Riverine Plains Barooga demonstration site

Comparing pasture quality and persistence and liveweight gains in clover and lucerne based pastures.

Background

This project aims to use the latest research on pasture species and management, to promote the use of perennial pastures within farming landscapes and increase resilience in dry seasons.

A species demonstration and grazing demonstration were established at Savernake and Barooga, respectively, in May 2023. These two demonstration sites aimed to showcase best-practice pasture management to build greater resilience for farmers in central and southern New South Wales.

Aim

To demonstrate the benefits of rotationally grazing lucerne for improving pasture persistence, pasture quality and animal production.

Method

The site consisted of two 10 hectare dryland paddocks, "A3 West" and "A3 East", which were sown to 9 kg/ha lucerne (cv L70) and 6 kg/ha arrowleaf clover (cv Zulumax) in late May 2023. Two irrigated 20 ha paddocks, "A7 West" and "A7 East", which were sown to lucerne in 2019, were also included as part of the demonstration.

Farming enterprise

Size — Approximately 1,200 hectares (ha).

Mixed farming — Producing first cross lambs from Merino ewes and Border Leicester rams, lambing in April–May.

Cropping — Winter cropping rotation includes wheat, canola and barley. Summer cropping rotation includes rice and corn.

Pasture quality samples were collected on 9 October 2023, 19 January and 14 March 2024. As the A3 West and A3 East paddocks were sown to the same species and treated similarly, quality samples were combined across both paddocks.

Lucerne quality samples from both A7 West and A7 East were also combined for measurement. Lucerne and arrowleaf plant density, composition and biomass were collected on 9 and 30 October 2023 (data not shown) and 14 March 2024.

Table 1: Barooga grazing demonstration site pasture quality.

	NEUTRAL DETERGENT FIBRE (NDF) - NIR	ACID DETERGENT FIBRE (ADF) - NIR	CRUDE PROTEIN (CP) - NIR	DRY MATTER DIGESTIBILITY (DMD) - NIR	CALCULATION OF METABOLISABLE ENERGY (ME) - NIR
	%	%	%	%	MJ/kg DM
Mid October 2023					
Lucerne - A3	23.2	13.1	22.1	83.9	13.1
Lucerne - A7	23.3	14.7	25.4	85.1	13.1
Arrowleaf clover - A3	27.7	15.4	20.3	79.0	11.8
Grass weeds - A3	41.6	23.3	12.0	80.5	12.0
Mid January 2024					
Lucerne - A3	25.8	18.5	26.8	81.4	12.5
Lucerne - A7	26.5	19.2	25.0	80.4	12.3
Mid March 2024					
Lucerne - A3	45.2	30.9	18.5	67.3	9.7
Lucerne - A7	37.9	27.1	24.1	71.4	10.6

Note: Pasture quality samples analysed on a dry matter basis by near-infrared spectroscopy (NIR).

Results

Pasture quality was relatively similar between the A3 lucerne and A3 arrowleaf clover (Table 1). The lucerne quality was also similar between the A3 and A7 paddocks. The volunteer grasses in the A3 paddocks were predominantly annual ryegrass, and had higher NDF and lower CP and ME than the legumes, reflecting their poorer quality.

Lucerne and arrowleaf clover plant density remained stable over the grazing period, indicating appropriate sowing rates and grazing management (Table 2). The only notable decline in lucerne density over the summer occurred in A3 West, where the grass weeds population had increased by March 2024. Arrowleaf clover plants were not present in the A7 paddocks (not sown), or in March in the A3 paddocks due seed dormancy. As such, arrowleaf clover density (Table 2) and composition were zero at this time (data not shown).

Table 2: Grazing demonstration site–plant density.

	End October 2023		Mid March 2024	
	Lucerne	Arrowleaf clover	Lucerne	Arrowleaf clover
	(plants/m²)			
A3 West	56	27	34	0
A3 East	46	30	41	0
A7 West	104	0	90	0
A7 East	98	0	87	0

The lucerne in A7 West and A7 East maintained almost 100% composition across all dates (data not shown). This, combined with the fact that the lucerne in these paddocks was more established and irrigated, likely contributed to its greater biomass at each sampling date (Figure 1). The late-summer dormancy of arrowleaf clover may have contributed to the lower total biomass in A3 West and A3 East during March.

Rotational grazing of all paddocks between October to March attributed to the decline in biomass between measurements (Figure 1). Similar weight gains were achieved for both mobs of wether lambs over the grazing period (data not shown).

Summary

Selecting the best sowing rate, species, and cultivar of pastures for your region and farming system, and rotationally grazing perennial pastures, is important for maximising pasture persistence and production. Lucerne provides a relatively high-quality feed option over summer, with quality being greatest in spring and declining through to autumn. Well managed perennial plants are valuable for extending the growing season and carrying livestock over summer, given their extensive root system and summer activity.
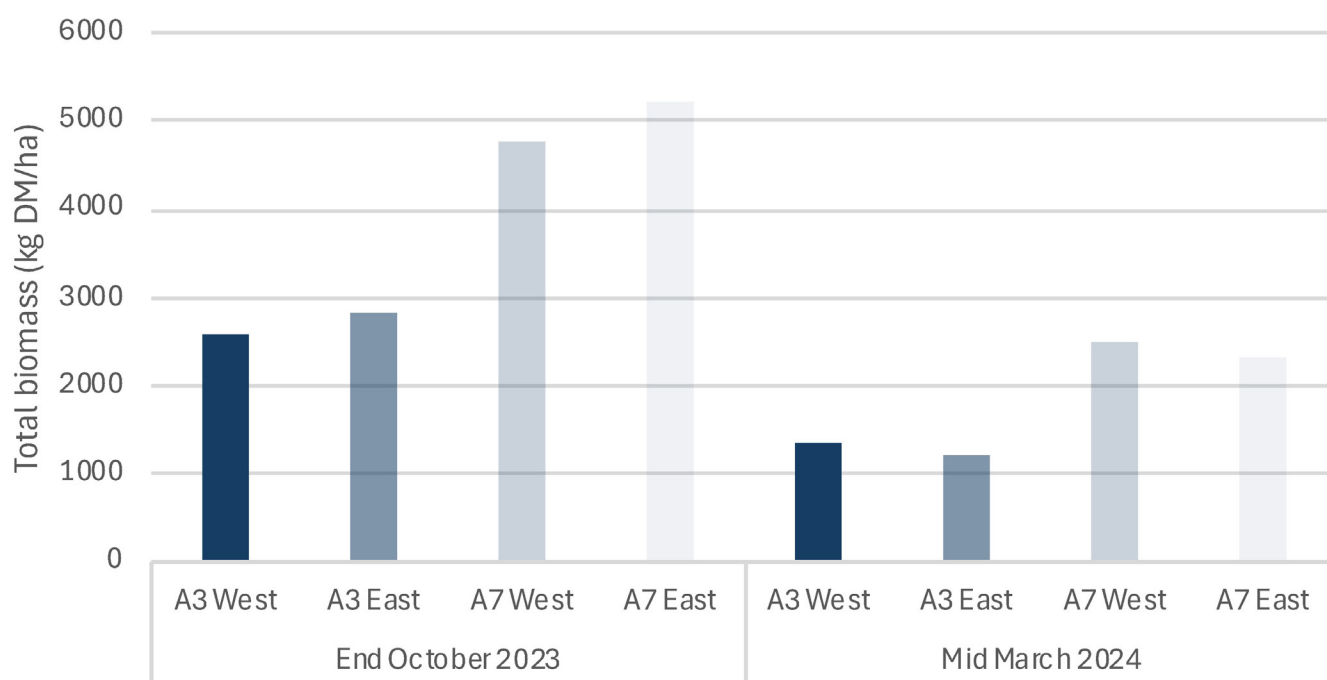
Figure 1 Barooga grazing demonstration site total biomass (kg DM/ha) for each paddock.

For more information

Details about the demonstration sites, as well as the results, are published in Research for the Riverine Plains, 2024.

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