Pasture case study: sown annual vs regenerated perennial

LANDHOLDER: Ben Zander

LOCATION: Angaston, SA

ANNUAL RAINFALL: 600mm

FARM SIZE: 250ha

ENTERPRISES: Vineyard, sheep, beef cattle

In 2012 Ben Zander sowed a perennial based pasture mix in one of his paddocks. He sowed most of the same paddock to a basic annual pasture multi-species mix in May 2023. This allowed an in-paddock comparison between the two pasture types throughout the 2023 growing season.

Background

Ben runs a mixed farm focussing on grape and livestock production. His livestock enterprises include 450 Corriedale ewes and 80 Hereford cows, which graze dedicated pasture paddocks. The sheep also graze his vineyard (40ha) for three months of the year.

The traditional feedbase of Ben's pasture paddocks are perennials (primarily phalaris and cocksfoot), however in the last few years he has resown some paddocks to annuals so to increase feed and fodder production for his livestock.

Pasture comparison

In 2012 Ben sowed a 3.5ha pasture paddock to a mix of phalaris, cocksfoot, perennial ryegrass, and sub clover. The paddock was rotationally grazed, with hay or silage made when the season allowed. In some years it has been over-sown with annual ryegrass to boost production. In addition, barley grass and silver grass has also started to 'creep' into the paddock.

On 26/5/23, 3.0ha of the paddock was sown to a basic multi-species annual pasture mix at 100kg/ha which included:

1. Oats (at 75kg/ha)
2. Annual ryegrass: (three varieties at 8kg/ha)
3. Balansa clover: (at 7kg/ha)

Key messages

- Compared to the regenerated perennial, the annual pasture had significantly increased late season production and quality
- Making silage helped clean up barley grass and silver grass

This allowed an in-paddock comparison of the 2023 sown annual pasture with the regenerated perennial-based section that was sown in 2012 (0.5ha).

March 2024

Pasture production

The annual and perennial pasture sections of the paddock were separately assessed for dry matter production throughout the 2023 growing season (Table 1).

Table 1: Effect of pasture type on dry matter production during the growing season

	Dry matter (kg/ha)		
	29/6/23	**13/9/23**	**11/10/23**
Sown annual	400	2200	6850
Regenerated perennial	2150	2400	4520

On 29/6/23, the perennial pasture produced 1750kg DM/ha extra production – this was not unexpected given the established perennials immediately responded to the rainfall break in mid-April, versus the annual pasture which was only sown in late May.

The paddock was grazed in mid-July and again in mid-August (stock had access to the whole paddock when grazing) before being 'locked up'.

When assessed on 13/9/23 both pastures had similar production. However, on 11/10/23 the annual section had significantly extra (2330kg DM/ha) production (Table 1, Figure 1).

The annual section of the paddock was cut for silage on 30/10/23 and baled two days later. It yielded 8.6t/ha, which is equivalent to 5.0t DM/ha (at 42% moisture).

Pasture quality

To measure feed quality, samples from each pasture type were collected on 13/9/23 and 11/10/23. At both dates, the crude protein of the annuals was 6% higher compared to the perennials (Table 2).

This is due to the high legume content of the annuals. For example, on 13/9/23 the annuals were composed of 25% balansa clover, while the perennials had zero clover content.

Figure 1: Sown annual pasture on 11/10/23

Table 2: Effect of pasture type on crude protein and metabolisable energy in spring

	13/9/23		11/10/23	
	Crude protein (%)	**Metabolisable energy (MJ/kg DM)**	**Crude protein (%)**	**Metabolisable energy (MJ/kg DM)**
Sown annual	27.9	12.3	18.9	11.2
Regenerated perennial	21.9	11.9	12.7	9.5

At both sampling dates, metabolisable energy (energy content in the feed) was higher for the annuals compared to the perennials - particularly on 11/10/23 which was 1.7 MJ/kg DM higher (Table 2). The silage cut from the annual section of the paddock was also tested for quality, with the crude protein being 14.2% and metabolisable energy, 10.3 MJ/kg DM. Both these values are considered above average quality for silage of a similar type (i.e., grass/legume silage that is grass dominant).

Summary and future pasture plans

This paddock demonstration highlighted that the sown annual pasture had significantly increased late season production and feed quality compared to the regenerated perennial pasture. However, as it was sown in late May, it produced low early season production and therefore did not help fill the early winter feed gap that traditionally occurs in the region.

The seed cost of Ben's annual pasture mix was $230/ha. When making pasture sowing decisions, the seed and sowing costs (including cutting and baling costs if making fodder) must be considered relative to the expected yield and quality. For this paddock, Ben was comfortable in his decision to sow an annual pasture as it allowed him to:

- Produce feed and fodder that was both high yielding and high quality
- Help 'clean' the paddock of problem grasses (barley grass, silver grass) through making silage
- By producing fodder on farm (instead of sourcing off-farm) it alleviated the biosecurity risk of weed seeds potentially being introduced onto the property

In future, Ben plans to continue to sow some of his pasture paddocks to a similar annual pasture mix (i.e., oats/ryegrass/clover), to not only provide high quality feed, but minimise barley grass and silver grass seed-set through making fodder (in conjunction with a pre-sowing knockdown herbicide). Once a paddock is relatively clean of problem grasses, Ben would like to sow it to a high performing perennial-based pasture mix (focussing on phalaris, cocksfoot and chicory). Once established, the perennial pasture would then save on yearly seed/sowing costs and will better utilise out-of-season rainfall (compared to annuals).

Australian Government Department of Agriculture, Water and the Environment
Future Drought Fund
SA DROUGHT HUB

This project received funding from the Australian Government's Future Drought Fund