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PHALARIS AND RYEGRASS PASTURES FOR ANIMAL PRODUCTION IN HAWKES BAY

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SUMMARY

The performance of *phalaris aquatica* L. 'Grasslands Maru' /white clover (*Trifolium repens* L. 'Grasslands Huia') pastures and of the lambs set stocked on them from January to September 1979 was at least as good as that of ryegrass (*Lolium perenne* L. 'Grasslands Nui')/white clover. Stock grazing phalaris pastures produced 0.35 kg more wool and were 2.3 kg heavier than those on ryegrass. The trial was ended in September because 10% of the 70 lambs had died from phalaris toxicity and a further 29% showed symptoms. Although the productive performance of the lambs that appeared unaffected was adequate, the widespread use of this phalaris cultivar cannot be encouraged. Liveweight responses to insecticide occurred on both pasture mixtures.

INTRODUCTION

Phalaris is a drought tolerant species (Saxby, 1956; Rumball, 1969; Corkill *et al.*, 1981) with good winter production (Kain *et al.*, 1979) and resistant to grass grub (Kain and Atkinson 1977; Kain *et al.*, 1979). Since Hawkes Bay pastures typically suffer from summer droughts and grass grub attack, these agronomic attributes should make it well suited to the region.

Phalaris toxicity has been widely reported in Australia (McDonald, 1942) and in New Zealand (Le Souef, 1948; Milne, 1955; Simpson *et al.*, 1969). The newly released cultivar Maru is known to be low in tryptamine alkaloids (Rumball, pers. comm.), the compounds thought to be implicated in toxicity (Gallagher *et al.*, 1964).

Encouraged by the performance of Maru in small plot trials at the Takapau Research Station (Kain *et al.*, 1979) we decided to evaluate it further at this site under high levels of utilisation, both in terms of pasture and animal production, with and without insecticide treatment for grass grub.

EXPERIMENTAL

Six recently weaned shorn lambs were set stocked in January 1979 in 0.2 ha paddocks which had been randomly allocated in four

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blocks each containing the treatments; ryegrass without (R −) or with (R +) insecticide; phalaris without (P −) or with (P +) insecticide. The grasses had been sown with white clover in autum 1975. Stock were grazed on reserve paddocks of the same pasture species for a month after the insecticide was applied in late February.

Ground level cuts (four per paddock) were taken at fortnightly intervals at sites with mean capacitance meter readings (Jones and Haydock, 1970) from grazed and protected areas, to estimate standing dry matter (DM), pasture production and pasture disappearance (presumed to be due to herbage consumption by stock, insect damage and senesence). The botanical composition was assessed in April and July.

Sheep were weighed at three-weekly intervals and fleece weights were recorded (for pasture species only) in October.

RESULTS AND DISCUSSION

The statistical significance of main effect comparisons, ryegrass v phalaris, no insecticide v insecticide and their interaction are indicated in Tables 1-2 and Figs. 1-4. Since treatment differences were not significant for pasture production and disappearance only species means are plotted in Figs. 2 and 3.

Under the high level of utilisation achieved, both main effects tended to have an advantageous effect on standing DM, net DM production and DM disappearance (Figs. 1-3). These differences were significant only for standing DM in April-May for phalaris and in July-August for insecticide. Phalaris, being less dominant than ryegrass allowed other species to enter the sward, particularly in winter (Table 1).

Hoggets grazing phalaris gained weight during May whereas those on ryegrass lost weight (Fig. 4). The advantage was maintained until the last weighing. Higher levels of standing herbage and pasture disappearance (and presumably intake) in phalaris pastures produced this benefit. Similar results have been reported in Australia (Axelsen and Morely, 1968).

Insecticide responses occurred in both pasture and animal performance in August.

Fleece weights were 2.44 and 2.79 kg/head for hoggets grazing ryegrass and phalaris respectively ($P < 0.001$), a 10 kg/ha or 14% advantage to phalaris.

Of the 70 lambs introduced to phalaris pastures in January, 10 had exhibited symptoms of phalaris staggers by July. By September,

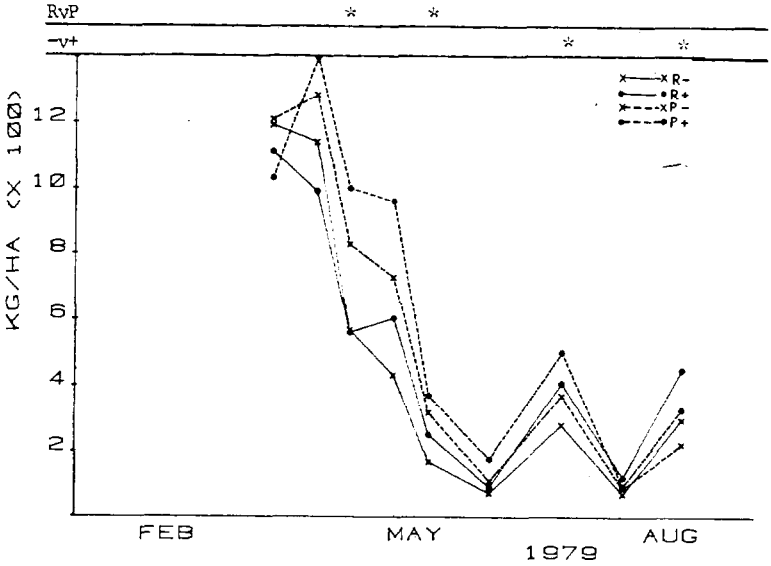

FIG 1: *Treatment Means for Standing DM Ryegrass (R) Phalaris (P) without (–) and with (+) insecticide*

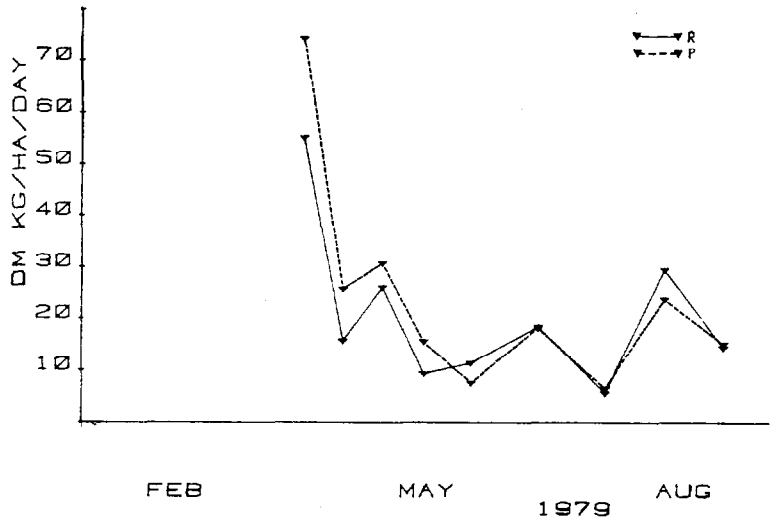

FIG 2: *Daily Pasture Production Ryegrass (R) Phalaris (P)*

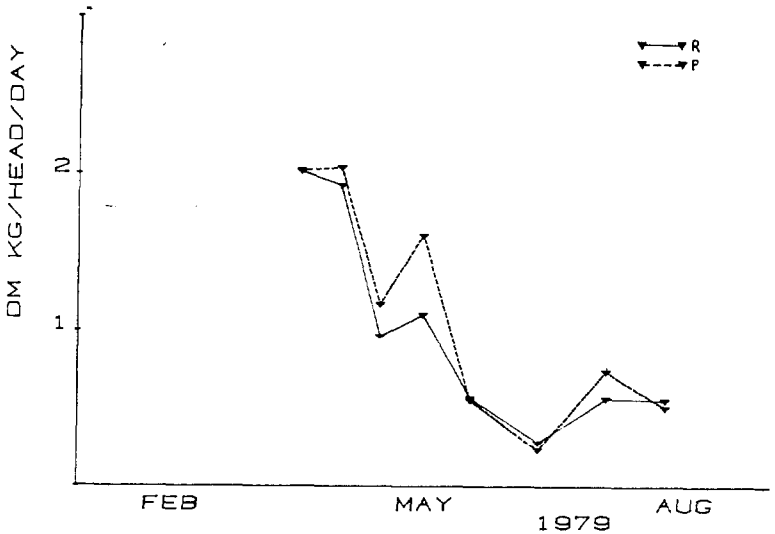

FIG 3: *Pasture Disappearance Ryegrass (R) Phalaris (P)*

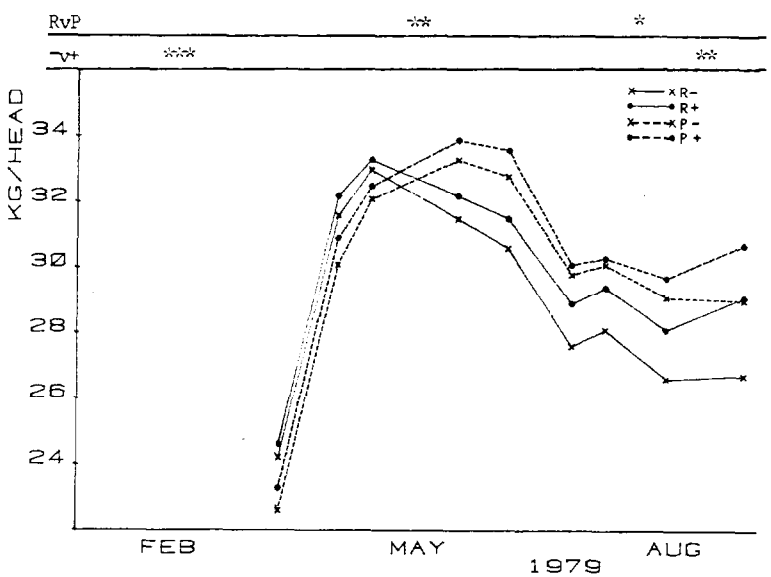

FIG 4: *Hogget Liveweight. Key as in Fig. 1.*

TABLE 1: PASTURE COMPOSITION (%DM)

	Sown Grass		*Clover*		*Other*	
	April	*July*	*April*	*July*	*April*	*July*
Ryegrass	95	86	5	9	0	4
Ryegrass + insecticide	93	78	6	10	0	11
Phalaris	83	64	9	8	8	28
Phalaris + insecticide	74	54	8	13	18	34
Ryegrass v Phalaris	*	*			**	*

TABLE 2: TOTAL LIVEWEIGHT CHANGE (kg/head)

	No Insecticide		*Insecticide*	*Mean*
Ryegrass	−1.0		1.8	0.4
				*
Phalaris	1.3		4.1	2.7
Mean	0.2	**	2.9	

27 had shown symptoms and of these 7 had died. Staggers first showed 7 weeks after the lambs began grazing phalaris and the first death was late in May, with all other deaths occurring from late July until the trial ended in September. Animals showing severe symptoms were replaced from reserve paddocks. Affected sheep still showed symtpoms 15 months after removal from phalaris pastures. Such slow and incomplete recovery has been reported elsewhere (Le Souef, 1948).

Conditions associated with the presence of phalaris toxicity are litter and shading induced by lax grazing, low soil cobalt status, the use of high risk cultivars, high N (following rapid clover growth), high temperatures and low light intensity, and periods of rapid growth following warm rains after a dry spell (CSIRO, 1967). Oral dosing with cobalt (not used in this study) needs to be frequent (Lee *et al.,* 1957) and its reliability is questionable (Watson, 1956) so that its use is doubtful economically or practically.

Advantages to insecticide frequently occurred particularly in liveweights. The absence of insecticide x pasture species interactions support the findings of Kain *et al.,* (1979) that the resistance of phalaris to grass grub diminishes when it is sown with clover.

Maru, in spite of being regarded as a low risk cultivar and contributing only 60% of the pasture DM, is likely to cause stock health problems. Its widespread use cannot therefore be recommended in

the more intensively grazed areas of Hawkes Bay or regions with similar environmental conditions, despite its desirable attributes.

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