

Improving Merino sheep reproductive performance in the NSW rangelands

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Pregnancy scanning is a key enabling component of a suite of management interventions that can increase the net reproduction rate (NRR, lambs weaned per ewes joined) of sheep flocks (Young *et al.* 2016). These interventions include differential nutritional and lambing management of single and twin-bearing ewes and informed ewe culling and selection decisions. These interventions were developed in high rainfall and mixed farming regions and are increasingly being used in those regions to actively manage breeding ewes. The applicability of these interventions to improve NRR of sheep enterprises in the NSW rangelands is unknown. Rangelands enterprises typically have large paddock sizes, difficulty specifically targeting the nutrition of twin-bearing ewes and extended joining periods, compared to the high rainfall and mixed farming regions. This paper presents the average reproductive performance of four rangelands sheep enterprises for five seasons before the start of a three-year Producer Demonstration Site (PDS) project (Pregnancy scanning in extensive sheep flocks). The aim of the PDS is to demonstrate that pregnancy scanning for foetal number together with wet and drying ewes at marking can be used to optimise breeding ewe management, identify and retain ewes with proven reproductive performance and increase the NRR of extensive flocks with extended joining periods.

A key component of the PDS is collecting a comprehensive suite of reproduction data from producers undertaking an on-farm mob comparison. A benchmarking questionnaire was designed to capture property, sheep enterprise, and general flock husbandry details and the past performance of the sheep enterprise. The past five-year performance (maiden and adult ewes) comprised the number of ewes joined, ram percentage, pregnancy scanning results, lambs marked, lambs weaned and ewe mortality. General comments and seasonal conditions were also recorded. The four properties are located within the western Riverina (between Hay and Darlington Point) and Western NSW (north of Wentworth and west of Wilcannia). Average rainfall is winter dominant, low (260 - 404 mm across the four properties) and highly variable. The total area of the properties ranges between 7,900 to 64,409 ha with 96 - 99% of the total area available for grazing and an average paddock size from 450 to 2,832 ha (Table 1). The smallest of the flocks has 3,052 breeding ewes and the largest 30,000 with stocking rates between 0.12 to 0.58 sheep per hectare.

Table 1. Total area (ha), average paddock size (ha) standard reference weight (SRW¹, kg), breeding ewes (hd), average NRR (%) and average ewe mortality (%) for four extensive sheep properties in western NSW from 2016 to 2020

Property ID	Total area (ha)	Ave. paddock size (ha)	SRW (kg)	Breeding ewes (hd)	NRR (%)	Ewe mortality (%)
1	31,504	450	60	3,865	45.9	2
2	64,409	2,832	65	7,335	47.0	11
3	7,900	718	55	3,052	47.7	unknown
4	52,000	1,500	70	30,000	77.8	3

¹SRW is the liveweight of a mature, bare shorn, dry ewe in condition score 3.

Each of the properties experienced dry to drought conditions for most of the past five seasons. The number of ewes joined was reduced in three of the four flocks. Containment areas (fenced sections of a property where stock are lot fed) were used to maintain numbers in the fourth flock. In 2018, one property did not join, and another joined only after late rain and lambed during summer in less-than-ideal conditions. Poor conception rates occurred twice in one of the flocks following atypical summer rainfall negatively impacting ewe performance. The five-year average NRR of the four flocks ranged from 45.9% to 77.8%, with ewe mortality between 2 and 11% (Table 1). An important outcome from collating and reporting the past performance of the four flocks was identifying that some key sheep reproductive data was not collected. In situations when key husbandry events coincide, like shearing and weaning, weaner numbers were not recorded due to a lack of labour. Where data was collected, it was not always stored in a format easily accessible for analysis and year-to-year comparison of flock reproductive performance. The benchmarking process has highlighted the need to develop data capture processes for sheep reproduction data to identify underlying issues and monitor the impact of new management practices. The four properties have each selected a control and a trial mob and will commence a paired comparison of reproductive performance for two breeding cycles starting with a six- or seven-week joining in late 2021 or early 2022.

References

Young JM *et al.* (2016) *Animal Production Science*. **56**(07): 669-678.

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