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Producer Research Support

Comparison of Highly Fertile Ewe Crossbreeds

Mount Gambier Prime Lamb Group

The Mount Gambier Prime Lamb Group undertook a trial to compare the productivity of three crossbred ewe genotypes, with perceived higher fertility than usual, with the Border Leicester x Merino crossbred ewes that are commonly used throughout the prime lamb industry in the south east of South Australia.

Key points

- Sheep studs now offer East Friesian or East Friesian composite rams.
- EF x M ewes produced 20% more weaned lambs than BL x M ewes. BoolL x M ewes showed similar fertility to EF x M ewes, but poor lamb growth rates.
- Average lambing percentages of EF x M and BoolL x M ewes were 104 and 106, but only 96 for the other genotypes.

Contact details

Tom Ellis, Private Bag 14
MOUNT GAMBIER 5290 SA

The project

Farm consultant, David Botting, demonstrated a direct relationship between a combined index of ewe fertility and stocking rate, and prime lamb gross margins. This lead to his conclusion that the two main drivers of a successful prime lamb enterprise are:

1. ewe fertility; and
2. stocking rate.

The Mount Gambier Prime Lamb Group compared the productivity of three crossbred ewe genotypes, with the Border Leicester x Merino crossbred ewes.

The crossbred ewes used in this trial were:

1. East Friesian x Merino (EF x M)
2. East Friesian x Border Leicester (EF x BL) x Merino ((EF x BL) x M)
3. Booroola Leicester x Merino (BoolL x M) and
4. Border Leicester x Merino (BL x M)

Objectives

1. To determine whether ewes with East Friesian or Booroola Leicester backgrounds crossed with Merinos, demonstrate advantages for prime lamb enterprises over the traditional Border Leicester x Merino ewe;
2. To learn about the differences in management of highly fertile ewes, compared with Border Leicester x Merino crossbred ewes, and identify potential issues;
3. To compare the physical attributes between the different ewe genotypes, that are relevant to prime lamb production;
4. To estimate the lamb live weight and lamb carcase averages on a per hectare basis; and
5. To communicate the results to the wider farming community.

What was done

The trial was conducted on Nangwarry Station. On-farm comparisons of sheep grazed by members of the Mount Gambier Prime Lamb Group were also used.

Although David Botting's earlier work identified fertility and stocking rate as the key drivers of profitability in prime lamb enterprises, this trial focused on ewe fertility and weight of weaned lambs. Stocking rate was not taken into consideration in this trial.

Nangwarry Station Trial

880 South Australian Merino ewes were randomly divided into four groups and mated with four breeds of rams in January and February.
The four ram breeds crossed with the Merino ewes were:

1. East Friesian;
2. East Friesian x Border Leicester;
3. Booroola Leicester; and
4. Border Leicester.

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The East Friesian group were mated via artificial insemination and the other three groups mated naturally. The first cross progeny were born in June and July and were weaned and weighed in September.

The ewe progeny were grazed on Kilbride, from mid December, mated in February to Poll Dorset rams and returned to Nangwarry Station in April, where they remained for the trial.

These ewes were mated in February of two consecutive years and data for the ewes and their progeny collected for four years. The data collected included:

1. Ewe live weights;
2. Lambing percentages;
3. Weaning data;
4. Pre-slaughter live weight and fat scores;
5. Carcasse data;
6. Fleece data; and
7. Pregnancy scanning data.

The brothers of the trial ewes (the wethers) were grazed on Nangwarry Station in December and slaughtered six months later.

What happened?

1. Ewe Live Weights

During the first eighteen months, the EF x M ewes were the heaviest (at 45kgs), and the BL x M ewes were the lightest (35kgs). The other two genotypes were approximately 40kg each. By the time the ewes were two and a half years old, the live weight differences between genotypes were minimal.

2. Lamb Marking Percentages

In the first year, the EF x M ewes had an 18–22% higher lambing percentage than the other genotypes.

In the second year, the BoolL x M ewes had a lambing percentage of 106 (>120 is regarded as good), 11–22% more than the other genotypes, but lower than expected for crossbred ewes this age. In the third year, lambing percentages for all genotypes were similar, 144–148.

Average lambing percentages over the study were 104 and 106 for EF x M and BoolL x M ewes respectively, and 96 for the other two genotypes.

3. Weaning Data

Weaning data of the progeny of each of the four ewe genotypes is reported as two separate factors:

1. Average weaning weights in kilograms; and
2. Average weaning weight in kilograms per ewe mated.

In the first lambing, lambs from EF x M ewes were the heaviest. This continued with the second lambing, but differences between the EF x M ewes and the other groups, were much lower. By the third lambing, genotype data was similar, although the BoolL x M ewes were slightly lighter.

Averaged over the three lambings, the relative weaned weights of lambs are shown below, as a percentage of the BL X M lambs (taken to be 100%).

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MLA also recommends

Sheep Genetics Australia

Sheep Genetics Australia (SGA) is the national genetic evaluation service for the Australian sheep industry. It is built around the world's most comprehensive sheep genetics database, and will deliver genetic information on a fee-for-service basis.

Tel (02) 6773 2493 or
www.sheepgentics.org.au

EDGEnetwork

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Workshops cover breeding, nutrition, grazing management, marketing and selling.

Call MLA on 1800 993 343 or
www.edgenetwork.com.au

Genotype	Weaned weight of lamb	Weaned weight of lamb/ewe mated
EF x M	108	121
(EF x BL) x M	97	98
BoolL x M	93	88
BL x M	100	100

4. Pre-Slaughter Live Weight and Fat Scores

Pre-slaughter live weights were collected for second and third year drop lambs. Data was not collected on the first year drop lambs because they were not grazed as one group. Fat scores were not taken on third year drop lambs before they left the property.

The average pre-slaughter live weight of lambs taken over two years was recorded as a percentage of the BL x M ewes (taken to be 100%).

Genotype	Pre-slaughter live weight	Fat score
EF x M	107	91
(EF x BL) x M	98	96
BoolL x M	98	96
BL x M	100	100

5. Carcase Data

The second cross lambs from each of the trial groups were compared for pre- slaughter live weight, dressing percentage, carcase weight and fat score. Lambs from the EF x M ewes were heavier in both carcase weight and live weight. Lambs from the BL x M ewes had the lowest dressing percent (42), while lambs from the BoolL x M ewes had the highest (46).

6. Fleece Data

Fleece data was collected at one shearing, when the ewes were two and a half years old.

The EF x M and BoolL x M ewes cut less wool than the other two genotypes. The EF x M had the shortest, finest and lowest yielding wool of the four genotypes. Staple strength was similar and low in all genotypes.

7. Pregnancy Scanning Data

The ewes were first mated as seven-month old ewe lambs, and lambed at 12 months. In the second year, they were mated as 19 month old ewes. On the first pregnancy scan, the average number of foetuses per ewe ranged from 97% in the EF x M ewes to 56% in the (EF x BL) x M ewes. The following year, figures ranged from 156% in the BoolL x M ewes to 139% in the EF x M ewes.

The pregnancy scanning data did not correlate with lambing percentages, with up to 25% fewer lambs than foetuses scanned. In the second year the actual lambing percentages were 45-61% below the scanned figures.

This result may be explained by the following:
1. Incorrect scanning technique;
2. Death and abortion of foetus between scanning and birth; and
3. Lamb mortality after birth (eg foxes).

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Discussion

The trial indicated that EF ewe fertility was similar to BoolL ewes and slightly better than EF x BL ewes, or BL ewes. Differences observed were lower than anticipated.

Pre-weaning growth rates of lambs from EF ewes were superior to the other genotypes in the trial, which may be attributed to better milk production of the EF.

In the first year, EF x M ewes produced 20% greater weight of lamb per ewe mated than the other genotypes. The superior performance of the EF x M ewes decreased significantly over the trial, questioning its long term sustainability would be sustainable long term.

The weight of lamb weaned per ewe mated was similar for the (BL x EF) x M and BL x M ewes which is surprising, given the weight of the lamb per ewe mated advantage of the EF x M ewes.

An estimate of the weight of lamb produced on a per hectare basis was not possible because of the movement of the flock throughout Nangwarry Station.

Next Steps

While this trial demonstrates superior fertility of East Friesian and Booroola cross ewes, it also indicates that these lambs may need supplementary feeding or early weaning to retain this advantage.

Differentiation in performance decreased as the trial progressed. A trial over the ewes' complete lifetime would be required to track long term genotype advantages.

Meat and Livestock Australia
Level 1, 165 Walker Street
North Sydney NSW 2060
Tel (02) 9463 9333
Fax (02) 9463 9393
Free Phone 1800 023 100 (Australia only)
www.mla.com.au