

US EPA ARCHIVE DOCUMENT

FEB
Files
CM
3/2/81

3-2-81

Date Out: EFB: MAR 2 1981

FILE COPY

To: Product Manager 12 - Ellenberger
TS-767

From: Dr. Willa Garner ¹¹
Chief, Review Section No. 1
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No: 352-372

Chemical: Oxamyl

Type Product: Insecticide

Product Name: Vydate

Company Name: DuPont

Submission Purpose: Review of groundwater and soil residue studies

ZBB Code: Other

ACTION CODE: 400

Date in: 2/4/81

EFB # 762

Date Completed: MAR 2 1981

TAIS (level II) 80 Days 4

Deferrals To:

Ecological Effects Branch

Residue Chemistry Branch

Toxicology Branch

1.0 INTRODUCTION

1.1 Purpose

Dupont Chemical Company is requesting review of ground water and soil residue data from Oxamyl-treated potato fields, tested during 1980 in Long Island, N.Y. [File No. 352-372, submitted on 1/6/81].

1.2 Background

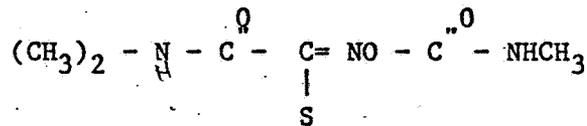
Oxamyl is currently registered for use on apples, tomatoes, celery (Fla.), tobacco, and potatoes (EPA Reg. No. 352-372). Registration for use on cotton, corn, peanuts, sweet potatoes, carrots, citrus, and pineapple is currently pending. Registered use pattern allows preplant incorporated application or in furrow application at a maximum dosage of 8 lbs. ai/A for nematode control, followed by multiple foliar application for insect control at 1 lb ai/A, 5-7 days intervals as needed. Registered use pattern on potatoes allows multiple application at 0.5-1.0 lb ai/A/application, 5-7 days intervals as needed (approved on 8/20/80). Proposed use on pineapple would allow a maximum of 48 lbs ai/A/crop.

Oxamyl T-1/2 is (2-6 months) water solubility is 28 gm/100 gm at 25°C and has a vapor pressure equal to 2.3×10^{-4} mm Hg at 25°C. Major degradates of oxamyl in water and soil are oxime, oximino, and a polar unidentified fraction. Leaching studies showed that oxamyl has an intermediate to high mobility in soil and that oximino moves more rapidly through soil than does oxamyl. However, leaching did not occur during the first month after application where rainfall was 1-6". After 3-5 months, most of the residual activity were not extractable.

1.3 Chemical

Common Name : Oxamyl
Trade Name : Vydate L
Type : Insecticide/Nematicide
Chemical Structure: Methyl N', N'-dimethyl-N-
[(methylcarbamoyl)oxy]-1-
thiooxamimidate - 2 lbs ai/gal.

Chemical formula:



1.4 Previous Reviews

352-372		5/19/80
352-372		2/12/80
352-372	6F1696 and 7F1907	12/5/78

1.5 Model Simulation

A simulated model evaluating the potential of oxamyl to contaminate groundwater, was performed by Carsel according to the method of Enfield (EFB review of 5/19/80). The simulation was performed for Long Island, N. Y., ^{potato} growing area. Among several input parameters, dosage input was 5 lbs ai/A applied at once and that the length of the run was 365 days with a simulated water depth of 18 feet.

Simulation results showed that ^{after 32 days,} oxamyl had migrated to a depth of 12 feet. Oxamyl concentrations could reach 0.001 ppm if the lowest degradation rate was used (15 days), whereas, with T- 1/2 equal to 6 months, oxamyl concentration could reach 0.3 ppm.

2.0 DISCUSSION OF DATA

Accession No. 263989, submitted on 1/6/81, contained the following data:

2.1 Well Water Analysis

Oxamyl was applied to potato fields during the 1980 growing season in Long Island, N.Y. Applications were made: [A] In-Furrow treatment - late April; and [B] Foliar treatments - on 6/11, 6/18, 8/4, 8/13, 8/18. Sampling for residue analysis in water was made on 4/11, 4/14, 4/29, 5/14, 6/05, 6/30, and 7/16/1980.

Table 1 summarizes well location, distance from treated potato fields, acreage treated, soil characteristics, dosage, and oxamyl residue in ppm.

FOIA Personal Privacy Exemption

Table 1: Analysis of Well Water Adjacent to Oxamyl- Treated - Potato Fields During 1980 in Long Island, N.Y.

Well Location	well depth (ft)	lb ai/A			soil texture	% OM PH		acres Treated	distance from well to field (ft)	ppm* residue
		[A]	[B]	Total						
	65	4	5	9	sandy loam	-	4.8	-	50	<0.01
	15	3	8	11	loam	4.2	4.8	25	30	<0.01
	60	3	8	11	silt loam	3.7	4.7	40	60	<0.01
	25	3	8	11	silt loam	3.7	4.7	40	80	<0.01
	30	4	6	10	silt loam	3.8	4.9	60	300	<0.01
	12	3	3	6	loam	4.2	4.8	-	60	<0.01
	30	-	3	3	silt	1.3	5.8	-	30	<0.01
	15	3	8	11	silt loam	3.7	4.7	40	80	<0.01

* For all 8 Locations.

4

FOIA Personal Privacy Exemptions

2.2 Soil Residue Analysis

Oxamyl was applied to potato fields during the 1980 growing season in Long Island, N.Y. Applications were made: [A] In-Furrow treatment - late April; and [B] Foliar treatments on June-September.

Table 2 summarizes field location, area treated, dosages, soil characteristics, sampling dates, and oxamyl residue in ppm.

Table 2: Soil Residue Analysis of Oxamyl-Treated-Potato Fields During 1980 in Long Island, N.Y.

Location	Acres	Slope%	Lbsai/A			Soil			Residue (ppm)						
			[A]	[B]	Total	Texture	% OM	PH	0-4"	4-8"	8-12"	12-16"	16-20"	20-24"	Total
Sample date 5/06/80															
17	0.2	4	0	4	Loam	2.9	4.8	1.6	0.26	0.13	<.02	<.02	<.02	1.99	
	0-2	4	0	4				1.1	0.28	0.02	<.02	<.02	<.02	1.38	
	2-6	4	0	4				0.33	0.28	0.03	<.02	<.02	<.02	0.64	
Sample date 7.23/80															
25	0.2	4	2	6	-	3.0	4.9	0.43	0.14	0.09	0.05	<.02	<.02	0.71	
	0-2	4	2	6				0.24	0.22	0.11	0.08	0.06	0.02	0.73	
	2-6	4	3	7				0.05	0.03	0.02	-	0.02	<.02	0.12	
Sample date 9/15/80															
15	0.2	4	4	8	Silt	-	-	0.26	0.2	0.15	0.08	<.02	<.02	0.69	
	0-2	4	5	9	Loam			0.41	0.24	0.18	0.06	<.02	<.02	0.89	
	2-6	4	6	10				0.02	<.02	0.02	0.02	<.02	<.02	0.02	

2.3 The following is a summary of the average rainfall and variations in temperature during 1980 in Long Island, N. Y.

Month	Inches	Temp.			Months	Inches	Temp.	
		Max.	Mins.	Max.			Min.	
1	1.63	-	-	6	3.76	77	56	
2	0.83	-	-	7	1.67	85	65	
3	6.21	-	-	8	1.33	85	66	
4	5.11	59	41	9	-	78	59	
5	1.82	73	52					
<u>Total</u>						22.36		

3.0 SUMMARY OF RESULTS

In studies performed during 1980 in Long Island, N. Y., Oxamyl was applied to Loam and silt Loam soil in April at 3-4 lbsai/A. This was followed by foliar application of 3-8 Lbsai/A during June-August, bringing the total up to 11 lbs ai/A. No oxamyl residues were detected in ground water from wells adjacent to treated fields. Soil samples taken from the same general area ^{with depth 6-24"} showed that oxamyl residues ^{in the} remained in the upper 20" of soil.

4.0 CONCLUSIONS:

There are several weaknesses in this monitoring study for oxamyl in ground water and soil residue which are:

- a. Monitoring (sampling) was not extended beyond last *date of* application. Data submitted showed that last date of treatment was made on 8/18 and last date of sampling was on 7/16/80.
- b. The average 1980 rainfall in Long Island, N. Y. was substantially less than the normal average for the area. (about 60%).
- c. The experimental design did not include analysis for oxamyl degrades, some of which are known to be highly mobile than the parent compound. Residues are known to be present in the lower root zone and could migrate downward. However, one would not expect residues in ground water from one year of application it will take about two years before results are confirmed.
- d. Instrumentation sensitivity of 1 ppb could be achieved ~~instead~~ instead of the reported level of <0.02 ppm, if an attempt is made to quantify oxamyl residue in water by gas chromatography utilizing a flame photometric detector equipped with a sulfur filter.

5.0 RECOMMENDATIONS

Based upon the above discussion, EFB recommends that further monitoring be pursued in a manner acceptable to the Agency in order to support potential registration actions [see monitoring deficiencies listed in the above section (4.0)]. Additionally, EFB recommends *that the* applicant perform a limited EUP before an accurate evaluation can be ~~made~~ made.

Sami Malak
Sami Malak, Ph.D.
Review Section No. 1
Environmental Fate Branch
Hazard Evaluation Division