US ERA ARCHIVE DOCUMENT

				Shaughnes	sy No.:_	12883	<u> </u>
				Date out	of EFGW	FAR 6	1990
TO:	G. T. LaRocca/A. Product Manager Registration Div	#15					
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)						
Attache	d, please find th	ne EFGWB review o	f				
Reg./Fi	le #:3125-3	351				<u>;</u>	
Chemical Name: Cyano (4-fluoro-3-phenoxyphenyl) methyl-3-(2,2-dichloro-							
	etheny	1)-2,2-dimethyl-	cyclopro	pane-carb	oxylate	,	
Type Product: Insecticide							
Common Name: Cyfluthrin, Baythroid 2						-1	
Company Name: Mobay Corporation							
Purpose	Label	Amendment - new-	use				
Date Re	ceived: 15 Feb	oruary 1990		Date Comp	leted:_	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 S	Staff, EFE	D		
	Non-Die	ary Exposure Bra	nch, HEI)			
	Dietary	Exposure Branch,	HED				
	Toxicole	ogy 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 X 10⁻⁸mm Hg @ 20°C

Solubility:

 $1-2 \times 10^{-6} \text{ g/100 mL at } 20^{\circ}\text{C}$

Octanol/water partition coefficient: Kow = 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 Freeseman, 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

5. APPROVED BY:

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

Date:

Signature

Date:

6 1990

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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:

	nmental Fate equirements	Status of Data Requirement	MRID No.						
Degrada	ation Studies-Lab								
161-1	Hydrolysis	Fulfilled (SH;5/9/85)	ØØ131493 ØØ137539						
161-2	Photodegradation in water	Fulfilled (SH;5/9/85:JHJ;2/20/8	ØØ149595 6)						
161-3	Photodegradation on soil	Fulfilled (JHJ;3/2/87)	ØØ157Ø43 ØØ137543						
161-4	Photodegradation in air	Pending results of 16	3–2						
Metabolism Studies-Lab									
162-1	Aerobic (Soil)	Fulfilled	ØØ131494						
162-2	Anaerobic (Soil)	(JHJ;2/20/86:CF;6/13/84:S Fulfilled (JHJ;2/20/86:CF;6/13/84:S	00131494						
Mobility Studies									
163-1	Leaching, Adsorption/ Desorption	Fulfilled (CF;6/13/84)	ØØ131495 ØØ13754Ø ØØ137544						
163-2	Volatility-lab	Not Submitted	22421244						
163-3	Volatility-field	Pending results of 163-2							

131492 149596 131506

Dissipation Studies-Field

164-1 Terrestrial

Fulfilled (JHJ:2/20/86)

ØØ149547 V

Accumulation Studies

165-1 Rotational crops-confined Fulfilled 00137541

(CF; 1/3/84)

165-2 Rotational crops-field This Review 41190201

(AR;4/4/89:HN;9/5/89) 41190202 (WGM;11/14/89) 40942701 Partially Fulfilled 00137541

165-4 In fish Fulfilled 00143143

(CF; 6/13/84:SH; 5/9/85) ØØ137547

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.

Baythroid 2 is an emulsible concentration herbicide currently registered for use on cotton (classified as a terrestrial food crop) at a single application rate of $\emptyset.0125-0.1$ lbs ai/acre/application and a maximum total seasonal application of $\emptyset.89$ lbs ai/acre/season and for use in German hops. An application by the registrant to amend the Baythroid 2 label to allow applications to alfalfa, soybeans, sunflowers, sweet corn, broccoli, brussel sprouts, cabbage, cauliflower, carrots, celery, lettuce, peppers, radish, spinach, and tomatoes at single application rates of $\emptyset.012-0.050$ lbs ai/acre/application and a maximum total seasonal application of 0.13-0.44 lbs ai/acre/season was conditionally concurred by EFGWB providing the registrant agrees to satisfy the remaining outstanding data requirements.

Since cyfluthrin is a new registration chemical it is not on List A, B, C, or D.

The Agency reviewed a field rotational crop study on small grains (40942701/41190201), and Mobay Corporation was provided with a 4 April 1989 (AR) Environmental Fate and Ground Water (EFGWB) review. In response, Mobay Corporation submitted an addendum 41190202, which addressed each of the deficiencies, discussed new developments, and discussed the general question of Baythroid residues in rotational crops. EFGWB then responsed to each items addressed in the addendum (WGM;11/14/89). This review is of addendum 41369301 which is Mobay's response to EFGWB's review of addendum 41190202.

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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

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Date. 11/01/89
Common Name: CYFLUIHRIN
Chem. Name . CYANO (4-FLUORO-3 PHENOXYPHENYL) METHYL-3(2 2 DICHLORO-
           : ETHENYL) 2 2-DIMETHYL-CYCLOPROPANECARBOXYLATE
                                                    CAS Number. 68359-37-5
Shaugh. # : 128831
Type Pest. PYRETHROID; INSECTICIDE
Formulation WATER-SOL. CONC.; EMULSIFIABLE CONC. ULV FORMULATION,
           : FOLIAR INSECTICIDE FOR CONTROL OF CHEWING INSECTS ON A
Uses
           : VARIETY OF CROPS SUCH AS CORN COTTON PEANUTS
                                                 VP (Torr) 3.3E-8
Empir. Form. C_{22}^{H_{18}NFO_3}^{Cl_2} Mol. Weight: 434.27
                                                 Log Kow : 5-62
                                                 Henry s
Solub. (ppm) . .01 @ 20 C
                                     Photolysis (161 2, 3
Hydrolysis (161-1)
                                     Air :[]
ph 5.[*] STABLE
                                     Soil:[*] 48-72 HRS, SdLm, Hg LAMP
pH 7.[*] 193 DAYS
                                     Water: [*] ABOUT 1 DAY IN NATURAL SUN
pH 9.[*] < 2 DAYS
                                           :[]
pH :[]
                                           .[]
pH .[]
                                           :[]
pH :[]
                        MOBILITY STUDIES (163-1)
                                        Rf Factors
Soil Partition (Kd)
                                        1. [*] AGED AND UNAGED RESIDUES
1.[]
                                        2. [ ] IMMOBILE IN AGRIC SAND (FL)
2. [ ]
                                      3. [ ] SdLm (OR) SdClLm (IN) SiLm
3. [ ]
                                        4. [ ] (NB) SiCl (MD)
4. []
                                        5. [ ]
5. [ ]
                                        6. [ ]
6.[]
                     METABOLISM STUDIES (162-1,2,3,4)
                                        Anaerobic Soil (162-2)
Aerobic Soil (162-1)
                                        1. [*] SAME AS WITH AEROBIC SOILS
1. [*] 56 DAYS IN GERMAN LOAM SOIL
                                        2. [ ]
2.[*] 63 DAYS "
                  " SANDY LOAM
                                        3. [ ]
 3.[]
                                        4. [ ]
 4. [ ]
                                        5. [ ]
 5.[]
                                        6.[]
 6. [ ]
 7. [ ]
                                        Anaerobic Aquatic (162-3)
 Aerobic Aquatic (162-4)
                                        1.[]
 1.[]
                                         2.[]
 2. [ ]
                                         3. [ ]
 3.[]
                                         4. [ ]
 4. [ ]
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Common Name: CYFLUIHRIN

Date 11/01/89

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

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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)

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 ISCMERS, ALL HAVING ROUGHLY THE SAME SOLUBILITY AND VAPOR PRESSURE.

References FARM CHEMICALS HANDBOOK; EPA REVIEWS

Writer

J. HANNAN

^{[*] ·} Acceptable Study · [#] = Supplemental Study

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)

1

- a-[[[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)