Lucerne

CHEMICAL CONTROL OF SITONA WEEVIL ON LUCERNE

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Summary

Laboratory tests and field trials indicate that adult sitona weevils (*Sitona humeralis*) may be controlled by some insecticides; particularly azinphos-methyl, dimethoate, and fenitrothion which were the only insecticides included in the field trials reported.

INTRODUCTION

The sitona weevil (*Sitona humeralis*) was discovered in large numbers, and identified from Banks Peninsula near Christchurch, late in January, 1976 (K. G. Somerfield, pers. comm.). Its presence was previously reported from the Hawkes Bay area in 1974 (Esson 1975) where it was found "in extremely high numbers".

Esson stated that no sitona weevils were found on lucerne in the Napier area. This has not been the case with the infestation on Banks Peninsula and the surrounding areas: all these infestations were on lucerne.

The fact that the adult weevils feed on the leaves and their larvae feed on the root nodules of lucerne indicate that the threat to this important crop may be great. Thus it was considered that confirmation of the overseas experience, that the adult could be controlled by insecticides, (e.g. Greenup 1967, Allen 1974) was required so that recommendations, based on New Zealand experience, could be made. This paper describes these preliminary investigations.

METHODS

Preliminary screening

Two tests were conducted. In the first test five insecticides were tested as foliar sprays applied to lucerne (Table 1). The sprays were applied by knapsack sprayer at the rate of 550 litres/ha and the lucerne was approximately 30 cm high. Random samples of leaves were collected from the plots at intervals and placed with adult sitona weevils in petrie dishes. Ten dishes each containing three weevils were tested per plot and mortality assessed daily; the lids of the dishes were cut out and covered with gauze to permit ventilation and diminish the possibility of mortality from excess vapour action of the chemicals.

In the second test (Table 1) the three most promising insecticides were selected from the first test and a further three included. In this test 10 petrie dishes were exposed on the ground in each plot which was sprayed in a similar manner to the first test. When the deposits were dry the dishes were collected and three adult weevils were caged in each overnight. After assessment of mortality each morning the dishes were uncovered and exposed to natural conditions, including sunlight, but not rain, until the evening when further weevils were caged overnight.

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TABLE 1: MEAN PERCENT MORTALITY OF SITONA WEEVILS CAGED IN PETRIE DISHES AFTER VARIOUS INSECTICIDE TREATMENTS

Treatment	Rate as kg/ha	% Mortality; days after treatment					
		1st day		2nd day		3rd day	
		A*	B*	A*	B*	A*	B*
carbaryl	1.0	50	—	53	—	10	—
maldison	1.0	66	—	66	—	7	—
trichlorfon	1.0	83	77	77	37	17	67
azinphos-methyl	0.5	83	63	87	87	90	97
fenitrothion	0.5	73	100	73	47	43	70
diazinon	1.0	—	100	—	30	—	53
dimethoate	1.0	—	97	—	60	—	90
parathion +	0.5	—	100	—	90	—	97
untreated		27	0	23	0	13	0

A* = leaves from treated plots added to petrie dishes

B* = petrie dishes sprayed on the plots

parathion + = mixture of parathion and parathion-methyl, ratio 6:3

Field tests

Selected insecticides were applied by a normal commercial type boom sprayer to plots replicated three times, in a lucerne paddock in which the lucerne was up to 40 cm in height. Plot size was 30 x 5.3 m and sprays were applied in 250 litres/ha.

Assessments were by four random samples per plot, each of 20 sweeps of a net 40 cm in diameter; the number of adults per sample was assessed by tipping the net contents into a tray and counting the weevils present.

RESULTS AND DISCUSSION

From the results of the screening trial (Table 1) one chemical, azinphos-methyl, was chosen for testing at two rates of application in one field trial and two others, fenitrothion and dimethoate were selected for inclusion with azinphos-methyl in the other field trial. Parathion was omitted since there appeared to be less toxic alternatives. Results are shown in Table 2.

TABLE 2: COUNTS OF SITONA WEEVILS AFTER TREATMENT OF LUCERNE WITH SELECTED INSECTICIDES. NUMBER PER SAMPLE

Field Trial 1		Days after Treatment					
Treatments applied	23.2.76 kg/ha	1	3	8	11	21*	
azinphos-methyl	0.5	21 cC	0 cC	4 cB	10 bB	8 bB	
azinphos-methyl	0.25	78 bB	6 bB	13 bB	10 bB	15 bB	
untreated		217 aA	85 aA	113 aA	82 aA	24 aA	
Field Trial 2		Days after Treatment				Total all days	
Treatments applied	24.2.76 kg/ha	1	6	13			
azinphos-methyl	0.5	28	10	2		40	bB
dimethoate	1.0	42	6	4		52	bB
fenitrothion	0.5	28	3	6		37	bB
untreated		86	85	44		215	aA

* Plots being grazed by sheep

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It is evident that the adult sitona weevil may be well controlled by some insecticides. There was no indication that the populations present in the trial sites caused any material damage; but further work is needed to determine the relationship of an adult population to the subsequent larval population and the damage that this later attack by the larvae can cause.

REFERENCES

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