

Evaluation of Border Leicester and Targhee Crossbred Ewes for the Pacific Coastal Northwest

THERE ARE TWO POTENTIAL BENEFITS from crossbreeding in commercial sheep production systems. One is heterosis—the superior performance for many production traits of crossbred ewes or lambs over the average performance of straightbreeds involved in the cross. Second is the opportunity to combine desirable traits of two or more breeds into the same individual. To be most beneficial, crossbreeding systems must utilize breeds that are productive and well adapted to their physical and management environment.

It is desirable that commercial ewes, when mated to meat-type sires, have a high twinning rate, shear heavy fleeces, and produce lambs with good growth potential and desirable carcasses. Commercial sheep producers need to use breeds that excel in maternal traits (fertility, prolificacy, milk production, and fleece weight) in their crossbreeding schemes.

A breed that has generated considerable interest among sheep producers in the Pacific Coastal Northwest is the Border Leicester. This breed originated in hill country on the English/Scottish border and should adapt well to Pacific Coastal Northwest conditions. It is a coarse wool (40s to 46s), openfaced breed noted for prolificacy and milking ability. Mature rams average 250 pounds and ewes average 200 pounds. With excellent feed and management, straightbred Border Leicester ewes can average a 180 percent lamb crop born with a high percentage of lambs weaned. Normally, Border Leicester lambs are fast-growing and produce desirable carcasses.

Border Leicester crossbred ewes have been used successfully in producing fat lambs when bred to meat-type sires. In Great Britain, Welsh Mountain, Scottish Blackface, and Swaledale ewes nearing the end of their productive lives under rugged hill pasture conditions are brought down

from hill farms and bred to Border Leicester rams. This move to lower elevations and better environmental conditions prolongs their productive lives. The ewe lambs from the hill ewe X Border Leicester matings are then mated to Down breed rams, mostly Suffolks, which results in the production of excellent slaughter lambs.

A similar situation occurs in Australia. Merino ewes from flocks in the arid interior of the country are moved to wetter zones near the coast in their declining years. These ewes, under the better conditions, remain productive longer and are mated to Border Leicester rams. The ewe lambs resulting from the crosses are mated in turn primarily to Dorset rams to produce excellent slaughter lambs. In recent years, large numbers of Merino X Border Leicester crossbred ewes have been exported to Middle Eastern countries to be used in improving their native sheep.

Border Leicester crossbred ewes have been studied at several university experiment stations in the United States. Results of these studies have varied considerably. At the North Dakota State University Hettinger Experiment Station, Border Leicester X Rambouillet ewes weaned more and heavier lambs than did North Country Cheviot X Rambouillet, Columbia X Rambouillet, and straightbred Rambouillet ewes. The Border Leicester X Rambouillet ewes averaged a 177 percent lamb crop weaned for the first three production years.

In Illinois, Ohio, and Kansas studies, Border Leicester crosses were not superior to crosses among the Dorset, Finn, Rambouillet, Suffolk, and Targhee breeds. In all three cases, Border Leicester crossbred ewes did not adapt well to the environmental conditions. In Illinois and Ohio, they could not withstand the heat stress and high humidity. In Illinois, very low conception rates and extreme

susceptibility to parasites were reported. Thus, the relative merit of Border Leicester crossbred ewes appears to be dependent upon environment. It is for this reason that a trial evaluating Border Leicester in comparison to Targhee crossbred ewes was started at Oregon State University in the fall of 1971.

Population and Management

In August 1971, 107 meat-type crossbred yearling ewes were allotted at random to be mated to one of two Border Leicester rams or to a single Targhee ram. Ewe lambs produced from those crosses were used in this study. The Border Leicester cross (BLX) and Targhee cross (TX) ewe lambs were first mated to Suffolk rams to lamb at one year of age. After that first year, half the ewes in each breeding group were transferred to irrigated pastures and half to dryland western Oregon hill pastures, where they remained from 1973 through 1978. Each year they were bred to Hampshire rams for a six-week mating season and were shed lambed starting on approximately February 15. Fertility, number of lambs born, number of lambs weaned, lamb weaning weight (adjusted mathematically only for the effect of lamb sex), and ewe wool weight were recorded. Management procedures for both groups are described in OSU Circular of Information 666 (1978).

Results and Conclusions

Production from the BLX and TX ewes during their first production year is summarized in Table 1. Fertility (the percent of ewes lambing of those exposed to rams the previous fall) was 93 percent and 73 percent for BLX and TX ewes, respectively. This large difference was caused in part by the fact that the BLX ewes averaged 22 days older than the TX ewes at the start of mating. (This difference was due to the mating schedule the previous year and was not the fault of the Targhee ram.)

The BLX ewes were more prolific, giving birth to 1.23 lambs per ewe lambing compared to 1.00 lamb for the TX ewes. The lambs born to TX ewes had a survival rate of 100 percent compared to 88 percent for lambs born to BLX ewes. Lambs from BLX ewes averaged 73 pounds at weaning compared to 59 pounds for lambs from TX ewes.

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Table 1. Production from Border Leicester (BLX) and Targhee (TX) crossbred ewes lambing at one year of age.

	BLX	TX
Fertility %	93	73
Prolificacy	1.23	1.00
Survival %	88	100
Ave. Weaning Wt. (lbs)	73	59
Lamb weaned per ewe exposed (lbs)	73	43
Wool per ewe (lbs)	5.0	5.5

Pounds of lamb weaned per ewe exposed to the ram were 73 pounds for BLX ewes compared to 43 pounds for the TX ewes. BLX ewes were far superior to TX ewes in lamb production as ewe lambs. It should be noted that this 30-pound advantage in lamb production from BLX ewes came largely from their higher fertility, which was probably linked to their advantage in age at the start of mating. Heavier lamb weaning weights, however, were also part of the advantage.

After the first production year, both groups had excellent fertility, as shown in Table 2. Averaged over the last five years of the study, the groups were essentially equal, 97 and 96 percent for BLX and TX ewes, respectively. The average ewe in both crossbred groups lambed on the tenth day of the lambing season, indicating no difference between groups in the ability to conceive early in the breeding season.

BLX ewes were slightly more prolific than TX ewes every year except the last year of the study, as shown in Table 3. Lambing at two through six



In six production years, the top-producing Border Leicester crossbred ewe has weaned 10 lambs weighing a total of 775 pounds and has produced 41 pounds of wool.

Table 2. Fertility of Border Leicester (BLX) and Targhee (TX) crossbred ewes from two through six years of age.

Production year	BLX	TX
2	100	100
3	100	100
4	92	87
5	92	93
6	100	100
Average	97	96

Table 3. Prolificacy of Border Leicester (BLX) and Targhee (TX) crossbred ewes from two through six years of age.

Production year	BLX	TX
2	1.64	1.62
3	1.74	1.57
4	1.95	1.81
5	2.44	2.23
6	1.66	1.77
Average	1.89	1.80

years of age, BLX ewes produced an average of 1.89 lambs per ewe lambing compared to 1.80 lambs for the TX ewes. In the last year of the study, the TX ewes produced 1.77 lambs compared to 1.66 lambs per BLX ewe. Possibly this indicates a slower decline in productivity with advancing age from the TX ewes.

Survival percentage is the number of lambs alive at weaning as a percentage of the total number of lambs born, both dead and alive. For the



In six production years, the top-producing Targhee crossbred ewe has weaned 10 lambs weighing a total of 725 pounds and has produced 52 pounds of wool.

purposes of this experiment, lambs grafted to another ewe or raised as orphans were considered fatalities. Thus survival percentages are lower than expected from well-managed commercial operations.

Lamb survival averaged over the five production years was equal from BLX and TX ewes (Table 4). From the second through the fourth production years, the survival rate for lambs born to TX ewes was essentially equal to that for lambs born to BLX ewes. In the fifth year, lambs from TX ewes had higher survival than the lambs out of BLX ewes—72 and 48 percent, respectively. In the sixth year, this difference was reversed—48 and 75 percent for TX and BLX, respectively.

Table 4. Survival percentage of lambs from Border Leicester (BLX) and Targhee (TX) crossbred ewes from two through six years of age.

Production year	BLX	TX
2	69	70
3	88	89
4	61	62
5	48	72
6	75	48
Average	68	68

Figure 1 shows the cumulative weight, from the second through the sixth production years, of lamb weaned per ewe exposed to mating for each

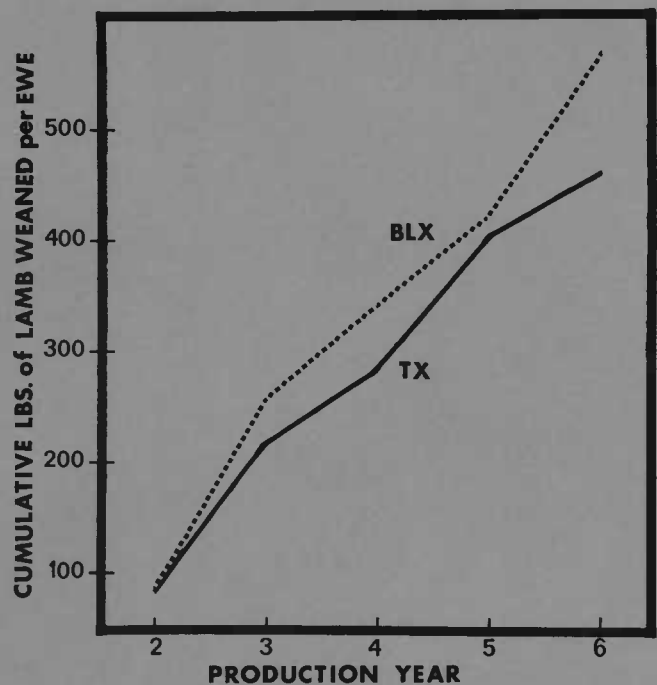


Figure 1. Cumulative pounds of lamb weaned per ewe exposed to mating for Border Leicester (BLX) and Targhee (TX) crossbred ewes.

crossbred group. BLX ewes clearly had the advantage over TX ewes. Only once did the TX ewes wean more pounds of lamb. The BLX ewes weaned an average of 114 pounds of lamb per ewe exposed per year compared to 92 pounds of lamb per TX ewe, an advantage of 22 pounds. This was due primarily to the superior fertility and prolificacy of the BLX ewes and to the increased weaning weights of their crossbred lambs.

Figure 2 shows cumulative wool production over the six years of the study. Each year, TX ewes produced more pounds of grease wool than BLX ewes. Overall, TX ewes produced an average of 7.4 pounds of wool compared to 6.3 pounds for BLX ewes.

This study indicated that under Pacific Coastal Northwest conditions, BLX ewes can produce highly satisfactory lamb crops compared to TX ewes. One of their main advantages may be pounds of lamb weaned per ewe exposed when bred at approximately seven months of age. Further studies are needed to confirm this observation. BLX ewes produced less wool than did TX ewes, but the disadvantage of producing 1.1 pounds less grease wool was overshadowed by 22 pounds more lamb weaned per year.

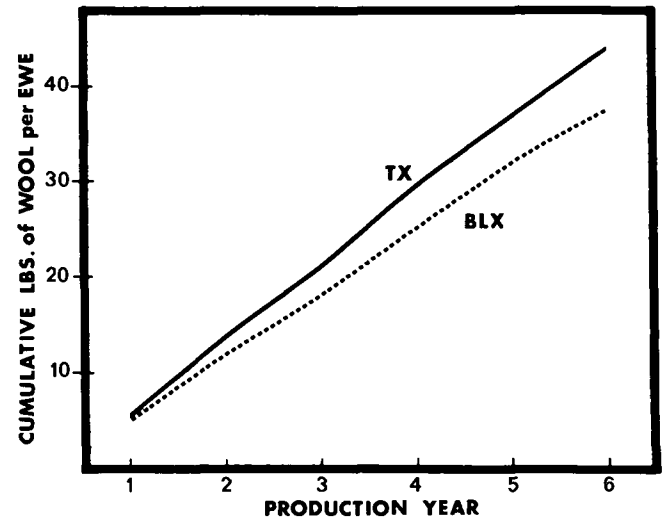


Figure 2. Cumulative wool production per ewe for Border Leicester (BLX) and Targhee (TX) crossbred ewes.

Since a limited number of ewes from few sires was used in this study, the results and conclusions should be considered as tentative. BLX ewes did, however, show promising production and warrant further consideration by Pacific Coastal Northwest producers.