

US EPA ARCHIVE DOCUMENT

Shaughnessy No.: 090301

Date Out of EFGWB: OCT 25 1989

To: Joanne Edwards
Product Manager #74
Reregistration Branch
Special Review and Reregistration Division (H7508C)

From: Emil Regelman, Supervisory Chemist
Review Section #2
Environmental Fate & Ground Water Branch (H7508C)

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

Attached, please find the EFGWB review of...

Reg./File # : 352-361

Common Name : Methomyl

Type Product : Insecticide

Product Name : Lannate

Company Name : E.I. du Pont de Nemours and Company, Inc.

Purpose : Review waiver request for studies (1) aerobic aquatic (\$162-4), (2) aquatic sediment (\$164-2), (3) accumulation in irrigated crops, (\$165-3), (4) accumulation in aquatic non-target organisms (\$165-5), (5) Spray drift (\$201-1 & \$202-1), and (6) Ground water monitoring due to low volume minor use aquatic watercress only

Date Received : 9/11/89

EFGWB #(s) : 90761

Action Code(s): 660

Total EFGWB Review Time: 3.5 days

Deferrals to: _____ Ecological Effects Branch, EFED
_____ Science Integration & Policy Staff, EFED
_____ Non-Dietary Exposure Branch, HED
_____ Dietary Exposure Branch, HED
_____ Toxicology Branch, I, HED
_____ Toxicology Branch, II, HED

1. CHEMICAL: Common name:

Methomyl

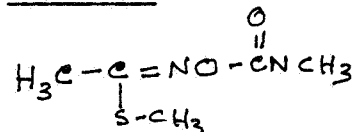
Chemical name:

S-Methyl-N-[(methylcarbamoyl)oxy]thioacetimidate

Trade name(s):

Lannate, Lanox 90, Lanox 216, Nu-Bait II, Nudrin,

Structure:



Formulations:

90% WP, 1.8 lb ai/gallon SC/L

Physical/Chemical properties:

Molecular formula : C₅H₁₀N₂O₂S.
Molecular weight : 162.2
Physical state : White crystalline solid.
Melting point : 78-79°C.
Solubility : Water, 5.8 g/100 g.
Methanol, 100 g/100 g.

2. TEST MATERIAL:

N/A.

3. STUDY/ACTION TYPE:

Review waiver request for studies (1) aerobic aquatic (§162-4), (2) aquatic sediment (§164-2), (3) accumulation in irrigated crops, (§165-3), (4) accumulation in aquatic non-target organisms (§165-5), (5) Spray drift (§201-1 & §202-1), and (6) Ground water monitoring on methomyl due to low volume minor use aquatic crop watercress only.

4. STUDY IDENTIFICATION:

N/A.

5. REVIEWED BY:

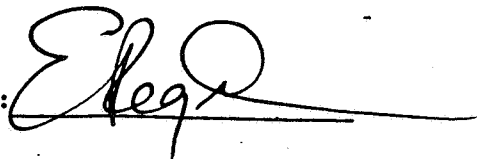
Padma R. Datta, Ph.D.
Chemist
Review Section #2
EFGWB/EFED/OPP

Signature: PRDatta

Date: 10/23/89

6. APPROVED BY:

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

Signature: 

Date: OCT 25 1989

7. CONCLUSIONS:

EFGWB has the following comments re the waiver requests for seven data requirements studies and ground water monitoring data of methomyl:

At present, there are no data available to estimate the aquatic fate of methomyl, which is also a major degradate of thiodicarb. The data from the 3 studies listed below are required to determine the aquatic fate and behavior of methomyl.

- §162-3 - Anaerobic aquatic metabolism
- §162-4 - Aerobic aquatic metabolism
- §164-2 - Aquatic (sediment)

Watercress (Radicula-nasturtium-aquaticum) is a perennial leafy aquatic crop which is grown in unshaded shallow pools of flowing clean water containing over 2 ppm of nitrate. A constant flow of a large volume of water is needed to supply other nutrients and for commercial cultivation. In other words, watercress requires a permanent irrigation system for commercial production. Springs in limestone regions (MD, VA and PA) with a rate of flow several 100 to 1000 gallons of water per minute are used in the production of watercress. The used water containing methomyl and its degradate(s) flow to streams, creeks and finally to rivers. Therefore, the data from the following 2 studies are also required to determine residues in irrigated crops and aquatic non-target organisms.

- § 165-3 - Accumulation in irrigated crops, and,
- § 165-5 - Accumulation in aquatic non-target organisms.

Since methomyl and oxamyl are both carbamate insecticides with similar formulations and directions for aerial application on their labels the data requirements for the 2 spray drifts studies are similar. EFGWB agrees that Du Pont (registrant) may provide the spray drifts studies for methomyl listed below using oxamyl as a surrogate for methomyl with acceptable justifications. The Agency has not completed the data evaluation of the existing spray drift data on Vydate® (oxamyl) to date.

- §201-1 - Droplet spectrum, and,
- §202-1 - Drift field evaluation.

The detection of methomyl in ground water has been confirmed but data are insufficient to assess the extent and degree of ground water contamination. Therefore, additional monitoring data of methomyl are needed.

8. RECOMMENDATIONS:

SRRD should inform Du Pont that EFGWB will not agree to the Agency granting waivers for first 5 of the seven studies cited in the background section because of inadequate data exist to evaluate the aquatic environmental fate of methomyl.

EFGWB reserves judgement on 2 needed for spray drift studies (§201-1 & §202-1) with methomyl pending review of such studies on oxamyl for acceptability, and for suitability for use as surrogate data for methomyl.

9. BACKGROUND:

In its 90 day response (8/20/89) to the Methomyl Registration Standard (second Round Review), case No. 0028 issued by the Agency April 19, 1989, E. I. du Pont de Nemours & Company, Inc. (registrant) requested waivers for the following data requirements studies for aquatic food crop use pattern:

- NO WAIVER*
REMOVED
- 1) Aerobic aquatic (§162-4),
 - 2) Aquatic sediment (§164-2),
 - 3) Accumulation in irrigated crops (§165-3),
 - 4) Accumulation in aquatic non-target organisms (§165-5),
 - 5) Ground water monitoring,
 - 6) Spray drift (§201-1), and,
 - 7) Spray drift (§202-1).

This request for waivers of studies on methomyl is based on the low volume minor use aquatic crop watercress only.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

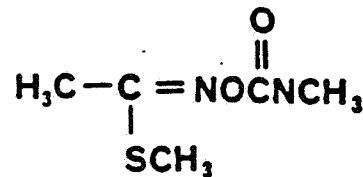
N/A.

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.



ENVIRONMENTAL FATE & GROUND WATER BRANCH
 PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY

Common Name: **METHOMYL** Date: 04/06/89
 Chem. Name : S-METHYL-N-[(METHYLCARBAMOYL)OXY]-THIOACETIMIDATE
 :
 Shaugh. # : 90301 CAS Number: 16752-77-5
 Type Pest. : Insecticide
 Formulation: GRANULAR; DUST; WATER SOL. POWDER;
 Uses : FIELD CROPS; VEGETABLES; FRUITS; ORNAMENTALS
 :
 :

Empir. Form: C₅H₁₀O₂N₂S VP (Torr): 5.0E-5
 Mol. Weight: 162.2 Log Kow : 0.3
 Solub.(ppm): 40,000 (58,000) 20 C Henry's :

Hydrolysis (161-1)	Photolysis (161-2, -3, -4)
pH 5:[*] STABLE	Air :[#] NO DECOMP IN SUN, 120 DA
pH 7:[*] STABLE	Soil :[*] SiClm, SUNLIGHT, 34 DAYS
pH 9:[*] 30 DAYS	Water:[*] 1 DAY IN ARTIF. LIGHT, AT
pH10:[] 3 HRS	:[] 25 C, pH 5.
pH 1:[] 21 HRS	:[]
pH 4:[*] STABLE	:[]

MOBILITY STUDIES (163-1)

Soil Partition (Kd)	Rf Factors
1.[*] FOR 4 SOILS, INCLUDING SdLm	1.[#] IN LIGHT TEXTURED SOILS METH.
2.[] AND SiLm, Kads RANGED FROM .86	2.[] WILL NOT LEACH MORE THAN 11"
3.[] TO .98, AND Kdes RANGED FROM	3.[] AND 15" IN 3- AND 5-MONTHS.
4.[] .5 TO 2.8.	4.[*] SdLm-SiClm-SiLm; 0.64-0.93
5.[]	5.[*] SdLm-SiLm-Si; 0.46-0.82
6.[]	6.[]

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

Aerobic Soil (162-1)	Anaerobic Soil (162-2)	} ? Compare to aerobic metab.
1.[*] SdLm 15-30 DAYS	1.[*] TOTAL CONVERSION TO CO2 IN	
2.[*] MUCK AND SiLm 45 DAYS	2.[] ABOUT 8 DAYS	
3.[*] IN STERILE FLANAGAN SiLm, 89%	3.[]	
4.[] STILL PRESENT AFTER 45 DAYS	4.[]	
5.[*] AT 4 PPM, IN SiLm, IN DARK, AT	5.[]	
6.[] 25 C AND 70% WHC; 30-45 DAYS	6.[]	
7.[]	7.[]	

Aerobic Aquatic (162-4)

1.[]
 2.[]
 3.[]
 4.[]

Anaerobic Aquatic (162-3)

1.[]
 2.[]
 3.[]
 4.[]

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

Common Name: **METHOMYL**

Date: 04/06/89

VOLATILITY STUDIES (163-2,3)

- Laboratory:
- Field:

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

Terrestrial Field (164-1)

- 1. [*] IN SiLm 98% METHOMYL DISSIPATES WITHIN 1 MONTH, IN LmSd 85% *dark, highly organic soil*
- 2. [] DISSIPATES AFTER 5 MONTHS; NO RESIDUE IN MUCK AFTER 7-32 DA.
- 3. [*] AT 4 LBS AIA, DECREASED FROM 91% AT DAY 0 TO 55% AT DAY 15,
- 4. [] AND TO 33% AT 30 DAYS IN SdLm SOIL IN A GREENHOUSE.
- 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. [*] AT APPL RATE 4X MAX USE, BEETS AND CABBAGE PLANT-
- 2. [] ED 30- AND 120 DAYS LATER, CONTAINED .04-.15 PPM

Field Rotational Crops (165-2)

- 1. []
- 2. []

Irrigated Crops (165-3)

- 1. []
- 2. []

Fish (165-4)

- 1. [*] 96-HR LC50 FOR WARMWATER FISH = 1.05-1.88 PPM; FOR COLDWATER
- 2. [] FISH = 1.6 PPM.

Non-Target Organisms (165-5)

- 1. [*] 48-HR LC50 FOR DAPHNIA = 31.7 PPB.
- 2. []

Common Name: **METHOMYL**

Date: 04/06/89

GROUND WATER STUDIES (158.75)

1. [#] IN NEW YORK, 9PPB; IN NEW JERSEY, 1-2 PPB; IN FLA, 12 PPB
2. []
3. []

DEGRADATION PRODUCTS

1. ACETONITRILE
2. CO2
3. (METHOMYL per se IS THE ONLY RESIDUE OF CONCERN IN PLANTS)
4. S-METHYL-N-HYDROXYTHIOACETIMIDATE
5. METHOMYL OXIME
- 6.
- 7.
- 8.
- 9.
- 10.

COMMENTS

IN PLANTS, METHOMYL IS ABSORBED BY ROOTS AND TRANSLOCATED TO LEAVES.
SLIGHTLY TOXIC TO AVIAN WILDLIFE.

DEGRADATION IN SOIL IS PRIMARILY A MICROBIAL PROCESS.

REPEATED APPLICATIONS WITHIN 19 DAY PERIOD MAY RESULT IN PROLONGED
PERIOD OF REDUCED NITRIFICATION.

CAN BE A HAZARD TO HONEYBEES AND OTHER BENEFICIAL INSECTS.

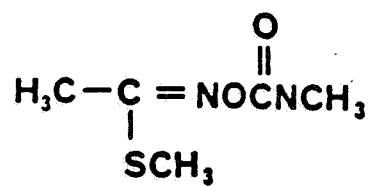
HEALTH ADVISORY LEVEL IS 175 PPB.

ADSORPTION IS DIRECTLY RELATED TO ORG. CONTENT OF SOIL; ADSORPTION
TO ORG. MATTER IS SIMILAR TO THAT OF TERBACIL.

SOIL Koc = 28 (ESTIMATE).

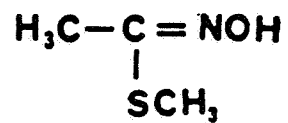
References: EPA REVIEWS

Writer : J. HANNAN

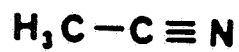


Methomyl

S-Methyl-N-[(methylcarbamoyl)oxy]thioacetimidate



S-Methyl-N-hydroxythioacetimidate



Acetonitrile



ESTABLISHED 1802

E. I. DU PONT DE NEMOURS & COMPANY
 INCORPORATED

WALKER'S MILL, BARLEY MILL PLAZA

P.O. Box 80038

WILMINGTON, DELAWARE 19880-0038

AGRICULTURAL PRODUCTS DEPARTMENT

August 20, 1989

Ms. Joanne S. Edwards
 Review Manager
 Registration Branch
 Special Review and Reregistration Division (H7508C)
 U.S. Environmental Protection Agency
 Office of Pesticide Programs (H7504C)
 Document Processing Desk (RS-0028)
 Room 266A, Crystal Mall 2
 1921 Jefferson Davis Highway
 Arlington, VA 22202

Subject: Methomyl Registration Standard, Case No. 0028
 Dated April 19, 1989, Received May 26, 1989
 90-Day Response

Dear Ms. Edwards:

E. I. Du Pont de Nemours & Co. (Inc.) is submitting herein our 90-day response to the Methomyl Registration Standard Case (Number 0028) dated April, 1989. This Standard was received by us on May 26, 1989.

This response consists of an administrative package, which accompanies this letter as a series of attachments, and one new submitted study plus its transmittal document. The administrative package is divided into six attachments, A-F. Each of these contains as follows:

Attachment A - Current list of Du Pont methomyl products which are affected by this Registration Standard.

Attachment B - Current list of Du Pont methomyl SLN registrations affected by this Registration Standard. Please note that there are many discrepancies between Du Pont's list of current SLN's and the Agency's list which accompanied the Guidance Document.

Attachment C - Confidential Statements of Formula and Certification Statements for the Du Pont methomyl products we intend to support through reregistration.

Attachment D - Evidence of Compliance with Data Compensation Requirements for manufacturing use products.

Attachment E - FIFRA Section 3(c)2(B) Summary Sheets for each Du Pont methomyl product affected by this Registration Standard.

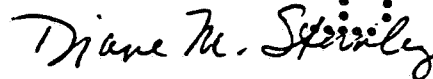
Attachment F - Du Pont comments concerning specific data requirements for methomyl. This attachment contains seven Exhibits, one for each main group of requirements (eg. product chemistry, residue chemistry, environmental fate, toxicology, reentry, spray drift, wildlife and aquatics). These exhibits contain requests for time extensions, requests for data waivers, statements as to why we do not believe certain requirements should apply to our products, authorizations to use non-Du Pont data and descriptions of where and how we intend to deviate from standard protocols.

Many of the items in Exhibit F require a response or clarification from the Agency before we can go forward. We would appreciate the Agency's prompt reply to these questions so that we can make every effort to meet the time frames set forth by EPA for satisfaction of these requirements.

Please direct any questions and all responses concerning methomyl reregistration to me at:

E. I. du Pont de Nemours & Co. (Inc.)
Agricultural Products Department
ATTN: Diane M. Stanley
Barley Mill Plaza, WM6-174
P.O. Box 80038
Wilmington, DE 19880-0038

Sincerely,



Diane M. Stanley, PhD
Registration & Regulatory Affairs

DMS/jls:a-1

cc: Mr. Dennis Edwards (PM-12)
Registration Division (H7505C)
Office of Pesticide Programs
U.S. EPA
Document Processing Desk (RS-0028)
Room 266A, Crystal Mall 2
1921 Jefferson Davis Highway
Arlington, VA 22202

Laboratory Data Integrity Program
Office of Compliance Monitoring (EN-34)
U.S. EPA
401 M St., S.W.
Washington, DC 20460

COMMENTS ON ENVIRONMENTAL FATE REQUIREMENTS 158.290

*Low volume
minor use
data waiver*

162.3 Anaerobic Aquatic

123/JD

Anaerobic aquatic metabolism studies are required to support aquatic use patterns for methomyl. Currently, labels on Du Pont methomyl products only contain one aquatic crop use, watercress. Du Pont does not choose to conduct anaerobic aquatic metabolism studies to support this use.

According to Du Pont data, there are only about 50 acres of field-grown watercress in current production in the U.S. Almost all of this acreage is in the Southeast. The remainder of the watercress crop is container-grown.

As such, we are requesting that the Agency grant a waiver of this requirement based upon methomyl's limited use on only one aquatic crop and the fact that the crop in question is of extremely low acreage. We do not believe that the extensive aquatic requirements in this Standard are in keeping with the Agency's policy of making minor use requirements commensurate with the anticipated extent of use and degree of exposure in the environment.

If a waiver is not granted, Du Pont will remove watercress from our labels. Revised labeling would be submitted in the 9-month response providing that we receive the Agency's decision in time. We have alerted IR-4 to the possibility that the watercress use may be lost in the event that they choose to work with the Agency to maintain the use.

162-4 Aerobic Aquatic

124/JD

We request a waiver of the aerobic aquatic metabolism requirement for the reasons presented for 162-3. If a waiver is not granted, we will remove watercress from our labels.

163-2 Lab Volatility

164-1 Aquatic Sediment

125/JD

We request a waiver of the aquatic sediment requirement for the reasons presented for 162-3. If a waiver is not granted, we will remove watercress from our labels.

165-3 Accumulation in Irrigated Crops

126/NT

Permanent irrigation

This requirement is mistakenly identified as 165-4 in Table A.

We request a waiver of the accumulation in irrigated crops requirements for the reasons presented for 162-3. If a waiver is not granted, we will remove watercress from our labels.

165-5 Accumulation in Aquatic Non-Target Organisms

129/NT

Table A does not identify this requirement with a particular use pattern. We believe this requirement is generally associated with aquatic use, "C". Therefore, we request a waiver of the accumulation in aquatic non-target organisms requirement for the reasons presented in 162-3. If a waiver is not granted, we will remove watercress from our labels.

Groundwater Monitoring

128/107

Small scale retrospective groundwater field monitoring studies are required for Methomyl.

We have obtained agreement from Rhone-Poulenc Ag. Co. to rely upon their groundwater monitoring study entitled, "Field Research Studies on the Movement and Degradation of Thiodicarb and Its Metabolite, Methomyl" (MRID 40532201 and MRID 40643001) for submission in fulfillment of the methomyl groundwater monitoring requirement. A copy of the letter from Rhone-Poulenc authorizing the Agency to access this study on our behalf is attached as an appendix to this exhibit.

After the Agency has had an opportunity to review the study, we hereby request a meeting with the Agency to discuss the applicability of the Rhone-Poulenc data to the methomyl groundwater monitoring requirement. Groundwater specialists from Du Pont and Rhone-Poulenc are prepared to meet at the Agency's earliest convenience to discuss any questions you may have about the data. Please notify us when such a meeting is appropriate.

12

COMMENTS ON DRIFT FIELD EVALUATION 158.440

201-1 Droplet Size Spectrum and Drift Field Evaluation

Spray drift droplet spectrum and drift field evaluation data are required for methomyl.

Du Pont contends that this requirement can be satisfied by existing droplet spectrum and spray drift studies for oxamyl. These data were submitted to the Agency on August 15, 1988 and January 23, 1989 in response to similar requirements for the reregistration of oxamyl (Case No. 108). The studies are entitled "Spray Drift Evaluation for Du Pont Vydate® L Insecticide" (Du Pont Report APD-88-1MK) (MRID 40790002) and "Supplement 1 to Spray Drift Evaluation of Du Pont Vydate® L Insecticide" (Supplement 1 to Du Pont Report APD-88-1MK) (MRID 40970901).

Both methomyl and oxamyl are carbamate insecticides. The oxamyl studies used Vydate® L (24%) which is a formulation very similar to Lannate® L (24%) the major Du Pont methomyl liquid formulation. Directions for application of both products are almost identical, especially with regard to aerial application, and both products are approved for use on a variety of the same fruit, vegetable and field crops.

The Vydate® studies were carried out according to the Pesticide Assessment Guidelines, Subdivision R, Pesticide Spray Drift Evaluation (EPA-540/9-84-002) with the purpose of determining the off-target movement of aerially-applied Vydate® L. Applications approximated commercial conditions under high and low wind speeds using both water and oil as spray carriers. Treatment rates were similar to those recommended for Lannate® L applied by air.

The Vydate® studies showed that there was little potential for drift to contaminate off-target crops or water located downwind of the applications, although certain weather conditions can increase drift potential. Our Lannate® labels contain statements to avoid application when conditions favoring drift exist.

We request that the Agency evaluate the existing Vydate® droplet spectrum and drift studies as surrogates for methomyl. If further data are required for methomyl, we believe it would be prudent to await the recommendations of the EPA-ARI-NACA group currently addressing drift requirements before beginning new studies. In that way we would be certain that any new data developed would meet Agency needs.