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Comparative performance of ewes shorn either once-yearly or 3 times in 2 years

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ABSTRACT

Performance data were collected between October 1985 and October 1991 from a flock of approximately 600 mixed-age Romney ewes allocated to 3 equal sized age-balanced groups and grazed on the same area at Whatawhata Research Centre. Two groups were shorn 3 times in 2 years at approximately 8-monthly intervals. One group was shorn in May, January and October and the other shorn in January, October and May during each succeeding 2 year period. The third group were shorn once-yearly in October.

Eight-monthly shorn ewes weaned heavier lambs and grew more greasy and clean wool than once-yearly shorn ewes. Shearing treatment did not affect ewe live weight after shearing in October or any parameter of lamb production, other than lamb weaning weight. Incidence of casting was less than 1%.

Net wool returns from 8-monthly shorn ewes exceeded that of once-yearly shorn ewes with the associated benefit that shearing 8-monthly as a split flock system would improve cashflow relative to a once-yearly system.

Keywords Shearing, Romney, live weight, lamb production, wool production.

INTRODUCTION

In recent years approximately two thirds of the crossbred body wool sold at auction in the North Island, and one third of similar wool sold at auction in the South Island, has been less than 12 months growth. While most of this wool would have been shorn at approximately 6 month intervals, there is a trend, particularly in the South Island, for an increasing number of sheep to be shorn every 8 months (New Zealand Wool Board, 1991a). Wool-growers shear more frequently than once-yearly for ease of management, cashflow and to improve the quality of their clip (Livingston, 1983).

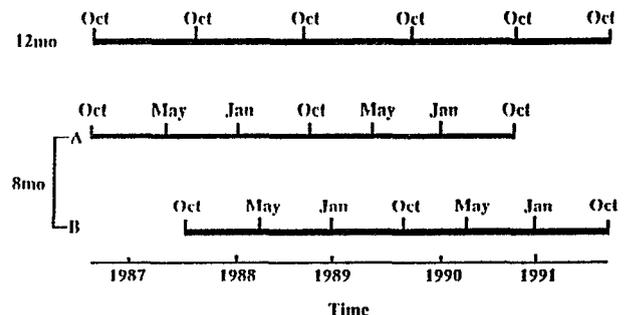
Previous trials at Whatawhata have quantified the effects of twice-yearly versus once-yearly shearing at different times of the year on sheep performance (Sumner and Scott, 1990; Sumner and Willoughby, 1985, 1988). Net wool returns in these trials were greatest for once-yearly shearing in the winter/spring period with shearing before mating increasing the number of lambs subsequently weaned. This paper reports the comparative effects of shearing either once-yearly or 3 times in 2 years as a split flock system.

EXPERIMENTAL

Trial design

A flock of approximately 600 mixed-age Romney ewes grazing at Whatawhata Research Centre, as part of a factorial design trial monitoring the interaction between early or late lambing and pastures containing either resident or improved pasture species, was used (Sheath *et al.*, 1990; Webby *et al.*, 1990). In October 1986 the ewes were randomized with respect to year of birth, live weight and lambing and grazing treatment, into 3 groups of approximately 200 ewes. One group, referred to as the 12mo group, were shorn once-yearly each October with lambs at foot. The other two groups, referred to as the 8mo A and 8mo B groups, were shorn at 8 monthly intervals beginning in October 1986 and October 1987 respectively. The relative timing of shearing for the 3 groups is indicated diagrammatically in Figure 1.

FIGURE 1 Shearing times



Ewes in all shearing treatment groups were culled for age as a 5 year-old after weaning in November. Replacement ewes entered each group the following January, as a 16 month-old last shorn the previous October, after randomisation for live weight and lambing and grazing treatment.

General management

Groups of ewes from each shearing treatment were rotationally grazed throughout the year, except during a period from lambing to October shearing, when they were continuously grazed (Webby *et al.*, 1990). Ewes were joined with Romney rams (Sheath *et al.*, 1990).

Both October shorn groups were crutched pre-mating in March. The 12mo group and the 8mo group shorn in January were crutched pre-lambing in July with the 8mo group shorn in May were dagged in November at weaning as a precaution against flystrike.

Measurements

All ewes were weighed in October before the required groups were shorn. Individual greasy fleece weight was recorded for all ewes at each shearing. Post-shear live weight was calculated by subtracting the greasy fleece weight from the pre-shear

live weight. Individual mid-side fleece samples, taken as part of an associated study, were objectively measured for staple length and yellowness (Hammersley and Thompson, 1974). Lines of shorn fleece and oddment wool were measured for yield and assessed for New Zealand Wool Board type at the woolbroker's store. Prices for each of the respective types at auction were obtained from the New Zealand Wool Board. As it was impractical to weigh individual crutchings the total greasy weight of crutchings for each shear treatment group was recorded at each crutching and an average weight for each ewe calculated.

Lambs were individually identified at birth and weighed at weaning.

RESULTS AND DISCUSSION

Production data from a total of 634 ewes in 1987, 632 ewes in 1988, 622 ewes in 1989, 616 ewes in 1990 and 436 ewes in 1991 were collected. No production data were collected from replacement ewes entering the flocks in 1991. Lambing performance data were compared on a within-year basis across shearing treatments. The 8mo ewes were subdivided into 2 groups, those shorn in January and October, and those shorn in May. This separated the 8mo ewes between the A and B groups on the basis of differential wool lengths at mating and lambing. Fleece data were compared on a biennial basis as the summation of total wool production between October shearings. Thus total wool production for the 12mo group and the 8mo A group were compared for the period following shearing in October 1986 up to and including shearing in October 1988, and for the period following shearing in October 1988 up to and including shearing in October 1990 (Figure 1). Total wool production of the 12mo group in each period included data from 2 shearings and 4 crutchings while that of the 8mo group included data from 3 shearings, 2 crutchings and 1 dagging. Similar comparisons were made for the 12mo group and the 8mo B group over the periods October 1987 to October 1989 and October 1989 to October 1991. Lambing performance and wool production data were analysed on a within period-basis by analysis of variance or deviance, adjusting for imbalance in ewe numbers within each ewe age and shearing treatment group.

Average of adjusted means for lambing performance for the years 1988 to 1990 are given in Table 1. No 8mo ewes were shorn in January 1987 (flock B) or May 1991 (flock A) (Figure 1). A trend for 8mo ewes shorn in January and October to wean heavier lambs than 12mo ewes approached statistical significance ($P < 0.10$) with lambs born to 8mo ewes shorn in May of intermediate weight. Shearing treatment did not significantly affect proportion of dry ewes, ewes lambing multiples or lamb survival. The average SED derived from within-year estimates, as presented here, ignores the repeated use over years of a considerable proportion of the sheep, thereby inflating its apparent variation. The trends between years for the 8mo flock consistently showed less dry ewes and more and heavier lambs at weaning. Similar trends between once and twice-yearly shorn ewes have been evident in previous trials at Whatawhata (Sumner and Scott, 1990; Sumner and Willoughby, 1988). These lamb growth effects appear to be associated with a combined effect of relatively short wool at lambing and a stimulus to the ewe's voluntary feed intake through shearing (Elvidge and Coop, 1974) in early lactation.

Live weight after shearing in October was not affected by shearing treatment (Table 2). Ewe deaths during the trial were

TABLE 1 Average mean within-year lambing performance between 1988 and 1990. Proportion of dry ewes, ewes lambing multiples and lamb survival analysed following logit transformation.

Parameter	Shear treatment			SED	Signif.
	12mo (Oct)	8mo (Jan/Oct)	8mo (May)		
Dry ewes (%)	13	10	11	3	NS
Ewes lambing multiples (%)	50	47	51	5	NS
Lamb survival (%)	79	81	80	3	NS
LW/EPM ¹	1.03	1.07	1.07	-	-
Lamb wean weight (kg)	19.3	20.1	19.9	0.4	+
WLW/EWL ¹ (kg)	26.4	27.3	27.0	-	-

¹ EPM Ewes present mating; EWL Ewes weaning lambs; LW Lambs weaned; WLW Weight of lamb weaned.

5.5% with less than 1% ewes being cast. Losses were not affected by shearing treatment.

An average of the total "annual" wool production, derived as half the biennial wool production, for each shearing treatment is given in Table 2. Ewes shorn 3 times in 2 years on a split flock system grew more total greasy wool and more clean wool than ewes shorn once-yearly. The magnitude of the wool growth response is equivalent to the composite effect observed at Whatawhata from shearing twice-yearly at different times (Sumner and Scott, 1990; Sumner and Willoughby, 1985, 1988) associated with a stimulation of voluntary feed intake following shearing (Elvidge and Coop, 1974) when the sheep are grazing pasture varying in availability and nutritional value.

The most important characteristics of unprocessed crossbred wool which affect subsequent processing performance are

TABLE 2 Average within-year means for post-October shear live weight and total "annual" wool production between October 1986 and October 1991.

Parameter	Shear treatment			Signif.
	12mo	8mo	SED ¹	
Post-October shear live weight (kg)	49.5	50.3	0.5	NS
Greasy wool (kg)	4.40	4.53	0.06	*
Clean wool (kg)	3.24	3.43	0.06	**

¹ SED without crutchings included. Significance based on this estimate of SED.

staple length and extent of unscourable discolouration. The latter is predominantly yellow. Averages of adjusted within-shearing means for staple length and Y-Z CIE tristimulus values with illuminant C and a 2° observer (yellowness) of the mid-side fleece samples are given in Table 3. Variation in length between the 8mo wools is of little or no manufacturing significance, whereas the length difference between the 8mo and 12mo wools is of manufacturing significance. The yellowness measurements quantify seasonal trends for unscourable yellow discolouration and its relationship with staple length. Yellow discolouration develops under warm moist conditions in the spring and to a lesser extent in the autumn with longer wools being more prone to discolouration than shorter wools. These trends in objectively measured wool characteristics of the fleece wool at each shearing aligned closely with a consistent pattern between the same characteristics when subjectively assessed, as expressed in their

TABLE 3 Average of within-shearing means for fleece characteristics and average New Zealand Wool Board flecce wool type code (Sequence: Diameter/Category/Style/Length).

Parameter	Shearing treatment				Significance	
	12mo October	January	8mo May	October	Treatment	Season
Staple length(mm)	158 ± 6	114 ± 5	107 ± 5	119 ± 5	***	*
Y - Z (Tristimulus value)	5.8 ± 0.4	7.1 ± 0.5	4.4 ± 0.3	4.7 ± 0.3	*	***
Fleece wool type code	37F4D	37F5G	37F3G	35F3G		

New Zealand Wool Board type number (Table 3). Eight month October shorn wools, which grew predominantly during the winter, appeared to have a smaller crimp than the other 8mo wools and were assessed by the trade as 35 micron types relative to the other wools which were assessed as 37 micron types. Style is an assessment of the extent of unscourable discolouration, ranging from 1 (white) to 5 (heavy yellow). The length classifications of D and G are equivalent to 100-150mm and 75-125mm respectively. Differences in staple length and yellowness of these magnitudes are reflected in significant auction price differentials with short and yellow wool being discounted (Maddever *et al.*, 1991). The length requirements for different wool processing systems result in 100-125mm length wools being worth relatively more per unit of length than shorter or longer wools (New Zealand Wool Board, 1991b).

The effect of 12mo and 8mo shearing policies on net wool returns were calculated for the mean annual wool production of each shearing treatment using New Zealand seasonal average wool prices and average prices in Auckland during the month after shearing. Shearing and crutching costs were included as, shearing \$1-35, full crutch 61c and fly crutch 31c in the 1986/87 season increasing by 7% per annum between seasons. Net wool returns from the 8mo split flock shearing system exceeded those from once-yearly shearing in 4 out of 5 years during the trial. The differential ranged from +84c/head in 1988/89 to -23c/head in 1990/91, based on seasonal average prices, and +95c/head in 1988/89 to -35c/head in 1990/91, based on the average Auckland prices during the month after shearing. During the trial 1988/89 was the season of highest wool prices and 1990/91 the season of lowest prices. This illustrates that premiums and discounts tend to be less in times of low prices. While shearing costs for the 8mo system were about 8% higher than for once-yearly shearing, the increased wool production and the preference for 100-125mm length wools by the wool trade, compensate for the additional shearing cost. Choice of shearing times for individual farms that will reduce the degree of yellowing in the summer shorn 8mo fleeces will potentially increase the net wool returns of the 8mo system. Wool growers utilizing an 8mo split flock shearing policy also have more opportunities for selling their wool at auction than woolgrowers shearing once-yearly. This will help to reduce the risks of price fluctuations associated with the currently unsupported wool auction system. The importance of increased selling opportunities on cashflow will differ between individual farms depending on their principal enterprises.

Of the ewe shearing policies compared at Whatawhata (Sumner and Scott, 1990; Sumner and Willoughby, 1985, 1988), the 8mo split flock system is comparable in net wool returns to once-yearly pre-lamb shearing, the policy yielding the highest net wool return, but is less demanding and more flexible in its management requirements.

CONCLUSIONS

This 5 year study has demonstrated production benefits in lamb and wool production associated with an 8mo relative to a 12mo shearing system. Shearing 8mo as a split flock system benefits cashflow making this a practical, and potentially profitable, shearing policy for Waikato hill country farms. Applicability of the 8mo split flock shearing system, with alteration in shearing time, to other areas of New Zealand will be dependent on climatic and associated feed supply conditions in those areas.

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