THE FLEECE CHARACTERISTICS OF SEVERAL MERINO-BASED BREED TYPES.

R.R. WOOLASTON* and E.M. ROBERTS*

Summary

The fleece characteristics of first cross Border Leicester-Merino (BLxMo), Dorset Horn-Merino (DHxMo), Dormer-Merino (DRxMo), South Australian Merino (SA Mo) and Peppin (PMo) ewes were compared. These sheep were obtained for use in an accelerated breeding programme. BLxMo and DRxMo ewes were born and reared at the same location and DHxMo, SA Mo and PMo ewes were purchased as weaners.

When averaged over three years, BLxMo ewes produced the highest clean fleece weights and the highest fibre diameter. DHxMo ewes produced the lowest weight of clean wool and PMo fleeces had the lowest fibre diameter. The calculated values of BLxMo, SA Mo and PMo fleeces were similar, while DHxMo fleeces had the lowest value. DRxMo fleece values were intermediate.

I. INTRODUCTION

Early sheep crossbreeding trials conducted by the various State Departments of Agriculture have compared breeds and crosses with respect to their profitability. Little detailed information exists on fleece measurements when breed types are run under similar conditions. Several Merino strain comparisons have been reported (Dunlop 1962; Dun and Hayward 1962; Jackson and Roberts 1971; Saville 1972), but fleece comparisons involving crossbreds have received less attention (McGuirk 1970; Kajons 1972).

This paper compares the fleece characteristics of Border Leicester-Merino cross ewes with those of four alternate breed types including two Merino strains.

It should be noted that although the breed groups studied in this trial were run under identical conditions for over three years, their early environments were not identical. Extremes of pre-natal and early post-natal nutrition can influence the wool-producing potential of Merino sheep (Schinkel and Short 1961).

II. MATERIALS AND METHODS.

Approximately 75 ewes of each breed type were obtained as weaners in January 1971 for use in an accelerated lambing programme at the Field Station of the University of New South Wales, Hay, New South Wales (Jackson and Roberts 1970). First cross Border Leicester-Merino (BLxMo) ewes and Dormer-Merino (DRxMo) ewes were born in autumn 1970 and reared together on the station and Dorset Horn-Merino (DHxMo) ewes, Bungaree Merino (SA Mo) ewes and Peppin Merino (PMo) ewes of the same age were purchased from commercial breeders in the area. The initial shearing was in February 1971. Ewes were run together on natural pasture supplemented with varying quantities of wheat grain plus limestone. Yearly average wheat-feeding levels were 0.91, 5.98 and 2.01 kg/ewe/week for 1971, 1972 and 1973 respectively. The durations of wheat

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### TABLE 1

Significance levels in the analyses of variance for fleece traits and body weight.

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>df</th>
<th>Greasy Fleece Weight Yield</th>
<th>Clean Fleece Weight</th>
<th>Fibre Diameter</th>
<th>Staple Length</th>
<th>Crimp Frequency</th>
<th>Fleece Value</th>
<th>Off-Shears Liveweight</th>
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</thead>
<tbody>
<tr>
<td>Breed type</td>
<td>4</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>Year</td>
<td>2</td>
<td>**</td>
<td>**</td>
<td>*</td>
<td>NS</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>Pregnancy Status</td>
<td>4</td>
<td>**</td>
<td>NS</td>
<td>*</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Lactation Status</td>
<td>8</td>
<td>**</td>
<td>NS</td>
<td>*</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Residual mean square</td>
<td>1025</td>
<td>0.73</td>
<td>39.5</td>
<td>0.40</td>
<td>5.15</td>
<td>1.74</td>
<td>4.68</td>
<td>2.49</td>
</tr>
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</table>

* P<0.05  ** P<0.01  NS, not significant

### TABLE 2


<table>
<thead>
<tr>
<th>Breed Type</th>
<th>No.</th>
<th>Greasy Fleece Weight</th>
<th>(%)</th>
<th>Clean Fleece Weight</th>
<th>Microns (cm)</th>
<th>(inch⁻¹)</th>
<th>(kg)</th>
<th>(kg)</th>
<th>(kg)</th>
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<tr>
<td>BLXMO</td>
<td>226</td>
<td>5.41</td>
<td>68.5</td>
<td>3.72</td>
<td>30.5</td>
<td>11.0</td>
<td>5.4</td>
<td>7.12</td>
<td>58.1</td>
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<tr>
<td>DHAMO</td>
<td>209</td>
<td>4.46</td>
<td>59.7</td>
<td>2.68</td>
<td>27.7</td>
<td>8.1</td>
<td>11.3</td>
<td>5.12</td>
<td>54.7</td>
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<tr>
<td>DRGM O</td>
<td>179</td>
<td>4.92</td>
<td>62.3</td>
<td>3.06</td>
<td>25.5</td>
<td>8.7</td>
<td>10.9</td>
<td>6.42</td>
<td>50.5</td>
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<td>SAMO</td>
<td>216</td>
<td>5.46</td>
<td>59.6</td>
<td>3.29</td>
<td>23.5</td>
<td>8.3</td>
<td>10.3</td>
<td>7.26</td>
<td>43.1</td>
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<td>PMSO</td>
<td>218</td>
<td>5.46</td>
<td>58.2</td>
<td>3.23</td>
<td>21.9</td>
<td>8.3</td>
<td>11.6</td>
<td>7.30</td>
<td>39.3</td>
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</table>

Means within a column with different superscripts differ significantly (P<0.05)
feeding for the three respective years were 70,366 and 174 days. For most of 1972 and the first six months of 1973, practically no pasture was available.

Ewes were joined to British breed sires at eight-monthly intervals commencing Feb.-Mar. 1972. Supplementary joinings were also held in Feb.-Mar. 1973 and Oct.-Nov. 1973.

Methods of measurement have been described by Jackson and Roberts (1970). Fleece values shown correspond to the "theoretical value" described by these workers. Results from shearings in February of 1972, 1973 and 1974 were analysed. Data were adjusted for year, lambs born and lambs weaned using the method of least-squares (Harvey 1960).

III. RESULTS

Levels of significance in the analyses of variance are presented in table 1.

The least-squares means for the various breed types are shown in table 2.

With one exception, wherever breed types did not differ significantly in table 2, breed × year interactions were large enough to affect their rankings in some years. The exception was that PMo ewes produced heavier clean fleeces than DHxMo ewes in all years.

IV. DISCUSSION

Differences in greasy fleece weights of 0.5 to 1.0 kg between BLxMo and DHxMo ewes are frequent in the literature (Sims and Webb 1945; Coleman and Godlee 1952; Miller and McHugh 1955; Kajons 1972). Moreover, Colebach and Scott (1927) found the greasy fleece weights of BLxMo ewes to be 0.1 kg lower than those of Merinos. However, the difference in clean fleece weights between SAMo and PMo strains was less than that reported by other workers (Dun and Hayward 1962; Dunlop 1962; Jackson and Roberts 1970; Saville, Gleeson and McManus 1971). Sampling errors may account for this discrepancy, or dissimilar prenatal environments. However, in view of the significant difference in mean liveweights of the two groups, it appears unlikely that early environmental differences were a primary cause (cf. Schinkel and Short 1961).

Under present market conditions, there is little difference between the fleece values of Merino and first cross BLxMo ewes. However, over the three years the average value of BLxMo fleeces was $2.00 higher than that of DHxMo fleeces. This difference can be almost totally explained by differences in clean fleece weights. Other factors for consideration include reproductive performance and value of the progeny. These aspects will be discussed in a later paper.

V. ACKNOWLEDGEMENTS.

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VI. REFERENCES

COLEBACH, W.J. and SCOTT, R.C. (1927). Journal of Agriculture, South Australia 31:118


