# Performance of Crossbred Ewes

## study made of four types of first-cross ewes to evaluate use of rams of medium-wool, dual-purpose breeds for replacements

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**Many sheepmen** who raise replacement ewes have stopped using rams of the finewool breeds and have substituted rams of medium-wool, dual-purpose breeds.

Several medium-wool, dual purpose breeds are available, and each has strong and weak points. To evaluate the breeds critically, it is necessary to compare them under identical environmental conditions.

The performances of four types of first-cross ewes were compared for several years on the Hopland Field Station range. Dams of all ewes were of Rambouillet-Merino — finewool — breeding. Sires of the four groups were Columbia, Corriedale and Romeldale—all medium-wool, dual-purpose type—and Border Leicester which is used extensively in this type of breeding in Australia.

All ewes were bred to Suffolk sires each year and individual weights and records of all their lambs kept. They were sheared about the end of April each year and their fleece weights and grades for fineness and staple length recorded. Some difference in age of the ewes exists, as they were born over a five-year period—1948–1953—but the data are averaged in such a way that it is believed this difference will have little if any effect on the comparison between crosses. Most of the production figures used are from 1953, 1954, and 1955.

In evaluating a type of ewe, there are many considerations. For this reason, the average production figures are tabulated on this page.

Earliness of lambing is important in some areas and the median lambing date seems the best measure of this. As shown in column *2* of the table there is only a two-days' spread in median date which is not large enough to be important. Also, there was little difference in the spread of the lambing season among the four types.

Column *3* gives the per cent lambs born alive of the ewes put to the ram. Border Leicester cross leads, followed by the Columbia cross, Romeldale cross and Corriedale cross. However, the difference is less at weaning time with Columbia cross ewes weaning the highest percentage and the others all the same. Loss percentages in column *5* explain this change. High lambing percentages and high losses go together somewhat, as mortality is higher in twins than singles. Average lamb weights adjusted to an age of 120 days are in the next column. Border Leicester cross lambs were heaviest, followed by Columbia cross. Column *7* is a summary of lamb production performance. Columbia cross ewes lead, followed by Border Leicester cross, Corriedale cross and Romeldale cross. For all these lamb production figures, records for 1953, 1954, and 1955 were averaged except the lambing dates which include 1952.

Columns *8* through *12* give summaries of wool production. There is a 1½ pound spread between the high Corriedale cross and the low Romeldale cross. Columbia cross and Border Leicester cross are intermediate and close together. The percentage of fleeces in the different grades shows that the Border Leicester cross runs coarser than the others, being mainly in the ⅜ and ¼ blood, while the other three crosses grade mainly in the fine and ½ blood.

The Romeldale cross is the most uniform in grade, having no coarse end such as shows in the Columbia and Corriedale crosses.

There is a noticeable and statistically significant difference in the average clean yields of the fleeces of the four groups in column *13*. Border Leicester cross fleeces average relatively high in yield which would be expected of coarser fleeces. However, among the three finer grading types, the Romeldale is higher yielding, Corriedale second, and the Columbia cross lowest. These yield data are available for only one year, 1952, while other fleece data cover the three years, 1953–55.

From these averages for wool and lamb production various comparisons of the four types can be made according to which measurements are considered most important. However, it may be useful to use some method of reducing the total production of ewes to a single figure. Many different methods might be used for such a purpose. Two examples were calculated and are reported in columns *15* and *16*.

Index *No. 1*—column *15*—was calculated by figuring the total production of the ewe and adjusting it to the basis of production per 100 pounds of ewe. The

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**Average Production of Crossbred Ewes at Hopland**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type ewe | No. ewes on hand at shearing time, 1954 | Median lambing date | % live lambs born of ewes bred | % lambs weaned of ewes bred | % lambs lost birth to weaning | Av. 120-day wts. of lambs | Lbs. lamb at 120-day age per ewe bred | Av. grease fleece wts. | % of fleeces in fineness grades: fine | ½ blood | ⅜ blood | ¼ blood | Av. % clean yield of fleece 1952 | Av. weight of ewes at shearing 1954 | Index No. 1 | Index No. 2 |
| Columbia × finewool | 48 | Jan. 2 | 116 | 107 | 8 | 67.1 | 70.6 | 9.4 | 46.7 | 40.2 | 12.0 | 1.1 | 57.4 | 116.7 | 86.5 | 90.0 |
| Corriedale × finewool | 30 | Dec. 31 | 99 | 95 | 4 | 66.6 | 63.9 | 9.9 | 42.9 | 37.5 | 17.9 | 1.8 | 59.1 | 107.6 | 88.5 | 94.3 |
| Romeldale × finewool | 26 | Dec. 31 | 113 | 95 | 16 | 65.5 | 62.1 | 8.4 | 59.6 | 40.4 | .. | .. | 62.4 | 103 | 82.0 | 89.3 |
| Border Leicester × finewool | 24 | Jan. 2 | 122 | 95 | 22 | 68.1 | 65.8 | 9.2 | 2.8 | 11.1 | 47.2 | 38.9 | 62.4 | 116 | 82.8 | 87.9 |

## EWES

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reason for the latter is that it is considered that the production per acre of land is of greatest interest. This depends on the number of ewes that can be run which in turn depends on the size of the ewes.

The total or gross production was calculated from estimated average values for the various grades of wool and dividing by the value of a pound of lamb—18¢ was used as an appropriate average figure for the area. This was then used to convert the wool production of each ewe according to grade, to an equivalent in pounds of lamb. This was added to each ewe's actual lamb production. Conversion factors ranged from 2.3 pounds lamb per pound wool for 3/8 blood clothing wool to 3.2 for fine staple and 3/8 staple. Whether this difference is a real one to the producer depends on whether the wool can be sold at a price which depends on the grade.

The index in column *15* is an attempt to express the ability of the type of ewe to produce total income per acre.

The index averaged in column *16* is calculated the same way as Index *No. 1* except that instead of using average yield figures in figuring the wool-to-lamb conversion factors, the actual average yield figures for each cross for 1952 were used—thus giving the Romeldale and Border Leicester crosses credit for higher yielding fleeces. Whether this is a better method than Index *No. 1* depends on whether the wool can be sold at prices reflecting both grade and clean yield.

For both indexes the Corriedale cross is highest and the Columbia cross is next, the Romeldale cross being lower than the Border Leicester cross for *No. 1* and higher for *No. 2*.

It is too early to tell with certainty, but it appears that the Border Leicester cross will be the shortest lived as they are being lost from the flock faster than the others. Very few ewes of the other crosses have been lost. This criticism, if valid, is applicable only to conditions on the particular type of country represented by Hopland Field Station. It is a thin country and sheep living on it have a rugged existence, particularly during the winter and early spring months. Under other conditions or areas a difference in longevity might not be found.

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## VALENCIAS

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in the graph in column 1 and show the relation of application timing as a relatively smooth curve with the highest points in late summer and the lowest points in March or April. Statistical data show that the mean values for the percentage of total soluble solids for oranges from plots sprayed with oil in the late summer do not differ significantly from those for plots receiving the non-oil treatment. However, they do indicate that the percentage of total soluble solids of Valencia orange juice may be reduced significantly by oil spray application during the period of November through June.

It is preferable to pick mature Valencia fruit prior to applying oil spray to the orchard. That practice avoids inhibition of degreening in the fruit rind either on the tree or during the packing process and avoids any deleterious effect on the quality of the juice of nearly mature fruit. Data obtained in this study indicate that the juice quality of the 1951 crop was not reduced by spraying the trees as the fruit neared maturity. But comparison of the two sets of samples taken in 1953 shows that total soluble solids increased more in fruit from the non-oil plots from June to October 1953, than in comparable fruit from the plots in which the crop of fruit had been sprayed with oil twice.

Differences in percentage of acid were not significant for the 1952 crop, and the single significant difference in the ratio of soluble solids to acid seems to be associated more with the reduction in soluble solids than with the effect of oil spray in April on the percentage of acid. The data for 1953 show that significant reductions of the percentage of acid occurred in fruit treated with oil in the winter months and particularly in treatments in which the application timing was such that oil spray was applied twice during the development of the crop; however, the various ratios of soluble solids to acid did not differ significantly from the value for the non-oil treatment.

Percentage of juice does not seem to be influenced appreciably by varying the application timing of oil spray.

Differences in fruit yield between the non-oil plots and those sprayed with oil during the period from August through December are not significant for the total number of oranges per tree for the 1953 crop. However, the curve presented in the graph in column 2 shows a progressive decline from the high for late summer to the low for oil spray applications in June, and by January the mean number of fruits for plots treated with oil spray was significantly lower than that for plots given the non-oil treatment.

The practical importance of the influence of fruit size on yield is indicated by the values for adjusted packed box sums. The shape of the curve in the graph in column 3 is similar, in general, to that of the curve in the graph of the number of fruits per tree. There is a progressive decline from a high for late summer to a low for the month of April. However, the adjusted packed-box sums for plots sprayed with oil in March and in April were the only values lower than that for the non-oil treatment. Even these differences are not significant, whereas the mean values for the number of fruits per tree for seven of the months and for field boxes per tree for six of the months are significantly lower than the mean values for the non-oil treatment.

The addition of 4 ppm of the isopropyl esters of 2,4-D to dilute aqueous oil spray mixtures applied in the summer appears to offer some advantage as a means of reducing the drop of mature fruit during the succeeding crop season, but the advantage was not sufficient to be reflected as an increase in any of the expressions of yield. The addition of 2,4-D did not provide any benefits with respect to the percentage of total soluble solids or to the number of fruit borne by the tree.

The data for percentage of fruit in size classes show that oranges from trees sprayed with oil are larger than those from trees which received the non-oil treatment. Also, the data indicate that the presence of spray oil on the Valencia orange tree in the spring affects the function of the tree in some way which culminates in a much smaller number of larger oranges; however, the net result in terms of yield is less.

Since oil spray is applied to citrus trees for pest control, timing of the application should be governed primarily by pest populations to obtain the maximum control efficiency. Experience with the scale insect and mite pests currently in citrus orchards of the coastal plain of southern California indicates that late summer is likely to be favorable for control of these pests by means of oil spray.

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