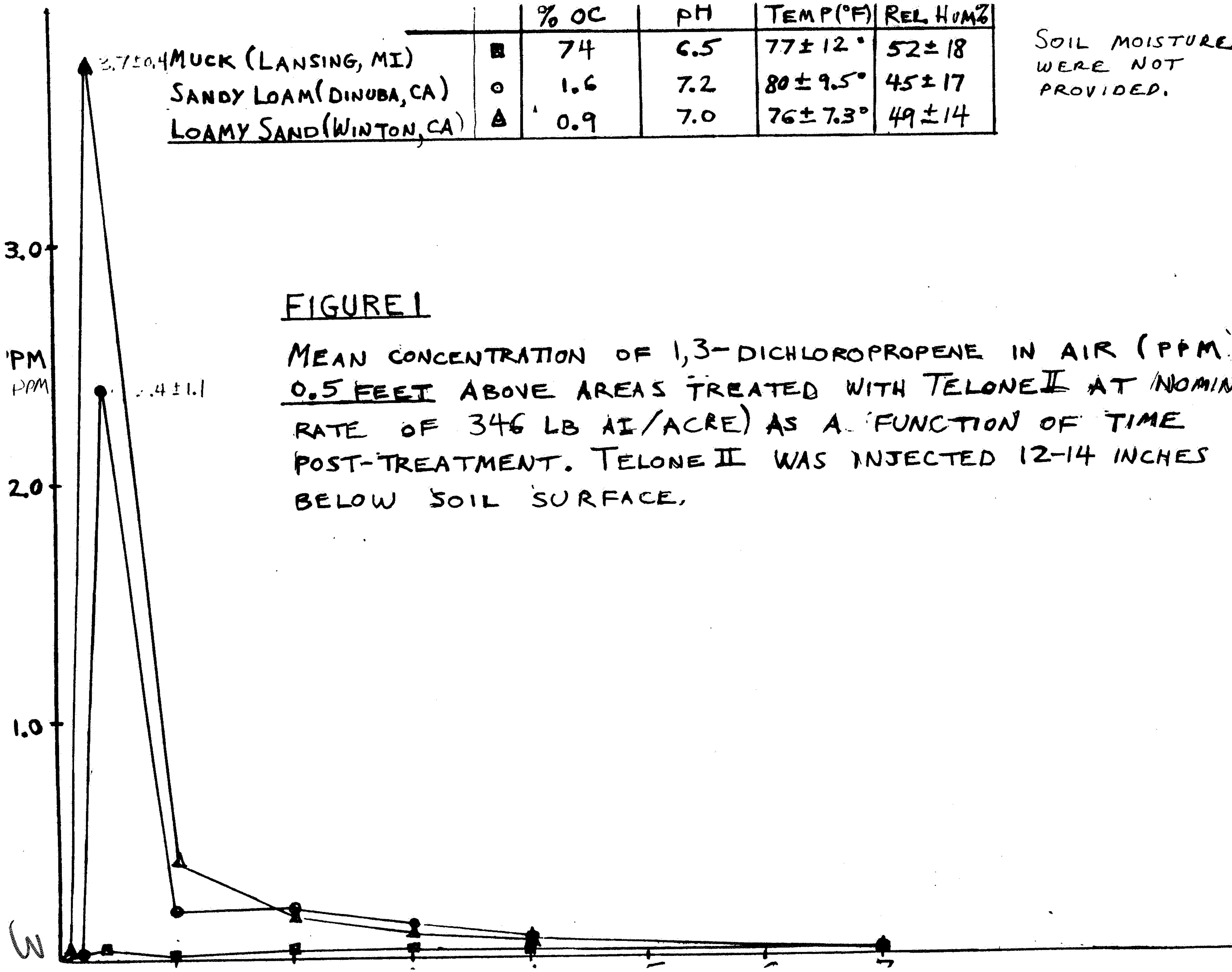
moisture on the volatilization of organics from soils with more intermediate moisture contents is difficult to predict and depends upon the chemical, soil type, and the initial moisture content.

There were no reviews of lab volatility and only one (EFGWB# 90601 dated 8/31/89) of a field volatility study for 1,3-dichloropropene in the EFGWB files. The field volatility study (41057701) did not satisfy the data requirement, but may be used for supplemental information. Attached in addition to the review are EFGWB plots of the vapor phase concentration of 1,3-dichloropropene in air as a function of post-treatment time at heights of 0.5 feet (Figure 1) and 5 feet (Figure 2) above areas of a muck soil (OC = 74%), a sandy loam soil(OC = 1.6%) and a loamy sand soil (OC = 0.9%) that had been nominally treated with 36 gal/acre of Telone II (RTU 95% 1,3-dichloroproprene). The treatment resulted in the injection of 1,3-dichloropropene 12-14 inches below the soil surface at a nominal rate of 346 lb ai/acre (the application rate was not confirmed by soil analyses).

As can be seen from Figures 1 and 2, and plots copied from the study report, maximum concentrations in the air were obtained in all cases within 6-12 hours post-treatment, decreased rapidly to much lower concentrations at day 1 post-treatment, and then decreased to negligible (relative to the maximum) concentrations thereafter. Maximum concentrations of 1,3-dichloropropene in air samples collected at 0.5 feet above the treated areas were 5-10 times the corresponding maximum concentrations at 5 feet. The effect of soil moisture on the volatilization rates could not be determined because soil moisture data were not provided and because other factors affecting volatilization rates were not comparable between soils. Differences between mean temperatures and between mean relative humidities among the 3 soil testing sites were small. Maximum concentrations of 1,3-dichloropropene in air samples collected above the soil with the lowest organic content (loamy sand OC = 0.9%) were 1.5-2.5 times those in air samples collected above the soil with the second lowest organic content (sandy loam OC = 1.6%). As might be expected for a neutral organic, concentrations in air samples collected above the high organic muck soil (OC = 74%) were negligible compared to those collected above the loamy sand and sandy loam soils.



		% OC	pH	TEMP (°F)	REL HUM%
MUCK (LANSING, MI)	■	74	6.5	77 ± 12°	52 ± 18
SANDY LOAM (DINUBA, CA)	○	1.6	7.2	80 ± 9.5°	45 ± 17
LOAMY SAND (WINTON, CA)	△	0.9	7.0	76 ± 7.3°	49 ± 14

SOIL MOISTURES WERE NOT PROVIDED.

FIGURE 1

MEAN CONCENTRATION OF 1,3-DICHLOROPROPENE IN AIR (PPM 0.5 FEET ABOVE AREAS TREATED WITH TELONE II AT NOMINAL RATE OF 346 LB AI/ACRE) AS A FUNCTION OF TIME POST-TREATMENT. TELONE II WAS INJECTED 12-14 INCHES BELOW SOIL SURFACE.

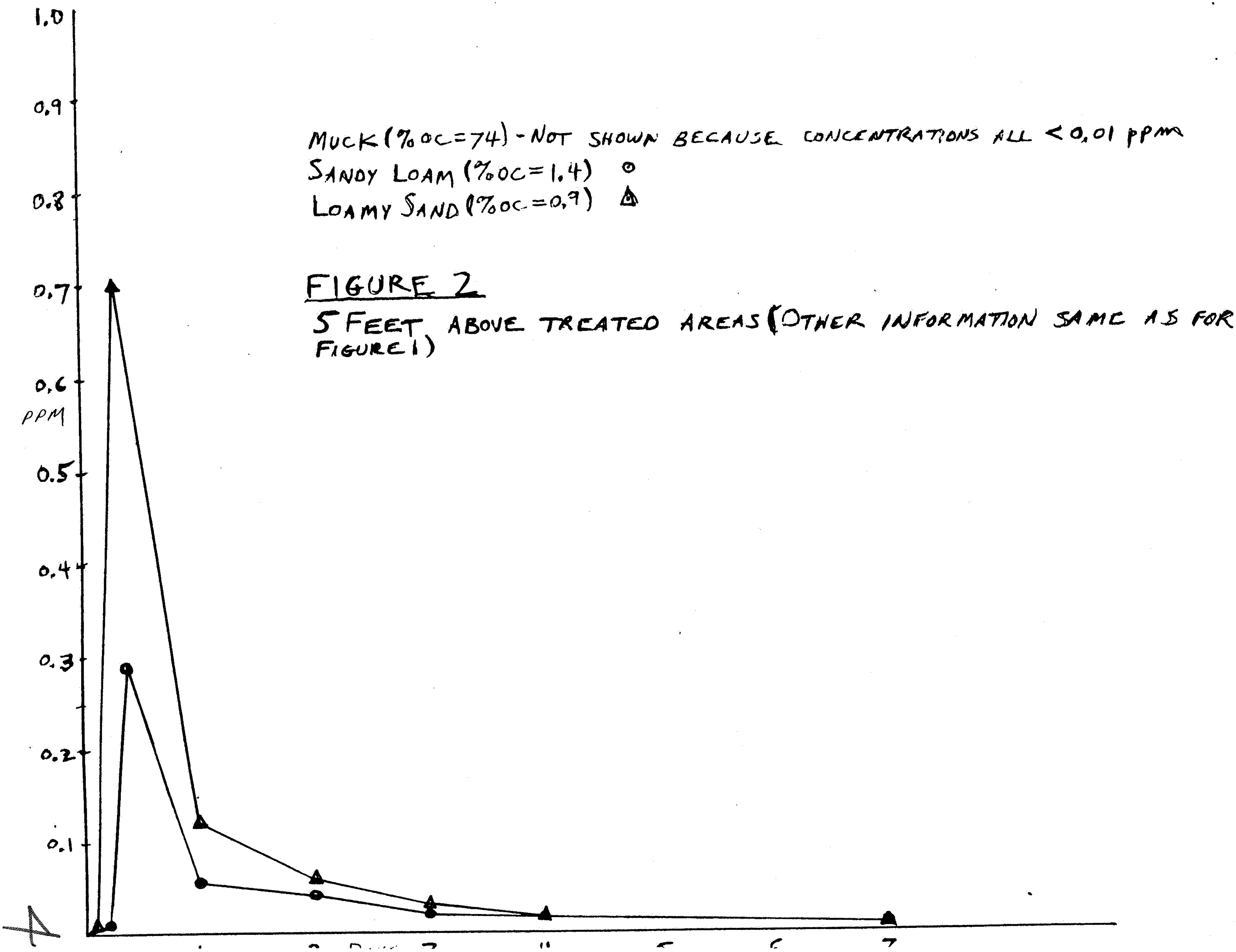


FIGURE 2

5 FEET ABOVE TREATED AREAS (OTHER INFORMATION SAME AS FOR FIGURE 1)

Aane/Amy
FYI Where does this task fall 2Q FY91? Hank J

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

SEP 20

MEMORANDUM

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

SUBJECT: Environmental Factors Affecting Air Levels of 1,3-dichloropropene (DCP)

FROM: Jan Auerbach, Chief Jan Auerbach
Special Review Branch
Special Review and Reregistration Division (H7508C)

TO: Henry Jacoby, Chief
Environmental Fate and Groundwater Branch
Environmental Fate and Effects Division

The Special Review Branch is currently developing a Preliminary Determination (PD 2/3) for DCP. The worker risk assessment presented in the PD 1 and in the Registration Standard from 1986 shows unacceptable worker risks. In addition, recent air monitoring data submitted by the California Department of Food and Agricuture indicates that persons residing in the vicinity of treated agricultural fields may be at risk due to inhalation exposure. A DCI is being prepared to gather the registrants' existing information on use, usage and product performance data in order to update this information.

Based on past EFGWB reviews, it has been shown that certain environmental conditions affect the amount of DCP that escapes the soil after injection. Since DCP is used throughout the country and is used under widely divergent environmental conditions, it is critical that we determine how different environmental conditions affect the amount of DCP that will be released into the air. The Non-Dietary Exposure Branch of HED has determined that the best approach would be to establish several regional "scenarios." In addition to the information requested via the DCI, we will need to be able to relate, at least qualitatively, environmental conditions to the amount of DCP which can be expected to be released from the soil.

The Special Review Branch is therefore requesting that EFGWB gather information from past submissions and, where possible, summarize the effects of the following environmental parameters on the release of DCP into the air:

1) Soil type;
2) Moisture, of soil and above ground;
3) Depth of Injection;
4) Temperature, of soil and above ground;
5) Any other factors which may substantially influence the amount of Telone to which workers and others in the vicinity of treatment could be exposed.

In addition, we are concerned about the mixture of DCP and chloropicrin found in Telone C-17 and Vorlex. The chloropicrin is added as a warning agent. We need to know if chloropicrin and DCP volatilize at the same rate so that temporally, the chlorpicrin serves as an adequate warning for DCP concentrations of concern.

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Shaughnessy No.: 029001

Date Out of EFGWB: AUG 31 1989

To: Susan Lewis
Acting Product Manager #21
Fungicide-Herbicide Branch
Registration Division (H7505C)

From: Emil Regelman, Supervisory Chemist
Review Section #2
Environmental Fate and Ground Water Branch/EFED (H7507C)

Thru: Henry Jacoby, Acting Chief
Environmental Fate and Ground Water Branch/EFED (H7507C)

Attached, please find the EFGWB review of . . .

Reg./File # : 464-511

Chemical Name : 1,3-Dichloropropene

Type Product : Nematicide/Fungicide/Herbicide/Insecticide

Product Name : Telone II

Company Name : Dow Chemical USA

Purpose : Addendum to a Standard; review of a field volatility study and response to EPA comments on field dissipation.

Date Received: 5/25/89 EFGWB # (s): 90601 & 90602

Action Code : 660 Total reviewing time: 2 days

Deferrals to:

_____ Ecological Effects Branch, EFED

_____ Science Integration and Policy Staff, EFED

_____ Non-Dietary Exposure Branch, HED

_____ Dietary Exposure Branch, HED

_____ Toxicology Branch I, HED

_____ Toxicology Branch II, HED

1. CHEMICAL: Common name:

1,3-Dichloropropene

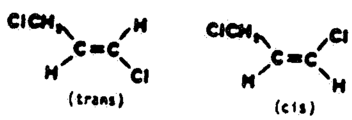
Chemical name:

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: 111.9
Physical state: Colorless to straw-colored liquid.
Solubility: Water - 0.1%.

2. TEST MATERIAL:

Telone II, a 94% RTU.

3. STUDY/ACTION TYPE:

Addendum to a Standard; review of a field volatility study and response to EPA comments on a terrestrial field dissipation study.

4. STUDY IDENTIFICATION:

McKellar, R.L., F.C. O'Melia, R.W. Bohl, D.L. Rick, and J. M. Hugo. 1989. Determination of residues of cis- and trans-1,3-dichloropropenes and 1,2-dichloropropane in air above or near soil treated with Telone II soil fumigant. Laboratory Project ID GH-C 2165. Unpublished study performed and submitted by Dow Chemical USA, Midland, MI. (41057701)

Oliver, G.R., E.L. Bjerke, K.B. Woodburn, and F.C. O'Melia. 1988. Field dissipation and leaching study for Telone II soil fumigant. Laboratory Project ID GH-C 2111. Unpublished study prepared and submitted by Dow Chemical USA, Midland, MI. (40855501)

5. REVIEWED BY:

Padma Datta, Ph.D.
Review Section #2
Chemist
EFGWB/EFED/OPP

Signature: PKDatta

Date: 8/23/89

6. APPROVED BY:

Emil Regelman
Review Section #2
Supervisory Chemist
EFGWB/EFED/OPP

Signature: ERegelman

Date: AUG 31 1989

7. CONCLUSIONS:

The field volatility study (163-3) is unacceptable because the registrant (Dow Chemical) provided inadequate soil data to confirm the 1,3-dichloropropene application rate. Recalculation of the volatility data is also required to express such data in the units stated in Subdivision N of the Guidelines.

In response to the Agency's comments (EFGWB review #90172, 3/24/89) on the terrestrial field dissipation study (164-1), Dow Chemical stated that storage stability data are unwarranted because all samples were extracted shortly after collection. However, EFGWB notes that methanol or diethyl ether extracts of 1,3-dichloropropene and its degradates were stored frozen for 43 days prior to analysis. EFGWB thus reiterates its request for storage stability data.

EFGWB concurs with Dow's statement that contamination occurred in soil samples in spite of the precautions taken to minimize contamination.

8. RECOMMENDATION:

RD should inform Dow Chemical to correct the deficiencies cited in the individual DERs of the field volatility (163-3) and field dissipation (164-1) studies, then resubmit both studies.

9. BACKGROUND:

On 4/6/89, Dow Chemical submitted a field volatility study (163-3), as required by the data gaps cited in the Registration Standard issued by the Agency on 9/18/86.

On 4/6/89, Dow Chemical also responded to the Agency's objections re the field dissipation study (164-1) cited in EFGWB review #90172 (3/24/89).

10. <u>DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:</u>

See attached individual DERs.

11. <u>COMPLETION OF ONE-LINER:</u>

See attached one-liner.

12. <u>CBI APPENDIX:</u>

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

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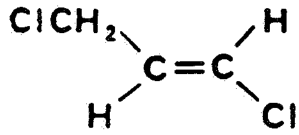

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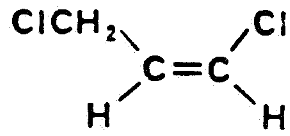

(cis)

ENVIRONMENTAL FATE & ...

PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY

Common Name: **DICHLOROPROPENE**
Date: 07/27/89
Chem. Name : 1,3-DICHLOROPROPENE
:
Shaugh. # : 29001
CAS Number: 542-75-6
Type Pest. : NEMATICIDE, FUNGICIDE; INSECTICIDE, HERBICIDE
Formulation: SINGLE ACTIVE INGREDIENT, 94% RTU
Uses : SOIL FUMIGANT, APPLIED PRIOR TO PLANTING TERRESTRIAL-FOOD
: AND NON-FOOD USE SITES.
:

Empir. Form: $C_3H_4Cl_2$
Mol. Weight: 110.9
Solub.(ppm). 2500 (OR 1000) @ 20 C

VP (Torr): 27.3
Log Kow : 25.00
Henry's : 1.8E-3

Hydrolysis (161-1)
pH 5:[*] 3-5 DAYS AT 30 C
pH 7:[*] 3-5 DAYS AT 30 C
pH 9:[*] 3-5 DAYS AT 30 C
pH :[ ] pH5.5, 2 C, 90-100 DAYS
pH :[ ] " 15 C, 11-13 DAYS
pH :[ ] " 29 C, 2 DAYS

Photolysis (161-2, -3, -4)
Air :[*] 0.5-3.3 DAYS W/GE SUNLAMP
Soil :[*] RAPID
Water:[ ]
:[ ]
:[ ]
:[ ]

MOBILITY STUDIES (163-1)

Soil Partition (Kd)
1.[#] LOAMY SAND .23
2.[#] SAND .32
3.[#] CLAY 0.42 AND 1.09
4.[ ] AVG MAX Koc VALUES WERE 20 FOR
5.[ ] SAND, 25 FOR LOAMY SAND, AND
6.[ ] 41 AND 42 FOR TWO CLAY SOILS

Rf Factors
1.[#] IN 30 CM COLUMNS OF SAND,
2.[ ] LOAMY SAND, AND FLA. CLAY,
3.[ ] LEACHED WITH >25" WATER, 1.9-
4.[ ] 4.6% APPL RADIO. REMAINED IN
5.[ ] SOILS AND 70-84% WAS IN
6.[ ] LEACHATE.

METABOLISM STUDIES (162-1,2,3,4)

Aerobic Soil (162-1)

1.[#]	SOIL	%OM	C	pH	T1/2DA
2.[ ]	SPIER SL	11.6	15	?	22
3.[ ]	SPIER SL	11.1	15	?	37
4.[ ]	HAREN SL	3.6	15	5.0	22
5.[ ]	BOGERCIE SL	3.6	20	5.6	25
6.[ ]	CLAY	1.1	20	6.8	3
7.[ ]	CLAY	1.8	20	7.2	8

Anaerobic Soil (162-2)

1.[*]	SOIL	TEMP	T 1/2
2.[ ]	SILT CLAY LOAM	15 C	9.1 DA
3.[ ]	" " "	25 C	2.4 DA
4.[ ]	SANDY LOAM	15 C	7.7 DA
5.[ ]	" "	25 C	2.4
6.[ ]			
7.[ ]			

Aerobic Aquatic (162-4)
1.[ ]
2.[ ]
3.[ ]
4.[ ]

Anaerobic Aquatic (162-3)
1.[*] AT pH 6.9-7.5, T1/2=20 DAYS
2.[ ]
3.[ ]
4.[ ]

[*] - Acceptable Study. [#] = Supplemental Study

Common Name: **DICHLOROPROPENE** Date: 07/27/89

VOLATILITY STUDIES (163-2,3)

[ ] Laboratory:
[ ] Field:

DISSIPATION STUDIES (164-1,2,3,5)

Terrestrial Field (164-1)
1.[#] 1,3-D APPLIED AT 342 LB AIA DECLINED FROM A MAX OF 130,000
2.[ ] PPB IN .30-.45 M LAYER, IMMEDIATELY AFTER TREATMENT, TO
3.[ ] <10 PPB (DETECTION LIMIT) IN ANY SOIL LAYER AT 71 DAYS; THIS
4.[ ] WAS IN A FIELD PLOT OF SAND SOIL IN CALIFORNIA.
5.[ ]
6.[ ]

Aquatic (164-2)
1.[ ]
2.[ ]
3.[ ]
4.[ ]
5.[ ]
6.[ ]

Forestry (164-3)
1.[ ]
2.[ ]

Other (164-5)
1.[ ]
2.[ ]

ACCUMULATION STUDIES (165-1,2,3,4,5)

Confined Rotational Crops (165-1)
1.[ ]
2.[ ]

Field Rotational Crops (165-2)
1.[ ]
2.[ ]

Irrigated Crops (165-3)
1.[ ]
2.[ ]

Fish (165-4)
1.[ ]
2.[ ]

Non-Target Organisms (165-5)
1.[ ]
2.[ ]

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[*] - Acceptable Study. [#] = Supplemental Study

Common Name: **DICHLOROPROPENE** Date: 07/27/89

GROUND WATER STUDIES (158.75)

1.[ ] 1,3-D NOT DETECTED BETWEEN 0 AND 170 DAYS POSTTREATMENT IN
2.[ ] FOUR WELLS LOCATED IN AND AROUND A FIELD PLOT OF SAND SOIL
3.[ ] TREATED AT 342 LBS AIA.

DEGRADATION PRODUCTS

1. NONE DETECTED IN LEACHED COLUMN STUDIES
2. 3-CHLOROALLYL ALCOHOL, IN FIELD DISSIPATION STUDIES, DECLINED
3. FROM MAX OF 410 PPB IN THE .66-.81 M LAYER AT 7 DAYS POST-TREAT-
4. MENT TO <10 PPB IN ANY SOIL LAYER AT 71 DAYS.
5. PROPIONIC ACID AND AN UNKNOWN (CONTG. AN ALCOHOL OR CARBOXYL)
6.
7.
8.
9.
10.

COMMENTS

IN ANAEROBIC STUDIES, 1,3-D HAS AN AFFINITY FOR THE WATER PHASE OVER THE ORGANIC PHASE.

1,3-D EXPOSED TO 275 W GE SUNLAMP DEGRADED; T 1/2 = .5 TO 3.3 DA

WELLS 65-1200 FEET IN SO. CAL. HAD NO 1,3-D OR CHLOROALLYL ALC..

WELLS IN SUFFOLK CO.(NY) HAD DETECTABLE 1,3-D AND 1,2-D 68 DAYS AFTER FUMIGATION OF FIELD WITH 140 L/HA; CONC PEAKED AT 83 DAYS AND PERSISTED FOR 138 DAYS.

DESPITE 7000 GAL SPILL IN CALIF, 1,3-D DECREASED TO <100 PPM IN 0-12"DEPTH 5.5 MOS LATER, AND WAS NEVER FOUND IN WELLS NEARBY.

References: EPA REVIEWS
Writer : J. HANNAN

[*] - Acceptable Study. [#] = Supplemental Study

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DYNAMAC
CORPORATION

1,3-DICHLOROPROPENE ADDENDUM

Task 1: Review and Evaluation of Individual Studies

August 17, 1989

Final Report

Contract No. 68D90058

Submitted to:
Environmental Protection Agency
Arlington, VA 22202

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

1,3-DICHLOROPROPENE

Table of Contents

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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

STUDY 1

CHEM 029001 1,3-Dichloropropene §163-3

FORMULATION--16--READY TO USE

STUDY ID 41057701
McKellar, R.L., F.C. O'Melia, R.W. Bohl, D.L. Rick, and J. M. Hugo. 1989. Determination of residues of cis- and trans-1,3-dichloropropenes and 1,2-dichloropropane in air above or near soil treated with Telone II soil fumigant. Laboratory Project ID GH-C 2165. Unpublished study performed and submitted by Dow Chemical U.S.A., Midland, MI.

DIRECT REVIEW TIME = 12

REVIEWED BY: J. Harlin TITLE: Staff Scientist

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

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

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

APPROVED BY: P. Datta
TITLE: Chemist
ORG: EFGWB/EFED/OPP
TEL: 557-9733

SIGNATURE: *PK Datta* 8/23/87

CONCLUSIONS:

Mobility - Field Volatility

1. This study is cannot be used to fulfill data requirements at this time.

2. These data are considered to be of uncertain value and should not be used to predict the environmental behavior of 1,3-dichloropropene and its degradates.

3. This study is unacceptable at this time for the following reason:

   the stated application rate of 1,3-dichloropropene to the field plots was not confirmed; data from analyses of soil samples were not provided for any of the test locations.

4. In order for this study to fulfill the field volatility data requirement, the registrant must submit sufficient soil data to confirm the 1,3-dichloropropene application rate. All other available soil data should also be submitted. In addition, volatility data should be recalculated as g/ha/day, and air concentrations of volatiles should be recalculated as "$\mu g/m^3$" or "ng/m^3", in accordance with Subdivision N guideline requirements.

METHODOLOGY:

1,3-Dichloropropene (Telone II, RTU, 95.1% 1,3-dichloropropene and <0.1% 1,2-dichloropropane) was applied as a preplant broadcast treatment at 36 gal/A, equivalent to 346 lb ai/A, to fields of sandy loam, loamy sand, and muck soils (Table 1). The field containing sandy loam soil, located in Dinuba, California, was treated on May 10, 1988; the field containing loamy sand soil, located in Winton, California, was treated on September 12, 1988; and the field containing muck soil, located in East Lansing, Michigan, was treated on June 6, 1988. 1,3-Dichloropropene was injected into the soils at a depth of 12 to 14 inches below the soil surface using commercial chisel injection equipment, which had chisels spaced 12 inches apart. Following treatment, the soil surfaces were sealed by compaction. Field conditions, including air temperature, relative humidity, and air movement, for each test site at various intervals during the study, are provided in Table II.

At each test location, air samples were collected at ten stations: five within the treated area; one located 50 feet upwind from the treated area; and four located 3, 50, or 150 feet downwind from the treated area (Figure 1). At each station, the inlets of activated carbon-filled adsorption tubes were placed at 0.5- and 5-foot heights above the soil surface. The adsorption tubes at each sampling site were connected with flexible tubing to a single vacuum pump, which drew air through the tubes at ≈1-1.5 L/minute. Air samples were collected at each station 24 hours prior to treatment, at 1-6 hours, 6-12 hours, and at 1, 2, 3, 4, 7, 14-15, and 21 days posttreatment. At sampling, the tubes were removed, sealed, and stored refrigerated or frozen until analysis.

The carbon within the tubes was removed, divided into primary and secondary breakthrough sections, and placed separately into vials containing chilled carbon disulfide; the vials were mechanically shaken for one hour. Aliquots of the extracts were analyzed for 1,3-dichloropropene and 1,2-dichloropropane using GC with either mass selective detection (sandy loam and muck soils) or flame ionization detection (loamy sand soil). The detection limit for air sample analyses was 0.01 ppm. Recovery efficiencies for cis-1,3-dichloropropene ranged from 89 to 114% at concentrations of 0.004-1.4 ppm, and for trans-1,3-dichloropropene were 90 to 108% at concentrations of 0.003-1.2 ppm. Recovery efficiencies for 1,2-dichloropropane ranged from 91 to 112% at concentrations of 0.007-2.6 ppm.

DATA SUMMARY:

1,3-Dichloropropene (Telone II, RTU containing 95.1% 1,3-dichloropropene and <0.1% 1,2-dichloropropane) was injected (12- to 14-inch depth) at 346 lb ai/A into fields of sandy loam, loamy sand, and muck soil. The concentration of 1,3-dichloropropene above the soil surface was greatest (0.09-4.4 ppm at 0.5-foot height) at 6-12 hours posttreatment, regardless of soil type or location of the sampling equipment, and decreased to ≈10-20% of maximum by 24 hours posttreatment (Tables VI-VIII). 1,3-Dichloropropene decreased to ≤0.03 ppm in all air samples from all locations by 7 days posttreatment; it was not detected above the loamy sand and sandy loam soils by 14 days or above the muck soil by 21 days. In general, the concentration of dichloropropene was also greatest in air samples taken from within the boundaries of the treated area rather than upwind or downwind, and in air samples taken from a height of 0.5 rather than 5 feet above the soil surface. Concentrations of 1,3-dichloropropene were highest in air samples taken from above the loamy sand soil, which had the greatest porosity, and were lowest above the muck soil, which was the least porous. At all three test sites, 1,3-dichloropropene was detected in air samples taken 50 feet upwind and up to 150 feet downwind from the treated areas.

In a plot of loamy sand soil located in Winton, California, that was treated with 1,3-dichloropropene in September 1988, 1,3-dichloropropene at a height of 0.5 feet was a maximum [illegible].3-4.4 ppm at 6-8 hours and declined to <0.01 ppm (detection limit) by 14 days; maximum concentrations at 5 feet were 0.39-1.2 ppm at 6-8 hours posttreatment) and declined to <0.01 ppm by 7 days (Table VIII). In air samples taken 50 feet upwind from the treated plot, 1,3-dichloropropene was detected only at 6-8 hours posttreatment; the concentrations at this interval were 0.46 and 0.39 ppm at the 0.5 and 5 feet sampling heights, respectively. In air samples taken at 3-150 feet downwind from the treated area, 1,3-dichloropropene reached maximum concentrations at 6-8 hours posttreatment, and was 1.5 ppm (3 feet), 0.71 ppm (50 feet), and 0.43 ppm (150 feet); it was not detected by 7 days posttreatment.

In a plot of sandy loam soil located in Dinuba, California, that was treated in May 1988, 1,3-dichloropropene was a maximum 1.4-4.2 ppm and 0.08-0.33 ppm at 0.5 and 5 feet above the ground, respectively (8-11 hours posttreatment), and declined to <0.01 ppm at both heights by 14 days (Table VII). In air samples taken 50 feet upwind from the treated plot, 1,3-dichloropropene was detected at up to 0.09 ppm (maximum 8-11 hours posttreatment). In air samples taken at 3-150 feet downwind from the treated area, 1,3-dichloropropene was a maximum 1.0 ppm at 3 feet (8-11 hours), 0.10 ppm at 50 feet (8-11 hours), and 0.02 ppm at 150 feet (72 hours).

In a plot of muck soil located in East Lansing, Michigan, that was treated in June 1988, 1,3-dichloropropene was a maximum 0.09 ppm at 0.5 feet above the ground (8-12 hours posttreatment), and was <0.01 ppm in all air samples by 21 days posttreatment (Table VI). 1,3-Dichloropropene was ≤0.07 ppm in air samples taken upwind or downwind from the treated area.

1,2-Dichloropropane was not detected (<0.01 ppm) in air samples from the muck soil site, was detected once (0.01 ppm) at the loamy sand site, and was detected twice (0.01-0.02 ppm) at the sandy loam site (Tables IX-XI).

The vapor pressure of cis- and trans-1,3-dichloropropene was reported to be 28 mm Hg at 20°C. The vapor pressure of 1,2-dichloropropane was reported to be 50 mm Hg at 25°C.

COMMENTS:

1. The stated 346 lb ai/A application to the field plots was not confirmed; data from analyses of soil samples were not provided for any of the test locations. The study authors stated that, although soil samples were collected from the plots at several intervals, the soil data were not included in this volatility report because analytical problems resulted in inconsistent recoveries of 1,3-dichloropropene from the samples. The study authors were attempting to correlate concentrations of 1,3-dichloropropene in the upper four inches of soil at various sampling intervals with the concentrations detected in the air directly above the soil. The authors added that they are attempting to determine if the soil data, however variable, can be treated statistically so as to permit correlations with the air sample data.

2. Volatility data were not expressed in terms of "g/ha/day".

3. Air concentrations of volatiles were expressed in terms of "ppm", rather than "$\mu g/m^3$" or "ng/m^3", in accordance with Subdivision N guideline requirements.

4. The application rate was calculated by the reviewer based on the label use directions for Telone II, which states that 1 gallon of Telone II weighs 10.1 pounds. Therefore:

    36 gallons of formulated product
    x 10.1 pounds/gallon of product
    x 95.1% ai in the formulated product
    = 346 lb ai/A.

5. Storage stability studies of spiked air samples stored at freezer temperatures (unspecified) for 90 days indicated no loss of cis- and trans-1,3-dichloropropene or 1,2-dichloropropane. Ambient storage of air samples for 24 days showed a decrease in recovery of ≈10% for the three compounds.

6. Dissipation curves for 1,3-dichloropropene in air samples taken from the sandy loam and loamy sand soils are provided in Figures 2-4.

RIN 3413-94 1,3-Dichloropropene Reviews
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Page_____ is not included in this copy.

Pages 21 through 34 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

STUDY 2

CHEM 029001 Dichloropropene §164-1

FORMULATION--16--READY-TO-USE

STUDY ID 40855501

Oliver, G., E. Bjerke, K. Woodburne, and F. O'Melia. 1988. Field dissipation and leaching study for Telone II soil fumigant (Supplemental information). Laboratory Project ID GH-C 2111. Unpublished study prepared and submitted by Dow Chemical U.S.A., Midland, MI.

DIRECT REVIEW TIME = 2

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SIGNATURE: PKDatta 8/23/89

CONCLUSIONS:

In a previous review of a terrestrial field dissipation study (3/24/89, MRID 40855501), it was concluded that the study did not fulfill EPA Data Requirements for Registering Pesticides because storage conditions for the soil and groundwater samples for the period between sampling and analysis were not adequately described, and because no data were provided to demonstrate that 1,3-dichloropropene and its degradates were stable during frozen storage.

The registrant has responded that storage stability data may be unnecessary because all samples were extracted shortly after collection in preparation for analysis. The registrant submitted data indicating that the soil and groundwater samples were stored frozen for 0-14 days (average 6-7 days) prior to extraction. It is probable that dichloropropene residues did not degrade during the sample storage period, and stability data for 1,3-dichloropropene and its degradates in soil and groundwater will not be required at this time.

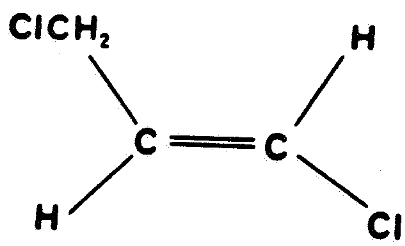
However, the storage data supplied by the registrant indicate that the soil and water extracts were stored frozen for up to 43 days (average 13-16 days) prior to analysis. The longer storage periods coincided with the later field sampling intervals, when storage instability could easily be masked by the dissipation that would be expected to occur in the field prior to sampling. The registrant should submit data demonstrating the stability of 1,3-dichloropropene and its degradates when stored frozen in methanol or diethyl ether for 43 days.

The registrant has also responded to comments in the field dissipation study review regarding "a serious contamination problem" that occurred during soil sampling. This response was unnecessary; the contamination problem was not considered a deterrent to acceptance of the study. The reviewer agreed with the registrant's original discussion about the contamination and accepts the statement that the registrant took maximum precautions to minimize contamination of the soil samples.

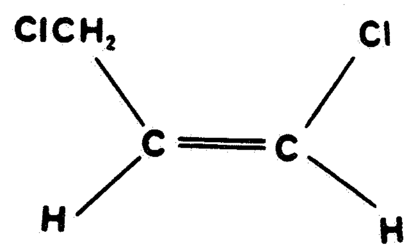
In conclusion, in order for this terrestrial field dissipation study to fulfill data requirements, the registrant must demonstrate that 1,3-dichloropropene and its degradates are stable during frozen storage in methanol and diethyl ether.

APPENDIX

STRUCTURE OF 1,3-DICHLOROPROPENE



(trans)



(cis)

1,3-Dichloropropene

TELONE II SOIL FUMIGANT