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Date Out EFB: MAY 14 1982

To: Product Manager 17 Gee
TS-767

From: Dr. Willa Garner
Chief, Review Section No. 1
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No.: 10182-AL

Chemical: Cypermethrin

Type Product: Insecticide

Product Name: Cymbush

Company Name: ICI Americas

Submission Purpose: Rotational crop studies

ZBB Code: other

Date in: 4/6/82

Date Completed: MAY 14 1982

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

ACTION CODE: 105

EFB # 270

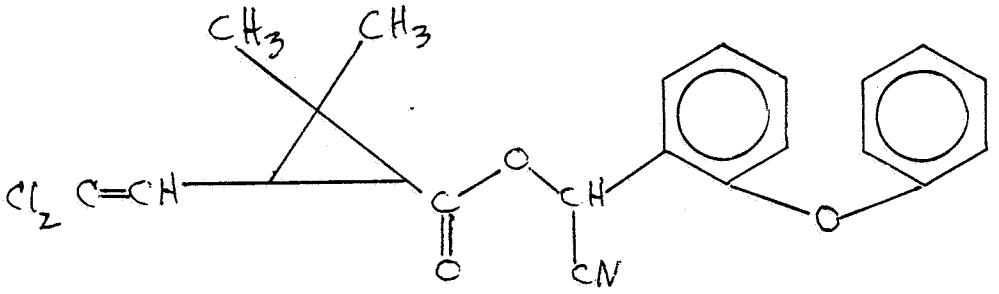
TAIS (level II)	Days
61	2

1.0 Introduction

Chemical Name and Type Pesticide: cypermethrin, (±)L-cyano-(phenoxyphenyl) (±)-cis,trans-3-(2,2-dichloroethenyl) -2,2-dimethylcyclopropane-carboxylate, 22.8%, 35.8%, ai, Insecticide.

Trade Name: CYMBUSH 3E Insecticide

Chemical Structure:



ICI Americas, Inc. is submitting the field rotational crop studies recommended in a previous review (29 April 1982, registration application for use on cotton).

2.0 Directions for Use

See previous review of 29 April 1982.

3.0 Discussion of Data

3.1 ROTATIONAL CROP STUDY (Field)

Cypermethrin Field Crop Rotation Study, 4 December 1981, Acc. #247111.

Experimental Procedure

Cypermethrin (Formulation JFUO38, GFU038A, or GFUO70) was applied at a rate of 0.5 lb of permethrin per acre to single bare soil plots located near Goldsboro, NC, Gainesville, FL, and Yuma, AZ. After the applications, the plots were rotovated to a depth of four inches. Crops representative of monocotyledons, dicotyledons, root crops, and leafy vegetables were planted 0, 15, 30, 60, 180, and 360 days after the application. Crops suitable for the geographic area and season were selected. The crops were maintained according to normal agricultural practices and were harvested at maturity or frost.

The samples were analyzed for residues of cypermethrin using the ICI Americas Inc. Method GRAM-7, a Gas Liquid Chromatographic Method for the Determination of Cypermethrin (PP383) in Soils. The method was used without modification. This method specifies the use of 50% acetone in hexane for extraction of the cypermethrin, cleanup with preparative gel permeation chromatography followed by Florisil column chromatography, then determination by GLC/EC.

The three metabolites were determined with a modification of Method GRAM-13, Gas Liquid Chromatographic Method for the Determination of Permethrin and its Metabolites in Animal Tissues and Eggs. With this method, the pentafluorobenzyl esters of the acid metabolites are formed, then determined by capillary column GLC/EC. Cleanup prior to the derivatization was done by aqueous-nonaqueous partitioning and cation exchange chromatography. The limits of determination were 0.01 ppm cypermethrin, 0.01 ppm of each isomer of DCVA and diacid, and 0.02 ppm 3-PB acid.

Results

The results in Tables 1-3 show that the residue in crops grown in cypermethrin treated soils were very low. No detectable residues of cypermethrin or its metabolites were found in crops planted 30 days or more after the soil was treated.

In trial 38AZ79-009, conducted near Yuma, Arizona; the lettuce planted 15 days after treatment contained 0.01 ppm trans-DVCA. The roots of carrots planted five days after the application had 0.02 ppm cis-DCVA and 0.02 ppm 3-PB acid. Traces of DCVA and diacid were found in lettuce and carrots planted five and 15 days after the application. None of the samples had detectable cypermethrin residues. There were no detectable residues of any of the compounds in any of the samples of peas, sorghum, or wheat.

There was only one measurable residue in the samples collected from the North Carolina trial (RUI-79-02). Collards planted 15 days after the application had 0.03 ppm 3-PB acid. There were traces of DCVA and diacid found in some of the samples from crops planted 0 and 15 days after the application.

There were 0.02 ppm trans-DCVA in turnips planted on the day of the application in the Florida trial (3OFL80-002). None of the other samples had measurable residues of any of the compounds.

Conclusion

Field studies of rotated leafy, root and grain crops in three use-states for cotton showed no detectable residues 30 days after planting.

4.0 Recommendation

EFB finds the submitted field rotational crop study to be satisfactory and concurs that no restriction is necessary for cypermethrin on cotton.

Herbert L. Manning

Herbert L. Manning, Ph.D.
Review Section No. 1
EFB/HED

Table 1. Residues in Crops Grown in Cypermethrin Treated Soil-Trial 38AZ79-009

Sample	Days after after Trt. to Planting	Residue, ppm /a,b																
		control								treated								
			DCVA			Diacid					DCVA			Diacid				
		Cypermethrin	cis	trans	total	cis	trans	total	3-PBacid	Cypermethrin	cis	trans	total	cis	trans	total	3-PBacid
Lettuce	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15	ND	ND	ND	ND	ND	0.01	0.01	ND	ND	ND	0.01	0.01	Tr	ND	Tr	ND
	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	60	ND	ND	ND	ND				ND	ND	ND	ND	ND	ND	ND	ND	ND
Carrot tops	5	ND								ND	ND	ND	ND	Tr	ND	Tr	
	15	ND								ND	ND	ND	ND	ND	Tr	Tr	
	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carrot Roots	5	ND								ND	0.02	ND	0.02	ND	ND	ND	0.02
	15	ND				ND	ND	ND	ND	ND	0.01	Tr	0.01	ND	ND	ND	ND
	30									ND	ND	ND	ND	ND	ND	ND	ND
	60	ND				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Peas	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sorghum (whole plant)	5	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND
	15	ND	ND	ND	ND				ND	ND	ND	Tr	Tr	ND	ND	ND	ND
Wheat (grain)	30	ND	ND	ND	ND				ND	ND	ND	ND	ND	ND	ND	ND	ND
	60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Wheat (plant)	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

a/ Values corrected for recoveries of <100%.

b/ ND = None detected, Tr = Trace (Limits of determination = 0.01 ppm cypermethrin, 0.01 ppm of each isomer of DCVA and diacid, and 0.02 ppm 3-PBacid.)

Table 2. Residues in Crops Grown in Cypermethrin Treated Soil-Trial RU1-79-002

Sample	Days after after Trt. to Planting	Residue, ppm /a,b															
		control								treated							
			DCVA			Diacid					DCVA			Diacid			
		Cypermethrin	cis	trans	total	cis	trans	total	3-PBacid	Cypermethrin	cis	trans	total	cis	trans	total	3-PBacid
Collards	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15	ND				ND	ND	ND	Tr	ND	ND	ND	ND	ND	ND	ND	0.03
	30	ND	ND	ND	ND	ND	ND	ND	Tr	ND	ND	ND	ND	ND	ND	ND	ND
Turnips	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND
	30	ND				Tr	ND	Tr	ND	ND	ND	ND	ND	ND	ND	ND	
	60	ND	ND	ND	ND				ND	ND	ND	ND	ND	ND	ND	ND	ND
Sweet Potatoes	0	ND	ND	ND	ND				ND	ND	ND	Tr	Tr	Tr	ND	Tr	ND
	15	ND				ND	ND	ND	ND	ND	ND	Tr	Tr	Tr	ND	Tr	ND
	30	ND	ND	ND	ND	Tr	ND	Tr	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sorghum	0	ND	ND	ND	ND				ND	ND	ND	Tr	Tr	ND	ND	ND	ND
	15	ND	ND	ND	ND				ND	ND	ND	Tr	Tr	ND	ND	ND	ND
	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	60	ND	ND	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND

a/ Values corrected for recoveries of <100%.

b/ ND = None detected, Tr = Trace (Limits of determination = 0.01 ppm cypermethrin, 0.01 ppm of each isomer of DCVA diacid, and 0.02 ppm 3-PBacid.)

Table 3. Residues in Crops Grown in Cypermethrin Treated Soil-Trial 30PL80-002

Sample	Days after after Trt. to Planting	Residue, ppm /a,b														
		control								treated						
			DCVA			Diacid					DCVA			Diacid			
		Cypermethrin	cis	trans	total	cis	trans	total	3-PBacid	Cypermethrin	cis	trans	total	cis	trans	total	3-PBacid
Sorghum	0	ND							ND	Tr	ND	ND	ND	ND	ND	ND	ND
	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND
Collards	0	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND
	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND
Turnips	0	ND	ND	Tr	Tr				ND	ND	ND	0.02	0.02	ND	ND	ND	ND
	15	ND	ND	Tr	Tr	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND
	60	ND				ND	ND	ND	ND	ND				ND	ND	ND	ND
Soybeans	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15	ND				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30	ND				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

a/ Values corrected for recoveries of <100%.

b/ ND = None detected, Tr = Trace (Limits of determination = 0.01 ppm cypermethrin, 0.01 ppm of each isomer of DCVA diacid, and 0.02 ppm 3-PBacid.)