

US EPA ARCHIVE DOCUMENT

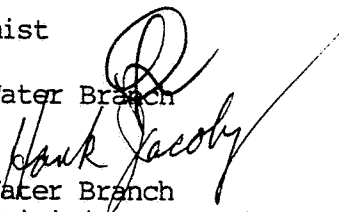
Shaughnessy No.: 128831

Date out of EFGWB: **MAY 25 1990**

TO: G. T. LaRocca/A. Heyward  
Product Manager #15  
Registration Division (H7507C)

FROM: Emil Regelman, Supervisory Chemist  
Chemistry Review Section #2  
Environmental Fate and Ground Water Branch

THRU: Hank Jacoby, Chief  
Environmental Fate and Ground Water Branch  
Environmental Fate and Effects Division (H7507C)



Attached, please find the EFGWB review of ...

Reg./File #: SLN IL 900001

Chemical Name: Cyano (4-fluoro-3-phenoxyphenyl) methyl-3-(2,2-dichloro-  
ethenyl)-2,2-dimethyl-cyclopropane-carboxylate

Type Product: Insecticide

Common Name: Cyfluthrin

Company Name: Mobay Corporation

Purpose: Review of 24C registration of TEMPO 2

Date Received: 27 April 1990 Date Completed: 4 May 1990

Action Code: 585

EFGWB #(s): 90-0515

Total Reviewing Time: 2.0 days

- Deferrals to:  Ecological Effects Branch, EFED  
 Science Integration and Policy Staff, EFED  
 Non-Dietary Exposure Branch, HED  
 Dietary Exposure Branch, HED  
 Toxicology Branch

1. CHEMICAL:

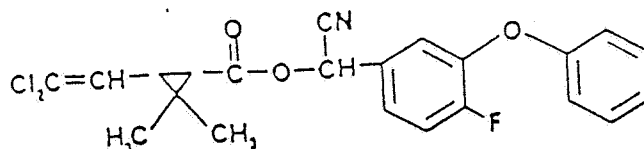
Chemical name: Cyano (4-fluoro-3-phenoxyphenyl) methyl-3-(2,2-dichloroethenyl)-2,2-dimethyl-cyclopropane-carboxylate

CAS no.: 68359-37-5

Common name: Cyfluthrin

Trade name: TEMPO 2

Chemical structure:



Formulations: Cyfluthrin.....24.3%  
Inert Ingredients.....75.7%

Molecular weight: 434.3

Physical/Chemical properties of active ingredient:

Physical characteristics: Viscous amber oil, partially crystalline

Vapor pressure:  $3.3 \times 10^{-8}$  mm Hg @ 20°C

Solubility:  $1-2 \times 10^{-6}$  g/100 mL at 20°C

Octanol/water partition coefficient:  $K_{ow} = 420,000$

2. STUDY/ACTION TYPE:

Review of Section 24C registration of TEMPO 2.

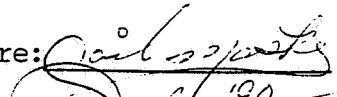
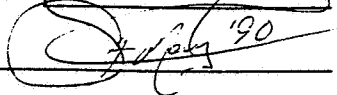
3. STUDY IDENTIFICATION:

Anderson, W.E. CORRESPONDENCE: TO DOUG CAMPT. State of Illinois, Department of Agriculture; 28 March 1990; Received by EPA-April 1990.

Webster, C. CORRESPONDENCE: TO W. ANDERSON. Mobay Corporation, Agricultural Chemicals Division, Kansas City, MO.; 21 Feb. 1990; Received by EPA-April 1990.


4. REVIEWED BY:

Gail Maske  
Chemist, Review section #2  
OPP/EFED/EFGWB

Signature:   
Date: 

5. APPROVED BY:

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

Signature:   
Date: MAY 25 1990

6. CONCLUSIONS:

The environmental fate data is sufficient to support the 24(c) registration of TEMPO 2 Ornamental Insecticide by the State of Illinois, Department of Agriculture. The 24(c) registration is requested to meet a Special Local Need (SLN) which is to control the black vine weevil on ornamentals from 1990 to 1995.

TEMPO 2 Ornamental Insecticide has been used since 3 March 1988 for control designated pests on trees, shrubs, foliage plants, and flowers in outdoor landscaped areas such as parks, recreational areas, athletic fields, institutional grounds, in nurseries and greenhouses, and interior plantscapes (such as in hotels, shopping malls, office buildings, etc.) where these plants are grown. TEMPO 2 Ornamental Insecticide also controls designated pests in home lawns. The proposed rate of application, 2.0 ozs/100 gals, should not exceed the rate of application on home lawns for control of designated pests. EFGWB does not anticipate any adverse environmental effects from the use of TEMPO 2 to control the black vine weevil on ornamentals.

All environmental fate data requirements have been fulfilled for domestic outdoor uses.

7. RECOMMENDATIONS:

The State of Illinois, Department of Agriculture and Mobay Corporation should be informed of the following:

- a. The environmental fate data is sufficient to support the 24(c) registration of TEMPO 2 by the State of Illinois, Department of Agriculture to meet a Special Local Need from 1990 to 1995.

8. BACKGROUND:

Cyfluthrin was registered as an unconditional indoor use general pesticide and for use on cotton crops on 30 December 1987. In August 1989 it was registered for use in imported German hops. TEMPO 2 was registered 3 March 1988.

TEMPO 2 is an emulsible concentration herbicide currently registered as a general use insecticide for broad-spectrum control of insect pests on trees, ornamentals, and home lawns. The use of TEMPO 2 Ornamental Insecticide for the control of ants, crickets, spiders, midges, wasps, flies, and mosquitoes is limited to ornamental areas and areas adjacent to buildings. Application is by general spray equipment at a rate of 1.0 to 1.5 oz/100 gals. When applied to home lawns, TEMPO 2 is applied when pests first appear at a rate of 4 to 6 mLs. per 1000 sq. ft.. TEMPO is reapplied when necessary based on pest reinfestation.

Cyfluthrine is toxic to fish, aquatic organisms, and honey bees. However, Tempo is low in mammalian toxicity.

9. DISCUSSION:

The State of Illinois-Department of Agriculture approved a 24(c) SLN request from Mobay Corporation for the use of Tempo 2 Ornamental Insecticide (EPA registration no. 3125-352) to control black vine weevil in ornamentals from May to August of 1990 to 1995.

Black vine weevil attacks the foliage of more than one ornamental plant but primarily Taxus (yew). The immature stage feeds on roots of Taxus. Nursery stock infested with black vine weevil cannot be sold without controlling the insect first.

Black vine weevil is a serious pest of nurseries and landscape contractors who develop and maintain industrial and urban landscape plantings. Nurserymen and landscapers have requested an improved control for black vine weevil. Landscape contractors have had a continual problem with black vine weevil.

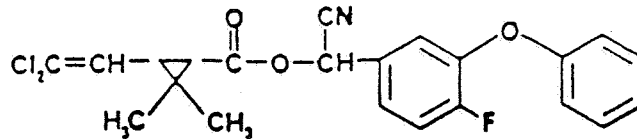
In trials, Tempo 2 Ornamental Insecticide compared favorably to Ficam in cost, and the efficacy was superior to that of Orthene and Guthion. The trials showed Tempo 2 Ornamental Insecticide applied at the rate of 2 oz/100 gallons of water will control adult black vine weevil. This treatment should be applied to foliage when adults are present by drenching plants with a boom sprayer every 3 to 4 weeks from May to August which is a maximum of 4 to 5 applications a year.

10: COMPLETION OF ONE-LINER:

See attached one-liner.

11: CBI APPENDIX:

This information is considered to be CBI by the registrant and should be treated as such.



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

Common Name: **CYFLUTHRIN** Date: 11/01/89  
 Chem. Name : **CYANO (4-FLUORO-3 PHENOXYPHENYL) METHYL-3(2,2-DICHLORO-ETHENYL) 2,2-DIMETHYL-CYCLOPROPANECARBOXYLATE**  
 Shaugh. # : 128831 CAS Number. 68359-37-5  
 Type Pest. : PYRETHROID; INSECTICIDE  
 Formulation : WATER-SOL. CONC.; EMULSIFIABLE CONC. ULV FORMULATION,  
 Uses : FOLIAR INSECTICIDE FOR CONTROL OF CHEWING INSECTS ON A VARIETY OF CROPS SUCH AS CORN COTTON PEANUTS

Empir. Form.  $C_{22}H_{18}FNO_3Cl_2$   
 Mol. Weight: 434.27  
 Solub. (ppm). .01 @ 20 C

VP (Torr) 3.3E-8  
 Log Kow : 5.62  
 Henry s

Hydrolysis (161-1)  
 pH 5: [\*] STABLE  
 pH 7: [\*] 193 DAYS  
 pH 9: [\*] < 2 DAYS  
 pH : [ ]  
 pH : [ ]  
 pH : [ ]

Photolysis (161 2, 3 4)  
 Air : [ ]  
 Soil : [\*] 48-72 HRS, SdLm, Hg LAMP  
 Water: [\*] ABOUT 1 DAY IN NATURAL SUN  
 : [ ]  
 : [ ]  
 : [ ]

**MOBILITY STUDIES (163-1)**

Soil Partition (Kd)

1. [ ]
2. [ ]
3. [ ]
4. [ ]
5. [ ]
6. [ ]

Rf Factors

1. [\*] AGED AND UNAGED RESIDUES
2. [ ] IMMOBILE IN AGRIC SAND (FL)
3. [ ] SdLm (OR) SdCLLm (IN) SiLm
4. [ ] (NB) SiCl (MD)
5. [ ]
6. [ ]

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

Aerobic Soil (162-1)

1. [\*] 56 DAYS IN GERMAN LOAM SOIL
2. [\*] 63 DAYS " " SANDY LOAM
3. [ ]
4. [ ]
5. [ ]
6. [ ]
7. [ ]

Anaerobic Soil (162-2)

1. [\*] SAME AS WITH AEROBIC SOILS
2. [ ]
3. [ ]
4. [ ]
5. [ ]
6. [ ]
7. [ ]

Aerobic Aquatic (162-4)

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

Anaerobic Aquatic (162-3)

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

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

Common Name: **CYFLUTHRIN**

Date 11/01/89

**VOLATILITY STUDIES (163-2,3)**

- Laboratory
- Field.

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

Terrestrial Field (164-1)

1. [\*] <31 DAYS IN UPPER 6" IN EIGHT DIFFERENT STUDIES; DEGRADATES
2. [ ] WERE NOT PERSISTENT AND DID NOT ACCUMULATE SIGNIFICANTLY
3. [ ]
4. [ ]
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. [\*] WITH .72 PPM IN SOIL AT DAY 0, CONC. DROPPED TO
2. [ ] .10 PPM BY DAY 359; RESIDUE MOSTLY PARENT COMPD.

Field Rotational Crops (165-2)

1. [#] WHEAT STALKS MAY CONTAIN RESIDUES IF PLANTING IS
2. [ ] DONE LESS THAN 9 MONTHS AFTER TREATMENT.

Irrigated Crops (165-3)

1. [ ]
2. [ ]

Fish (165-4)

1. [\*] BLUEGILL SUNFISH BCF: 550-850 X; WITH DEPURATION, T/12 FOR
2. [ ] RESIDUES = ABOUT 9 DAYS.

Non-Target Organisms (165-5)

1. [ ]
2. [ ]

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

7



Common Name: **CYFLUTHRIN**

Date. 11/01/89

**GROUND WATER STUDIES (158.75)**

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

**DEGRADATION PRODUCTS**

1. CO2
2. 4-FLUORO-3 PHENOXYBENZALDEHYDE (FCR 1260)
3. 4 FLUORO-3-PHENOXYBENZOIC ACID (FCR 3191)
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

**COMMENTS**

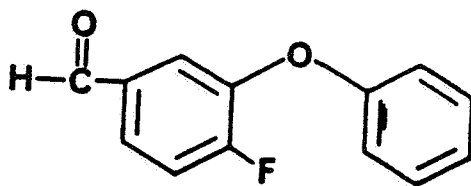
SOIL Koc = 10,000.

RAT TOXICITY STUDIES INDICATE THAT THE FPB ACID IS MUCH LESS TOXIC THAN THE PARENT COMPOUND.

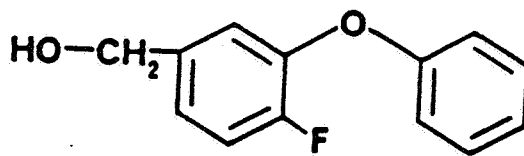
THE TECHNICAL GRADE OF CYFLUTHRIN CONSISTS OF FOUR ISOMERS, ALL HAVING ROUGHLY THE SAME SOLUBILITY AND VAPOR PRESSURE.

References. FARM CHEMICALS HANDBOOK; EPA REVIEWS  
Writer J. HANNAN

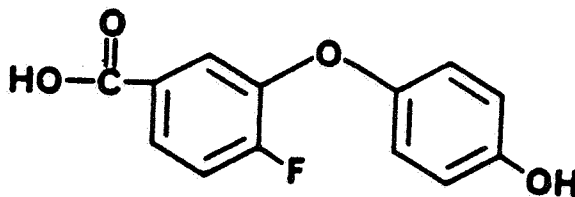
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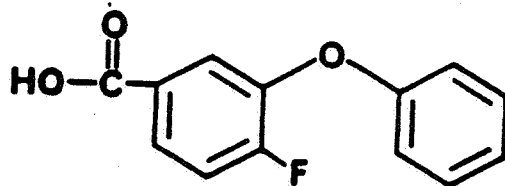
4-Fluoro-3-phenoxybenzaldehyde  
(FCR 1260)



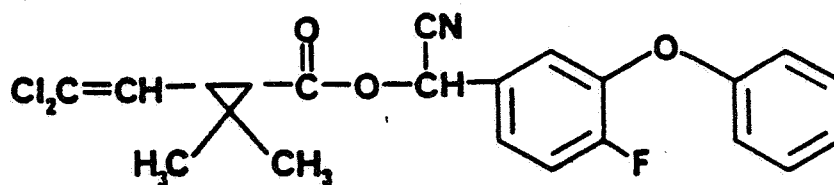
4-Fluoro-3-phenoxybenzenemethanol  
(FCR 1261)



4-Fluoro-3-(4-hydroxyphenoxy)benzoic acid  
(FCR 3145)

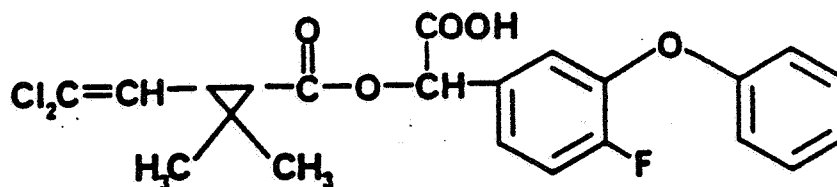


4-Fluoro-3-phenoxybenzoic acid  
(FCR 3191; COE 538/78)



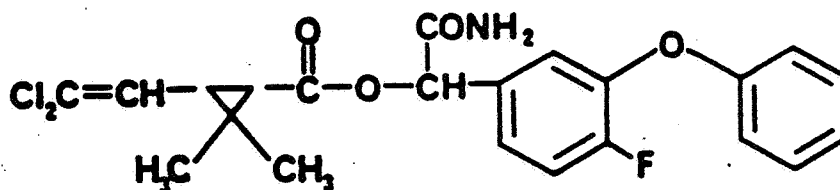
Cyano(4-fluoro-3-phenoxyphenyl)methyl-3-(2,2-dichloroethenyl)-  
2,2-dimethylcyclopropanecarboxylate

(Cyfluthrin, FCR 1272)



$\alpha$ -[[[3-(2,2-Dichloroethenyl)-2,2-dimethylcyclopropyl]  
carbonyl]oxy]-4-fluoro-3-phenoxybenzeneacetic acid

(FCR 2728)



2-Amino-1-(4-fluoro-3-phenoxyphenyl)-2-oxoethyl-3-  
(2,2-dichloroethenyl)-2,2-dimethylcyclopropane-  
carboxylate

(FCR 2978)