PRODUCER MANAGED FLOCK EVALUATION

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SUMMARY
Wool producers in the Tumby Bay Agricultural Bureau, SA, designed a trial to compare the breeding value of members' ewe flocks, and the breeding value of some rams. A trial involving 150 ewes from 10 SA Merino flocks, and five Merino rams, was run until the shearing, at 18 months of age, of the progeny.

Keywords: Merino, genetics, progeny testing, technology transfer, producer groups.

INTRODUCTION
Wether trials and hogget competitions have been used by producer groups (Jones 1979 and Atkins et al. 1995) to learn to objectively compare sheep, and to give an indication of the breeding value of their sheep.

Flock evaluation is a technique whereby the progeny of both ewes and rams can be objectively compared. It emphasizes to producers the value of progeny testing, and removes the environmental bias inherent in wether trials and hogget competitions.

This trial shows that producer groups can run worthwhile genetic evaluations, but also highlights some difficulties. It provides a model that other groups can follow.

MATERIALS AND METHOD
Selection. Ten members selected fifteen 5.5 year old ewes, at random, from their Merino breeding flocks. The selected ewes were checked to ensure they were physically sound. The members then took their 15 ewes to the one property, Seamour.

The ewes were shorn, treated for lice and worms, ear tagged, body weighed and condition scored. The ewes were run in one mob at all times except during mating and lambing. Management of the flock was consistent with the district average.

Five rams were selected for inclusion in the trial from three local Performance Sheep Breeders.

Mating. The ewes were divided into five groups such that each group had three ewes from each member. Rams were single sire mated to each group for 5.5 weeks. The ewes were then returned to one mob.
Lambing. Eleven days before lambing the ewes were divided into their mating mobs and run separately. Ten weeks later the ewes and lambs were brought to the yards to match each lamb to its mother. For each mob in turn, lambs were separated from the ewes for a short time. The lambs were then reintroduced to the ewe mob and members identified the mother of each lamb by watching the mothering up process. Six lambs could not be mothered up and so their results were not included in the ewe analysis.

Lambs were ear tagged, and the sire and dam of each lamb recorded. The ewes and lambs were then run as one mob until weaning.

Weaning. The lambs were weaned 15 weeks after the start of lambing and shorn 10 weeks later. The progeny were run together, under commercial management, until shearing 12 months later.

Worm resistance. At 14 months of age the progeny were given an artificial challenge of worm larvae under guidance from CSIRO, Armidale, (Sandra Eady, personal communication). A month later each sheep was sampled for a faecal egg count (FEC) test.

Shearing. At 18 months old the progeny were visually classed for wool colour, wool appearance and face cover. They were shorn, fleeces weighed, and mid-side samples taken. Sheep were then weighed and wrinkle scored. Wool was sent to Turrerfield Research Centre for testing. Results were analysed by CSIRO, Armidale, by BLUP analysis which accounted for birth type (single/twin) and the relationship between animals.

RESULTS AND DISCUSSION

Members' flock evaluation. Unfortunately, there was a variation in the number of progeny from each members' flock. At shearing, five flocks were represented by seven progeny or less. For this reason the results may not be reliable and are not reported here. However, the results were discussed amongst group members.

Visual assessment. Members used the visual assessment of the progeny in their discussions. However, no analysis of the results was done.

Lambing. The lamb marking percent of members' ewes varied from 46 to 100 percent. This was strongly correlated ($R^2 = 0.65$) to the average liveweight of the ewe mobs at mating (see Figure 1). Each 1 kg of extra live weight at mating resulted in 2.0 percent more lambs marked.

Sire Evaluation. The number of identified progeny available at the first adult shearing was sufficient to give reliable evaluation of the five rams used (see Table 1).

The rams S blue 3 and S blue 55 are half brothers. When compared with the rest of their drop as hoggets S blue 3 ranked third, while S blue 55 ranked on the average. When their progeny were tested S blue 3 had an index of $24$ above that of S blue 55.
Figure 1. The association between average flock mating weight and percent of lambs marked.

Table 1. Estimated breeding value (EBV) of the five sires - deviations from the average

<table>
<thead>
<tr>
<th>Sire</th>
<th>Clean fleece weight</th>
<th>Fibre diameter (micron)</th>
<th>Body weight (%)</th>
<th>Faecal egg count (sdunits)</th>
<th>Index $^\text{A}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yantay (14)</td>
<td>5.7</td>
<td>-0.1</td>
<td>-1.2</td>
<td>0.3</td>
<td>109</td>
</tr>
<tr>
<td>NP 165 (24)</td>
<td>2.6</td>
<td>-0.6</td>
<td>1.5</td>
<td>0.2</td>
<td>109</td>
</tr>
<tr>
<td>S blue 3 (21)</td>
<td>9.0</td>
<td>0.7</td>
<td>-1.5</td>
<td>-0.03</td>
<td>108</td>
</tr>
<tr>
<td>S black 7 (10)</td>
<td>-5.4</td>
<td>0.4</td>
<td>-0.4</td>
<td>-0.1</td>
<td>90</td>
</tr>
<tr>
<td>S blue 55 (20)</td>
<td>-12.6</td>
<td>-0.3</td>
<td>1.6</td>
<td>-0.4</td>
<td>84</td>
</tr>
</tbody>
</table>

$^\text{A}$ Index calculated using a 5 percent micron premium (WOOLPLAN Option 1). Faecal egg count EBVs are not included in the index shown.

Resistance to worms. The variation in resistance between progeny of members' flocks was small. Greater variation was seen in the progeny test results of the rams.

From Table 1, S blue 55 had a FEC EBV of -0.4 and Yanta y had a FEC EBV of +0.3. This difference in FEC EBV translates into a predicted FEC of 390 epg (eggs per gram) for progeny of S blue 55, and 596 epg for progeny of Yanta y, when the average FEC for progeny from all rams was 500 epg.
Members gained experience in objectively assessing sheep, ie. in body weighing, condition scoring, mothering up lambs, faecal sampling, weighing fleeces, mid-side sampling, face cover scoring, wrinkle scoring, wool colour scoring and wool appearance scoring.

They learnt that comparing the performance of the progeny of a flock, or of a ram, is a better indication of breeding value than comparing the performance of the individuals themselves.

Among the producer group, interest in objective breeding of sheep has increased.

CONCLUSION
Flock evaluation is a practical method for producers to learn about progeny testing and objective measurement of sheep.

The members found that comparing the breeding value of a number of sires was relatively easy. However, to obtain a valid comparison between members' flocks the number of ewes submitted needed to be increased to allow for losses due to poor lambing, deaths, and unidentified lambs.

Members concluded that:
- a greater mating weight was associated with extra lambs born,
- the use of higher index rams resulted in higher performing progeny.

The trial could be repeated, using one or more link sires from this trial. The results could then be combined across years in order to obtain a better assessment of between flock variation.

The design of future trials could be changed to suit the goals of the members. Some groups may be interested in comparing sires, while others may use less sires and focus on flock comparison. In districts where worm control is not a problem, the trial could be simplified by not testing for resistance to worms.

Flock evaluations should be used more as an educational process for Merino breeders.

REFERENCES