

THE EFFECT OF SHEARING FREQUENCY ON STAPLE LENGTH AND GREASY FLEECE WEIGHT IN DRYSDALE, TUKIDALE AND ELLIOTDALE SHEEP

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SUMMARY

One hundred and forty four carpet wool wethers consisting of 3 breeds and 24 bloodlines, were run together in south western Victoria. Sheep were divided into 2 shearing groups, and shorn either 2 or 3 times each year for 3 years.

The more frequently shorn sheep sometimes grew more wool, but always produced a greater proportion of premium grade wool than the less frequently shorn group, hence grossing a higher return. This increased return did not recover the necessary additional shearing costs in the current economic climate.

A genetic solution to overlength wool is proposed rather than a management solution, as examples of dense but shorter woolled, heavy cutting sheep were present in the trial.

Carpet wool production from wether flocks was shown to be a productive enterprise, although not currently financially attractive.

Keywords: carpet wool, shearing frequency, staple length, greasy fleece weight.

INTRODUCTION

Drysdale, Tukidale and Carpetmaster, breeds of sheep which produce specialty carpet wool, were introduced into Australia from New Zealand in the mid 1970s. Elliottdales were released at about the same time from the Elliott Research Station in Tasmania. The 4 breeds are closely related to Romneys, often with only a single gene differentiating them (Calver *et al.* 1988). Specialty carpet wool consists of a range of fibres; included with wool fibres are hair, kemp and heterotype fibres. They are pure white with a high proportion of medullated (hollow) fibres with diameters of well over 30 μm . These fleeces are blended into pure wool or wool blend carpets to impart the desirable properties of resilience, durability and appearance retention (Calver *et al.* 1988).

Whilst Australia is by far the world's largest apparel wool exporter, we still need to import carpet wool to supply our carpet manufacturing industry. Therefore these carpet wool breeds of sheep grow wool that substitutes for otherwise imported wool.

Classing of carpet wool is done on both style and length. Superior grades of carpet wool are classed as AAA CW, and lambs wool is classed as CWL. The decision of the classer to downgrade wool to the inferior grade, AA CW, is based on the visual characteristics of increased crimp, lustre and softness (Australian Wool Corporation 1993). There is evidence that style is not only genetically influenced but can be affected by environment (Kajons 1985).

The optimum length for carpet wools, as defined by processors to Carpet Wool Marketers Ltd., is 75 to 125 mm. The fleeces of most breeds of carpet wool sheep can grow to lengths of 300 mm or more annually and therefore easily exceed the optimum lengths. Premiums and discounts are applied to staple length by Carpet Wool Marketers Ltd., the grower owned cooperative that trades most of the carpet wools. Length is traditionally quoted in inches.

The only practical way producers can manipulate length within a mob of sheep is through shearing interval. In Australia, carpet wool sheep are routinely shorn at least twice a year, with some sheep being shorn up to 4 times a year. If, by increasing shearing frequency, a higher proportion of wools from each shearing are sold at price premiums and not discounts, the gross return for wool would increase.

There are reports that more frequent shearing will promote wool growth in Merinos (McGuirk *et al.* 1966) and in Romneys (Bigham 1974). If this were found to occur in carpet wool breeds then extra wool sold would contribute towards offsetting the additional shearing costs. The primary aim of this trial was to calculate the optimal shearing interval for carpet wool sheep.

Running carpet wool wether flocks for wool production is not a common practice. Being dual purpose breeds, the wether portion is usually sold as prime lambs. Under different economic conditions, however, particularly if prices of meat sheep drop and carpet wool increases, running carpet wool wethers could be a viable enterprise on some farms. A further aim of this trial was to collect production data on running wethers specifically for wool production.

MATERIALS AND METHODS

Twenty four stud or commercial carpet wool sheep breeders each donated a team of 6 wether lambs to the trial. There were 17 teams of Drysdale, 5 teams of Tukidale and 2 teams of Elliotdale. Sheep from each group of 6 were randomly allocated to 1 of 2 shearing groups. One group was shorn approximately every 6 months, the other was shorn approximately every 4 months. The sheep were always run together as one mob on the VCAH Glenormiston Campus in south western Victoria.

Data were collected on fleece weights, wool quality or style and staple length at each shearing. The wool was classed under commercial conditions, by a registered classer experienced in carpet wool. All sheep were weighed and condition scored at the conclusion of the trial. The trial ran from March 1990 until May 1993.

The value of wool produced at each shearing by each sheep was calculated by weighing and classing the wool and multiplying by the relevant prices at the time provided by Carpet Wool Marketers Ltd.

RESULTS

The sheep that were shorn more frequently grew slightly more wool ($P < 0.10$, Table 1). In the second year there was a highly significant increase ($P < 0.01$) in the weight of wool produced from the more frequently shorn group, but in the first and third years there were no significant differences in the quantity of wool produced by each shearing group.

Table 1. Mean annual fleece weight (kg) for each shearing frequency group for each year of the trial

	Mean	Shearing frequency		s.e.d.
		2X	3X	
Year 1	4.61	4.62	4.60	0.133
Year 2	4.99	4.80	5.18	0.136 **
Year 3	6.22	6.13	6.31	0.187
Total	15.94	15.64	16.23	0.340 *
* $P < 0.1$; ** $P < 0.01$.				

At the first shearing all wool was classed as CWL, after that over 95% of the wool styles were AAA CW. Of the few inferior fleeces, AA CW, some appeared consistently in the same sheep, others occurred randomly between shearings within sheep. Style was not affected by shearing interval.

The gross value of the wool was significantly greater each year and overall ($P < 0.01$) for the sheep shorn more frequently (Table 2). Shearing more frequently eliminated the problem of overlength wools which are heavily discounted.

Table 2. Mean gross value (\$) of fleeces (at the time of shearing) for each shearing group for each year of the trial

	Mean	Shearing frequency		s.e.d.
		2X	3X	
Year 1	12.60	11.42	13.78	0.310 **
Year 2	12.24	11.39	13.09	0.302 **
Year 3	15.61	14.88	16.34	0.440 **
Total	40.70	37.82	43.58	0.742 **
** $P < 0.01$.				

At the conclusion of the trial there were no significant differences between liveweight (off shears: mean \pm s.e.m., 65.9 ± 0.8 kg) or condition score (mean \pm s.e.m., 3.62 ± 0.05).

DISCUSSION

The increase in wool produced from the more frequently shorn sheep is consistent with the findings of both McGuirk *et al.* (1966) and Bigham (1974). The fact that this only occurred 1 year out of 3 indicates that there are age and/or environmental effects occurring. These were beyond the scope of this trial to determine, but may relate to an increase in appetite caused by shearing (Wheeler *et al.* 1963), and varying amounts of pasture available at different shearing times under paddock conditions which will affect intake. Therefore extra wool production is a possibility, but not a certainty, when sheep are shorn more frequently.

Shearing more frequently improved the length of the wool, allowing a higher proportion to be sold at the premium length of 3-5 inches rather than the discounted 4-6 inches length. It also eliminated the problem of the further discounted overlength (greater than 6 inches) category. Shearing about every 4 months did mean however that the wool from some sheep was too short, falling in the discounted 2-4 inches category and negating some of these benefits.

The fact that inferior styles occurred occasionally in all breeds and treatments, plus repeatedly in a few sheep, indicates both genetic and environmental influences are affecting style, compatible with Kajons (1985). Since shearing frequency did not appear to affect style, the discount taken on style did not contribute to the increased value of wools in the more frequently shorn group.

The wool can be of higher value for 2 reasons, firstly the higher proportion of wool valued at premium lengths and secondly the greater quantity of wool in the second year only. It can be seen from Table 2 that the extra value of wool grossed from the additional shearing ranged from \$1.46 to \$2.36 per year. This extra value may or may not cover the costs of shearing. The award rate for shearing is currently \$1.42/hd. Patterson (1992) however, in a survey of farm costs, quotes a figure of nearly \$2/dry sheep equivalent once shed hands, classers etc. are accounted for.

It should be born in mind that this was a very heterogeneous mob of sheep. A more uniform mob of a single breed and bloodline could have a more tailor designed shearing date to enable the bulk of wool to be sold as premium length, and result in fewer fleeces being too long or too short.

As prices for wools of different lengths change in the future, financial data can be reworked with those prices, and the optimal shearing practices of the day can be revised and updated. It appears however that discounts for overlength wools are well established in carpet wool marketing. Since using shearing interval alone to manipulate wool length is clumsy and expensive, other ways should be investigated to manipulate wool length.

Some sheep, although regularly cutting very long stapled wool, did not produce heavy wool weights. Conversely some sheep produced shorter wool, but still managed to maintain heavy wool weights. The unmeasured factor of wool density is apparently playing an important role. It would be much more desirable to have sheep with a denser but shorter wool that only needs shearing twice a year, than a long fleeced sheep that produces no more wool yet needs more frequent shearing to remain of optimal length.

At the moment many carpet wool sheep breeders appear to be biding time. Returns for carpet wool are disappointing given our high domestic requirement for carpet wool, let alone the possibility of exporting the surplus. The indications about the future demand for wool carpets are good. Many of the participating breeders to this trial still have some carpet wool sheep, although most no longer rely on them as their major source of income. As flocks are reduced, selection should be applied to produce a nucleus of sheep that produce heavy wool weights by growing wool more densely rather than by growing excessively long. The solution to the overlength problem needs to be genetic rather than management.

This trial demonstrated that carpet wool wethers will produce heavy quantities of top quality carpet wool at least into their fourth year. At the conclusion of that time their heavy liveweights would be suitable for the mutton or live sheep export trades. As a possible enterprise of the future it could well have a place. Such sheep could be used as a pasture and disease management aid on dairy farms or as a sideline enterprise by specialist lamb producers. They could be run for little cost yet produce substantial quantities of wool.

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