MATING PATTERN OF MAIDEN CROSSBRED EWES MATED ALONE OR IN FLOCKS OF MIXED AGES

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Summary

In an experiment in northern Victoria maiden Border Leicester x Merino ewes were mated either alone or in flocks of mixed ages containing 33 or 66% of mature ewes. In spring only 65% of the maiden ewes were mated with rams over a mating period of 10 weeks whereas 97% of similar ewes mated in a six week period in autumn. In autumn, but not in spring, the incidence of returns to service in maiden ewes rose from 17 to 36% as the proportion of mature ewes was increased from 0 to 66%.

I. INTRODUCTION

The Border Leicester x Merino ewe is the predominant dam used in the Australian prime lamb industry. In northern Victoria crossbred ewes are commonly joined in October. Such early matings are accompanied by variable service and mating results (Cannon and McConchie 1963). Killeen and Dawe (1966) found that oestrus activity of crossbred ewes did not commence until December in southern New South Wales. However Cannon and Bath (1971) have reported consistent mating performances from earlier joinings of maiden ewes (November and December) in north-eastern Victoria.

On commercial properties the results of early joining are unpredictable, particularly in maiden ewes. Kelliher and McConchie (pers. comm.) recorded that an early mating of maidens was more successful when they were run with mature ewes than when they were mated separately. This paper reports an experiment at Kyabram Irrigation Research Station in northern Victoria in which the effects of the presence of mature ewes on the mating performance of maiden ewes in spring and autumn were measured.

II. MATERIALS AND METHODS

The observations were made on 616 Border Leicester x Merino ewes which were purchased as 12 month old maidens at Hay, New South Wales in August 1970 and 310 multiparous ewes of the same breed but five to seven years old which had been at Kyabram for a number of years.

The mating performance of the maiden ewes was compared in spring and autumn when they were joined either alone (Groups A and D) or with mature ewes where maidens comprised two-thirds (Groups B and E) and one-third (Groups C and F) of the flock. A random procedure was adopted for allotting ewes of both age groups from stratified liveweight classes to the treatment groups.

The ewes were joined with rams during a ten week period from October 27, 1970 to January 7, 1971 (spring) and for a six week period from March 3, 1971 to April 14, 1971 (autumn). All ewes had been shorn in 1970 prior to mating; the mature ewes in June and the maiden ewes in August.

The Dorset Horn rams used in the study were four years old and had been chosen because they were physically sound and had semen of good quality. The four rams used in each of the three groups of ewes joined at each mating time were fitted with Sire-Sine harnesses and crayons to identify matings. Occurrence of mating was recorded weekly. The rams were rotated between mating groups every 14 days.

Each group of ewes was joined on plots which were 2.8 ha in area. The plots on which Groups A and D were mated was isolated by a distance of 0.5 km from the plots where the other groups were mated. All groups were introduced to their plots

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at least a fortnight before the introduction of rams. After the mating periods the ewes were run in one flock and lambed together.

The main components of the annual pasture on all plots were *Lolium rigidum* Gaud., *Trifolium subterraneum* L. and *Hordeum leporinum* L.. Hay was provided to avoid major weight loss in all groups during mating; the amounts provided were adjusted according to live weights which were recorded each fortnight.

The proportions of ewes which mated and the returns to service in the different treatments were compared by $\chi^2$ analysis.

III. RESULTS

(a) Live weight

The maximum difference in mean live weight that occurred between ewes of similar age at a particular time in any of the groups was 2.5 kg. During the spring mating the mean live weights of the mature ewes varied between 62 and 66 kg while that for the maiden ewes varied between 44 and 50 kg. Live weights of all ewes were lower at the autumn mating than at the spring mating. Live weights of mature and maiden ewes were 51 and 38 kg respectively at the commencement of the period of autumn mating and rose to 58 and 45 kg at the end of mating.

(b) Oestrus

Only minor differences were found in the patterns of oestrus activity within ewe groups of comparable age during each mating period. Accordingly the service data from all three groups were pooled for maiden or mature ewes, and Figure 1 shows the cumulative numbers of ewes joined during each season.

![Graph showing cumulative % of ewes marked during each joining period.](image)

Fig. 1. Cumulative % of ewes marked during each joining period.

maiden ewes: autumn , spring
mature ewes: autumn  , spring
It can be seen from Figure 1 that the onset of oestrus was delayed for two weeks at the spring joinings in both age groups and only 8% of maidens and 40% of mature ewes mated during the first three weeks. After 10 weeks 97% of the mature ewes had been served compared with 65% of maidens. In autumn 88% of maidens and 96% of mature ewes had displayed oestrus within the first three weeks of joining.

(c) Returns to service

The return to first service data for the maiden ewes at the spring and autumn matings are shown in Table 1. In autumn, but not in the spring, the incidence of returns to service of young ewes rose as the proportion of mature ewes in the flock increased. In Group F 36% of maiden ewes returned to service at the autumn mating while in Group D only 17% of maidens returned ($\chi^2 = 8.34, P < 0.01$). This effect was even more marked in young ewes served in the first two weeks of the autumn mating period: when 50% of the mated maidens returned to service in Group F compared with only 17% of those in Group D.

There was no difference between seasons in the proportion of maiden ewes returning to service when they were mated alone (Groups A and D). On the other hand, seasonal differences in the returns to service of maiden ewes were statistically significant when they were with mature ewes (Groups B and E $\chi^2 = 9.67, P < 0.01$; Groups C and F $\chi^2 = 13.99, P < 0.001$).

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Mating performance of the maiden flocks in spring and autumn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mating period of maiden ewes</td>
<td>Oct. 27 to Jan. 7</td>
</tr>
<tr>
<td>Group*</td>
<td>Group A</td>
</tr>
<tr>
<td>Number of ewes</td>
<td>153</td>
</tr>
<tr>
<td>Ewes mated (%)</td>
<td>63.4</td>
</tr>
<tr>
<td>Returns to service</td>
<td>1/7</td>
</tr>
<tr>
<td>Returns to service (%)</td>
<td>17.5</td>
</tr>
</tbody>
</table>

* Maiden ewes comprised 100, 66 and 33% of the ewes in either Groups A, B and C or Groups D, E and F respectively.

IV. DISCUSSION

The increased incidence of breeding activity in crossbred ewes in autumn compared with spring matings in this experiment was similar to the seasonal effect described by Fletcher et al. (1970). That this was an effect of season—rather than an effect of liveweight—was evident from consideration of the liveweights of the ewes since both maiden and mature ewes tended to be lighter at the autumn joining. The work of Fletcher et al. (1970) and Killeen (1967) has shown that plane of nutrition does not appear to affect the onset of oestrus in crossbred ewes, provided they maintain liveweights above 40 kg.

At both times of joining the rates of service of mature ewes exceeded that of maiden ewes. The difference was most marked at the spring mating. It seems unlikely that failure to have reached puberty could have been the cause of the poorer performance of young ewes since they were well grown at the spring joining and were 14 months old. Cannon and Bath (1969) found that in February in north-eastern Victoria 98% of 10 month old maiden ewes exhibited oestrus and 83% of them lambed. Thus there appears to be an age by season interaction affecting the incidence of oestrus behaviour in young ewes. Whether this spring anoestrum was of behavioural or physiological origin needs to be examined.
The increased returns to service observed in young ewes joined in flocks of mixed ages in autumn is a finding of particular importance in the development of management procedures for breeding young ewes. The appearance of this effect when maiden ewes were mated with a high proportion of mature ewes in autumn but not in spring may have been a result of the higher initial incidence of breeding activity at the autumn joining and may indicate the importance of competition between maiden and mature ewes for rams.

At lambing (unpublished data) the percentage of ewes which did not lamb when young ewes were joined alone or with mature ewes showed a similar pattern of return to service. Thus ewes which returned to service must have subsequently conceived.

It is concluded that to achieve a high lambing percentage young maiden ewes should be joined separately in autumn rather than in flocks of mixed ages.

VI. ACKNOWLEDGEMENTS

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VI. REFERENCES