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TENDER WOOL CAN BE AVOIDED

By I. G. RALPH, Adviser, Sheep and Wool Branch.

THE production of tender wool which will not stand the tension and friction of the combing process can be reduced by an alteration in sheep management practices.

This is the finding of research carried out by the Sheep and Wool Branch of the Department of Agriculture over an eight-year period.

It is important that the amount of tender wool in the W.A. clip is reduced.

The price of this tender wool in the period 1953-58 was about 5 per cent. less than that obtained for a sound wool of similar type and washing yield. At present the deduction may be higher than this—from 3 to 6 cents per lb. greasy.

The lower price occurs through deductions for a lower average fibre length in the top, a greater coefficient of variation for fibre length, a higher percentage of noil and a greater combing cost.

The research showed that the worst combination for tender wool is autumn lambing/spring shearing. A change in either of these practices will reduce the percentage of tender fleeces from the lambing ewes.

Fibre strength

The tensile strength of a wool fibre is determined by its fibre diameter (Figure 1). The thinner the fibre the lower the strength. The overall strength of the fibre is naturally determined by its diameter at its thinnest point.

The position in the fibre of this thin, weak portion determines whether or not the wool is tender. If the thin portion is in the central region then the wool has a high chance of being classed as tender; if it is at either end the wool has little chance of being classed tender.

Causes of tender wool

The main cause of "tenderness" is a sufficiently great reduction in wool growth as a result of poor nutrition or health. Two-thirds of any change in wool growth is brought about by a change in fibre diameter.

Changes in fibre diameter can be the result of two independent factors—nutrition, and adrenal hormone secretions in response to a stress such as flystrike or disease. The latter probably account for most of the "breaks" in the fleece, while poor nutrition is probably responsible for most of the less severe defects of tender wool.

Food supply

The normal rate of wool growth is not constant throughout the year, but varies according to the amount of feed available—least in autumn, most in spring. This pattern of growth is illustrated in Figure 2, which is based on sampling from young wethers at Muresk.

Total wool production is least in autumn and fibre diameter is thinnest.

Lambing.

Pregnancy and lactation place a great additional burden on the nutrition of the ewe. If lactation occurs in autumn, tender wool will almost certainly result unless large amounts of supplementary feed are supplied.
Figure 2.—Weight of wool produced in various months.

Despite supplementary feeding, 24 per cent. of autumn lambing/spring shorn ewes produced tender fleeces compared with 2 per cent. of the spring lambing/spring shorn ewes in a trial at Merredin Research Station.

Autumn lambing accentuates the normal decrease in wool production in autumn and, because most of this decrease in volume is due to a decrease in fibre diameter, there is an increase in the amount of tender wool when the ewe is shorn in spring.

Weaners

Weaners produce a high proportion of tender fleeces and on some properties in the Great Southern there may even be a large number of cotted fleeces where secondary fibres have ceased production and have been shed.

There are many causes of this, ranging from parasites to a lack of suitable drinking water. The main reason, however, is that the weaner is a growing animal and body growth is competing strongly with wool growth for the available protein.

Fibre diameter of wool from weaners is normally finer than the wool from adult sheep. This finer wool makes weaners far more likely to produce tender wool than grown sheep given a similar nutritional set-back.

Other causes

The other isolated causes of “tenderness”, which affect tensile strength without altering fibre diameter, are a deficiency of copper in the diet, fibre damage through pink-rot which may follow fleece rot, and the action of sunlight which results in the weathered tip of fibres and, sometimes, weak backs in wheatbelt wools.

Apart from these causes, tenderness in wool is almost entirely associated with the reduction in fibre diameter in autumn.

Results of tender wool

Even if the wool is not regarded by the classer as tender, the presence of a thin or weak portion in the central area of the fibre impairs manufacturing performance.

Tender wool breaks during the carding and combing process. Wool which has the thin part in the central region, even if not classed as tender, has a tendency to break and a proportion of the fibres do so.

This means that tender wool produces—

- a shorter fibre in the top,
- a higher proportion of noil—short or wasting fibres removed during the combing process,
- a greater variation in fibre length.

All of these tend to reduce the value of the wool.

Reducing tender wool

There are two ways to reduce the amount of tender wool in the clip.

Improved nutrition

The thinning of the wool fibre in autumn can be reduced by running less sheep per acre or by supplementary feeding. With most W.A. wools, neither of these practices is likely to be economical.

Better pastures can help reduce the nutritional stress in summer and autumn. The low summer feed value of grasses can be improved by maintaining a high percentage of sub-clover in the pasture. Lupins and lucerne, in areas where they can be grown successfully, are useful in improving summer and autumn nutrition.

Fewer than half the fibres in this staple continued to grow when the sheep was badly fly-struck. This produced a distinct “break” (arrowed).
The long-fibred top (C) and the shorter, less valuable noil (B) are the wool products of greasy wool (A). Tender wool produces more noil and a shorter average fibre length in the top.

Management

Lambing time should be such that the ewe will at least be lactating on green feed.

Shearing in autumn can almost eliminate tender wool because it places the thin part of the fibre at the ends rather than in the centre. Autumn shearing may result in a greater percentage of vegetable matter in the wool than spring shearing and may give a higher incidence of fleece rot in susceptible sheep in high rainfall areas. The latter can be overcome by selecting fleece rot resistant sheep.

If sheep are shorn in autumn, an active policy of reducing vegetable matter in the wool will usually be necessary. Grass seeds can generally be controlled by either an increased stocking rate or mowing. Some success has been achieved with barley grass by dragging a wire rope across the paddock just as the seeds are starting to “fly”. The corkscrew seed of wild geranium can be a big problem and may warrant the use of a herbicide at the break of the season.

Without the control of seed which can produce shive in the top it may be uneconomical to shear in the autumn even though fibres are stronger.

Recommendations

- Mules all sheep to avoid blowfly strike, which causes a break in the wool.
- Shear in the autumn to position the thinnest part of the fibre at the end.
- Lamb on green feed to avoid the nutritional strain on wool growth caused by lactation.