

US EPA ARCHIVE DOCUMENT



Shaughnessy No.: 125301

Date Out of EFGWB: *6/24/91*

To: Mr. Phillip Hutton
Product Manager # 25
Registration Division (TS-767)

From: Paul Mastradone, Ph.D., Chief *PM*
Environmental Chemistry Review Section #1
Environmental Fate & Ground Water Branch/EFED (H7507C)

Thru: Henry Jacoby, Chief *Henry Jacoby*
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Attached, please find the EFGWB review of...

Reg./File #: 064573-EUP-R

Chemical Name: Fenoxycarb

Type Product: Insecticide

Product Name: LOGIC

Company Name: Texas Tech University

Purpose: Review of environmental fate data for EUP

Action Code: 700 EFGWB #(s): 91-0354

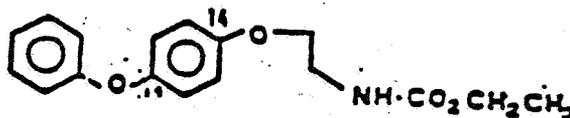
Date Received: 1/29/91 Total Reviewing Time: 1 day

- Deferrals to:
- Ecological Effects Branch
 - Dietary Exposure Branch
 - Non-Dietary Exposure Branch
 - Toxicology Branch I
 - Toxicology Branch II

1.0 CHEMICAL:

chemical name: Ethyl (2-[4-phenoxyphenoxy]-ethyl) carbamate
common name: Fenoxycarb
trade name: Logic Fire Ant Bait
structure:

CAS #:
Shaughnessy #:125301



2.0 TEST MATERIAL: discussed in DER

3.0 STUDY/ACTION TYPE:

Review of environmental fate data in support of experimental-use permit (064573-EUP-R) - to use fenoxycarb on pastures and rangeland in Texas.

4.0 STUDY IDENTIFICATION:

Dieterle, P. and R. Kaufman. 1982. Hydrolysis Study With the Radiolabeled [¹⁴C]-Ro 13-5223/024. Report No. 041/2922. Maag Agrochemicals. Accession No. 071847.

Dieterle, P. et al. 1983. Laboratory Aerobic Soil Metabolism Studies with [¹⁴C]-Ro-13-5223/024 Report No. 141/3644. Maag Agrochemicals. Accession No. 248411.

Pyrde, A. and M. Etterli. 1982. Laboratory Leaching with [¹⁴C]-Ro 13-5223/024. Report No. 041/2830. Maag Agrochemicals. Accession No. 071847.

Pyrde, A. and M. Etterli. 1982. Freundlich Adsorption and Desorption Constants for [¹⁴C]-Ro 13-5223/024 in Four Soils. Report No. 041.2674. Maag Agrochemicals. Accession No. 071853.

Pyrde, A. and P. A. Vonder Muhl. 1985. Accumulation and Elimination of [¹⁴C]-Ro 13-5223/024 by Bluegill Sunfish in a Flow-through System. Report No. 041/5368. Maag Agrochemicals. Accession No. 257788.

5.0 REVIEWED BY:

James A. Hetrick, Ph.D.
Chemist, ECRS # 1
EFGWB/EFED/OPP

Signature: *James A. Hetrick*
Date: JUN 24 1991

6.0 APPROVED BY:

Name: Paul Mastradone, Ph.D.
Section Chief, ECRS # 1
EFGWB/EFED/OPP

Signature: *Paul Mastradone*
Date: JUN 24 1991

7.0 CONCLUSIONS:

The proposed EUP (064573-EUP-R)- to use fenoxycarb on pastures and rangeland in Texas- was evaluated as a terrestrial feed crop use pattern. The status of environmental fate data supporting the EUP is as follows:

<u>Data Requirements</u>	<u>Status</u>
Hydrolysis (161-1)	Satisfied
Aerobic Soil Metabolism (162-1)	Satisfied
Adsorption/Desorption (163-1)	Not Satisfied
Confine Rotational Crop (165-1)	Not Satisfied
Fish Accumulation (165-4)	Satisfied

GENERAL: Because the laboratory studies for fenoxycarb were conducted on soils of Swiss origin, EFGWB believes these studies may not adequately portray fenoxycarb behavior in coastal soils of Texas. Additionally, the leaching and adsorption/desorption studies were conducted on finely-sieved soil and, therefore, underestimates fenoxycarb mobility in soil. EFGWB is also concerned that fenoxycarb may indiscriminately affect terrestrial arthropods other than red imported fire ants.

Based on the environmental fate data, parent fenoxycarb appears to be moderately persistent ($t_{1/2}$ 83 days) in aerobic mineral soil. The major route of degradation appears to be dependent on biological mineralization with subsequent residue incorporation into nonlabile soil organic matter. More importantly, parent fenoxycarb appears to be immobile (K_d 18 to 70) in mineral soils; however, additional data are required to adequately predict the mobility of fenoxycarb and its degradates. The submitted environmental fate data suggest parent fenoxycarb is moderately persistent, and possibly immobile, in terrestrial ecosystems.

EFGWB believes if the EUP is granted, the proposed experiment should be conducted on permanent pastures and rangeland. This restriction is necessary because no data are available to support fenoxycarb use in rotational cropping systems.

8.0 RECOMMENDATIONS: Please refer to Section 7

9.0 BACKGROUND:

Texas Tech University is requesting an experimental-use permit (064573-EUP-R)- to use fenoxycarb (formulated as LOGIC) on pastures and rangelands in Texas.

The experimental program proposes to use 7000 lbs of LOGIC or 70 lbs of fenoxycarb on 2,500 acres of Texas coastal plain soil over a two period. The fenoxycarb, formulated as a free-flow granular (1% active ingredient), will be broadcast applied at a maximum application rate of 1.5 lbs of LOGIC per acre (0.016 lbs a.i/A). It is unclear whether the fenoxycarb will be applied by ground or aerial equipment.

10.0 DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

Please refer to attached DERs for details concerning environmental fate studies. Summaries of the environmental fate data are as follows:

Hydrolysis - The study (Dieterle and Kaufman, Accession No. 00109328) provides acceptable data on the hydrolysis of fenoxycarb. Radiolabeled fenoxycarb did not hydrolyze in pH 3, 7, and 9 buffer solution.

Aerobic Soil Metabolism- The study (Dieterle et al., Accession No. 00131804) provides acceptable data on fenoxycarb metabolism in aerobic mineral soils.

Radiolabeled fenoxycarb had an average half-life of 83 days in three Swiss soils. During a 12 month aerobic incubation period, the [¹⁴C]-fenoxycarb either was mineralized to CO₂ (25% of applied) or was stabilized in soil as intermediate phenolic metabolites (65% of applied). The metabolites were tentatively identified as Ro-16-8797 (ethyl[2-(P-(P-hydroxyphenoxy) phenoxy)ethyl]carbamate) and Ro 17-3192. In addition, unidentified polar compounds (> 10% of the applied) were extracted from fenoxycarb treated soils.

Mobility - The studies (Pyrde and Etterli, Accession No. 001093323 and 00109333) provide supplemental data on the mobility of fenoxycarb and its degradates in soil. These studies do not meet Subdivision N guidelines for the following reasons: batch equilibrium studies were conducted on finely sieved (< 0.8 mm particle-size distribution); and, soil column leaching studies were conducted using only 40% of the eluant volume. EFGWB believes the problems associated with the mobility studies consistently underestimate fenoxycarb mobility in soil.

Radiolabeled fenoxycarb had a moderate to high adsorption affinity for soil colloids (K_d 18 to 77). In the soil column leaching studies, [¹⁴C]-fenoxycarb and its residues did not move through a 30 cm, moist-packed soil column.

Fish Accumulation - The study (Ellgehausen, Accession No. 00148191) provides acceptable data on fenoxycarb accumulation in fish tissues.

The bioaccumulation factor for radiolabeled fenoxycarb was 277.6X in whole fish, 138.9X in edible tissues, and 439X in nonedible tissues. After a 14 day depuration period, the accumulated [¹⁴C]-fenoxycarb was eliminated from fish tissues. The [¹⁴C]-residues in fish tissue were identified as Ro 16-8797 as well as numerous unidentified polar degradates.

11.0 COMPLETION OF ONE-LINER: NA

12.0 CBI APPENDIX: There is no CBI used in this review.