WOOL PRODUCTION AND CHARACTERISTICS OF MERINO AND LONGWOOL EWES AND THEIR RESPECTIVE BOOROOLA CROSSES

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SUMMARY

Data are reported from three comparisons of local breeds with their Booroola Merino crosses. Wool production of Booroola cross and local hoggets was similar in all trials. In both trials involving adult ewes the Booroola cross produced less wool than the local breed.

Booroola Merino and local Merino ewes grew very similar wool. Booroola × longwool crossbreeding resulted in additive changes in fibre diameter, bulk, staple length and yield. The Booroola cross fleeces had poorer colour before scouring but similar colour after scouring. The lower yield of Booroola cross wool resulted in a lower price per kilogram of greasy wool.

INTRODUCTION

Crossing New Zealand sheep breeds with the Booroola Merino can lead to substantial increases in the reproductive performance of the progeny (Allison *et al.*, 1978). However, changes in the amount and type of wool produced also need to be documented. This paper reports data from three trials on the wool production and characteristics of local breeds and their crosses with the Booroola Merino.

MATERIALS AND METHODS

Trial 1: At Tara Hills the productivity of first cross Booroola Merino × local Merino (B×M) ewes born in 1973 and 1974 is being compared with that of contemporary local Merino (M) ewes.

Trial 2: At Invermay, first cross Booroola × Romney (B×R) ewes born in 1975 and 1976 are being compared with Romney (R) ewes.

Trial 3: In 11 on-farm comparisons in 1979, various Booroola first cross hoggets were compared with "local" breeds. The local breeds were either halfbreds (*e.g.*, Merino × Romney) or longwools (*e.g.*, Romney, Coopworth). The crosses are referred to here as *halfbreds* or *quarterbreds* depending on the proportion of *Merino* genes.

In trials 1 and 2, greasy fleece weights (GFWs) and the characteristics of a midside sample from each fleece were recorded. Individual GFWs were recorded in trial 3, but the midside samples within each flock were blended and each wool characteristic measured on a composite grab or core sample.

RESULTS AND DISCUSSION

Wool Production

Differences in fleece weights between Booroola cross and local ewes in trials 1 and 2 are shown in Table 1. B×M ewes born in 1973 had lower hogget GFWs than the local ewes, but for B×M ewes born in 1974 and for both year of birth groups of B×R ewes there were negligible differences. From 2 years of age onwards the Booroola cross ewes in both trials had lower fleece weights than their local contemporaries. Presumably the lower wool production of the Booroola cross ewes is at least partly attributable to their greater reproductive performance.

TABLE 1: ADVANTAGE IN GFW (kg) TO LOCAL MERINO (M) AND ROMNEY (R) EWES OVER CORRESPONDING BOOROOLA (B) CROSSES

Ewe Age	*M vs. B×M*		*R vs. B×R*	
(yrs.)	*Born 1973*	*Born 1974*	*Born 1975*	*Born 1976*
1	0.42	–0.07	–0.07	0.07
2	0.54	0.04	0.34	0.31
3	0.49	0.15	0.47	0.40
4	0.81	0.50	0.31	
5	0.96	0.07		
6	0.63			
S.E.D.[1]	0.24	0.17	0.19	0.13

[1] Standard error of the difference (pooled across ages).

In trial 3, generalizations with respect to wool production are difficult because of diverse environments and management. However, on five farms where longwools and quarterbreds were compared, the longwools averaged 0.1 kg heavier hogget GFWs, and their liveweights were 2 kg higher off-shears. On four farms with halfbreds, their longwool counterparts averaged 0.2 kg heavier GFWs and had 6 kg higher liveweights off-shears. On two other farms with halfbred control flocks, these had on average 0.1 kg heavier GFWs than did the Booroola halfbred flocks.

It can be concluded that crossing local breeds with Booroola Merinos will have little effect on hogget GFWs. In both trials 1 and 2 the Booroola cross ewe flock clearly produced less wool than the local breed ewe flock. Further information is, however, required with different longwool breeds and also with ewes with different proportions of Booroola genes. Attention should also be paid to selection of the high fecundity sires on the basis of their wool production.

Wool Characteristics

Crossing Booroolas with the local fine/medium Merinos at Tara Hills (trial 1) has had little effect on wool characteristics. At all ages the B×M and M ewes have had similar mean fibre diameters (20 - 22 μm) and staple lengths. The local Merinos have consistently had a higher (*c.* 2%) mean yield.

The wool characteristics of the hoggets in trials 2 and 3 are summarized in Table 2.

TABLE 2: WOOL CHARACTERISTICS OF BOOROOLA × LONGWOOL AND LONGWOOL HOGGETS

	Halfbred	*Quarterbred*	*Longwool*
Fibre diameter (μm)	26.0 ± 0.5[1]	31.2 ± 0.5	34.3 ± 0.4
Bulk (cm^3/g)[2]	26.3 ± 1.2	22.8 ± 1.4	20.9 ± 1.2
Staple length (cm)	10.4 ± 0.8	11.1 ± 1.0	12.8 ± 1.0
Brightness	66.2 ± 0.6	65.7 ± 0.6	64.2 ± 0.2
Yellowness	2.7 ± 0.5	2.3 ± 0.6	2.2 ± 0.2
Yield (%)	75.3 ± 0.7	79.8 ± 1.6	80.2 ± 1.2

[1] Between-flocks S.E.M.
[2] Excludes Booroola × Perendale and Perendale hoggets.

Relative to longwools, the halfbreds and quarterbreds averaged 8 and 3 μm finer in fibre diameter, respectively. The higher bulk of the halfbreds and quarterbreds probably results from higher fibre crimp frequency. On the only farm with a Perendale base flock, bulk was 30.6 and 28.2 cm^3/g for the Booroola cross and Perendale hoggets, respectively. The other data for these hoggets are included in the means in Table 2. The Booroola crosses had, on average, shorter staples than the longwools, but there were large differences between farms due to different shearing patterns. The wool characteristics of normal and Booroola halfbred hoggets (not shown in Table 2) were very similar.

In trial 3 the colour of halfbred and quarterbred fleeces at shearing was consistently inferior to that of longwool fleeces. This was most marked in South Otago, where extensive fleece rot and some associated green bacterial discoloration was observed in halfbreds on two farms. However, the objective measurements of colour (brightness and yellowness in Table 2) on scoured midside samples from the Booroola cross and longwool hogget fleeces were very similar. This suggests either that the subjective colour differences between the greasy fleeces were due to scourable contaminants or that the midside is not representative of average fleece colour.

It is apparent from Table 2 that a reduction in yield accompanies Booroola × longwool crossbreeding in comparison with longwool breeds. However, the mean yields for halfbreds and quarterbreds shown in Table 2 are at least 4% higher than would normally be expected for such wools (NZWB, 1979). This has probably occurred because halfbred, quarterbred and longwool sheep are normally run in different environments rather than on the same farms as in these trials. Selling with objective yield certificates could prevent unwarranted discounts for low yield in these circumstances.

The price per kilogram of greasy wool received for the Invermay B×R animals has consistently been below that for the Romneys as in recent years fineness has not compensated for the lower yield. The most likely use of the Booroola Merino within the sheep industry may be as a quarterbred, which will probably result in a moderate increase in fecundity and negligible differences in wool production in comparison with local breeds. However, the indications are that there will be lower wool production and a possible price disadvantage with a halfbred type wool in comparison with longwools.

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