2-10-92

DP Barcode : 103301
PC Code No. : 103301
EFGWB Out : 2/10/92

To: B. Crompton
Product Manager PM 50
Special Review and Reregistration Division (H7508W)

From: Henry P. Nelson, Ph.D., Head (acting) H Nelson
Environmental Assessment Section
Environmental Fate & Ground Water Branch/EFED (H7507C)

Thru: Henry Jacoby, Chief
Environmental Fate & Ground Water Branch/EFED (H7507C)

Attached, please find the EFGWB review of...

Reg./File # : 239-2471

Chemical Name : O, S-dimethylacetylphosphoramidothioate

Type Product : Insecticide

Product Name : Acephate

Company Name : Chevron

Purpose : Review additional spray drift information

Action Code : 660 EFGWB #(s): 89-0619 Total Review Time: 1 days

EFGWB Guideline/MRID Summary Table: The review in this package contains...					
161-1		162-1	164-1	165-1	166-1
161-2		162-2	164-2	165-2	166-2
161-3		162-3	164-3	165-3	166-3
161-4		162-4	164-4	165-4	167-1
201-1	410235-03	163-1	164-5	165-5	167-2
202-1	410235-04	163-3			

1/8

1. Chemical:

Common name: Acephate
Product name: Orthene
Chemical name: O, S-dimethylacetylphosphoramidothioate

Type of product: insecticide.

Physical/Chemical Properties
molecular weight: 183.16
aqueous solubility: 650,000 ppm at 20 C.
Vapor pressure (Torr): 1.7 E-6

2. Test Materials:

The droplet size spectra studies (FIFRA Section 3 Guideline Reference No. 201-1) were conducted with a sugar solution because poisonous materials can not be used in the University of California Wind Tunnel. Dr. Robert W. Holst (former Deputy Branch Chief of EFGWB) informed Professor Akesson during a telecom that surrogate chemicals could be used for the Drift Field Evaluation (FIFRA Section 3 Guideline Reference No. 202-1). Dr. Akesson submitted Drift Field studies with the synthetic pyrethroid, pounce, and the herbicide, atrazine.

3. Study/Action Type:

Review additional data concerning studies which were submitted to fill the requirement for Droplet Size Spectra and Drift Field Evaluation studies for acephate. Provide overall analysis of the status of the registrant's effort to fill these data gaps.

4. Study Identification:

Akesson, Norman B.1989. Droplet size spectrum study (comments). University of California Report. U.S. EPA Accession 410235-03. and

Akesson, Norman B. 1989. Drift Field Evaluation. University of California. U.S. EPA Accession 410235-04.

5. REVIEWED BY:

Robert K. Hitch, Ecologist, R Hitch Date: Jan 16 92
Surface Water Section
Environmental Fate and Groundwater Branch

6. APPROVED BY:

Henry Nelson, Ph.D., Acting Chief, H Nelson Date: 2/4/92
Surface Water Section
Environmental Fate and Groundwater Branch

7. Conclusions:

201-1 Droplet Size Spectrum.

The supplemental information provided (MRID-410235-03) is adequate to remove information gaps cited in the EFGWB review of the original study (MRID 403233-01), therefore, the droplet size spectrum data requirement is satisfied.

202-1 Drift Field Evaluation.

The supplemental information provided (MRID 410234-04) is adequate to remove information gaps cited in the EFGWB review of the original study (40323302). Therefore, the drift field evaluation data requirement is satisfied. The reguirement for a drift field evaluation is filled by MRID's 40323302 and 41023504. From the registrant's Tables in MRID 410235-04, we can see that that the offsite drift at 50 meters was about 0.6 percent for atrazine and about 2 percent for pounce. Note that this is for treatment of a single swath and that treatment of an entire field would greatly increase these deposition values.

8. Recommendations

Currently there are labels for acephate which put no limitation on the windspeed which can occur during application. It is noted that studies in the open literature show that even when the wind speed has been less than 10 mph, 20 percent of the applied material has occasionally deposited 100 feet downwind from treated fields. The downwind deposition probably gets much higher at windspeeds above 10 mph. If this is of concern, the EFGWGB can recommend restrictions to reduce drift.

9. Background:

According to the 1987 Registration Standard, acephate is registered for insect control on several of the biggest acreage crops including cotton and soybeans. Additionally it is registered for forest insect control.

The registrant had previously submitted the Droplet Size Spectrum (EPA MRID No. 403233-01) and Drift Field Evaluation studies (MRID-403233-02). I reviewed that data (EAB # 70997) and identified data gaps including the need for scaled drawings of the application sites, locations of the collections stations and the raw data concerning the amount of pesticide collected at each station.

10. Discussion

In personal communication 22 July 91 Professor Norm Akesson provides the following information about the two studies:

(a) The pyrethroid spray drift study was conducted with a Snow Air Tractor fixed wing aircraft on August 11 and 12 1980 in Inverness Mississippi.

(b) The atrazine study was conducted June 6 1978 at a with a Piper Pawnee model 235 on a ranch 6 miles east of Davis California.

(C) The registrant notes in MRID 410235-04 that the viscosity of the atrazine spray mixture used in the Drift Field Evaluation Test was probably in the range of 1.85 centipoise. However the viscosity of the maximum label rate spray mixture of acephate ranged from 1.25 to 1.31 Cp in two measurements presented by Akesson 403233-01.

Professor Akesson states that published work that he conducted with a Dr. Haq demonstrates that viscosity is of relatively little importance in affecting drop size compared to surface tension. Professor Akesson noted that Nalcotrol affects droplet size by increasing viscosity but the viscosity must be about 30 fold higher to effectively increase droplet size.

One of the important statistics gathered from the Drift Field Evaluation is the "percentage of applied" of the pesticide depositing out downwind. Professor Akesson provides tables showing the grams per hectare that would

have deposited if the application rate was one kilogram per hectare. This converts easily to percent of applied. For example for atrazine at 50 meters he found 6.6 grams/hectare which would convert to 0.66 percent. For the pyrethroid, he found 23.8 g/ha which would convert to 2.38 percent of the applied.

11. One-liner

See attached.

12. Confidential Appendix

NA.

Spray Drift, Droplet Spectrum (201-1)

[V] >In six trials the volume mean diameter ranged from 258.4 to 500 <
[ ] >microns. <
[ ] > <
[ ] > <

Spray Drift, Field Evaluation (202-1)

[ ] >In two trials the offsite deposition at 50 meters downwind ranged<
[V] >from 0.66 to 2.38 percent of the applied. Studies were appli- <
[ ] >cations to a narrow swath. Drift would have been much higher in <
[ ] >a large field situation <

Raw Data from Akesson's Drift Field Evaluations

Field Test II

Table 3. Field Test II
Pyrethroid

Downwind dist. m	Total Residue µg/ft²		Corrected to g/ha	
	Fallout Mylar	Air Filter	Mylar	Air Filt.
9	2030	-	307	-
22	784	-	118.8	-
50	157	3370	23.8	383
100	38.7	1400	5.87	159
200	23.5	1250	3.5	142
400	7.0	470	1.06	53
800	0.9	180	.136	20

The field drift test data for Test I is shown in Table 2.

Table 2. Field Test I
Atrazine

Downwind dist. m	Total Residue on Collectors, µg		Corrected to g/ha	
	Fallout Mylar	Air Filter	Mylar	Air Filter
12.5	113,043	-	402	-
25	9,652	-	34.4	-
50	1,848	847	6.6	73.3
100	509	352	1.8	30.4
200	135	146	.48	12.6
400	100	190	.36	16.4
800	33	45	.12	3.9

Use this form for individual studies & to submit pesticide applications.

United States Environmental Protection Agency
Office of Pesticide Programs
Washington, DC 20460

Data Review Record

Confidential Business Information - Does not contain National Security Information (E.O. 12065)

Pack Number	Date Received
#9396 EFED	4-7-89

1. Product Name

Chemical Name: ACEPHATE

2. Identifying Number	3. Record Number	4. Action Code	5. MRID/ Accession Number	6. Study Guideline or Narrative
103301 8		660	41023503	201-1 droplet size spectrum
139-2471			41023504	202-1 drift field evaluation

7. Reference No.	8. Date Rec'd (EPA)	9. Prod/Review Mgr/DCI	10. PM/RM Team No.	11. Date to HED/ EFED/RD/BEAD	12. Proj Return Date	13. Date Returned to RD/SRRD
	3/9/89	B. Crompton			8/30/89	

Instructions

resubmission of spray drift data to be reviewed

This Section Applies to Review of Studies Only

14. Check Applicable Box

- ☐ Adverse 6(a)(2) Data (405)
- ☐ Special Review Data (870)
- ☐ Generic Data (Reregistration)(660)
- ☐ Product Specific Data (Reregistration)(655)

15. No. of Individual Studies Submitted: 2

16. Have any of the above studies *(in whole or in part)* been previously submitted for review?

- ☐ Yes *(Please identify the study(ies))*
- ☐ No

17. Related Actions

18.	To	Type of Review	19. Reviews Also Sent to	20. Data Review Criteria
HED	☐	Science Analysis & Coordination	☐ SAC ☐ PC	A. Policy Note No. 31
	☐	Toxicology/HFA	☐ TOX/HFA ☐ PL	☐ 1 = data which meet 6(a)(2) or meet 3(c)(2)(B) flagging criteria
	☐	Toxicology/IR	☐ TOX/IR	
	☐	Dietary Exposure	☐ DEB ☐ EA	☐ 2 = data of particular concern from registration standard
	☐	Nondietary Exposure	☐ NDE ☐ AC	
EFED	☐	Ecological Effects	☐ BA	☐ 3 = data necessary to determine tiered testing requirements
	☒	Environmental Fate & Groundwater	☐ EEB	
SRRD	☐	Special Review	☐ EFGWB	B. Section 18
	☐	Reregistration		☐ 1 = data in support of section 3 in lieu of section 18
	☐	Generic Chemical Support	☐ SR	
RD	☐	Insecticide-Rodenticide	☐ RER	C. Inert Ingredients
	☐	Fungicide-Herbicide	☐ GSC	☐ 1 = data in support of continued use of List 1 inert
	☐	Antimicrobial		
	☐	Product Chemistry	☐ IR	
	☐	Precautionary Labeling	☐ FH	
BEAD	☐	Economic Analysis	☐ AM	
	☐	Analytical Chemistry		
	☐	Biological Analysis		

☐ Confidential Statement of Formula (EPA Form 8570-4) Attached *(Trade Secrets)*

☐ Label Attached

EPA Form 8570-17 (Rev. 11-88)
Previous editions are obsolete.

White - Data Coordinator
Yellow - Data Review Section
Pink - PM/RM/DCI
Green - Return with completed review