

US EPA ARCHIVE DOCUMENT

Shaughnessy No.: 128831

Date out of EFGW MAR 6 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 #: 3125-351

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

Type Product: Insecticide

Common Name: Cyfluthrin, Baythroid 2

Company Name: Mobay Corporation

Purpose: Label Amendment - new-use

Date Received: 15 February 1990 Date Completed: 21 Feb. 1990

Action Code: 300

EFGWB #(s): 90-0353

Total Reviewing Time: 1.5 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:

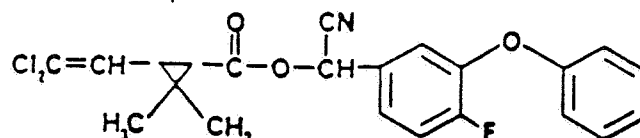
Chemical name: Cyano (4-fluoro-3-phenoxyphenyl) methyl-3-(2,2-dichloroethenyl)-2,2-dimethyl-cyclopropane-carboxylate

CAS no.: 68359-37-5

Common name: Cyfluthrin

Trade name: Baythroid 2

Chemical structure:



Formulations: SC/L, EC, G, WP

Molecular weight: 434.3

Physical/Chemical properties of active ingredient:

Physical characteristics: Viscous amber oil, partially crystalline

Vapor pressure: 3.3×10^{-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:

Label amendment for deletion of crop rotation restriction for small grain crops.

3. STUDY IDENTIFICATION:

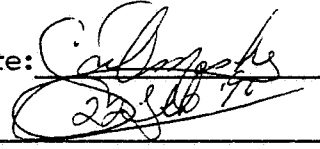
Leslie, W. L. BAYTHROID-RESIDUES IN FIELD ROTATIONAL CEREAL CROPS. Performed by Cambridge Analytical Association, Inc. under Laboratory Project No. BD850086R01; Sponsored and Submitted by Mobay Corporation, Agricultural Chemical Division, Kansas City, MO under Baythroid Objective No. 8500; Completion date was 28 Nov. 1988; Received by EPA 4 August 1989, MRID No. 41190201/40942701.

Leslie, W. L. BAYTHROID -RESIDUES IN FIELD ROTATIONAL CEREAL CROPS - ADDENDUM NO. 1. Submitted by Mobay Corporation, Agricultural Division, Stilwell, KS; Completed on 12 July 1989; Received by EPA 4 August 1989; MRID No. 41190202.

Minor, R.G. and Freese, P.L. FREEZER STORAGE STABILITY OF CYFLUTHRIN IN APPLES, COTTON, POTATOES, AND SOYBEANS. Sponsored and Submitted by Mobay Corporation, Agriculture Chemical Division, Research and Development Department under Mobay Project No. 99631, Completion Date 15 September 1989; MRID No. 41369301.

4. REVIEWED BY:

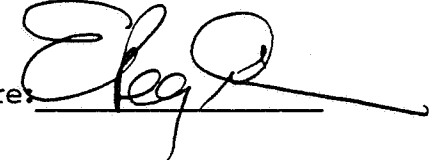
Gail Maske
Chemist, Review section #2
OPP/EFED/EFGWB

Signature: 

Date: 2/26/90

5. APPROVED BY:

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

Signature: 

Date: MAR 6 1990

6. CONCLUSIONS:

The field rotational crop study on small grain is not acceptable at the present time to meet Subdivision N data requirements and to remove the one year label restriction on crop rotation of small grain. The storage stability data furnished was not related to the storage stability of wheat green forage in study 41190201/40942701. Therefore, the study was not reviewed in detail. The new data furnished gave storage stability for potato and soybean green forage (as well as for other products) which showed a decomposition rate of 0% and 19% at 2436 and 164 days, respectively. As shown in the storage stability data furnished earlier, there was a range of 4 and 19% decomposition rate between cotton and soybean green forage, respectively, which was 2 to 3 times shorter storage time than the wheat green forage storage time in study 41190201/40942701. The maximum time in frozen storage for the wheat green forage was 664 days. With the data furnished, there is no way to determine the accuracy of the analytical data furnished on the parent and residue(s) concentrations in wheat green forage. If the registrant wishes to remove or otherwise modify the existing label restriction against rotating small grains within 12 months of application, then a new rotational crop-field study on small grain will be required. The storage stability portion of the experiment must be run contemporaneously with the field study.

Seven deficiencies were addressed by the Agency (AR;4/4/89) in its review of the study (40942701/41190201). Conclusions with respect to Mobay's response to each of the cited deficiencies (41190202) were addressed by WGM (11/14/89). All deficiencies were satisfied except for storage stability data on wheat green forage.

7. RECOMMENDATIONS:

The registrant should be informed of the following:

- a. The field accumulation study on small grains is not acceptable to meet Subdivision N data requirements and remove the one year label restriction on crop rotation of small grain crops. If the registrant wishes to remove or otherwise modify the existing label restriction against rotating small grains within 12 months of application, then a new rotational crop-field study on small grain will be required. The storage stability portion of the experiment must be run contemporaneously with the field study.
- b. The status of the Environmental Fate Data Requirements for registration is as follows:

<u>Environmental Fate Data Requirements</u>	<u>Status of Data Requirement</u>	<u>MRID No.</u>
Degradation Studies-Lab		
161-1 Hydrolysis	Fulfilled (SH;5/9/85)	00131493 00137539
161-2 Photodegradation in water	Fulfilled (SH;5/9/85;JHJ;2/20/86)	00149595
161-3 Photodegradation on soil	Fulfilled (JHJ;3/2/87)	00157043 00137543
161-4 Photodegradation in air	Pending results of 163-2	
Metabolism Studies-Lab		
162-1 Aerobic (Soil)	Fulfilled (JHJ;2/20/86;CF;6/13/84;SH;5/9/85)	00131494
162-2 Anaerobic (Soil)	Fulfilled (JHJ;2/20/86;CF;6/13/84;SH;5/9/85)	00131494
Mobility Studies		
163-1 Leaching, Adsorption/ Desorption	Fulfilled (CF;6/13/84)	00131495 00137540 00137544
163-2 Volatility-lab	Not Submitted	
163-3 Volatility-field	Pending results of 163-2	

9. DISCUSSION:

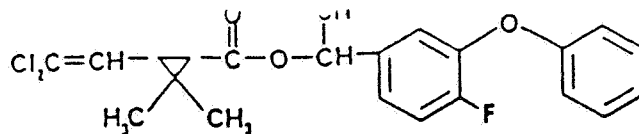
None

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

Page 1

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. $C_{22}H_{19}FNO_3Cl_2$
 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) SdCLm (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. []



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 K_{oc} = 10,000.

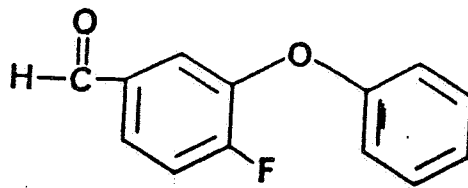
RAT TOXICITY STUDIES INDICATE THAT THE FPB ACID IS MUCH LESS TOXIC THAN THE PARENT COMPOUND.

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

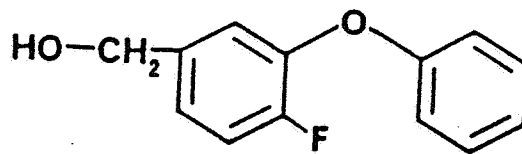
References. FARM CHEMICALS HANDBOOK; EPA REVIEWS
Writer J. HANNAN

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

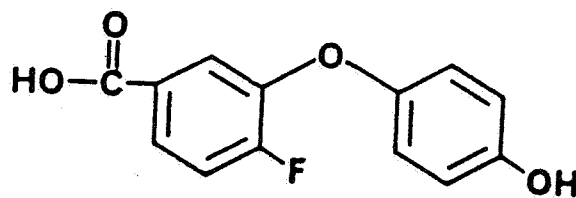
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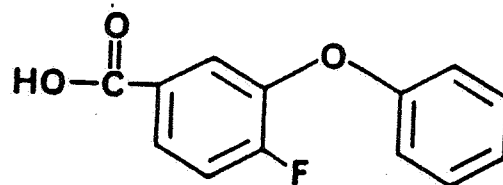
4-Fluoro-3-phenoxybenzaldehyde
(FCR 1260)



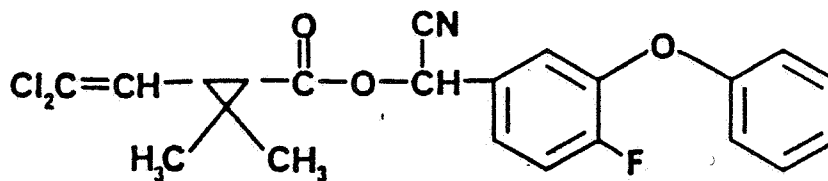
4-Fluoro-3-phenoxybenzenemethanol
(FCR 1261)



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

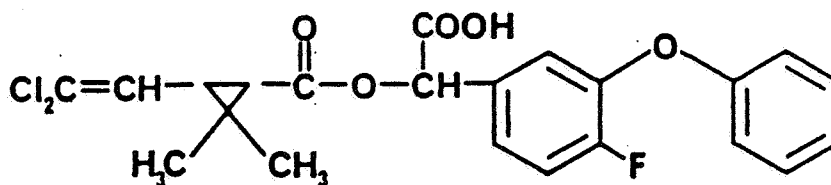


4-Fluoro-3-phenoxybenzoic acid
(FCR 3191; COE 538/78)



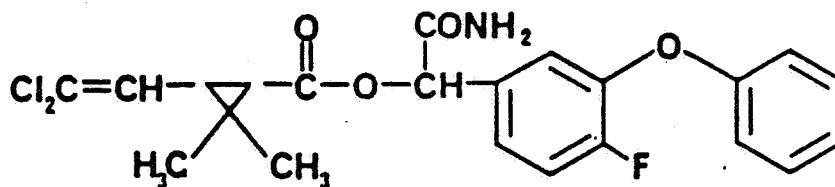
Cyano(4-fluoro-3-phenoxyphenyl)methyl-3-(2,2-dichloroethyl)-
2,2-dimethylcyclopropanecarboxylate

(Cyfluthrin, FCR 1272)



α -[[[3-(2,2-Dichloroethyl)-2,2-dimethylcyclopropyl]
carbonyloxy]-4-fluoro-3-phenoxybenzeneacetic acid

(FCR 2728)



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

(FCR 2978)