CHEMICAL CONTROL OF STRIPED CHAFER AND PORINA IN IMPROVED TUSsock GRASSLAND

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SUMMARY

Field trials were carried out to investigate the effect of insecticides on striped chafer (*Odontria striata*) and porina (*Wiseana* spp) populations and dry matter production of an oversown tussock pasture and a cultivated pasture at Millers Flat, Central Otago. Lindane and diazinon were applied to the pastures in winter of two consecutive years. Lindane gave good control of striped chafer and was thought to have effected mortality in spring and early summer when young larvae are present near the pasture surface. Insecticides gave 92% and 86% control of porina in the cultivated and oversown pastures respectively. Porina control was apparently extended into the following season in the oversown pasture.

INTRODUCTION

Larval infestations of striped chafer had been discovered in oversown tussock pastures near Millers Flat in Central Otago. Local run-holders also recognise porina as a commonly occurring pest, which is particularly damaging in cultivated pastures within the first 2-4 years after sowing.

Insecticidal control of these species and the resultant effect on pasture production was investigated.

METHODS

The paddocks chosen for the trials were both at 450 m altitude on the Lammerlaw Range on Pinelheugh silt loam soils (upland YBE) (Leamy and Wilde 1971). A tussock pasture oversown in 1966 which had supported a high striped chafer larval population of over 300/m² in January 1978, and a three-year-old cultivated pasture with a damaging porina infestation were selected.

Treatments were applied in six randomised blocks on 10 x 20 m plots:

- (1) untreated control
- (2) insecticide: lindane granules at 2 kg/ha plus diazinon granules at 1 kg/ha broadcast on 12 July 1978 and 1 June 1979.

A fertiliser treatment with and without insecticide was also included in the trials.

Insects were sampled by taking soil cores of 10 cm diameter and 20 cm depth: sample numbers and dates are given in Table 1. Cores were hand-sorted in the laboratory to extract insects.

Pasture production was estimated by taking 3-weekly cuts, when growth allowed, from pasture frames. Both paddocks were grazed according to normal farm practice on the property.

RESULTS AND DISCUSSION

There were no significant insecticide/fertiliser interactions, so only insecticide effects are discussed. The results of insect sampling are shown in Table 1.

Striped chafer

Striped chafer beetles emerge in March, fly to feeding sites and return to the pasture in early spring to mate and lay eggs (Barratt and Campbell 1982). Most larvae reach the third instar by June, although some over-winter as second instars, developing further in spring and allowing synchronous pupation in February (Barratt 1982).

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The larval population present in the oversown pasture at the time of insecticide application was low, the previous generation present in January 1978 having pupated and emerged as adults. No significant mortality was indicated by sampling in October 1978 but by April 1979, when the 1978/9 cohort had entered the population, a high degree of control was achieved. Since diazinon has short residual activity it is thought that lindane, with comparatively longer residual properties caused mortality during November-December after first instar larval emergence. Larvae feed near the pasture surface (Barratt, unpub.) and would come into contact with lindane which tends to remain within the top 10 mm of the soil profile (Henzell *et al* 1981).

Porina

In Central Otago porina flights occur in spring and early summer and larval development takes place between February and October (Helson 1967).

In the cultivated pasture the density of porina larvae in July 1978 was high and damage characteristic of this pest was visually apparent. Insecticide application gave 92% control. In the oversown pasture 86% control was achieved although the population was not as high at the time of application as in the cultivated pasture.

Both insecticides probably contributed to porina mortality in the first year. In the oversown paddock the porina population in the following year (before the second insecticide application) was also significantly reduced ($P < 0.01$) in the insecticide treated plots. This suggests that either lindane residues caused mortality in surface-dwelling first-instar larvae in late summer 1979 or that fewer eggs were laid in insecticide-treated plots following high mortality of the previous generation.

Pasture production

Total DM yield in the cultivated pasture in 1978/79 was 12% higher ($P < 0.05$) in insecticide-treated plots (an increase of 750 kg/ha) mainly as a result of a 37% increase from the first two spring cuts ($P < 0.01$).

Insecticide application in the oversown pasture provided an 8.6% increase in DM production (826 kg/ha) ($P < 0.05$), again attributable mainly to a 24% increase in the first spring cut. Since striped chafer larval numbers were low at this time the pasture response obtained was thought to be a result of insecticidal control of porina.

There were no significant differences in DM production in the second season.

TABLE 1: Density (No./m²) of striped chafer and porina populations in the cultivated and oversown pastures with (+ I) and without (– I) insecticide treatments applied on 12 July 1978 and 1 June 1979.

Sampling date	pasture: insect: No. cores /plot	oversown striped chafer			oversown porina			cultivated porina		
		+I	–I	LSD	+I	–I	LSD	+I	–I	LSD
11 Jul 78	10	3.2	4.3	3.3	20.1	10.6	10.3	57.2	79.4	34.8
24 Oct 78	20	1.1	3.8	4.0	1.6	11.1	5.8	1.1	14.2	11.8
23 Apr 79	20	0.0	34.5	22.8	3.2	20.7	9.1	8.5	14.4	7.9
25 Oct 79	20	2.1	31.3	12.5	not sampled			0.0	0.6	2.3

LSD, $P < 0.05$

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