THE EFFECT OF SPRING PASTURE MANAGEMENT ON EWE LIVEWEIGHT OVER THE SPRING AND SUBSEQUENT SUMMER

A. S. BEATTIE[A], *R. P. THOMPSON*[A], *E. M. BOND*[B], *P. MICHELL*[A] *and P. J. O'MAY*[A]

*Tasmanian Department of Primary Industry, P.O. Box 180, Kings Meadows, Tas. 7249.
[B]Tasmanian Department of Primary Industry, P.O. Box 96, Oatlands, Tas. 7120.

SUMMARY

The effect of spring pasture conservation on ewe liveweight change over spring and summer, without feeding back the conserved feed, was monitored over 2 years. Removing the true pasture excess in the spring did not reduce ewe liveweight at the end of summer. The weaning weight of lambs and ewe weights at the end of spring also were not affected by reducing the grazing area in the spring. The proportion of green material in the pasture was increased by heavier spring grazing combined with early fodder conservation of the excess pasture growth.

Keywords: sheep, grazing management, forage conservation, liveweight.

INTRODUCTION

Pasture growth rates during the spring are generally greater than animal intakes in the temperate pasture regions of Australia (Thomas 1981). Conserving this pasture excess is common in the Tasmanian dairy and beef fattening industries located in the high rainfall regions. In the lower rainfall (< 700 mm) apparel wool growing districts, however, conservation of the spring excess is not common. The little that is done generally does not control the excessive spring pasture growth and occurs too late in the season. Consequently in many years there is excess dry standing pasture carried into the summer. In a series of grazing management seminars run by the Department of Primary Industry, Tasmania, during 1989, producers stated that dry standing feed was required to maintain their animals through the summer as there was no pasture growth. However, large quantities of dead material in a sward can have detrimental effects on animal performance (Bishop and Birrell 1975). The pastures in these regions are based on perennial grass species so some summer production must occur. Better management of these pastures in the spring may also increase the density of perennial plants at the start of the summer (Michell and Fulkerson 1987); this would give the potential to increase pasture growth rates during that time (Korte *et al.* 1981).

The aim of this experiment was to examine the effect of various spring pasture managements, through fodder conservation, on sheep performance over the spring and subsequent summer without feeding any conserved fodder back.

MATERIALS AND METHODS

The experiment was at York Plains, Tasmania, on an old pasture originally sown to perennial ryegrass, subterraneum clover and white clover but heavily infested with weedy annual grasses; *Vulpia* spp., *Bromus* spp. and *Hordeum* spp. The pasture had a good fertiliser history with yearly applications of superphosphate (9.1% P) at approximately 150 kg/ha until the time of the experiment. No fertiliser was added during the 2 years of the experiment. Monthly rainfall values were recorded at Oatlands 5 km from the experimental site. Average rainfall values were also available from this point. Eighty (1989-90) or 88 (1990-91) lambed Comeback ewes and their approximately 2-week old lambs were randomly assigned to 8 plots in September of each year. The plots were each 1 ha and the stocking rate was regarded as high for the district.

Each plot within a 4 plot replicate was assigned at random to 1 of 4 treatments. These were: (i) normal management (no conservation); (ii) early (spring surplus removed early in the season); (iii) late (spring surplus removed late in the season) or (iv) set late (a set 20% of the plot was conserved late in the season).

The animals were continuously grazed throughout the experimental period (September-March) but in treatments (ii) and (iii) the area grazed was reduced in the spring by closing portions off for fodder conservation. The amount closed for conservation was derived by attempting to graze the ewes and lambs at 1500–1750 kg dry matter(DM)/ha measured as 4-5 cm pasture height with a rising plate pasture meter. Portions of the plots were not initially closed for conservation until the pasture availability had reached 1500 kg DM/ha. During the period April to September 1990 the plots were grazed in common. The same plots were used for each treatment in the second year with a different area in each plot cut for conservation. The early cut was on 16 November 1989 and 9 November 1990.

The late cut was on 19 December 1989 and 4 December 1990. The animals were given immediate access to the whole plot after the conservation cut. Lambs were weaned in mid December of each year and removed from the plots. Animal liveweights were monitored monthly or at strategic times.

Pasture level was estimated monthly with a rising plate meter in the spring using a calibration of 250 x average meter height (cm) + 500 kg DM/ha (calibration determined from cuts of similar pasture over many years by P. Michell) or by taking 6 strip cuts of 1 m from each plot in the summer. The proportion of green pasture on offer was determined in January of each year by separating 6 strip cuts into green leaf and dead material.

Animal liveweights from the various treatments were analysed using analysis of variance.

RESULTS

The average annual rainfall at the Oatlands weather station is 500 mm evenly distributed throughout the year. In 1989-90 pastures dried off early, as November and December rainfall was approximately half the average. March was also dry. In 1990-91, December and January rainfall was above average, while only 1.6 mm and 28 mm fell in February and March respectively resulting in dry late summer conditions.

Table 1. Lamb liveweights (kg) at approximately 2 weeks (Sepember) and 14 weeks (December) resulting from various spring pasture managements

Treatment	1989–90		1990–91	
	Sept.	Dec.	Sept.	Dec.
Normal	7.8	21.0	7.7	25.3
Early	8.6	23.7	8.6	26.3
Late	7.3	20.3	9.3	25.8
Set late	7.6	21.2	9.0	25.0

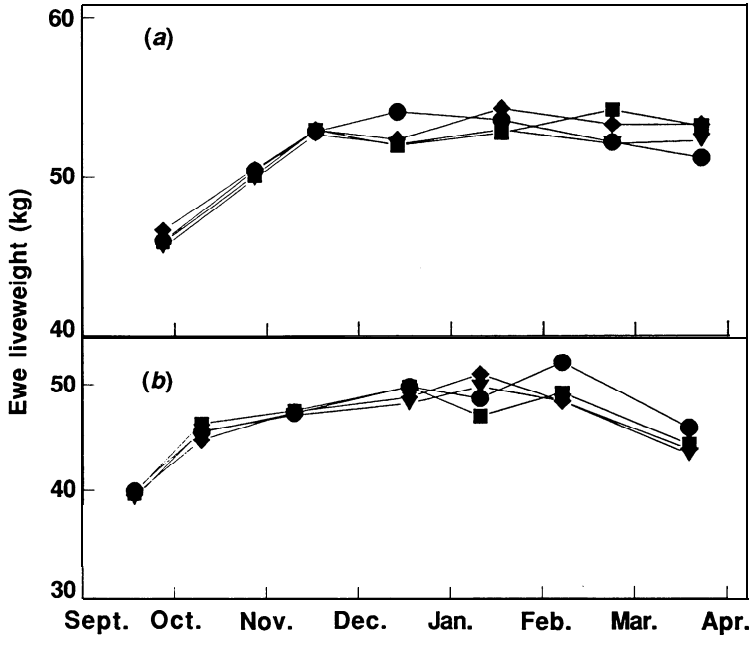

Fig. 1. The effect of pasture management treatments (■ normal, ● early, ▼ late, ◆ set late), on ewe liveweight at various times during the spring and summer of *(a)* 1989-90 and *(b)* 1990-91.

The ewe liveweights (Fig. 1) and lamb liveweights (Table 1) were not significantly different between treatments.

Pasture grazing levels during the spring, amount of area in each treatment closed up for fodder conservation, and the proportion of green material in the herbage on offer are detailed in Table 2. The level of pasture in the conservation areas was approximately 5000 and 4500 kg DM/ha for the early and late treatments respectively in 1989 and 4000 and 5000 kg DM/ha respectively in 1990.

The effect of the treatments on the pasture's botanical composition is reported elsewhere (Beattie *et al.* 1992) and show that the high level of annual grass weeds can be reduced by an early silage conservation cut.

Table 2. Pasture characteristics for 1989–90 and 1990-91

Treatment	Grazing level (kg DM/ha) Nov.	March	Percentage closed up	Percentage green Jan.	Grazing level (kg DM/ha) Nov.	Feb.	Percentage closed up	Percentage green Jan.
			1989–90				*1990–91*	
Normal	3150	2000	0	2	3300	2600	0	6
Early	2000	1000	50	6	2000	1300	30	13
Late	2000	1200	50	2	2000	1800	30	8
Set late	2500	1650	20	3	2800	1800	20	3

DISCUSSION

Liveweights were not reduced in the spring by closing up significant proportions of the grazing area. The final liveweight values also show that the excess pasture grown in the spring can be removed without negatively affecting animal production. It follows then that if any excess pasture in the spring is not removed it represents a large under-utilisation of resources.

Indirect benefits from controlling the spring surplus can also occur. On the same site early conservation reduced the annual grass weed problem (Beattie *et al.* 1992). Quigley (199 1), from a survey of Victorian pastures, also postulated there was a correlation between poor pasture utilisation and low clover content. Improved pasture quality in the early summer can result from early conservation (Bishop and Birrell 1975). This also occurred in the present study, as the proportion of green material in the herbage on offer was enhanced by increasing spring grazing intensity and cutting the excess feed before soil moisture was exhausted . Under normal lax grazing conditions the sward is usually characterised by a large quantity of dry reproductive plant material. Effective grazing area is reduced as sheep tend to avoid grazing these areas of accumulated dry residue. Cutting late does not allow plants in the cut area to recover as well as cutting early. Also, the intensity of grazing on the pasture grazed during the spring is not decreased before the onset of dry conditions. This may lead to over-grazing late in the spring with the late cutting management. Cutting early possibly has a greater weather risk and drying rates of the cut material will be slower. However, in these dryer environments this is not as pertinent and probably means it is even more important to conserve fodder early.

In years with extended dry periods the growth of the controlled pasture may not be sufficient to maintain animal production while the uncontrolled pastures will have some poor quality feed that hungry sheep will seek out among the long patches of dead reproductive residues . The 'something is better than nothing' situation will apply. Excessively high stocking rates may have a similar effect. However, the conservation system has a feed reserve not used in this study that can provide a supplement, thereby reducing grazing pressure in a drought.

Fodder conservation is only one method of utilising the excess pasture grown in the spring. Other management options such as maximising the spring stocking rate (Lambing and calving in spring, agistment, and resting run country) and planting summer forage crops also may reduce the excess.

It must be recognized that excess pasture growth rates do not occur in every year so a very flexible system of spring management is required in these regions of lower and variable rainfall. The economics of storing pasture based feed versus buying supplementary feed when required or even selling the conserved fodder would also need evaluating on an individual basis.

The message from this study is that the excess spring growth from temperate perennial pastures in Tasmania used for apparel wool production can be removed in the spring without loss of animal

production in the spring or following summer. Providing economic methods of utilising this spring surplus resource would therefore have significant benefits and requires more research.

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