Effects of location and source of ewes and rams on the onset of oestrus in Romney ewes

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ABSTRACT

Differences in onset of oestrus in Romney ewes has been observed between locations at similar latitudes in the North Island. Two experiments compared source of ewes and rams, and time of transfer of ewes between locations on the onset of oestrus in Romney ewes. In Expt 1, groups of 30 ewes were interchanged between Wanganui and Takapau on 14 Nov, 5 Dec and 8 Jan. The next day these ewes plus 30 local ewes were joined with 3 Poll Dorset rams. There were no effects of ewe source but ewes at Takapau joined on 15 Nov, 6 Dec and 9 Jan had earlier onsets-of-oestrus than ewes at Wanganui ($P<0.05$ to $P<0.01$). Ewes joined on 15 Nov and 6 Dec at Wanganui had a later ($P<0.01$) onset of oestrus than ewes joined on 9 Jan. In Expt 2, 60 ewes and 3 Poll Dorset rams were interchanged between Wanganui and Poukawa on 13 Nov. These ewes plus 60 local ewes were randomly divided in half and recombined to form 2 mixed groups which were joined with 3 Poukawa or 3 Wanganui Poll Dorset rams. Onset of oestrus was earlier at Poukawa ($P<0.001$) and for ewes joined with Wanganui rams ($P<0.001$) but there were no effects of ewe source.

Keywords Oestrus, breeding season, teaser rams, Romney ewes, location, ewe source.

INTRODUCTION

Knight *et al.*, (1989) found differences in onset of oestrus and ovarian activity between Romney ewes at 4 locations which could not be accounted for by differences in latitude or altitude. Muir *et al.*, (1989) transferred ewes between Wanganui and Takapau on 15 November and found the earlier onset of oestrus at Takapau was independent of the source of the ewes.

The results of two experiments presented in this paper show the differences in onset of oestrus in Romney ewes between Wanganui and research stations in Hawkes Bay were not due to ewe or ram genotype and differences in oestrus activity occur even when ewes are transferred in December and January.

MATERIALS AND METHODS

The locations were Wanganui Research Station (Wanganui, latitude 39° 54'S, longitude 175° 20'E, altitude 30-270 m); Takapau Research Station (Takapau; latitude 39° 57'S, longitude 176° 19'E, altitude 335 m); Poukawa Research Station (Poukawa; latitude 39° 45'S, longitude 176° 45'E, altitude 50 m). In both experiments the ewe management at each location was similar and groups were separated from each other and other ewes and rams by at least one paddock. Rams were fitted with harnesses and crayons and mating marks were recorded weekly and crayon colours changed every 2 weeks.

Experiment 1

At both Wanganui and Takapau 180 mature Romney ewes were randomised into 6 groups. Groups of 30 ewes were interchanged between Wanganui and Takapau on 14 Nov, 5 Dec and 8 Jan. The next day the newly arrived 30 ewes and 30 local ewes were weighed and joined together with 3 Poll Dorset rams. Ewes joined at the different dates were grazed separately from each other.

Experiment 2

In early Nov 120 mature Romney ewes at Wanganui and at Poukawa were weighed and randomized into 2 groups. On 13 Nov, groups of 60 ewes were interchanged between Wanganui and Poukawa. At the same time but using different transport, groups of 3 Poll Dorset rams were interchanged between Wanganui and Poukawa. On 15 Nov the 60 Wanganui ewes and 60 Poukawa ewes at each location were randomly divided in half. Thirty Wanganui ewes and 30 Poukawa ewes were joined together with either 3 Poukawa or 3 Wanganui rams.

Statistical Analysis

Cumulative percentages of ewes mating at each date were analysed using Kolmogorov-Smirnov tests for comparisons between paired cumulative frequencies. In experiment 1, none of the ewes from Takapau joined on 6 Dec. at Wanganui were mated despite ewes from Wanganui in the same group being mated and ewes from Takapau joined on 15 Nov and 9 Jan at Wanganui being mated. There was no explanation for the failure of this group of Takapau ewes to be mated and as such these ewes were left out of subsequent analysis.

RESULTS

Experiment 1

Takapau ewes were heavier ($P<0.001$) than Wanganui ewes (15 Nov, 57.5± 0.8 vs 49.3 ± 0.6 kg; 6 Dec, 55.3 ± 0.7 vs 52.6 ± 0.6 kg; 9 Jan, 60.9 ± 0.8 vs 51.0 ± 0.7 kg). A comparison of onset of oestrus at the 2 locations for ewes from Takapau and Wanganui joined on 15 Nov and on 9 Jan indicated no differences between ewes from the 2 sources and in subsequent analysis they were pooled.

There was an earlier onset of oestrus and a higher proportion of ewes mated at Takapau than Wanganui for ewes joined on 15

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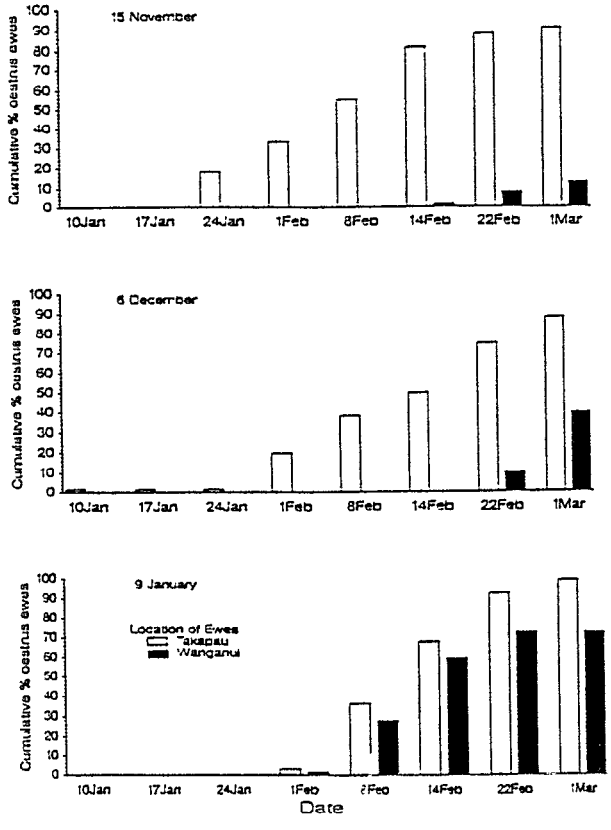
FIGURE 1 Cumulative percentage of ewes marked by the Poll Dorset teaser rams at Takapau and Wanganui when joining occurs on 15 Nov, 6 Dec and 9 Jan in Expt 1. Ewes from Wanganui and Takapau have been pooled at each location.



Nov (P<0.001) and 6 Dec (P<0.001) (Fig 1). The onset of oestrus activity was similar at both locations for ewes joined on 9 Jan but a higher (P<0.05) proportion of ewes were mated at Takapau. No ewes were mated before 30 Dec. The median intervals from joining to first oestrus for ewes joined on 15 Nov, 6 Dec and 9 Jan were 75, 70 and 32 days at Takapau and >117, >86 and 33 days at Wanganui.

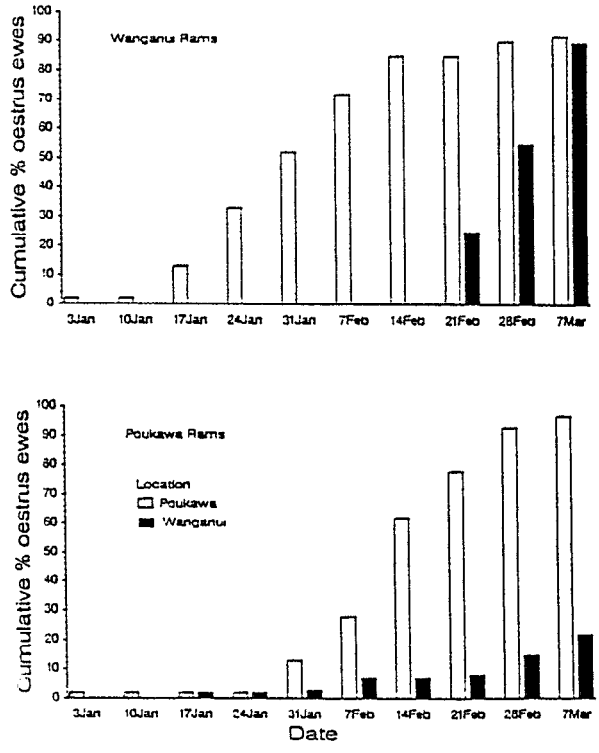
Onset of oestrus and proportion of ewes exhibiting oestrus were higher for ewes at Wanganui joined on 9 Jan than on 15 Nov (P<0.001) or 6 Dec (P<0.01) (Fig. 1). There were no differences in oestrus activity between these two earlier dates of joining. At Takapau the onset of oestrus was earlier for ewes joined on 15 Nov than on 6 Dec (P<0.01) or 9 Jan (P<0.01) despite the overall proportion mated tending to be higher for ewes joined on 9 Jan.

Experiment 2

There were no differences in liveweight between Poukawa (52.3 ± 0.5 kg) and Wanganui (53.4 ± 0.6 kg) ewes. Since source of ewes had no effect on onset of oestrus at either location, ewes from Wanganui and Poukawa were pooled in subsequent analysis.

Onset of oestrus was earlier and proportion of ewes mated was higher (P<0.001) at Poukawa than Wanganui (Fig. 2). No ewes exhibited oestrus before 26 Dec. The median dates of oestrus at Poukawa and Wanganui were 3 Feb and 3 March respectively or 80 and 108 days after joining. Ewes joined to Poukawa rams had a later (P<0.001) onset of oestrus at both Poukawa and Wanganui than ewes joined to Wanganui rams (Fig. 2). At Wanganui there was also a lower total proportion of ewes mated by ram's from Poukawa.

FIGURE 2 Cumulative percentage of ewes marked by the Poll Dorset teaser rams from Wanganui and from Poukawa for ewes at Poukawa and Wanganui in Expt 2. Ewes from Wanganui and Poukawa have been pooled at each location.



DISCUSSION

Earlier onset of oestrus in ewes at the two Hawkes Bay locations was not because of differences in genotype of the ewes or rams. This confirms findings by Muir *et al.*, (1989) that difference in onset of oestrus at Takapau and Wanganui was independent of ewe source. Similarly, differences in onset of oestrus between locations was not associated with any environmental, photoperiod or animal management differences occurring before the 6 Dec. Factors influencing the onset of oestrus at the different locations may only apply to ewes after joining and the critical period may be in early January when ewes are becoming receptive to rams. A number of management, environmental and social interactions between animals have been identified as modifying the response of ewes to teaser rams over the joining period (Smith *et al.*, 1989).

At Wanganui, ewes joined on 15 Nov and 6 Dec had slower onset of oestrus than ewes joined on 9 Jan. This suggests these early joined ewes had become refractory to the rams running with them. Ewes becoming refractory to rams has been reported (Riches and Watson 1954), but has usually been in Merino ewes where rams have stimulated ovulations and then the ewes have returned to anoestrus despite the continuous presence of rams. It is possible that fresh rams introduced on 9 Jan would have stimulated the early joined ewes to exhibit oestrus at the same time as those joined on 9 Jan. Knight (1990) found continuous contact with rams from mid-Dec did not prevent an oestrous response to the introduction of fresh rams in mid-Feb. In contrast

to the ewes at Wanganui, those at Takapau did not appear to become refractory to the rams.

The later onset of oestrus and overall lower proportion of ewes mated by the Poukawa rams compared with Wanganui rams probably reflects differences between ram strains in libido and/or ability to stimulate ewes into oestrus (Smith *et al.*, 1989).

ACKNOWLEDGEMENTS

Messrs G.T Wallace and A. McConachy and Miss A Death for technical assistance.

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