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A REVIEW OF EFFECTS OF SHEARING ON SHEEP PRODUCTION

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SUMMARY

The effects of once-yearly vs. multiple shearing are reviewed. In the trials where shearing took place in March or July an increase in wool growth occurred. Based on returns from auction, second-shear wools show a price discount for reduced staple length. This discount and extra shearing costs need to be counterbalanced by the advantages of improved colour, reduced crutching and ease of physical handling of animals.

Research indicates that time of shearing can influence liveweight gains, incidence of facial eczema, onset of oestrus, ovulation rate, mean date of lambing and lamb growth rates. The review indicates there is a need for a major increase in research on the effects of shearing on all aspects of sheep production.

INTRODUCTION

About 40% of New Zealand Romney and Romney-cross flocks (up to 75% in the northern North Island) are shorn more frequently than once a year. The effects of shearing on sheep production are complex but the questions that need to be answered to maximize total production are: How often, at what times of the year, and under what nutritional conditions should sheep be shorn?

The advantages claimed for double shearing are increased wool production per sheep, better colour of wool, fewer oddments, reduced crutching and dagging, more active sheep and hence fewer becoming cast, improved lambing performance, earlier lambing, and improved lamb growth. The real benefits in these areas need to be weighed against the effects of reduced wool fibre length, additional shearing costs, higher feed requirements, and the greater risk of deaths from cold stress.

WOOL PRODUCTION RESPONSES

Evidence associating increased wool production with multiple shearing has come from trials designed to look at such parameters

TABLE 1: SUMMARY OF GREASY WOOL WEIGHT DIFFERENCES

<i>Authors</i>	<i>Trials</i>	<i>Month 2nd Shorn</i>	<i>Difference Twice - Once</i>
Clarke & Reed	2	May	-50 g to -150 g
Dobbie & Fegan	1	May	0
Summer & Bigham	3	May	0
Wodzicka-Tomaszewska	2	March	50 g to 300 g
Inkster	2	March	325 g to 375 g
Clarke & Foskett	4	July	50 g to 375 g
Everitt	2	July	325 g to 375 g

as 2-year-old infertility, mothering ability and lamb growth. Table 1 summarizes the wool growth responses reported by several workers. Two trials show a negative, four nil, and ten a positive response to second shearing.

It is interesting to note that the negative and zero results occurred when the second shear occurred in May while the positive results were achieved with the second shear being March or July. This variation may be explained by the time of shearing relative to the wool growth cycle and feed supply post-shearing. After May, both the feed supply and wool growth decline. Gandar (1965) achieved highest wool weights with hoggets using a shearing regime of December, March, October and March. R.M.W. Sumner (unpublished) suggested that the wool growth response to autumn shearing may be dependent on feed supply.

Style grade (colour), for which there is a premium of 3 to 5c/kg clean/grade, can be improved in wetter and warmer climates by about one grade with second shearing (Wiggins and Beggs, 1979). Another wool price advantage of multiple shearing is associated with wool preparation procedures. At present about 15% of oddments are picked from the main line with second-shear wools, compared with 20 to 25% for full-length wool. This difference could be reduced if Wool Board skirting recommendations for full fleece were followed.

Staple length data indicate that it is possible to obtain two clips per year of at least 100 mm from Romney and Coopworth

ewes. For every 25 mm below 175 mm a discount of 10c/kg at present applies on average prices. The 30c discount in price applying at present to 100 mm second shearing will be overcome to some extent by an improvement in style, fewer cotts and a smaller proportion of oddments.

EFFECTS ON LAMBS WEANED

Pre-lamb shearing is considered to prevent ewes becoming cast and increase the lamb survival by encouraging ewes to seek shelter (Frengley, 1964). There is little experimental evidence to support this claim. Everitt (1961) found in the North Island that shearing 1 to 1½ months before lambing did not increase survival but did improve growth of the lambs. G. A. Wickham (pers. comm.) has also shown a small response in lamb growth rate to a post-lambing shear. Australian experiments (J. Lynch, pers. comm.) indicated that the percentage of ewes within 6 m of shelter decreased from 90% over first week off shears to 46% by 4 weeks and 28% by 8 weeks. The 1979 results, however, showed no increase in lamb survival following pre-lamb shearing even when shelter was available.

Choice of shearing time has influenced fertility in a number of trials. Gandar (1965) reported an increase in lambs docked in 2-year-old ewes by shearing them as hoggets in March-April and a depressed docking percentage following May-June second shearing (compared with conventional once-yearly shearing), but the number of sheep in each group was small.

Shearing 2-tooth ewes within 6 weeks of joining can increase the number of ewes lambing by up to 20% and may result in lambing being 6 to 7 days earlier, with improved lamb survival (Inkster, 1959; Wodzicka-Tomaszewska and Dobbie, 1967). There are large variations among farms in response to pre-joining shearing of 2-tooths. Part of the variation can be explained by the results of Wodzicka-Tomaszewska and Dobbie (1967), who found a significant response to pre-joining shearing of 2-tooths only in ewes of 43 to 50 kg liveweight, which gained 4.5 kg in liveweight over the 6-week post-shearing period. There was a suggestion from this work that for 2-tooths that lost weight over the post-shearing period, the shearing had a detrimental effect on the percentage of ewes lambing. However, no post-shearing data on feed supply were recorded in these trials.

The pre-joining shearing of 2-tooths had no effect on the onset of oestrus or on fertilization rates, but more shorn than unshorn 2-tooths held to first service (Inkster, 1959; McClure, 1960). Thus the shearing appears to improve the survival of the fertilized ova with the effect occurring before day 12 of the oestrous cycle. Shearing 2-tooths lowered body temperature by 0.4°C, and this may be sufficient to influence the survival of ova. M. Wodzicka-Tomaszewska and R. A. S. Welch (unpublished) found that the conception rate was positively associated with the maximum temperature on the day of mating in shorn 2-tooths, and negatively associated with the temperature in unshorn 2-tooths.

It is noted that joining in most of these experiments has been in late February-March. It is not known if similar responses can be obtained for 2-tooths joined later in the breeding season. While the response is said to occur for 2-tooths shorn 6 weeks before joining or 6 to 9 weeks before mating, the thermal insulation has probably reached a maximum after only 4 weeks (Hutchinson and Wodzicka-Tomaszewska, 1961). The intake, however, remains elevated for 4 to 6 weeks (Wodzicka-Tomaszewska, 1964), but was not reflected in liveweight increase in this winter trial. Inkster (1959) found that the ovulation rate of 2-tooths shorn immediately before joining was lower than for unshorn 2-tooths (1.10 vs. 1.35). In recent field trials the authors have observed in consecutive years on one farm that the mature ewes shorn 4 to 7 days before joining had a lower ovulation rate for ewes mated in the first 2 weeks of joining as compared with unshorn ewes and the shorn ewes mated in the second 2 weeks of joining. When the two years were pooled (Table 2) there were differences in ovulation rate between treatments ($P < 0.05$) and between periods 1 and 2 for the shorn ewes ($P < 0.05$). Further work is planned to demonstrate the adverse effects of shearing on ovulation rate and to define the critical period from shearing to oestrus when the effects occur.

Choice of shearing time can influence lambing pattern. Welch *et al.* (1979) found that the shearing of ewes 10 days after mating

TABLE 2: OVULATION RATE OF SHORN AND UNSHORN EWES IN PERIODS 1 AND 2

<i>Period</i>	<i>Shorn</i>	<i>Unshorn</i>
1	1.41	1.65
2	1.58	1.65

caused the lambing to be delayed overall. However, the percentage of ewes lambing was higher for both the shorn 2-tooth (93% vs. 84%) and mature ewes (92% vs. 87%) as compared with the unshorn ewes. Subsequent field trials by R. A. S. Welch (unpublished) have confirmed that shearing in the middle of joining can cause a break in the lambing pattern, although provided there is a long joining period, the percentage of ewes lambing is unaffected.

FACIAL ECZEMA SUSCEPTIBILITY

There is also a suggestion that shearing may provide some protection against facial eczema. Smith *et al.* (1979) found that ewes that had been shorn 20 to 30 days before a period when sporidesmin spore counts were high had a lower incidence of liver damage than unshorn ewes as shown by gammaglutamyl-transferase levels. In addition, shearing shortly after the period of elevated spore counts appeared to be associated with a more rapid recovery from liver damage.

CONCLUSIONS

Wool weight and lamb production can be influenced by shearing. The interrelationships of the various responses are not understood. The decision of whether to shear ewes once or twice a year, and if twice, when, is at best a series of educated guesses. It may be suggested that if the optimum times of shearing were determined, all the sheep could not be shorn at those times. The farmers should, however, have the information that will enable them to calculate the consequences of shearing at other times. Farmers and their advisers need to know under what feed and climatic conditions, and at what stage in the wool growth cycle, a response to shearing in wool weight can be achieved. The effects of shearing on the whole lamb production cycle need further research, with emphasis on defining in particular the feed supply in which the results were obtained. This requires access to large numbers of sheep. All sheep farmers must shear their sheep at least once a year. At the moment it is not a matter of when it is optimum for production, but of when the shearers arrive.

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