WRINKLE SCORE SELECTION AND REPRODUCTIVE PERFORMANCE OF MERINO SHEEP IN NORTH WEST QUEENSLAND

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Summary

Differences in reproductive performance of groups where rams were selected for high wrinkle score (Wrinkly) and low wrinkle score (Plain) were small but the Plain group performed better at all stages of reproduction. Differences in mean wrinkle score of the groups were also small. However there has been a far greater decline in ewe numbers in the Wrinkly group so the use of plain-bodied rams offers some benefit in performance in this harsh environment.

I. INTRODUCTION

Reproductive performance of Merino sheep in north west Queensland is extremely low (Rose 1972) so the definition of selection criteria for breeding sheep better able to produce in this environment would be of considerable benefit to producers.

Dun (1964) reported a lower net reproductive rate for a Merino flock selected for skin fold than for a flock selected against skin fold. Drinan and Dun (1965) in a study in 14 New South Wales flocks reported an overall 17 per cent advantage in lambs marked for plain ewes compared with developed ewes. However on half the properties increasing wrinkle score was not associated with a marked decrease in fertility. Dun (1964) suggested that skin fold would be a more important fault the more difficult the environment.

This paper reports the reproductive performance of ewes in groups where rams were selected for high and low wrinkle score and in a random group at Julia Creek, north west Queensland.

II. MATERIALS AND METHODS

The experimental flock was run on Toorak Sheep Field Research Station, Julia Creek. The environment and flock history have been described previously (Beattie 1961; Rose 1972).

In 1959 the ewe flock was divided into three groups based on wrinkle score using the photographic standards of Turner et al. (1953). Ewes were scored within age groups and placed in order based on this score. The Random group comprised every third ewe. The remaining ewes were divided into two groups; ewes with lower scores forming the Plain group and the others the Wrinkly group. No ewes were culled during the experiment.

Ram selection was based primarily on wrinkle score. Plain rams were selected from those with the lowest scores in the Plain group and Wrinkly rams from those with the highest scores in the Wrinkly group. The selected Plain and Wrinkly rams were joined to ewes in the Random group so that equal numbers of Random ewes were joined to Wrinkly and Plain rams.

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III. RESULTS

Figure 1 shows the mean wrinkle score (neck + side score) for the ewes in each wrinkle group as scored immediately after shearing in June/July of each year. The difference in scores achieved at the formation of the groups was 1.6 and was little changed by selection. The difference between scores for the Plain and Wrinkly groups was only 2.2 at its maximum (1970) and at its minimum 1.3 (1966, 1971, and 1973), the Random group being intermediate in score.

TABLE 1

Reproductive performances for wrinkle groups and season of joining

<table>
<thead>
<tr>
<th>Stage</th>
<th>Autumn (1959-64)</th>
<th>Spring (1965-72)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W</td>
<td>R</td>
</tr>
<tr>
<td>Oestrus</td>
<td>74.6</td>
<td>79.8</td>
</tr>
<tr>
<td>Service</td>
<td>67.4</td>
<td>71.9</td>
</tr>
<tr>
<td>Conception</td>
<td>53.0</td>
<td>55.8</td>
</tr>
<tr>
<td>Lambing</td>
<td>39.3</td>
<td>46.1</td>
</tr>
<tr>
<td>Marking</td>
<td>27.1</td>
<td>32.6</td>
</tr>
</tbody>
</table>

All figures expressed as a percentage of ewes at joining
W = Wrinkly; R = Random; P = Plain

Table 1 shows the reproductive performance of the wrinkle groups recorded at stages of the reproductive cycle for autumn and spring joinings. Performances of all groups were extremely low. However the Plain group performed consistently better than the Wrinkly group.
The performance of the Random group was intermediate to the other groups. The differences between groups were not statistically significant.

Neonatal losses (Table 2) were extremely high in all groups being highest in the Wrinkly group and lowest in the Plain group, except for the period from 7 days to marking (spring joining). Losses in the Random group were again intermediate to the other groups. Differences between groups were not statistically significant.

TABLE 2

<table>
<thead>
<tr>
<th>Time of loss</th>
<th>Autumn (1961-64)</th>
<th>Spring (1965-72)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W</td>
<td>R</td>
</tr>
<tr>
<td>1, 2, 3 days after birth</td>
<td>15.5</td>
<td>13.5</td>
</tr>
<tr>
<td>4, 5, 6 days after birth</td>
<td>6.7</td>
<td>4.6</td>
</tr>
<tr>
<td>7 days to marking</td>
<td>17.6</td>
<td>16.9</td>
</tr>
</tbody>
</table>

All figures expressed as a percentage of lambs born
W = Wrinkly; R = Random; P = Plain

Age specific death rates in ewes in the two groups showed little difference in adult death rates for either autumn or spring joinings but more Wrinkly ewes died between birth and first joining at 1.5 years. When the groups were joined in autumn 30 per cent of Wrinkly ewes and 25 per cent of Plain ewes died before entering the breeding flock and with spring joining ewe losses prior to first joining were 52 per cent in the Wrinkly group and 32 per cent in the Plain group.

IV. DISCUSSION

Selection in the wrinkle groups has only maintained the difference in wrinkle score achieved at the formation of the groups. The expression of wrinkliness was greatest in years with more favourable seasonal conditions. However even in 1962 when the wrinkle scores were highest the mean side score of the Wrinkly group was only 3 on the scale from 0 (absence of any body wrinkles) to 5 (extremely wrinkled). These ewes were only moderately wrinkled although the mean neck score of 5 on the scale from 0 to 6 showed a comparatively high degree of wrinkling on the neck. In most years sheep in all groups were relatively plain-bodied.

The main reason for the very small differences achieved in wrinkle score for the groups over more than twelve years of selection was probably the lack of any effective selection differential. Apparently in sheep bred and selected in the area natural selection keeps wrinkle scores at a low level so little response can be expected by selecting for plain-bodied sheep amongst those bred in the area.

Although the differences in wrinkle score and reproductive performance recorded for the Plain and Wrinkly groups were small they were consistent and supported the relationship of increasing wrinkle score with decreasing reproductive performance.
At the end of the experiment the Plain group was more than twice the size of the Wrinkly one. Since there were only small differences in the groups' reproductive performance and death rates of lambs and adult ewes, the Wrinkly group's more rapid decline can only be explained by the much poorer survival rates of ewe weaners especially with spring joinings.

In this harsh environment there is some advantage in keeping the ewe flock as plain as possible. This can be achieved by the use of plain-bodied rams.

More research is required to define the characters which enable sheep to survive and reproduce in this area. Studies are continuing at Julia Creek into sheep better adapted to the harsh conditions as well as into other avenues of improving reproductive performance through the amelioration of the effects of heat and poor nutrition.

V. ACKNOWLEDGEMENTS

Grateful acknowledgement is made of the assistance of Miss Roslyn Grant who maintained the records and of the many staff members of Toorak Sheep Field Research Station who have collected these records.

VI. REFERENCES


