



# Mixed pasture species at Mangoplah

## *What mix of perennial and annual pasture species provides maximum productivity, profitability and resilience to drought?*

Pasture mixes in southern NSW in recent times have become highly annualised. Over time, perennial pasture systems have degraded, increasing vulnerability during drought periods.

A productive perennial pasture can support the agronomic and economic performance of the farming business by maintaining ground cover and soil health whilst reducing the demand for supplementary feeding. However, finding the optimal mix of species is required.

## Aim

Assess the long-term persistence capabilities of various perennial and annual pasture species mixes and fertiliser combinations by comparing their productivity and resilience in the Riverina region.

## Site

This trial site is located at the Barrett family's property in Mangoplah, NSW. It was established in May, 2023, by Holbrook Landcare Network as part of the SNSW Innovation Hub's Resilient Pastures project funded through the Future Drought Fund.

## Treatments

The trial included 5 pasture mixes of various species (Phalaris, serradella, sub-clover, lucerne and chicory – Table 1) with each main plot split in half — half receiving 100 kg/ha Mono-Ammonium Phosphate (MAP), and the other half 245 kg/ha Single Super Phosphate (SSP). Each species/fertiliser treatment was replicated 3 times. Plots were 8 m x 108 m.

Challenges were experienced at site establishment, including slug and other pest damage, followed by unseasonably wet conditions. This made site access extremely difficult, delaying timeliness of pest management.



In addition treatments outlined in Table 1, the site is now looking to include different N management options across sub-plots. In coming seasons, the site will be monitored for biomass production, pasture composition and plant density.

**Table 1: Treatments used in the Mangoplah mixed species trial.**

Each species treatment is split, with half receiving 100 kg/ha Mono-Ammonium Phosphate (MAP), and the other half 245 kg/ha Single Super Phosphate (SSP).

Species Treatment	Cultivar	Sowing Rate (kg/ha)
1	Holdfast GT Phalaris	4
	Avila Serradella	5
2	Holdfast GT Phalaris	4
	Stamina GT5 Lucerne	3
	Monti Sub Clover	3.6
	Campeda Sub Clover	3.6
3	Holdfast GT Phalaris	3
	Puna Chicory	1.5
	Stamina GT5 Lucerne	1.5
	Monti Sub Clover	2.7
4	Campeda Sub Clover	2.7
	Puna Chicory	4
	Sardi Grazer Lucerne	5.94
	Monti Sub Clover	2.7
5	Campeda Sub Clover	2.7
	Holdfast GT Phalaris	4
	Monti Sub Clover	3.6
	Campeda Sub Clover	3.6

## What will this tell us?

This site will investigate the risks associated with annual grazing systems and the impacts of drought periods. The outputs of this trial will improve understanding of the key management actions that support persistence in a perennial pasture system.

Furthermore, a frequent decision to be made by farmers is the timeliness of nitrogen application (fertiliser-based) seasonally and to support pasture production during autumn/spring seasons.

As the conversation around mixed pastures continues to evolve, the application of urea typically follows suit. The topic of nitrogen fixation through subclover is commonly raised as a process of providing nitrogen to a pasture base, as compared to the economic and environmental impacts of applying a fertiliser such as urea. It's well known that establishing and maintaining a legume in a pasture stand will provide nitrogen to the system through nitrogen fixation – a process that generally has a long-term effect. However, it is also understood that applying nitrogen fertiliser to a pasture stand with a component of legume, will adversely affect the legume content, albeit, with a short-term result of increased pasture production.

This addition to the site is aimed at displaying a 'side by side' comparison of the varying ways to source nitrogen to a pasture, concerning short-term and long-term production effects.

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### For more information

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