Shaughnessy No: 029001

Date Out of EFGWB: JUL 28 1989

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

From: Emil Regelman, Supervisory Chemist
Chemistry Review Section #2
Environmental Fate & Ground Water Branch (H7507C)

Thru: Henry Jacoby, Acting Chief
Environmental Fate & Ground Water Branch
Environmental Fate & Effects Division (H7507C)

Attached, please find the EFGWB review of...

Reg./File # : 464-511

Common Name : dichloropropene

Type Product : Nematicide, herbicide

Product Name : Telone II (94% RTU)

Company Name : Dow Chemical Company

Purpose : Review aerobic soil metabolism of 1,3-dichloropropene

Date Received: 4/24/89 Action Code(s): 660

Date Completed: 7/27/89 EFGWB #(s) : 90537

Total Reviewing Time: 1 day

Deferrals to: _____ Ecological Effects Branch, EFED

_____ Science Integration & Policy Staff, EFED

_____ Non-Dietary Exposure Branch, HED

_____ Dietary Exposure Branch, HED

_____ Toxicology Branch, FHA support/HED

1. CHEMICAL: Common name:

Dichloropropene

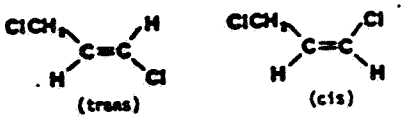
Chemical name:

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	:	110.9
Physical state	:	Colorless to straw-colored liquid
Vapor pressure	:	22 mm Hg at 20°C.
Solubility	:	Water, 0.1%.

2. TEST MATERIAL:

1,3-dichloropropene-2-^{14}C (Radiochemical purity 99 + %)

3. STUDY/ACTION TYPE:

Review aerobic soil metabolism of 1,3-dichloropropene

4. STUDY IDENTIFICATION:

Moye, H.A., J.R. Peterson, M.H. Malagodi, R. Weintraub, and J. Yoh. 1989. Aerobic soil degradation of 1,3-dichloropropene. Laboratory project ID GH-C 2158. Unpublished study performed by Pesticide Research Laboratory, Gainesville, Florida, and Dow Chemical U.S.A, Midland, Michigan. MRID# 410557-01

2

5. REVIEWED BY:

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

Signature: PRDatta

Date: 7/27/89

6. APPROVED BY:

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

Signature: Eregel

Date: JUL 28 1989

7. CONCLUSION:

This study (MRID #410557-01) on the aerobic soil degradation of 1,3-dichloropropene (§162-1) which was submitted by Dow Chemical Company (registrant) has inadequate data/information/methodology and several major deficiences which are not repairable/recoverable. Therefore, this study is being returned unreviewed to the registrant. (For details, see the attached Dynamac note to P. Datta, 5/19/89).

8. RECOMMENDATION:

RD should return this study on the aerobic soil degradation of 1,3-dichloropropene (MRID #410557-01) to Dow Chemical Company and request them to repeat the aerobic soil metabolism study (§162-1) following the guidance in Subdivision N of the Pesticide Assessment Guidelines.

9. BACKGROUND:

On 3/29/89, Dow Chemical Co. submitted a study on the aerobic soil degradation of 1,3-dichloropropene (MRID #410557-01) to fulfill the data requirement for aerobic soil metabolism of 1,3-dichloropropene in soil (§162-1). This submission was to support reregistration of pesticide products containing 1,3-dichloropropene as active ingredient, as required by the 1986 Registration Standard (Case No. GS-0328, 9/18/86).

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

N/A.

11. COMPLETION OF ONE-LINER:

See attached one-liner.

12. CBI APPENDIX:

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

May 19, 1989

TO: P. Datta, EFGWB/EFED

FROM: W. Spangler, Dynamac

RE: Dichloropropene: Metabolism, Aerobic soil.
Study MRID# 410557-01.

Moye, H.A., J.R. Peterson, M.H. Malagodi, R. Weintraub, and J. Yoh. 1989. Aerobic soil degradation of 1,3-dichloropropene. Laboratory Project ID GH-C 2158. Unpublished study performed by the Pesticide Research Laboratory, Gainesville, FL, and Dow Chemical U.S.A., Midland, MI, and submitted by Dow Chemical U.S.A.

The above study is being returned unreviewed because of the following insufficiencies:

The method could not detect 3-CAA, the major degradate of 1,3-DCP in soil extracts (p. 48 of the study).

A passive collection system was used to recover [^{14}C] volatiles; the study author suggested that considerable amounts of radioactivity may have been lost as volatiles when the flasks were opened during sampling or trap replacement.

The mass balances were inadequate; 49.4-73.5 and 55.3-104% of the applied was recovered from studies conducted with 100 and 1 ppm 1,3-DCP, respectively. In addition, recoveries were corrected for extraction efficiencies as described below (Table 3).

Method recovery for ca 26 ppm each of cold cis- and trans-1,3-DCP applied to soil was 28.3-58.4 and 39.6-60.3%, respectively (Table 4). The author cited losses due to volatility supported by the heightened recovery of the trans isomer over the cis isomer, which is consistent with the differences in vapor pressure.

A theoretical time 0 value was listed for 1,3-DCP, and used in the half-life determination (Figures 12a and 12b).

No raw data or representative chromatograms were submitted concerning the parent and degradates described in the soil extracts and gas trapping solutions.

ENVIRONMENTAL FATE & GROUND WATER BRANCH
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. $C_3H_4Cl_2$ VP (Torr): 27.3
Mol. Weight: 110.9 Log Kow : 25.00
Solub.(ppm). 2500 (OR 1000) @ 20 C 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
H5.5, 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)

		SOIL	%OM	C	pH	T1/2DA
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)

		SOIL	TEMP	T 1/2
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

5

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.[ ]

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

Use this form for individual studies & to submit pesticide applications.

United States Environmental Protection Agency
Office of Pesticide Programs
Washington, DC 20460

Data Review Record

Confidential Business Information - Does not contain National Security Information (E.O. 12065)

Pack Number	Date Received
49262 EFED	4-25-89

1. Product Name: Tolone

Chemical Name: 1,3-Dichloropropene

2. Identifying Number	3. Record Number	4. Action Code	5. MRID/ Accession Number	6. Study Guideline or Narrative
464-571	244176	660	41055701	162-1

7. Reference No.	8. Date Rec'd (EPA)	9. Prod/Review Mgr/DCI	10. PM/RM Team No.	11. Date to HED/ EFED/RD/BEAD	12. Proj Return Date	13. Date Returned to RD/SRRD
	4/5/89	Lewis/Tonia	21	4/24/89	6/19/89	

Instructions

Attn: Emil Regelman/ Padma Datta
Aerobic Soil Degradation study !

This Section Applies to Review of Studies Only

14. Check Applicable Box

- [ ] Adverse 6(a)(2) Data (405)
- [ ] Special Review Data (870)
- [x] Generic Data (Reregistration)(660)
- [ ] Product Specific Data (Reregistration)(655)

15. No. of Individual Studies Submitted:

16. Have any of the above studies *(in whole or in part)* been previously submitted for review?

- [ ] Yes *(Please identify the study(ies))*
- [ ] No

17. Related Actions:

18.	To	Type of Review	19. Reviews Also Sent to		20. Data Review Criteria
HED		Science Analysis & Coordination	SAC	PC	A. Policy Note No. 31
		Toxicology/HFA	TOX/HFA	PL	
		Toxicology/IR	TOX/IR		[ ] 1 = data which meet 6(a)(2) or meet 3(c)(2)(B) flagging criteria
		Dietary Exposure	DEB	EA	
		Nondietary Exposure	NDE	AC	[x] 2 = data of particular concern from registration standard
EFED		Ecological Effects		BA	
	✓	Environmental Fate & Groundwater	EEB		
SRRD		Special Review	EFGWB		[ ] 3 = data necessary to determine tiered testing requirements
		Reregistration			
		Generic Chemical Support	SR		
RD		Insecticide-Rodenticide	RER		B. Section 18
		Fungicide-Herbicide	GSC		[ ] 1 = data in support of section 3 in lieu of section 18
		Antimicrobial			
		Product Chemistry	IR		C. Inert Ingredients
		Precautionary Labeling	FH		[ ] 1 = data in support of continued use of List 1 inert
BEAD		Economic Analysis	AM		
		Analytical Chemistry			
		Biological Analysis			

- [ ] Confidential Statement of Formula (EPA Form 8570-4) Attached *(Trade Secrets)*
- [ ] Label Attached

EPA Form 8570-17 (Rev. 11-88) Previous editions are obsolete.

White - Data Coordinator
Yellow - Data Review Section
Pink - PM/RM/DCI
Green - Return with completed review

8