Grass control in pastures: implications for livestock

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Summary. Control of pasture grasses to restrict cereal root diseases may result in reduced feed the following autumn. Grassy pastures either sprayed to control grass, or unsprayed, were grazed by Merino wethers from May to July 1991 and although pasture production was greater on the unsprayed pastures, wether growth was similar on both pasture treatments. Merino lambs grazed the same pastures from September 1991 to May 1992. Weight gain was greater on the sprayed pastures resulting in a 15 kg/head advantage by February. Supplementary feeding was required on the unsprayed pastures. Weight gain in May 1992 was similar on both treatments.

Introduction

The practice of grass control in legume-based pastures is increasing in popularity because substantial increases in cereal grain yields can be made through the control of cereal root diseases. increased legume content of pastures and ease of crop establishment the following year. Grasses, however, are recognised as providing valuable livestock feed in the autumn/winter period and their removal from pastures is seen as a significant disadvantage for the grazing animal. Some investigations have shown that dry matter production (DMP) may be reduced in the year of spraying (7,2) but others have reported no decrease in DMP (3.8). All report a large change in botanical composition.

Growth rates of sheep at the break of season are greater on grass pastures than on clover pastures because of the more upright growth habit of grasses (1,5) but when intake is not restricted, sheep growth rates on clover pastures are generally greater than on grass pastures (1,7,6).

The aim of this trial was to monitor the growth of sheep at the break of season on pastures sprayed to remove grass or unsprayed and to also monitor the effects of grass control on the performance of Merino lambs over the summer drought and into the autumn break of season.

Methods

Six adjacent grassy pastures (3.63 ha each) dominated by barley grass, Hordeum spp.. were divided into three paired replicates. One paddock of each pair was sprayed with 350 mUha of Fusilade 212R (212 g/L fluazifop-P [butyl ester] a.i.) plus 2(X) mL wetting agent (BS 1000) /100 L spray volume on 10 September 1990. The pastures were grazed by woolly lambs till December 1990 to observe the effect of grass control on lamb production in spring. This work has been reported elsewhere (4). The results of two further grazing trials on these pastures are presented here.

Grazing trial I

Fifteen mature Merino wethers (6.5 DSE/ha) grazed from 3 May to 25 July 1991. The pastures had not been grazed since December 1990. At the conclusion of the wether grazing, the six pastures were heavily grazed with 555 adult sheep until 5 September 1991 to reduce the bulk of feed.

Grazing trial 2

On 6 September 1991. 40 woolly Merino lambs (14.2 DSE/ha) were placed on the pastures where they remained until 16 January 1992 when numbers were reduced to 24 (8.5 DSE/ha) on all pastures to prolong the summer grazing. The lambs stayed on the pastures until 5 May 1992. The bodyweight data presented are the means of the 24 animals that were on the pastures from September 1991 to May 1992.

On 9 October 1991 the unsprayed pastures were slashed to reduce the risk of grass seeds in eyes and half the lambs on all pastures were shorn to see if this gave added protection against grass seeds.

Wethers and lambs were weighed regularly (maximum 30 days) and the following agronomic data collected from the 6 pasture paddocks which were divided into 10 strata for sampling: dry matter production based on 10 open and 10 closed quadrats of 0.1 m^2; botanical composition by hand sorting. Levi-Point Quadrat or visual estimates; seed reserves from 100 soil cores (1(X) mm diameter); plant establishment counts from 1(X) soil cores (1(X) mm diameter); digestibility *(in vitro)* and crude protein (Nx6.25) from composite grab samples during the green and dry season and from individual legume, grass and weed samples during the green season.

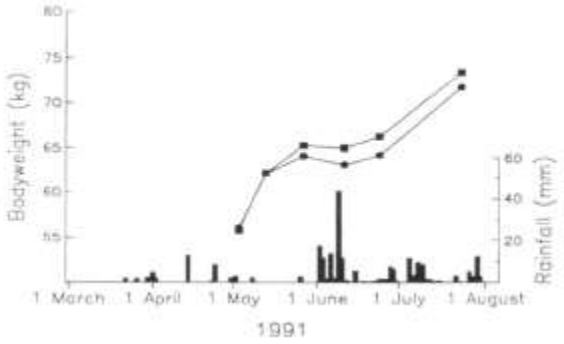

Figure 1. Mean bodyweight of wethers grazing pastures sprayed to control grass (0---0) or unsprayed (M---n). Histograms show daily rainfall

Results and discussion

Grazing trial I

Pastures emerged in mid April 1991 but the true break to the season did not arrive until June. Despite the very dry start to the season, wether liveweights did not differ significantly (Fig. 1).

Pasture growth rates to 9 May were 7.0 and 15.9 kg/ha/day (P=0.052) for the sprayed and unsprayed treatments respectively. Pasture growth rates were not significantly different beyond May except for the September to October period. The limited available dry matter (ADM) on the sprayed pastures in May 1991 (Fig. 2) suggests that the wethers on the sprayed treatments may have still been selecting legume burrs to sustain their weight gain. Seed reserves taken in January 1991 recorded 295 and 174 kg/ha of legume seed for the sprayed and unsprayed pastures respectively. However, plant counts on the sprayed pastures taken in August 1991, indicated that despite the grazing pressure there was still sufficient legume seed to establish 1000 plants/m^2. Only 150 plants/m^2 established on the unsprayed pastures, presumably due to competition from the grasses.

Weeds played a major role in early feed production (and perhaps accessibility) on the sprayed pastures representing over 50% of the ADM (Fig.2). Digestibility of the weed component comprising cape weed, *Arctotheca calendula,* Geranium, *Erodium* spp. and Soursob, *Oxalis pes-caprae,* in August was 86.5%, higher than legumes (78.8'4) or grass (83.2%). Crude protein of all pasture components in August was

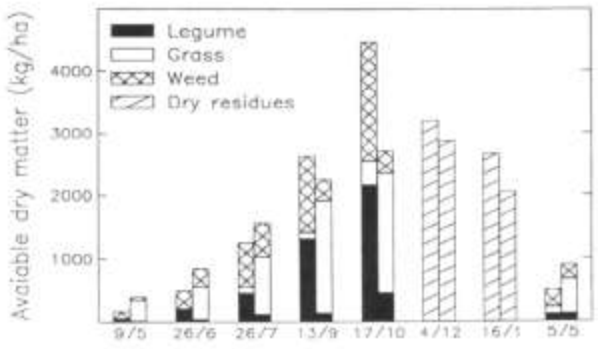

Figure 2. Available dry matter and botanical composition of pastures sprayed to control grass (left-hand histogram) or unsprayed (right-hand histogram) in 1991/92

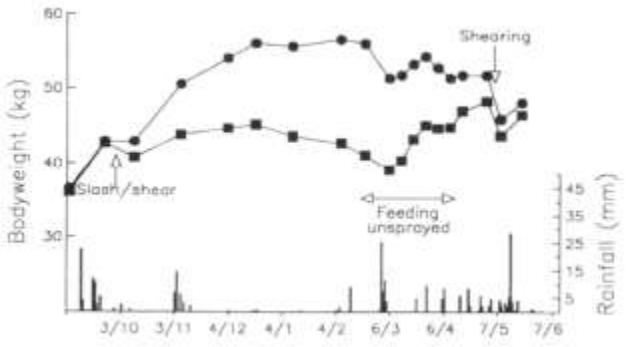

Figure 3. Mean bodyweight of lambs grazing pastures sprayed to control grass (0—•) orunsprayed ( ) in 1991/92. Histograms show daily rainfall

greater than 20%. The weed percentage of all pastures was reduced by the heavy grazing at the conclusion of the whether grazing trial.

The data suggest that even though grass control in the previous year resulted in slower autumn pasture growth, the quality of the sprayed pastures were such that the weathers were able to sustain growth rates similar to weathers on the higher-yielding grassy pastures.

The use of dry sown oats (CCN resistant) for grazing could also be employed to compensate for the lack of early growth if desired. However, the risk of losing oats sown dry (normally sown in April) was demonstrated in 1991 with < 10 mm rain falling in the month of May.

Grazing trial 2

There was no Spray-treatment x Shearing-treatment interaction so the bodyweights presented for each spray-treatment are means of the shown and unshorn animals. No eye problems were encountered in any treatment. The lambs on both pasture types gained weight for the first three weeks (mean 321 g/head/day). Following the slashing of the grassy pastures on 9 October 1991, the lambs on these pastures continued to gain weight slowly (63 g/head/day) until late December 1991 after which weight loss occurred (-65 g/head/day) until hand feeding of two of the three replicates commenced in late February 1992. Feeding of the unsprayed treatments continued until 10 April 1992. The lambs on the sprayed pastures recorded substantial weight gains (187 g/head/day) until late December 1991 after which they maintained weight until rain fell in early March 1992 (Fig. 3). They did not require any supplementar^{y} feeling and were 15 kg/head heavier than the lambs on the grassy pastures ($P<0.01$)

when hand feeding commenced on the grassy pastures. All lambs were shorn on 5 May 1992 and produced similar \k eight gains of *210 y* head/day when placed back on 'their respective pastures. Pasture growth rates to 5 May 1992 were 7.8 and 14.0 kg/ha/day for the sprayed and unsprayed treatments respectively.

The ADM was estimated at greater than 2.0 t/ha over the spring/summer period on both pasture treatments and was not responsible for the poor performance of lambs on the unsprayed pasture treatments. Digestibility of the pasture grab sample was higher on the sprayed pastures in the spring (August. September, October) but lower in the summer (December, January, February) (spring 80.1% v 75.3%; summer 51.1% v 53.9%; sprayed and unsprayed treatments respectively). The mean digestibility was greater on the sprayed pastures (65.6% v 64.6%; $P<0.05$). Crude protein of the pasture grab samples was greater on the sprayed pastures from September 1991 to February 1992 ($P<0.05$). Crude protein measu'ed in September 1991 (25.1% sprayed; 20.7% unsprayed) fell progressively to February 1992 (10.1% sprayed; 8.2% unsprayed).

Weeds were a substantial component of the diet in the sprayed pastures and would have contributed to the performance of the lambs. Digestibility of the pasture components in September were as follows: weeds 87.1 %, grasses 80.8% and legumes 78.9%. All species had similar digestibility's by October (75.0%).

This trial has shown that the improved quality of pastures sprayed to control grasses will sustain weight gains of Merino lambs into the summer period longer than lambs grazing grassy pastures and confirms the work of others (5,7). The weight advantage in the following autumn to lambs grazing sprayed pastures removed the need for supplementary feeding. Sprayed pastures had reduced growth rates at the break of season but grazing animals were not disadvantaged as they were heavier and able to withstand a period of weight loss until sufficient green pasture became available. The digestibility of the sprayed pastures over the summer (51.1%) suggests that further improvements to lamb growth could be made if improvements to the digestibility of dry legume residues were possible. particularly to the burr. The performance of the lambs on the sprayed pastures, however, suggests that they may have been selecting a more nutritious diet than what our figures suggest.

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