

US EPA ARCHIVE DOCUMENT

103801

Date Out EAB: FEB 20 1986

To: G. Werdig
Product Manager 50
Registration Division (TS-767)

From: Samuel M. Creeger, Chief *SM*
Environmental Chemistry Review Section 1
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

Attached please find the environmental fate review of:

Reg./File No.: _____

Chemical: Oxamyl

Type Product: Nematicide

Product Name: _____

Company Name: DuPont

Submission Purpose: Response to GWDCI

ACTION CODE: 495

Date In: 06/17/85

EAB # 5674

Date Completed: FEB 20 1986

TAIS (level II) Days

4.0

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

Monitoring study requested by EAB:

Monitoring study voluntarily conducted by registrant:

DESIGN NO.:

CONFIDENTIAL BUSINESS INFORMATION
Does NOT Contain National Security Info. (E.O. 12812)

PACK No.: 11014
6-17-85

CHEMICAL NAME: OXAMYL

(RD PROVIDE)
SHAUGHNESSY NO.
103801

Identifying Number	Action Code	Reference Number	Record Number	Study Guideline or Narrative Description	Reg. Std. Review Submission Criteria (SEE BELOW)	Accession Number	(RSEB Provide) MRID Number	(HED/BUD/TSS Complete) Review Results: Acceptable (A)/Unacceptable(U)
103801	495		153155			257434		

PRODUCT MANAGER (PM) or REVIEW MANAGER (RM) AND NUMBER: 50
G. Weidig/Lewis

PM/RM TEAM MEMBER AND NUMBER:

DATE RECEIVED (EPA): 3/29/85

RD BRANCH CHIEF INITIALS:

CHECK APPLICABLE BOX:

Adverse 6(a)(2) Data (405,406) Data Waiver Request (Reregistration) (650,651)

Suspect Data (415,416) Formulation Data and Labeling (Reregistration) (655,656)

IBT Data (485,486) Generic Data (Reregistration) (660,661)

Groundwater Data (495,496) Special Review Data (870,871)

AH

NUMBER OF INDIVIDUAL STUDIES SUBMITTED: 1

TO BE COMPLETED BY RSEB

RELATED ACTIONS:

DATE SENT TO HED/BUD/TSS: 6-17-85

INSTRUCTIONS: Screen data from E.I. du Pont

PRIORITY NUMBER: 50

for Photodegradation 161-3

PROJECTED RETURN DATE: 6 weeks 7-26-85

S. Creeger

DATE RETURNED TO RD (HED/BUD/TSS PROVIDE):

REVIEWS SENT TO:
HED: SIS TB RCB EAB EEB RD: TSS BUD: EAB SSB

TO:	TYPE OF REVIEW: SCREEN	NUMBER OF ACTIONS			FOR DATA SUBMITTED UNDER A REGISTRATION STANDARD: Review Submission Criteria
		Reregistration	Special Review	Other	
HED	Toxicology				Policy Note #31 1 = data which meet 6(a)(2) or meet 3(c)(2)(B) flagging criteria 2 = data of particular concern 3 = data necessary to determine tiered testing requirements
	Ecological Effects				
	Residue Chemistry				
	XX Exposure Assessment				
RD/TSS	Product Chemistry				
	Efficacy				
	Precautionary Labeling/Acute Tox.				
EAB	Science Support				NOTE TO TSS: Return 1 Copy To RSEB
	Economic Analysis				

INCLUDE AN ORIGINAL AND FOUR (4) COPIES OF THIS COMPLETED FORM FOR EACH BRANCH CHECKED FOR REVIEW.

All studies required under the GWDCI for Oxamyl have been submitted. All studies are useful for the purposes of the screen with the exception of the Aged-Column Leaching study (163-1). This study's deficiencies will be discussed later in this review following the environmental fate summary chart listed below. EAB concludes that Oxamyl has the potential to reach ground water when used agriculturally. The chemical is flagged.

The environmental fate data screened here will now be reviewed in detail to determine the likelihood of Oxamyl to reach ground water under use conditions.

	Oxamyl	Triggers
Hydrolysis	<p>pH °C t_{1/2}</p> <p>5 22 stable</p> <p>7 22 9.5 days (70% remains after 96 hrs.)</p> <p>9 22 3.0 days (50% " " 48 ")</p> <p>6.2 31 (98% " " 168 ")</p> <p>Oxamyl that is lost is quantitatively converted to the methyl N-hydroxy-N',N'-dimethyl-1-thiooxamimidate (oximino) compound with no loss of ¹⁴C activity.</p>	<p>Half-life greater than 25 weeks.</p>
Aqueous Photolysis	<p>t_{1/2} C₀ %Oxamyl</p> <p>days ppm</p> <p>Dist. 11 1.0 61</p> <p>H₂O 3-4 1000 28</p> <p>River 1-2 1.0 2</p> <p>H₂O 3-4 1000 22</p> <p>Water irradiated for 168 hours with artificial light at 31°C. 2 isomers formed of methyl N-hydroxy-N',N'-dimethyl-1-thiooxamimidate (oximino) the same as the hydrolysis product.</p>	<p>Half-life greater than 1 week.</p>
Soil Photolysis	<p>t_{1/2} days Soil %s,s,c %OM pH %Oxamyl %Oximino %Bound %CO₂</p> <p>5 SiL 22,69,9 5.6 4.5 0.8 2.0 45.4 7.9</p> <p>3 SL 61,21,18 6.5 6.5 0.0 0.0 62.1 27.4</p> <p>In the dark control, 30% of the ¹⁴C Oxamyl remains at day 20, 18% oximino. Photolysis is an important method of degradation.</p>	<p>----- at 20 days -----</p>
Aerobic Soil Metabolism	<p>t_{1/2} (weeks) Soil %s,s,c %OM Appl. (lb ai/A)</p> <p>2-4 SiL 21,62,17 2.75 4</p> <p>2-4 " " " 20</p> <p>1.5% degraded at 8 weeks to form the oximino compound, 5.5% remained as Oxamyl, 25.6% was bound at 8 weeks, 63% of material applied was volatilized as CO₂. Degradates account for < 4% of the originally applied material.</p>	<p>Soil half-life greater than about 2-3 weeks.</p>

	Oxamyl		Triggers		
Anaerobic Soil Metabolism	t1/2 (days)	Soil	% Oxamyl at 4 wks	% Bound at 4 wks	% Oximino at 4 wks
	<7	SiL	2.0	5.0	61.0
Under anaerobic conditions, oximino compound increases.					

Sterile Soil	t1/2 (weeks)	Soil	% CO ₂
	2-4	SiL	< 8
Sterile conditions inhibit breakdown. CO ₂ production decreases under sterile conditions, but results indicate a similar t1/2.			

Mobility/Leaching	Soil	pH	% clay	%OM	Kd	
Ads/Des						Kd less than 5, usually less than 1 or 2.
	M	8.5	7.5	0.11	0.05	
	B.D.	7.9	13.7	0.68	0.08	
	G.	7.8	23.1	0.95	0.15	
	S.	7.2	70.0	1.23	0.26	
	N.Y.	7.7	70.0	2.03	0.31	
TLC	muck	6.7		83.5	Rf 0.53	
	SiL	6.0		6.0	0.69	Oxamyl is very mobile.
	SiL	5.4		2.1	0.79	
	LS	5.8		0.7	1.00	

Parent Leaching	%s,s,c	% OM	% leached
SL	59,30,10	0.79	100
SiL	5,64,31	4.02	83

Glass columns were pre-wetted and leached with 20 inches of water.

Aged Leaching	%s,s,c	% OM	% leached	% activity in column
SL	59,30,10	0.79	61	6.7 (8.2 in upper 2 cm)
SiL	5,64,31	4.02	63	11.0 (4.7 " " ")

Oxamyl-treated soil was aerobically aged for 30 days, then added to soil columns and leached. The amount of water used was not specified. The leachate was not analyzed specifically for Oxamyl and oximino compounds, but was instead analyzed for ¹⁴C residues. It is not known how much of the ¹⁴C activity found in the leachate was due to Oxamyl or the oximino compound. Because neither Oxamyl nor the oximino were analyzed for in the leachate, this study is inadequate. A new study is recommended.

Oxamyl

Triggers

Field Dissipa- tion	Depth (in.)	Soil	Appl. Rate (lb ai/A)	Oxamyl Residues (ppm)			Rainfall (inches)
				14 Day	35 Day		
	0-4	LS-SL	10	0.062	0.031		35/10 mos.
	4-8			0.027	0.030		
	8-12			0.025	0.060		
	12-24			0.022	0.070		
	24-36			ND	0.027		
	36-48				0.022		
	48 +				ND		
				<u>1 Day</u>	<u>7 Day</u>	<u>21 Day</u>	29/7mos.
	0-4	"	17	.13/0.09	.034/.034	.025/.011	
	4-8			.07/0.02	.028/.021	ND	
	8-12			.012/ND	.047/.024	ND	
	12-24			ND	ND	ND	
	24-36			.014/0.014	.012/.011	ND	
	36-48			ND	ND	ND	
	<p>Oxamyl and the oximino degradate are moving to the 3 feet depth, at least, in concentrations of > 10 ppb. A soil pH is needed. The soil is expected to be alkaline, because it is located in a lemon-growing area in Southern California. Soils of the San Joaquin Valley associated with citrus agriculture typically have a pH of 8.0.</p> <p>These soils were irrigated with furrow irrigation. Oxamyl has been shown to degrade more rapidly in wet soils than in dry soils. This and the alkaline conditions may account for lower concentrations of Oxamyl than expected in the soil.</p> <p>More soil information and more accurate irrigation information is needed.</p>						

Ground-
Water
Study

Oxamyl was found in July 1981 in 3 shallow wells in N.Y. at 5.0-5.4 ppb. The wells were 8.8-12.2 feet deep and they were located within 10 feet of a potato field previously treated with Oxamyl in 1980-1981. Subsequent sampling in August-December showed no Oxamyl (< 5ppb). Eight (8) other wells were also sampled. No oxamyl was detected. These wells were 300-400 feet away from Oxamyl-treated areas.

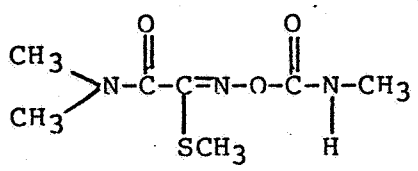
FOIA Personal Privacy Exemption

Soils from the nearby fields were sampled and analyzed for Oxamyl. The following results apply to these analyses.

Field	pH	Soil	%OM	Days Post-Treatment	Depth (in.)	[Oxamyl] (ppm)
[Redacted]	4.8	loam	2.9	25	0-4	3.7
				25	75	0.02
				75	0-4	0.64
				75	38	0.02
				173	ND at all other depths	
[Redacted]	4.9	?	3.0	25	0-4	0.64
				25	38	0.02
				75	0-4	0.40
				75	26	0.03
				173	ND at all other depths	
[Redacted]	6.8	loam	4.2	25	0-4	<.02
				25	75	<.02
				75	0-4	<.02
				75	14	<.02
				173	ND at all other depths	

Note: Acidic soils. Samples taken down to 100 inches.
D.L. = 0.02 ppm.

Product Chemistry	Solubility = 2.8×10^5 ppm	Solubility > 30 ppm
	Kow = 0.33	
	Vapor Pr. = 2.3×10^{-4} @ 25°C	



Oxamyl
Methyl N',N'-dimethyl-N-[(methyl carbamoyl)oxy]-1-thiooxamimidate

Catherine Eiden
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Section #1
EAB