9-5-84

FILE

103801

Date Out EAB: 05 SEP 1984

TO: Jay Ellenberger
Product Manager 12
Registration Division
TS-767

FROM: Samuel M. Creeger, Chief
Review Section No. 1
Exposure Assessment Branch
Hazard Evaluation Division

Attached please find the environmental fate review of:

Reg./File No.: 352-372

Chemical: Oxamyl

Type Product: Insecticide

Product Name: Vydate

Company Name: Du Pont

Submission Purpose: Field dissipation study addressing leaching potential

ZBB Code: ?

ACTION CODE: 400

Date in: 5/25/84

EFB # 4383

Date Completed: 9/4/84

TAIS (level II)	Days
63	3

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

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1.0 INTRODUCTION

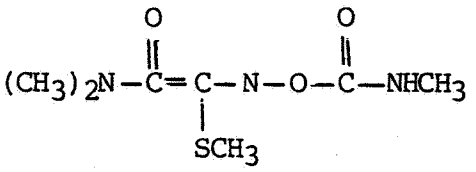
Du Pont Chemical Company has submitted a field leaching study for Vydate® L Insecticide/Nematicide (Oxamyl, as a. i.) for review.

1.1 Chemical

Common name: Oxamyl

Chemical name: Methyl N',N'-dimethyl-N-[(methylcarbamoyl)oxy]-1-thiooxamimidate

Chemical structure:



2.0 DIRECTIONS FOR USE

No specific use was included in the submission.

3.0 DISCUSSION

A Two-Year Field Study to Determine the Fate of Oxamyl in Soil During Flood Irrigation. C. L. McIntosh, et al., Du Pont Report. 1984.

A desert soil plot, replicated 5 times, was flood irrigated with water into which oxamyl was metered at a rate of 1 lb a. i./A. Oxamyl treatments were repeated monthly from April, 1981, to January, 1982. A total of 10 lb. oxamyl a. i./A was applied. During the time 35 acre inches of irrigation was applied to the site. The soil was sampled 14 and 35 days after last treatment. The field was irrigated twice between the sampling dates. An untreated control plot was maintained.

The study was continued a second year wherein oxamyl was applied at 1 lb. a. i./A from April through October, 1982. A total of 7 lb. a. i./A was applied. During the time, 29 acre inches of irrigation water was applied. The soil was sampled at 1, 4, 7, 14, and 21 days after last application. Also, an untreated area was irrigated with water into which oxamyl had been metered at a single 10 lb. a. i./A dose (10X the normal use rate).

The surface soil was characterized as sandy loam to loamy sand. Soil layers below surface ranged in texture from sand to silt loam. The soil was low in organic matter (<1%) and had soil pH of 7.3 to 8.5. Soil moisture ranged from 4.4% to 13.6% depending on depth.

For the first sampling period (1981), soil was sampled at depths of 0-4", 4-8", 8-12", 1-2', 2-3', 3-4', 5-6', 7-8', 9-10, 13-14', 15-16', and 19-20'. Samples were taken for residue analyses, moisture analyses and texture determination. Soil sampling for the second period (1982) was only to the 4 foot depth.

Samples for residue analysis were wrapped in aluminum foil, inserted into plastic-lined cloth bags and placed in field boxes containing dry ice.

Analyses of the first soil samples was by referenced method of Holt and Pease†. This method analyses for the total concentration of oxamyl and the oxime degradation product. Soil is extracted with ethyl acetate:water (100:25) solution then with ethyl acetate alone. After further partitioning, the aqueous phase is made alkaline to pH 12 and heated. This results in hydrolysis of oxamyl to a more volatile oximino derivative. The determination of residues is by GC equipped with sulfur-sensitive flame photometric detector. The method sensitivity is reported as 0.02 ppm. Recovery of added oxamyl to soil averaged 94% (range 74-120%) in the 0.04-6.6 ppm fortification range.

The second period samples were analysed by an HPLC method (Du Pont unpublished report, but not submitted) which determines the residue of oxamyl and the oxime metabolite separately.

Results

The soil texture at the various depths is reported as primarily sandy loam and loamy sand with soil moisture ranging from 4.4% to 13.6%, depending on depth. See registrant's Tables 1 and 2*, attached.

The authors report that, after 10 applications of 1 lb. a. i./A repeated monthly, low levels of oxamyl plus oxime residues were found down to the two foot depth when soil was sampled 14 days after last application. When sampled 35 days after last application, residues were found down to the four foot depth. No residues were found below the six foot depth. See registrant's Table 3*, attached.

From the second sampling period, the authors report that very little or no residues of oxamyl or the oxime metabolite were detected below the 36 inch soil depth. In one sample, residue levels of 0.12 ppm oxime and 0.027 ppm oxamyl were found at the 24-36" and 36-48" soil depths, respectively, 14 days after the last treatment. See registrant's Table 4*, attached.

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*All Tables are taken directly from registrant's submission and are considered Confidential Business Information.

†Holt, R. F. and H. L. Pease., J. Agr. Food Chem., 24 263-266 (1976).

At the exaggerated rate, one sample showed residue levels of 0.058 ppm oxamyl and 0.040 ppm oxime at the 48" depth 14 days after last application. See registrant's Table 5*, attached.

The authors report that the half-life for oxamyl was 1 to 4 days under the conditions of the study.

The authors conclude from the data that after 17 treatments at monthly intervals over a two year period, residues were not found below 60 inches even in sandy soils under heavy irrigation.

4.0 CONCLUSION

4.1 EAB concludes that, while the study appears to be scientifically sound, it is inadequate to demonstrate that oxamyl residues will not leach and contaminate groundwater from flood irrigation.

Soil samples should have been taken over the whole period of the study, not just after the last of 10 monthly applications. Oxamyl could have leached to depths greater than 4 feet and degraded in the alkaline soil.

Had the soil been acidic, which is common in other agricultural uses, the residues may have persisted. Hydrolysis data indicate that oxamyl is more stable at lower pH values.

4.2 Any conclusions drawn from the results of this study cannot be extrapolated to uses in other agricultural areas. A lemon orchard use in desert soil is an atypical agricultural use. For example, soil temperatures may be higher. Also, 35 inches of rain per year is not unusual for other agricultural areas where oxamyl may be used.

The irrigation schedule should have been provided.

4.3 EAB suggests that, in the future, the registrant submit a protocol for review before initiating field studies conducted to monitor for leaching and ground water contamination.

Clinton Fletcher
Review Section No. 1
Exposure Assessment Branch
Hazard Evaluation Division

RHD 3755-96

Page_____ is not included in this copy.

Pages 5 through 9 are not included.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

_____ Identity of product impurities.

_____ Description of the product manufacturing process.

_____ Description of quality control procedures.

_____ Identity of the source of product ingredients.

_____ Sales or other commercial/financial information.

_____ A draft product label.

_____ The product confidential statement of formula.

_____ Information about a pending registration action.

__✓__ FIFRA registration data.

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