11-4-80

MULTIPLE

TDMS0030 DATA EVALUATION RECORD PAGE 1 OF 5

CASE GS0014 ENDOSULFAN PM 110 ~~08/12/79~~

CHEM 079401 Endosulfan (hexachlorochexahydromethano)

BRANCH EEB DISC 40 TOPIC 05051545

FORMULATION 12 - EMULSIFIABLE CONCENTRATE (EC OR CB ~~E~~)

FICHE/MASTER ID 05002083 CONTENT CAT 01

Clinch, P.G. (1969) Laboratory determination of the residual fumigant toxicity to honey bees of insecticide sprays on white clover (Trifolium repens L). New Zealand Journal of Agricultural Research 12(1):162-170.

SUBST. CLASS = S.

DIRECT RVW TIME = 4 Hrs. (MH) START-DATE 2/6/80 END DATE 2/7/80

REVIEWED BY: Allen W. Vaughan
TITLE: Entomologist
ORG: EEB/HED
LOC/TEL: Crystal Mall #2/71405

SIGNATURE: Allen W. Vaughan DATE: 11/4/80

APPROVED BY:
TITLE:
ORG:
LOC/TEL:

SIGNATURE: DATE:

35% a.i.

Conclusions

This study is scientifically sound.

Methods and Materials

Test Procedures

Initial Fumigant Toxicity - Enclosures were designed to confine test bees so that they were directly over, but not in contact with, treated filter paper or treated blossoms. In this case (initial toxicity) bees were collected, anesthetized, and placed in the enclosures. Pesticides were applied to filter papers in petri dish lids, and the enclosures were then immediately placed over the wet filter papers. After one hour of exposure the bees were removed to holding cages. Mortality was recorded after 24 hours.

Residual Fumigant Toxicity - Procedure was similar to that used in testing initial fumigant toxicity, with the following changes:

1) Pesticides were applied to clover flowers or, in some cases, to artificial (foil) flowers;
2) Pesticide deposits were allowed to dry prior to bee exposure.

For the first part of this test, pesticides were applied three hours before exposure to bees, to simulate early morning application. Toxic compounds were then retested by applying 18 hours before exposure to bees, to simulate evening application. As ~~in (A)~~ above, exposure was for one hour, and mortality was determined after 24 hours.

Statistical Analysis - Abbott's formula was used to correct for control mortality.

Results

Reported Results - Of 18 pesticide compounds tested for fumigant effects, only four showed initial fumigant toxicity: Cyanox, diazinon, dichlorvos, and lindane. Of these, only Cyanox, diazinon, and lindane showed residual fumigant toxicity. Data from the tests showed that initial fumigant toxicity is not a satisfactory index of a pesticide's residual fumigant toxicity.

Discussion/Results - For detailed results see Tables 1, 2, and 3.

Discussion

Test Procedure - Procedures were sound.

Statistical Analysis - None reported other than Abbott's formula.

Discussion/Results - This study is scientifically sound.

2

TABLE 1 - Insecticides Showing No Initial or Residual Fumigant Toxicity in Tests

	Insecticide	Formulation and % active material	Equivalent full rate of application per acre (lb active material)
1.	Aminocarb	WP 75% W/W	1.13
2.	Arprocarb	WP 50% W/W	1.00
3.	Bromophos	EC 20% W/V	0.50
4.	Carbaryl	WP 80% W/W	2.00
5.	DDT	EC 20% W/V	1.00
6.	DDT	WP 50% W/W	1.00
7.	Demeton-O-methyl	EC 25% W/V	0.38
8.	Endosulfan	EC 35% W/V	0.77
9.	Fenitrothion	EC 60% W/V	1.13
10.	Malathion	EC 50% W/V	1.25
11.	Malathion	WP 25% W/W	1.25
12.	Monocrotophos	EC 50% W/V	0.31
13.	Oxydemeton-methyl	EC 25% W/V	0.38
14.	Phenthoate	EC 50% W/V	1.25
15.	Surecide	EC 25% W/V	1.25
16.	Trichlorfon	SP 80% W/W	1.20

EC = emulsifiable concentrate.
WP = wettable powder.
SP = soluble powder.

TABLE 2 - Initial Fumigant Toxicity

Insecticide	Formulation and % active material	Equivalent full rate of application per acre (lb active material)	Percentage mortality* 24 hours after exposure					
			Rate					
			Full	1/2	1/4	1/8	1/16	1/32
1. Cyanox	EC 50% W/V	1.25	100	100	100	100	0	0
						100	3	0
2. Diazinon	WP 40% W/W	1.00	100	100	100	28	0	-
					100	35	0	-
3. Dichlovos	EC 50% W/V	0.31	100	100	100	18	0	-
					100	33	0	-
4. Lindane	EC 20% W/V	0.75	100	100	100	90	25	0
					100	90	15	0

* Corrected for mortality in the controls using the method of Abbott (1925).
EC = emulsifable concentrate.
WP = wettable powder.

TABLE 3--Residual Fumigant Toxicity

Insecticide	Formulation and % active material	Equivalent full rate of application per acre (lb active material)	Time between application and exposure (hours)	Percentage mortality* 24 hours after exposure above sprayed white clover flowers**				
				Rate				
				Full	1/2	1/4	1/8	1/16
1. Cyanox	EC 50% W/V	1.25	3	100 (100)	100 (100)	50 (100)	0 (80)	-- (0)
				--- ---	100 (100	48 (100)	0 (62)	-- (0)
			18	100 (100)	98 (100)	2 (38)	0 (0)	
				--- ---	100 (100)	12 (42)	0 (0)	
2. Diazinon	WP 40% W/W	1.00	3	100 (100)	100 (100)	78 (92)	0 (0)	
				--- ---	100 (100)	43 (60)	0 (0)	
			18	100 (100)	58 (8)			
				--- (100)	--- (0)			
3. Dichlorvos	EC 50% W/V	0.31	3	0 (0)	0 (---)			
			18	0 (0)	0 (---)			
4. Lindane	EC 20% W/V	0.75	3	78 (98)	8 (33)	-- (0)		
				--- (92)	0 (12)	-- (0)		
			18	5 (2)	2 (0)			
				0 (0)	— (0)			

* Corrected for mortality in the controls using the method of Abbott (1925).
** Figures from comparative tests using foil artificial flowers are shown in brackets.