

THE REPRODUCTIVE PERFORMANCE OF MAIDEN EWES IN THE MULGA ZONE OF SOUTH-WESTERN QUEENSLAND

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ABSTRACT

Maiden ewes were joined with 3% of young inexperienced rams and another with 3% of older experienced rams in two successive years. The reproductive performance of the ewes was not influenced by the age of the rams. Pre-natal and post-natal losses of 11.6% and 20.0% respectively were recorded. Liveweight at joining influenced the reproductive performance of the ewes in one year of the two that observations were made.

INTRODUCTION

Quantitative studies of factors limiting the reproductive performance of sheep in mulga lands are lacking. Gibb (1963) and Ebersohn (1972) imply that nutritional aspects are important in Queensland. Ebersohn (1972) noted that breeding is mainly restricted to those properties with an appreciable area of watercourse frontage country. Even so, reproductive performance in these favoured areas is still poor (average 53.3% lambmarking for Queensland's mulga country over a period of ten years—Anson pers. comm.).

The relative infertility of maiden ($1\frac{1}{2}$ to $2\frac{1}{2}$ year old) ewes is well documented (Barton 1947; Moule 1960; Turner and Dolling 1965), and is no less a problem in mulga country. This infertility has been attributed to failure to mate or to conceive, and to pre- and post-natal lamb losses (Barton, 1947; Alexander and Petersen, 1961). Two recent reports (Blokey and Cumming, 1970; Connors and Giles, 1970) indicate that most reproductive losses in maiden ewes are due to mating failure.

The influence of ram age on flock fertility is not clear. Terrill and Stoehr (1939), Wiggins, Terrill and Emik (1953) and McMEniman and Beasley (1970) could find no interaction between age and fertility whereas Haughey (1959) did find a positive relationship between ram age and fertility. Also, Lightfoot and Smith (1968) found that older rams were more fertile than $1\frac{1}{2}$ -year-olds when joined at 50 ewes per ram, but not when joined at 25 ewes per ram.

The following experiment was conducted on a mulga-river frontage property over two years to determine the areas of reproductive wastage in maiden ewes and to examine the influence of ram age on ewe fertility.

MATERIALS AND METHODS

(a) Location, sheep and management

The observations were carried out on a property 177 km west of Charleville, Queensland. The vegetation on the experimental area was mulga (*Acacia aneura*) woodland on the slopes grading into a mixed Box (*Eucalyptus populnea*)—Gidyea (*Acacia cambagei*) creek frontage. The rainfall during the two years of observations was 294.6 mm and 258.1 mm for 1969 and 1970 respectively. In 1970, 66.5 mm of rain fell during the first week of joining.

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Maiden ewes of medium wool Peppin Merino origin were joined with 3% of rams, either young and previously unmated (2 to 2½ years old), or older (3½ to 5½ years old) experienced rams (Groups 1 and 2 respectively). Each group was depastured separately in paddocks of approximately 1,220 ha, and joined during the last week of April for 8 weeks in 1969 and 6 weeks in 1970. Lamb marking occurred approximately six weeks after lambing had ceased.

(b) Observations

Rams were fitted with ewe marking harnesses and crayons (Radford, Watson and Wood, 1960), and mating records were taken fortnightly. Ewes in both groups were weighed off pasture at the commencement of joining in 1969. In 1970, only Group 1 ewes were weighed at the commencement and end of joining.

Pregnancy diagnosis was carried out on all ewes during the last month of pregnancy, using a foetal blood flow detector.† Lamb survival data and lactation status of the ewes were recorded at lamb marking. Lamb losses were calculated using the combination of pregnancy diagnosis and lamb marking data.

(c) Analyses

The reproductive data were analysed by chi-square, with correction for continuity for all 2 × 2 tables. The liveweight data were analysed using analysis of variance.

RESULTS

The reproductive performance is shown in Table 1; there were no significant differences due to experience of rams in either year.

Pooled reproductive data for both years are shown in Tables 2 and 3. In both years the pregnancy rate of ewes which returned to service was significantly lower than that of ewes that did not ($P < 0.05$) (Table 2).

TABLE 1
The reproductive performance of maiden ewes mated to experienced rams (I) and young rams (II)

Group	Mated		Pregnant		Reared Lamb		Total
	No.	%	No.	%	No.	%	
1969 I	375	98.8	315	83.1	240	63.3	379
II	178	98.9	158	87.8	127	70.6	180
Total	553	98.9	473	84.6	367	65.7	559
1970 I	546	98.2	494	88.8	365	65.6	556
II	242	95.7	214	84.6	175	69.2	253
Total	788	97.4	708	87.5	540	66.7	809

No significant differences between groups or years.

TABLE 2
The reproductive performance of maiden ewes that mated once and mated more than once

Group	Pregnant		Reared Lamb		Total
	No.	%	No.	%	
†1969 Mated once	398	87.3*	310	68	456
Mated more than once	67	78.8	51	60	85
1970 Mated once	598	91.0*	463	70.5	657
Mated more than once	111	84.7	89	67.9	131

* Mated once significantly greater than mated more than once in 1969 and 1970 ($P < 0.05$).

† In 1969 the ewes were joined for eight weeks. The records from the sheep mated during the last fortnight of joining have not been included in these results.

‡ Sonicaid-Allard International, Bucks, UK.

TABLE 3
The reproductive performance of ewes which mated during the first fortnight and ewes which mated during the subsequent fortnights of the joining period

Group	Pregnant		Reared Lamb		Total
	No.	%	No.	%	
1969 Mated 1st fortnight	319	89.4*	259	72.6	357
Mated subsequent fortnights	79	79.8	51	51.5	99
1970 Mated 1st fortnight	454	93.4*	352	72.4	486
Mated subsequent fortnights	144	84.2	111	64.9	171

* Mated 1st fortnight significantly greater than mated subsequent fortnights in 1969 ($P < 0.05$) and 1970 ($P < 0.01$).

Table 3 shows that in both years the pregnancy rate in ewes mated during the first fortnight of joining was significantly higher than that of ewes mated later.

In both years a high percentage of ewes had mated by the end of the first fortnight of joining (78.3% in 1969 and 74.0% in 1970), indicating that most of the ewes were experiencing regular oestrous cycles when joined. Pooling the data in Table 1 showed that 2.0% of ewes did not mate, 11.9% mated and failed to lamb, and 23.2% lambed and failed to rear the lamb.

The mean liveweight of the ewes at the beginning of joining was 35.3 kg in 1969 and 26.7 kg in 1970 (Table 4). Liveweight at the beginning of joining had no influence on the reproductive performance of ewes in 1969, but in 1970 some associations between these parameters were observed. Ewes mated during the first fortnight of joining and not returning to service were significantly heavier than those that did not mate. In addition ewes which reared a lamb were heavier at joining than ewes which did not mate or those mated but not lambing.

In 1970, ewes increased their liveweight by an average of 8 kg during the period of joining, due to the increased forage availability after the rain in April of that year.

TABLE 4
The influence of liveweight at joining on subsequent reproductive performance of maiden ewes

	Liveweight kg	
	1969	1970
1. Mated first fortnight—no return to service	35.4	27.0
2. Mated second or third fortnight—no return to service	34.8	26.3
3. Returns to service	35.2	26.2
4. Not mated	34.7	24.1
5. Mated but did not lamb	34.7	25.7
6. Lambed and lost lamb	35.2	26.4
7. Reared lamb	35.4	27.1

For 1970: 1 > 4 $P < 0.05$
 7 > 4 and 5 $P < 0.05$

DISCUSSION

Age and previous experience of rams had no effect on the reproductive performance of ewes in either year, confirming previous work in south-western Queensland (McMeniman and Beasley, 1970). The ram percentage used in this experiment (3%) may have masked any age effect, since Haughey (1959), who reported a positive ram age/ewe fertility relationship, used a low ram percentage (approximately 1%), while

Lightfoot and Smith (1968) found that the effect of ram age, noted when 2% of rams were used was not evident when 4% of rams were used. Authors who found no effect of ram age on ewe fertility (Wiggins, Terrill and Emik, 1953; McMeniman and Beasley, 1970) used more than 2% of rams, and these results suggest that age of ram does not influence ewe fertility, providing the ram percentage is 3% or greater.

Ewes that mated during the first fortnight of joining and did not return to service had higher conception rates and reared significantly more lambs than ewes that mated later and did not return to service. Lamb rearing percentage was also higher in this class than in ewes which returned to service. Both of these relationships may have been due to differences in liveweight at joining, the heavier ewes mating earlier and having fewer pre- and post-natal mortalities. From Table 4, it is evident that liveweight at joining did influence reproductive performance of the ewes in 1970 but not in 1969. The prejoining nutritional status and consequently the liveweight of the ewes was much lower in 1970 than in 1969 (26.7 vs. 35.3 kg). However, during the joining period in 1970 the nutritional status of the ewes improved and their liveweight increased by an average of 8 kg over the joining period. Coop (1962) found that barrenness increased in ewes with a joining liveweight less than 36.3 kg. However, Suiter and Fels (1971), who showed that increased joining liveweight led to increased numbers of lambs born, failed to detect any critical joining liveweight. If a critical weight existed in the ewes in this experiment it must have been below 35 kg, the average liveweight in 1969 when no liveweight/reproductive performance relationships were detected.

Fertilisation failure is important in northern Queensland (Entwistle, 1970), and could have occurred here since 11.9% of the ewes mated but failed to lamb. Lamb losses in 1969 and 1970 were very similar (18.9% and 20.8% respectively), and were not related to joining liveweight. Closer management of the lambing maiden ewe may be one method of alleviating some of these losses.

That nutritional status at joining and during pregnancy influences the reproductive rate of ewes in mulga lands has been shown (McMeniman, 1972); it is concluded that if the ewe at joining weighs between 30 and 35 kg and has enough forage for pregnancy, improved lambmarking percentages can be attained.

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