CHEMICAL CONTROL OF GRASS GRUB RESULTS OF TRIAL WORK DURING 1967-8 SEASON

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Summary

The performance of ten experimental chemicals in the control of *Costelytra zealandica* White was assessed in 13 trials. All materials were formulated as granules and broadcast by hand. Only "Mocap" gave acceptable control, similar to that obtained with diazinon 5% which was used as a standard of comparison.

EXPERIMENTAL

SITES were chosen deliberately for degree and uniformity of infestation and the trials laid out in blocks of 10 ft $\times$ 10 ft squares. In most cases 10 replications were made, allotting treatments within each block by random choice.

Results were measured by survivor counts, taking four 8 in. $\times$ 8 in. $\times$ 7 in. spade samples per square on a fixed pattern, and by visual assessment of pasture response, using a scale 0 to 10 (0 = bare soil, 10 = a dense sward of vigorous pasture of a desired composition).

Where it was shown in early assessments that chemicals had obviously not been effective, digging was dispensed with in subsequent evaluation and only pasture response recorded.

All chemicals were applied as granules at a rate of 2 lb a.i./acre. 5% and 10% formulations of diazinon and formparanate were compared and a gross dose of the former, 20 lb a.i./acre, was used in an attempt to gain an impression of pasture appearance under high level grub control. The standard treatment used was diazinon 5% at 2 lb a.i./acre.

Statistical analysis was done by applying Student's t-test to the grub numbers in each plot after these had been transformed into $\sqrt{(n + 1)}$.

Trial 3 was conducted in co-operation with the Department of Agriculture, Lincoln.

MATERIALS USED

formparanate	ethoate-methyl
B 5860	NA 33
"Surecide"	NA 34
"Salithion"	diazinon
"Aphidan"	methomyl
"Mocap"	

All formulation was done by the laboratory of the Farm Chemicals Company with the exception of "Mocap" granules used in Trial 13, which were of American manufacture.

LOCATION AND RAINFALL

Trials were laid down in a variety of locations so as to include a diversity of conditions under which the materials might be required to perform.

<i>Trial No.</i>	<i>Location</i>	<i>Rainfall</i>
1, 2, 3	Mid-Canterbury	No. 3: 1 in. within a week
4, 5	Marton	Light rain at application, heavy fall within a fortnight.
6	Kiwatea	} 2 in. within a fortnight
7, 8	Dannevirke (foothills)	
9	Dannevirke (plain)	
10	Pohanginau Valley	
11	Inglewood	} Heavy immediately after
12	Eltham	
13	Brightwater	

RESULTS AND DISCUSSION

Results are given in Tables 1 to 3.

Of the experimental materials, only "Mocap" achieved consistently good results equalling standard treatment in pasture response and survivor count. It is claimed to have good persistence in the soil relative to most organo-phosphate chemicals. The use of formparanate results in good pasture response for at least 2 years' duration (earlier unreported work) but achieves no corresponding population reduction during the season of application.

After its highly promising performance in an earlier North Island trial, B5860 was disappointing in both forms tested, namely, carried by a pumice granule and by a calcite core granule.

Diazinon tested as a 5% and 10% formulation gave equal results. It should be noted that at 20 lb a.i./acre it reduced the grub population to only 38% of its original level.

ACKNOWLEDGEMENTS

The author wishes to thank the several farmers for co-operation in more ways than one, J. J. Lloyd who prepared the granules, and W. Marris who assisted with digging. He is further indebted to R. L. Taylor for his overall guidance and assistance with digging and interpretation of results.

TABLE 1: MEAN PASTURE RESPONSE

Trial Date No.	Treatments													LSD																							
	Assessed		Untreated		formparanate 5%		formparanate 10%		diazinon 5%		diazinon 10%		diazinon 20 lb a.i./acre			B5860 on calcite		B5860 on pumice		"Surecide"		"Aphidan"		"Salithion"		"Mocap"		ethoate-methyl		NA 33		NA 34		methomyl		P > 0.05	
1	7/5	27/6	1.3		2.0	2.9	1.7	2.4	2.5			3.3	3.6			3.5	4.7	1.7	2.1	1.4	2.9													1.31	2.18		
2	17/4	26/6	1.7				4.5	3.8	4.9			3.7	3.2																						0.92	1.17	
3	8/5	27/6	3.1				3.8	5.6				5.2	5.4																						0.66	0.95	
4	1/4	31/7	4.0				6.2	6.1				5.7	5.8																						0.45	0.65	
5	4/4	31/7	5.2				6.2	4.6				4.2	4.7																						0.75	1.08	
6	2/4	17/7	3.7				4.7	6.1				6.6	6.8																						1.34	2.24	
7	3/4	24/6	5.6				6.8	7.0				6.9	6.4																							1.28	2.14
8	3/4	25/6	5.8				6.6	6.0	7.0			5.8	5.5																							0.89	1.13
9	25/4	12/7	3.6		5.2	5.1	6.0	5.5				4.8	5.2																							1.45	2.43
10	3/4	19/6	5.2				5.6	5.5				3.7	4.0																							1.04	1.44
11	23/4	26/6	3.9		4.1	4.8	4.0					5.1	4.8																							1.00	1.44
12	24/4	5/7	4.5				5.5					6.0	5.8																								
13	9/4	15/6	5.8				6.1	5.5	6.3			5.1	4.8																								

TABLE 2: MEAN NUMBER OF GRUBS PER SQUARE FOOT

Trial No.	Date	Treatments																	
		Treated	Assessed	Untreated	formparanate 5%	formparanate 10%	diazinon 5%	diazinon 10%	diazinon 20 lb a.i./acre	B5860 on calcite	B5860 on punice	"Suicide"	"Aphidan"	"Salithion"	"Mocap"	ethoate-methyl	NA 33	NA 34	methomyl
1	7/5 27/6			22.3	20.6	21.3	15.8	10.8		30.5	31.4	25.7		25.3	5.8				
2	17/4 26/6			38.6			9.6			10.7	11.4								
3	8/5 7/8			19.9			3.2	2.7		11.1	12.1	12.7							
4	1/4 31/7			11.1			8.2	8.5											
5	—			not dug															
6	2/4 17/7			19.4			4.8	6.8			14.2								
7	3/4 24/6			4.3			3.8	6.9		6.7	3.5								
8	3/4 25/6			16.3			10.9	5.9		11.8	11.0	12.6	10.7						
9	25/4 12/7			36.6	19.2	20.0	9.2	9.9		24.5	14.5	24.6			9.3				
10	3/4 19/6			19.7			9.4	11.6	10.1	16.9	16.3	21.0	26.1						
11	23/4 26/6			26.6			15.6			25.0	22.2				16.7				
12	24/4 5/7			19.5			10.9			13.7					8.0				
13	9/4 15/6			7.2			3.5	3.8		7.7	7.2	9.5	8.3	6.8	4.9	9.5	7.5	9.8	10.3

TABLE 3: TRANSFORMED NUMBERS OF SURVIVING GRUBS

Trial No.	Date	Treatments												LSD						
		Treated	Assessed	Untreated	formparanate 5%	formparanate 10%	diazinon 5%	diazinon 10%	diazinon 20 lb a.i./acre	B5860 on calcite	B5860 on punice	"Surecide"	"Aphidan"			"Salithion"	"Mocap"	NA 33	NA 34	methomyl
1	7/5	27/6	7.63	7.40	7.26	6.47	5.38		7.83	7.88	7.02		6.99	3.16					2.02	3.35
2	17/4	26/6	8.75			4.10			6.60	6.82									1.07	1.54
3	8/5	7/8	8.67			3.74	3.31		5.66	5.93	6.16								4.38	10.09
4	1/4	31/7	5.44			4.91	4.96												1.13	1.63
5	4/4		not dug																	
6	2/4	17/7	6.45			3.32	3.74			5.52									1.08	1.56
7	3/4	24/6	2.49			2.24	3.28		3.08	2.00									2.34	3.88
8	3/4	25/6	5.29			4.44	2.96		3.94	4.18	4.70	4.11							2.05	3.43
9	25/4	12/7	7.92	4.07	5.95	3.95	4.07		4.98					4.08					1.13	1.62
10	3/4	19/6	6.57			4.67	5.11		6.14	6.08	6.86	7.67							1.38	2.29
11	23/4	26/6	7.26			5.61		4.38	7.05	6.58				5.79					0.81	1.16
12	24/4	5/7	6.30			4.68			5.22					4.04					0.65	0.94
13	9/4	15/6	4.03			3.15	3.20		4.53	4.31	4.75	4.68	4.54	3.72	5.09	4.38	4.75	5.22	0.86	1.23