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Insecticide and Acaricide Tests 8:254

MEDICAL AND VETERINARY

LABORATORY TESTS
Imported fire ant: Solenopsis invicta Buren

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EVALUATION OF CANDIDATE CHEMICALS AS BAIT TOXICANTS AGAINST IMPORTED FIRE ANTS IN LABORATORY SCREENING TESTS, 1981: All tests are conducted in 30-ml disposable plastic medicine cups. Twenty worker ants from laboratory colonies deprived of food for 14 days were collected from the inside of rearing cells containing brood (brood tenders) and placed in each test cup ca 24 h preceding start of a test. This pretreatment holding period allows time for the ants to recover from handling and to orient. Candidate chemicals are dissolved directly in once-refined soybean oil and offered to the ants on saturated cotton swabs. Preliminary tests with all chemicals are conducted at 3 concentrations (1.0, 0.1 and 0.01%). Compounds giving complete kill at the lowest concentration are tested further until the minimum concentration giving 90% or greater kill is determined. The ants are allowed to feed on the toxic bait for 24 h after which they remain without food for an additional 24 h. At the end of this time, cotton swabs saturated with soybean oil are placed in the chamber and left for the remainder of the test period. Mortality counts are made at intervals of 1, 2, 3, 6, 8, 10 and 14 days following initial exposure. Each test consists of 3 replications plus a soybean oil control and a mirex standard. Room temperature is maintained at 26.7±2.2°C.

Compounds were tested as all 3 concentrations specified above but the data reported in the following table are only for 1% and any lower concentrations that gave greater than 20% kill. Of the 55 chemicals tested, 21 (20 from American Cyanamid and 1 from Dupont) showed delayed toxicity at 1 concentration. Studies have shown that a bait toxicant performs satisfactorily in the field only if it exhibits delayed toxicity. Delayed toxicity is defined as less than 15% mortality after 24 h and more than 89% mortality at the end of the test period (see mirex standard at 1.0 and 0.1% concentrations). Several of the American Cyanamid chemicals showed delayed toxicity at 1.0 and 0.1% concentrations and therefore should be excellent candidates for control of natural populations of fire ants.

Company name and number	Concn (%)	Percent kill after day indicated						
		1	2	3	6	8	10	14
American Cyanamid AC 222,381	0.1	0	0	2	58	70	85	98
	1.0	0	60	98	100			
American Cyanamid AC 233,956	0.1	0	0	0	28	50	64	76
	1.0	4	16	55	86	93	99	100
American Cyanamid AC 222,231	0.1	0	2	5	22	47	62	82
	1.0	0	13	35	65	68	68	93
American Cyanamid AC 222,332	0.1	0	2	2	23	25	67	90
	1.0	2	21	54	86	92	94	98
American Cyanamid AC 222,344	0.1	0	0	0	30	40	43	85
	1.0	0	27	65	89	90	92	94
American Cyanamid AC 222,381	0.1	0	0	2	58	70	85	98
	1.0	0	35	68	91	96	98	98
American Cyanamid AC 222,654	0.01	0	2	2	5	7	12	27
	0.1	0	0	0	13	43	60	83
	1.0	2	38	82	98	98	100	
American Cyanamid AC 222,782	0.01	0	0	0	0	0	5	20
	0.1	0	0	2	23	42	63	88
	1.0	2	29	67	93	97	98	99
American Cyanamid AC 222,786	0.1	2	3	3	85	90	93	97
	1.0	4	41	63	97	98	100	
American Cyanamid AC 222,881	0.1	2	2	2	45	57	75	93
	1.0	0	35	65	92	95	95	97
American Cyanamid AC 222,932	0.1	0	0	0	8	28	65	73
	1.0	1	30	68	97	97	98	98
American Cyanamid AC 222,933	0.1	0	0	0	10	23	40	77
	1.0	0	16	87	99	99	99	99
American Cyanamid AC 222,934	0.1	0	0	2	8	45	77	92
	1.0	0	17	72	97	98	99	100
American Cyanamid AC 233,032	1.0	1	1	10	50	70	87	96
American Cyanamid AC 233,117	0.1	0	0	0	0	5	18	65
	1.0	4	28	47	79	88	93	99
American Cyanamid AC 233,118	0.1	0	0	0	7	17	43	67
	1.0	2	34	67	89	93	96	96
American Cyanamid AC 217,768	0.1	0	0	5	57	67	90	95
	1.0	4	45	78	95	97	98	99
American Cyanamid AC 233,956	0.1	0	0	0	28	50	64	76
	1.0	4	16	55	86	93	99	100
American Cyanamid AC 239,342	0.01	0	2	2	5	10	15	27
	0.1	0	0	2	3	8	13	40
	1.0	0	8	50	72	82	86	93
American Cyanamid AC 239,382	0.01	0	0	0	3	15	17	22
	0.1	2	2	2	3	10	15	25
	1.0	1	1	32	86	88	89	94
DuPont DPX 6177	1.0	0	0	0	2	2	2	5
DuPont DPX 5444	0.1	8	35	75	93	95	97	97
	1.0	53	98	100				
Lilly L 331	0.01	1	6	8	15	20	24	38
	0.1	44	64	74	81	84	84	84
	1.0	90	96	97	99	100		
Lilly LY 127262	0.1	8	32	33	37	37	37	37
	1.0	45	65	67	67	67	67	70
Lilly LY 125775	0.01	35	47	47	55	55	55	57
	0.1	67	72	73	75	77	77	77
	1.0	2	3	5	5	7	7	13

MEDICAL AND VETERINARY
(Williams & Lofgren, cont'd)

Company name and number	Concn (%)	Percent kill after day indicated						
		1	2	3	6	8	10	14
Lilly LY 049703	0.1	0	2	3	27	35	43	48
	1.0	20	57	73	92	93	98	100
Lilly LY 057869	0.1	3	5	12	37	38	42	53
	1.0	7	23	43	67	73	78	83
Lilly LY 057931	1.0	0	2	2	7	8	12	20
Lilly LY 127950	0.1	12	33	38	40	42	42	42
	1.0	25	38	43	45	47	47	47
Lilly LY 65873	0.1	3	17	33	60	60	63	75
	1.0	22	72	85	95	95	98	100
Lilly LY 074795	0.1	0	0	2	5	8	10	22
	1.0	2	25	30	43	45	50	57
Lilly LY 116521	0.01	2	2	2	2	5	10	33
	0.1	5	27	33	53	55	55	72
	1.0	45	73	77	88	88	93	98
Lilly LY 134952	0.1	2	2	3	15	20	22	38
	1.0	2	23	33	42	42	43	45
Lilly LY 134953	1.0	15	45	55	63	67	67	73
Lilly LY 146950	0.01	3	7	7	12	17	20	23
	0.1	2	3	7	8	13	23	23
	1.0	0	8	28	65	67	72	78
Lilly LY 146951	1.0	5	8	10	10	10	12	25
FMC 54617	0.1	95	100					
	1.0	95	100					
ICI Americas PP 563	0.01	67	67	67	67	67	67	70
	0.1	100						
	1.0	100						
Nor-Am SN 72826	0.01	0	2	2	2	7	15	23
	0.1	53	58	65	73	73	75	77
	1.0	75	88	92	95	98	100	
Nor-Am SN 75411	0.1	38	38	45	55	60	77	80
	1.0	85	85	87	92	92	92	93
Nor-Am SN 75734	0.1	2	10	12	27	32	32	37
	1.0	42	57	62	73	67	73	77
Nor-Am SN 75969	0.1	0	7	18	38	50	60	68
	1.0	72	85	92	97	100		
Nor-Am SN 78849	1.0	0	0	0	0	0	0	0
Nor-Am SN 78850	1.0	2	2	2	3	5	7	12
Nor-Am SN 80196	0.01	2	2	2	20	30	38	42
	0.1	52	67	80	92	92	92	93
	1.0	93	97	97	97	98	98	100
Nor-Am SN 81093	0.1	45	62	65	75	75	77	78
	1.0	95	98	98	98	98	98	100
Nor-Am SN 81627	0.1	10	25	37	62	67	70	73
	1.0	50	63	78	93	95	98	98
Pfizer Central Res UK 32,985	1.0	2	3	3	3	7	15	18
Pfizer Central Res UK 37,889	1.0	0	0	2	3	7	7	13
Pfizer Central Res UK 31,159	1.0	0	0	0	2	2	5	10
Pfizer Central Res UK 39,021	1.0	2	3	5	8	10	10	27
Pfizer Central Res UK 39,445	1.0	0	0	0	2	2	2	10
Pfizer Central Res UK 40,724	1.0	2	2	2	8	10	12	13
Stauffer R 52717	1.0	0	0	0	7	8	8	10
Stauffer R 52858	1.0	0	0	2	2	3	3	3
Mirex (standard)	0.01	0	1	1	9	21	53	75
	0.1	0	0	28	80	87	93	100
	1.0	0	64	95	100			
Soybean oil (check)		0	0	0	2	2	4	7