Shaughnessy Number: 029001

Date Out of EFGWB: DEC 22 1989

TO: Schnaubelt/Toma
Product Manager 74/SRRD
Registration Division (H7505C)

FROM: Michael Barrett, Acting Chief
Ground-Water Section
Environmental Fate & Ground-Water Branch/EFED (H7507C)

THRU: Henry Jacoby, Chief
Environmental Fate & Ground-Water Branch/EFED (H7507C) 12/27/89

Attached, please find the EFGWB review of:

Reg./File #: _____

Chemical Name: 1,3-Dichloropropene

Type Product: Soil Fumigant

Company Name: Dow Chemical U.S.A.

Purpose: Review Submission of Information on Degradation Products of 1,3-D in Soils.

Date Received: 9-06-89 ACTION CODE: 660

Date Completed: 12-21-89 EFGWB #(s): 90774

Monitoring study requested: X Total Review Time: 4 hours

Monitoring study voluntarily: ___

Deferrals To: _____ Biological Effects Branch

_____ Science Integration & Policy Staff, EFED

_____ Non-Dietary Exposure Branch, HED

_____ Dietary Exposure Branch, HED

_____ Toxicology Branch, HED

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

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

EPA Data Review Record

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

Pack Number	Date Received
49685 [illegible]	[illegible]

1. Product Name	Chemical Name
Telone	1,3-[illegible]

2. Identifying Number	3. Record Number	4. Action Code	5. MRID/ Accession Number	6. Study Guideline or Narrative
000464-00511	251863	660		Soil metabolism [illegible] (1,3-D); ground water monitoring study.

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
1	09/06/89	[illegible]/TUMA	74/EFED	09/20/89	10/31/89	

Instructions

Attn: [illegible] (EFGWB), EFED
Telone Fate & T.E. ground water monitoring 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: n/a

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

- [x] Yes *(Please identify the study(ies))* MRID # 42555-01 (19[illegible])
- [ ] No

17. Related Actions

18.	To	Type of Review
HED		Science Analysis & Coordination
		Toxicology/HFA
		Toxicology/IR
		Dietary Exposure
		Nondietary Exposure
EFED		Ecological Effects
	✓	Environmental Fate & Groundwater
SRRD		Special Review
		Reregistration
		Generic Chemical Support
RD		Insecticide-Rodenticide
		Fungicide-Herbicide
		Antimicrobial
		Product Chemistry
		Precautionary Labeling
BEAD		Economic Analysis
		Analytical Chemistry
		Biological Analysis

19. Reviews Also Sent to

SAC	PC
TOX/HFA	PL
TOX/IR	
DEB	EA
NDE	AC
	BA
EEB	
EFGWB	
SR	
RER	
GSC	
IR	
FH	
AM	

20. Data Review Criteria

A. Policy Note No. 31

- [ ] 1 = data which meet 6(a)(2) or meet 3(c)(2)(B) flagging criteria
- [x] 2 = data of particular concern from registration standard
- [ ] 3 = data necessary to determine tiered testing requirements

B. Section 18

- [ ] 1 = data in support of section 3 in lieu of section 18

C. Inert Ingredients

- [ ] 1 = data in support of continued use of List 1 inert

- [ ] 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

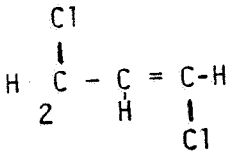
1. CHEMICAL:

Chemical name: 1,3-dichloropropene

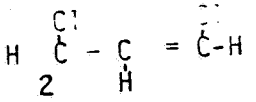
Common name: 1,3-D

Trade name: Telone II

Structure:



trans



cis

2. TEST MATERIAL:

Not Applicable.

3. STUDY/ACTION TYPE:

Review of information submitted about degradation products of 1,3-D in soils.

4. STUDY IDENTIFICATION:

Title: Memo to Catherine Eiden from Robert Peterson, Ph.D. (Aug. 28, 1989). RE: Products of the Soil Metabolism of 1,3-dichloropropene.

Author: Robert Peterson, Ph.D.

Submitted by: The Dow Chemical Company
P.O. Box 1706
Midland, MI 48641-1706
Research Triangle Park, NC 27709

Identifying No.: 000464-00511
Action Code: 660
Accession Number: n.a. (part of MRID # 408555-01 (1988))
Record Number: 251863
Date Sent to EFED: 09-20-89

5. REVIEWED BY:

Elizabeth Behl
Hydrogeologist
OPP/EFED/EFGWB/Ground-Water Section

Signature: Eliz Behl

Date: 12/21/89

6. APPROVED BY:

Michael R. Barrett
Acting Chief
OPP/EFED/EFGWB/Ground-Water Section

Signature: Michael R. Barrett

Date: 12/22/89

7. CONCLUSIONS:

The objective of this review is to obtain information on degradates of 1,3-D needed to properly design a ground-water monitoring study to track the fate of this compound in the subsurface. Five sites have been selected for small-scale retrospective ground-water monitoring studies using 1,3-D and the studies are underway. Samples will be analyzed for 5 analytes: cis and trans isomers of 1,3-D, cis and trans 3-chloroallyl alcohol (the degradate), and the impurity 1,2-D.

There is not yet enough information on the fate of a second degradate, 3-chloroacrylic acid, to determine the mobility and persistence of this compound. EFGWB is interested in examining this at one of the five retrospective study sites. If results of previous and on-going studies (field studies, aerobic soil metabolism, and field leaching laboratory studies) indicate that this acid degradate is mobile and persistent, further monitoring may be required.

8. RECOMMENDATIONS:

1) An analytical method must be developed for 3-chloroacrylic acid, a degradate of 1,3-D.

2) Samples from one of the five retrospective monitoring sites must be analyzed for the acid degradate of 1,3-D, in addition to the other 5 analytes. This site should be selected by the Ground Water Section.

3) More intensive monitoring (and instrumentation) may be required based on results of field and laboratory studies of the degradates.

9. BACKGROUND:

Telone II is a broad spectrum soil fumigant, mainly applied as a preplant fumigant by chisel injection for nematode control. According to the 1986 Guidance for reregistration of this product, the predominant use of Telone II is on vegetables, field crops, citrus, and fruit and nut trees. Application rates are generally high ranging from 38.3 lb ai/A (field crops and vegetables) to 1000 lb ai/A (citrus, fruit and nut trees).

EPA has categorized the active ingredient (1,3-D) as a B_1 oncogen. An impurity, 1,2-D, has been classified as a possible carcinogen (Group C). Because application rates are quite high; this accentuates the need for an evaluation of both of these compounds as well as the degradates 3-chloroallyl alcohol and 3-chloroacrylic acid. As a result of normal agricultural use, 1,3-D has been found in ground water in New York; 1,2-D has been found in ground water in New York, California, Connecticut, and Massachusetts (Pesticides in Ground Water Database: Interim Report 1988). EPA determined that the registrant must evaluate the impact on ground water occuring from registered 1,3-D use by conducting monitoring studies at different locations (EAB #6572; 6/23/86).

Dow submitted a protocol for conducting a small-scale retrospective monitoring study which was reviewed in EAB # 70575 (6/16/87), significant revisions were recommended in the review. A revised protocol was submitted and reviewed in EFGWB #90565 (6/6/89).

A verbal go-ahead was given by EFGWB to begin sampling for the site characterization phase. Six monitoring sites were tentatively approved (EFGWB #90565; 6/6/89). These sites are located in: Jackson County, Florida; Grant County, Washington; Merced County, California; Monterey County, California; Wayne County, North Carolina; and Scotts Bluff County, Nebraska. Because of monitoring complications sites in Florida and Hawaii are on hold. Field work has been initiated.

10. DISCUSSION:

The first step in the degradation of 1,3-D in soil involves the hydrolysis of 1,3-D to produce 3-chloroallyl alcohol. In laboratory degradation studies the average half-life of 1,3-D is 19 days or less in 13 different soils. The half-life in soil of 3-chloroallyl alcohol is reported as 2 days or less, due to microbial activity. In one study, with exhaustive extraction of a sandy-loam soil, up to 35 % of the applied radioactivity was extracted as 3-chloroallyl alcohol twenty weeks after application.

A second degradation product, 3-chloroacrylic acid, is produced from 3-chloroallyl alcohol. The concentration of extractable 3-chloroacrylic acid reported in these studies ranged from of 4-8 % of the applied radioactivity at maximum. Other products were reported; two degradates were present at concentrations of less than 3 % of applied, and disappeared after 8 weeks of incubation. Two other degradates were extracted at concentrations between 4-11 % with acetone, and 7-28 % with sodium hydroxide.

Results are presented from several field studies performed to evaluate the fate of 1,3-D and 3-chloroallyl alcohol in "highly permeable sand and loamy sand soils". Soils and ground water were sampled and both compounds were found in the upper 3 meters of soil. Results of the ground water analysis and analysis of the acid degradate are not discussed in this memorandum. Results of a rotational crop study are presented in which soils were sampled 3 times at 6-month intervals. Results of this study are presented as evidence that the acid degradate is rapidly incorporated into the soil organic matrix.

Previous discussions have indicated that the acid degradate may be more persistent than the alcohol degradate. Because there is not yet enough information on the fate of 1,3-D, all the degradates, and 1,2-D, EFGWB is interested in extending the monitoring at one of the five retrospective study sites. The Registrant has agreed (meeting 12/20/89) to submit information documenting the application rate of 1,3-D in laboratory studies, and reports of "prospective" type field studies so that EFGWB can determine the extent to which monitoring will be required.