Blue-Green Lucerne Aphid

PIRIMICARB FOR THE CONTROL OF BLUE-GREEN LUCERNE APHID

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Summary

Trials carried out in Manawatu and Canterbury in the spring of 1976 showed pirimicarb, at rates of 50-250 g/ha, to provide up to 5 weeks control of blue-green lucerne aphid (*Acyrtosiphon kondoi*) and resulted in increased lucerne (*Medicago sativa*) yields.

INTRODUCTION

Following the rapid and widespread infestation of lucerne in New Zealand by the blue-green lucerne aphid (BGLA) and reports of resultant losses in lucerne productivity (Kain *et al* 1976), trials were initiated in the spring of 1976 to evaluate a range of rates of pirimicarb for the control of this pest.

METHOD

The two trials reported were carried out at Bunnythorpe in the Manawatu, and at Springston in Canterbury.

The Manawatu trial was a randomized block design of four replicates and a plot size of 8 x 3 m. The treatments were applied with a plot sprayer in 292 litres/ha on 5 October 1976, at which time the lucerne was 25 cm high and harboured a mean of 71 aphids per stem. Post treatment aphid counts were from 10 stems per plot cut at ground level; the stems were immersed in hot water to dislodge the aphids and the solution then passed through a filter and the aphids counted (Kain *et al* 1976). Yield measurements were not taken due to irregularities in the crop resulting from a heavy aphid infestation the previous autumn.

The Canterbury trial was a Latin square design of five replicates and a plot size of 10 x 10 m. The treatments were applied with a plot sprayer in 280 litres/ha on 8 October 1976, at which time the lucerne was 20 cm high and harboured a mean 11 aphids per stem. Post treatment counts were from 50 stems per plot cut at ground level; the aphids were detached from the foliage by a modified vacuum cleaner and counted. Lucerne yields were measured by cutting 3 m² per plot at random on 16 November 1976, dissecting out the weeds and drying and weighing the lucerne.

In both trials the pirimicarb was formulated as a dispersible grain and the chlorpyrifos as an emulsifiable concentrate.

Winged and wingless aphids were differentiated at each counting date.

RESULTS

All treatments provided a rapid knockdown of BGLA as shown by the 3 day counts (Tables 1 and 2).

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TABLE 1: Number of BGLA/stem at intervals post treatment — Manawatu

Treatment	g/ha	3 days	7 days	14 days	21 days	28 days	35 days
untreated	—	28.5	47.5	30.7	34.9	62.0	51.1
pirimicarb	50	0.9	0.6	1.1	0.3	2.6	5.0
pirimicarb	100	1.1	0.3	0.4	0.1	0.8	2.9
pirimicarb	150	0.7	0.1	0.1	0.1	0.6	2.5
pirimicarb	200	0.8	0.1	0.1	0.2	0.7	1.1
pirimicarb	250	1.1	0.3	0.2	0.2	0.4	3.7
chlorpyrifos	160	0.8	0.2	0.2	0.1	0.6	4.3

TABLE 2: Number of BGLA/stem at intervals post treatment and lucerne yields — Canterbury

Treatment	g/ha	3 days	14 days	18 days	31 days	40 days	Yield kg DM/ha
untreated	—	16.8	44.8	138.8	303.2	275.0	3160 bA
pirimicarb	75	0.7	1.2	1.6	7.4	27.5	5370 aA
pirimicarb	125	0.2	0.4	0.7	2.7	17.0	5230 aA
pirimicarb	250	0	0	0.2	1.2	7.8	4590abA
chlorpyrifos	160	0.1	0.2	0.2	2.8	13.6	4870 aA

Statistical analysis — Data from both trials were subjected to Duncan's Test and showed there to be no significant differences (at the 5% level) between treatments but all treatments to be highly significantly different (at the 1% level) from untreated at all counts.

On the Manawatu trial, all treatments held aphid populations to a very low level up to the 28 day count, but there was an indication at 35 days that numbers were increasing.

Whilst not significant, there was an apparent rate response from pirimicarb, 125 g/ha being generally similar to the chlorpyrifos treatment. Except on the pirimicarb 75 g/ha treatment, aphid numbers were held to a uniformly low level up to the 31 day count, but had increased rapidly by the 40 day count.

No winged aphids were found on the Manawatu trial until the 28 day count on 2 November 1976, when there was a ratio of 1 winged to 250 wingless, and by the 35 day count the ratio had increased to 1 to 40. These ratios were similar for untreated and treated plots. On the Canterbury trial there was a ratio of 1 winged aphid to 10 wingless on treated and untreated plots at the 49 day count on 1 November 1976.

DISCUSSION

Results show pirimicarb at rates of 100 g/ha or above to have generally provided a superior degree and duration of control to the lower rates evaluated. On the Manawatu trial there was no advantage

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from an increase in rate above 100 g/ha, while on the Canterbury trial there was only a marginal advantage from 250 g/ha over 125 g/ha, except on the day 40 count when the differences became more pronounced.

The period of control of BGLA achieved by the treatments appears to have been markedly influenced by the absence of winged forms for the major period of the trials, as it is unlikely that either chemical has the residual life to provide effective control for these periods.

Yield data confirm field observations that, at rates below 200 g/ha, any initial phytotoxic effects of these insecticides are of negligible consequence. Phytotoxic symptoms have not been recorded outside periods of soft spring lucerne growth.

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REFERENCES

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