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Shearing and time of joining effects on reproduction in two-tooth ewes

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ABSTRACT
The effects of three times of shearing on fertility of ewes joined in either early March or early April were investigated. Ewes were shorn either 4 or 2 weeks before joining or remained unshorn throughout. Ewe fertility was increased by shearing 4 weeks before joining compared with the other shearing treatments. Joining ewes in April increased fertility. It is concluded that ewes should be shorn at least 4 weeks before joining and joined in April rather than March if lamb production is to be maximised.

INTRODUCTION
Shearing two-tooth ewes prior to joining can affect the number lambing (McClure, 1960). Large increases have consistently been obtained in medium sized ewes gaining weight after shearing (Wodzicka-Tomaszewksa and Dobbie, 1967). Although these latter authors suggested beneficial effects from shearing up to 6 weeks before joining, the optimum time has not been determined. A higher proportion of shorn two-tooth ewes lamb if mated in April rather than March (Knight and Hight, 1976) but it is not known if this occurs in unshorn ewes.

The aim of this trial was to determine the effects of three times of shearing on the reproductive performance of two-tooth ewes joined in either March or April.

EXPERIMENTAL
Two-tooth Romney ewes were randomised on initial live weight (February 12) into 6 groups in a factorial design (n = 115 N = 690). Shearing times were 4 (S4) or 2 (S2) weeks prejoining and at least 2 weeks post-joining for controls (US). Joining was for 6 weeks beginning on either March 12 (MJ) or April 9 (AJ), 1981. tupping, ovulation rate, joining live weight and lambing data were recorded and were analysed using the ‘GLIM’ statistical package.

RESULTS
Live Weight
Ewes lost live weight (adjusted to February 11 shearing date for all groups) after shearing but maintained live weight throughout joining. Mean initial and joining live weights were 45 kg and 41 kg respectively. Shearing treatment had no effect on joining live weight but MJ ewes were 2 kg heavier (P<0.001) than AJ ewes at joining.

Joining live weight had positive (P<0.01) effects on numbers of ewes: mated over the first fortnight of joining; mated during joining; returning to service; lambing to first service; lambing; lambing multiples; and negative (P<0.01) effects on lambing date.

Mating
Shearing reduced the number of ewes mated over the first fortnight of joining at both times of joining (P<0.05). Over the full period, 95% of the ewes were mated and main effects were not significant (Table 1). Shearing reduced the number of MJ ewes returning to service (9% v 27% P<0.01) but had no effect on AJ ewes (19% v 18%). Multiple ovulation rate was reduced by shearing (9% v 20% P<0.05). Time of joining had no effect on multiple ovulation rate.

<table>
<thead>
<tr>
<th>Main effects</th>
<th>First fortnight</th>
<th>Full period</th>
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<tbody>
<tr>
<td>Shearing</td>
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<tr>
<td>4 weeks</td>
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<td>96</td>
</tr>
<tr>
<td>2 weeks</td>
<td>44</td>
<td>96</td>
</tr>
<tr>
<td>Unshorn</td>
<td>56</td>
<td>*</td>
</tr>
</tbody>
</table>

Joining
March        | 27             | 95          |
April        | 71             | ***         |

Lambing
First-service conception rate and percentage ewes lambing/ewes joined was improved in S4 ewes compared to S2 and US ewes (P<0.001) (Table 2). Time of joining had no effect on ewes lambing to first service but the percentage ewes lambing/ewes joined was higher in AJ than MJ ewes (P<0.01) (Table 2). Shearing reduced the number of multiple births (4% v 10% P<0.01) but time of joining had no effect (Table 2). Overall, percentage lambs born/ewe joined was highest for S4 and AJ ewes.
(Table 2). Time of shearing had no effect on lambing date (mean = September 8) but MJ ewes lambed earlier than AJ (August 28 v September 17, \( P<0.001 \)).

### TABLE 2 Shearing and time of joining effects on ewes lambing (%)

<table>
<thead>
<tr>
<th></th>
<th>ELFS/ EM</th>
<th>EL/EJ</th>
<th>ELM/ LB/EJ</th>
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</thead>
<tbody>
<tr>
<td><strong>Main effects</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Shearing</td>
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<tr>
<td>4 weeks</td>
<td>83</td>
<td>88</td>
<td>3</td>
</tr>
<tr>
<td>2 weeks</td>
<td>70</td>
<td>77</td>
<td>4</td>
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<tr>
<td>Unshorn</td>
<td>62</td>
<td>72</td>
<td>10</td>
</tr>
<tr>
<td><strong>Joining</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>69</td>
<td>75</td>
<td>6</td>
</tr>
<tr>
<td>April</td>
<td>75</td>
<td>84</td>
<td>5</td>
</tr>
</tbody>
</table>

**ELFS** = Ewes lambing to first service  
**EL** = Ewes lambing  
**ELM** = Ewes lambing multiples  
**LB** = Lambs born  
**EM** = Ewes mated  
**EJ** = Ewes joined

**Weaning**
Shearing had no effect on lamb survival or weaning weight. Lamb survival was higher in AJ ewes compared to MJ ewes (88% v 81% \( P<0.05 \)) but weaning weights were similar for lambs of the same age.

**DISCUSSION**
These results show that significant increases in two-tooth fertility occur in medium-sized ewes shorn 4 rather than 2 weeks prior to joining. In addition, ewes shorn 2 weeks prior to joining were no more fertile than ewes remaining unshorn throughout joining. These results were consistent in both March and April joined ewes.

Although ewes in this trial lost weight after shearing the number of ewes lambing was not reduced by shearing. This contrasts with earlier survey results which indicated that post-shearing weight loss in medium-sized two-tooth ewes was likely to decrease the number of ewes lambing compared to unshorn ewes (Wodzicka-Tomaszewska and Dobbie, 1967). It is clear that factors other than live weight change can affect fertility responses to shearing. In this trial higher joining live weights increased the likelihood of ewes lambing for all shearing treatments.

The reduction in numbers of unshorn ewes lambing was mainly due to an increase in mated ewes failing to lamb rather than more ewes failing to mate. Post-fertilisation failure appears to account for repeated conception failure in unshorn two-tooths (Inkster, 1959). Why shearing 4 rather than 2 weeks prior to joining enhances embryo survival remains unresolved.

Delaying joining until April increased the number of ewes lambing as early as well as the number of ewes lambing and agrees with earlier findings (T. W. Knight, unpublished).

Multiple ovulation rate was decreased by shearing. Large reductions have also been reported for ewes shorn 1 day prior to joining (Inkster, 1959). However, shearing 24 days prior to joining did not reduce multiple ovulation rate (R. A. S. Welch, unpublished). Recent trials at Whatatwata have shown extremely variable responses in multiple ovulation rate following prejoining shearing of two-tooth ewes (T. W. Knight, unpublished). The reduction in multiple birth rate following shearing was small but significant and agrees with earlier work (Wodzicka-Tomaszewska and Dobbie, 1967). However, more lambs were born per ewe joined for shorn ewes in this trial.

Shearing had no effect on mean lambing date. Shorn two-tooths have consistently lambed earlier in other trials where joining was longer than 12 weeks (I. J. Inkster, unpublished). The finding that April ewes lambed only 20 days later than March joined ewes even though joinings were 28 days apart agrees with other work (T. W. Knight, unpublished). This was due to the faster onset of mating activity and improved fertility in the later joined ewes.

It is concluded that shearing two-tooth Romney ewes 4 weeks before joining increases fertility compared with shearing 2 weeks before joining or not shearing. The response is consistent with ewes joined in March or April. Delaying joining until April improves fertility and lamb survival but delays lambing.

**ACKNOWLEDGEMENTS**
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