

Section III. Bee Poisoning

RESIDUAL BEE POISONING BIOASSAY

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Tests were conducted with insecticides applied with a R&D CO₂ pressurized sprayer at a rate of 26 gallons per acre applied to 0.01 acre plots of alfalfa. Samples of 500 cm of foliage were taken from plants, clipped to 1-inch lengths and placed into plastic petri dish whose tops and bottoms were separated by a wire screen insert. Worker bumble bees (BB) were taken from commercial colonies. Worker honey bees (HB) were obtained from colonies and anesthetized with CO₂ to facilitate handling. Alfalfa leafcutter bees (LB) were emerged in an incubation chamber at 85° F., allowed to fly in the lab, and collected off the windows. Alkali bees (AB) were collected from nesting sites and chilled at 35° F. to facilitate handling. Residual test exposures were replicated by caging 15 BB, 30 worker HB, 25 LB or 20 AB with each of four foliage samples per treatment and time intervals. Bees in cages were fed syrup in a wad of cotton, and the bees held at 75 degrees F. for 24 hour mortality counts.

Materials with less than 25% mortality with 2 hour residues can be applied during early morning with little hazard to bees and those with less than 25% mortality with 8 hour residues can probably be applied during late evening with little or no hazard to bees.

Table 1. Mortalities of alkali (AB), alfalfa leafcutter (LB), and honey bees (HB) exposed to different age residues of insecticides. Touchet, WA. 1994.

Treatment	lb (AI)/a	24 hr % mortalities of bees caged with treated foliage age of residues					
		HB		AB		LB	
		2 hr	8 hr	2 hr	8 hr	2 hr	8 hr
Stalker 245SC	0.1	2	0	9	11	72	24
Stalker 245SC	0.2	22	0	12	6	78	53
Lannate 90SP	0.25	--	--	69	24	33	18
Lannate 1.8EC	0.25	--	--	18	13	26	5
Lannate 90SP + Comite	0.25	--	--	56	19	34	19
Sterling 50WP	300 gm	--	--	4	5	17	17
Sterling + Comite	300 gm	--	--	8	2	6	11
Admire 240FS	0.05	--	--	16	10	25	14
Admire 240FS + Sylgard	0.05	--	--	7	6	13	12
Admire 240FS + Comite	0.05	--	--	27	26	16	15

Table 2. Mortalities of honey bees (HB) exposed to different age residues of insecticides applied to 0.01 acre plots. Prosser, WA. 1994.

Treatment	lb (AI)/a	24 hr % mortalities of bees caged with treated foliage	
		age of residues	
		HB	
		2 hr	8 hr
Admire 240 FS	0.25	97	78
ICIA 5504 50WP	0.2	0	0
Naturalis-L	15 oz	0	0
S-71639 0.83EC	0.066	0	0
S-71639 0.83EC	0.11	0	0
TD-2342-1 2FM	2.0	100	100
TD-2344-1 0.4EC	0.0125	13	7
TD-2344-1 0.4EC	0.019	48	47
TD-2344-1 0.4EC	0.025	46	69
TD-2345-1 2FM	0.5	100	100
TD-2345-1 2FM	1.0	100	100
TD-2348-1 2FM	1.0	100	100
TD-2348-1 2FM	2.0	100	100
XDE-# 2.4SC	200 gm	0	0
XDE-# 80WG	100 gm	96	86
YI # 50EC	50 gm	0	0
Adios	0.25 lb/a	0	3
Adios	0.50 lb/a	0	1
Adios	0.75 lb/a	1	4
Demize	132 oz/a	0	

Table 3. Mortalities of bumble bees (BB), honey bees (HB), alkali bees (AB), and alfalfa leafcutter bees (LB), exposed to different age residues of insecticides applied to 0.004 hectare plots of alfalfa.

	lb(AI)/a	BB		HB		AB		LB	
		2	8	2	8	2	8	2	8
PennCap MS 2FM	0.5	73	6	100	100	100	100	100	100
Carzol 92SP	1.0	63	50	48	20	100	40	100	100
Supracide 2E	0.5	58	20	100	100	100	100	100	100
Vydate 2L	1.0	29	46	100	96	100	100	100	100
Ambush 2E	0.05	44	11	100	79	73	36	100	89
Imidan 50WP	1.0	75	17	100	100	100	100	100	100
Danitol 2.4EC	0.2	95	94	52	29	100	100	100	100
BAS 300111 75WP	0.4	0	10	23	31	36	15	48	6
Monitor 4E	0.75	6	2	100	99	100	92	100	100
Ammo 2.5EC	0.05	100	40	63	68	76	29	83	75
Dylox 80SP	1.0	7	0	73	85	76	6	45	25
Larvin 3.2AF	1.0	0	3	12	8	67	39	69	50
Decis 0.2EC	0.019	3	0	10	4	15	17	27	19
Furadan 4F	0.25	63	10	100	100	100	100	100	100