

Dryland pasture legumes to meet feed demand

Growing red meat productivity through the selection and establishment of perennial legumes

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John and Kate Simpson: *Horfield*, Northern Midlands

Background

John and Kate Simpson purchased *Horfield* 5 years ago and since that time have been experimenting with pasture mixes to fill feed gaps. Like many mixed cropping/grazing enterprises, juggling cropping rotations and the availability of water for irrigating fodder or pasture has been a challenge. In addition, seasonal rainfall patterns at Nile leave paddocks waterlogged in winter and extremely dry and compacted in summer. The challenge is to find a dryland pasture mix that can grow feed to support their agistment heifers and increase feed base diversity across the farm. The Simpsons use short rotation ryegrass and clover pastures in their irrigated cropping rotation to provide feed through winter. These areas can be opportunistically irrigated as other crops on the property are harvested and water becomes available. However, the dryland areas of their property prove to be more difficult as they struggle to support traditional ryegrass and clover pastures.

Sowing a dryland perennial pasture mix

In autumn 2023, the Simpsons trialled two different pasture mixes following a canola crop (Table 1). The paddock was cultivated twice prior to sowing on 22 April with an Amazon Cirrus-disc air seeder. Unfortunately, the TIA perennial pasture mix was sown at double the rate it should be, so true comparisons between the two mixes cannot be attained. However, we can still see the general trends and track the feed quality differences between the two mixes.

Table 1. Pasture mixes trialled at *Horfield*.

Diverse pasture mix	TIA perennial pasture mix
13.9 kg/ha perennial ryegrass	6.6 kg//ha cocksfoot
8.3 kg/ha tall fescue	4.4 kg/ha phalaris
2.7 kg/ha chicory	8.8 kg/ha red clover
2.8 kg/ha red clover	2.2 kg/ha strawberry clover
2.8 kg/ha persian clover	2.2 kg/ha chicory
1.7 kg/ha timothy grass	

Establishment

Autumn establishment in 2023 was very slow at *Horfield*. The Autumn break came late and by this time, soil temperatures had dropped, meaning a very slow and late establishment of the sown perennial pasture. The chicory and clover content in the pasture mixes were particularly affected by these cold conditions as they favour sowing into warmer soil temperatures (>10°C). John and Kate noticed that the higher sowing rate and plant numbers in the TIA mix appeared to suppress weeds in the trial strip, which may have aided the establishment of the pasture.

Snapshot

- John and Kate Simpson, *Horfield*, Nile Tasmania
- 230 ha mixed cropping and heifer agistment enterprise
- 115 ha irrigated
- 626 mm annual rainfall
- Running agistment heifers (450-480 from May to November with 200 keep all year round).
- The Simpsons have a strong emphasis on growing feed for agistment heifers that can tolerate winter waterlogging and persist in hot dry summers



Above: TIA Research Fellow, Rowan Smith in the Simpson's dryland pasture sown 22/04/2023.

Pasture composition

Pasture cuts were taken from each pasture mix in mid-November 2023 and the dry matter composition of each mix was calculated (Figure 1). We found that 72% of dry matter in the diverse pasture mix consisted of ryegrass and the TIA mix contained 21% background ryegrass. In addition, the TIA mix contained a higher legume and chicory content compared to the diverse mix. Although background ryegrass was the dominant grass component of the TIA mix, phalaris (13%) and cocksfoot (12.3%) were also present.

Feed quality differences

Feed test results from samples taken in mid-November are displayed in Table 2. The results show that the TIA pasture mix had a lower Neutral Detergent Fibre (NDF) percentage and higher Crude Protein (CP), Dry Matter Digestibility (DMD) and Metabolizable Energy (ME) compared to the Diverse pasture mix. As perennial ryegrass flowers and turns reproductive the quality in the feed drops quickly. The legume component of a pasture maintains good quality even when the plant senesces. Chicory is also known to have very good feed quality characteristics and the deep rooting nature of this species means that it can access moisture at depth in the soil profile. The added feed quality from the legumes in pasture mixes can help to maintain pasture quality during the reproductive phase of grasses. This is evident in the feed test results for the two mixes trialled here. We will continue to monitor feed quality and pasture composition changes at this site.

Table 1: Feed test results for the two pasture mixes.

Sample Date	Pasture Mix	NDF %	CP %	DMD %	ME MJ/kg DM
13 th November 2023	TIA Pasture Mix	41.9	16.4	72.9	10.8
	Diverse Pasture Mix	49.9	12.1	69.4	10.2
6 th February 2024	TIA Pasture Mix	53.7	12.5	60.3	9.1
	Diverse Pasture Mix	55.9	10.6	60.1	8.3

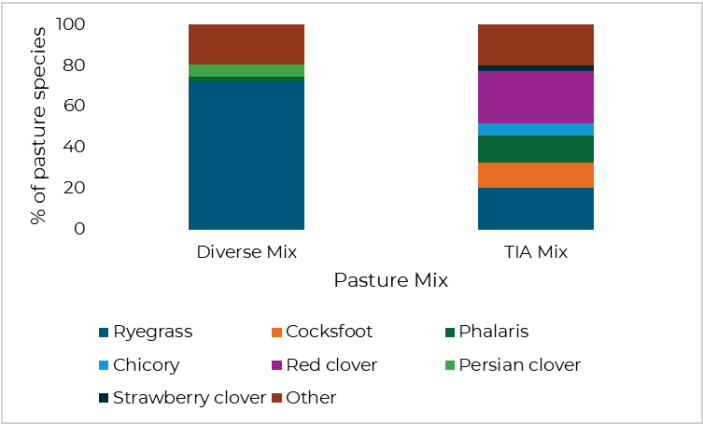


Figure 1: Comparison of dry matter contribution (%) of pasture mix components for two pasture mixes sown.

KEY POINTS

- Feed base diversity across farm can help fill the seasonal feed gaps.
- Having a higher legume content in pastures leads to prolonged feed quality when traditional ryegrass pastures senesce.
- Soil temperatures play a key role in establishment of legumes and chicory.
- Deep rooted dryland pasture mixes may offer a feasible alternative to irrigating forage crops for summer feed.



Left: Establishing chicory plant in mid-September under attack from Red Legged Earth Mite. Right: Side by side comparison of the two pasture mixes; the 'Diverse pasture mix' on the left and the 'TIA pasture mix' on the right. Picture taken early January 2024 after being grazed mid-December 2023.

Scan for more project info



Next steps in Involve and Partner

- We will continue to follow the Simpsons progress over the coming months.
- Further Involve and Partner sowings will continue in the mid-low rainfall region of the midlands.

This project was co-funded with Meat & Livestock Australia. For more information please contact: Rowan.Smith@utas.edu.au or visit our project page www.utas.edu.au/tia/research/research-projects/projects/growing-red-meat-productivity-through-the-selection-and-establishment-of-perennial-legumes

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