



# Pasture selection and its impact on sheep production in Temora

*How do commercially available pastures (subclover, annual medic, lucerne, cocksfoot and phalaris) differ in productivity and impact sheep production over a range of seasonal conditions at Temora?*

## Introduction

Pasture species selection either, alone or in mixes will determine the overall availability of dry matter produced in a pasture system.

The impact of dry seasons and drought will further impact the dry matter production and create feed gaps that need to be filled by supplementary feeding.

GrassGro software was used to compare the growth patterns of selected perennial and annual pasture species to determine the effects on a sheep enterprise at Temora across a range of seasons.

The data used in the whole modelling analysis by Dr Susan Robertson analysed pasture and seasonal data from the time span of 1970–2019 for the Temora region.

The practice of mixing annual and perennial species endeavours to broaden the growth curve of a given pasture by exploiting differences in root structures. Ultimately providing access to deeper soil moisture, as well as differences in growth patterns across the growing season.

The results in this simulation do not consider the establishment costs of pastures. Actual pasture costs in systems need to be considered as this will affect the interpretation of results.



Figure 1: Lucerne in the Riverina.  
Photo credit: Geoff Minchin

Stocking rates for the enterprise at Temora have been set at 3.5 Merino ewes/ha, joined to a Dorset ram. This is an example of a common enterprise for the region. The results of modelled pasture growth in poor, average and good seasons can be seen in Figure 2.

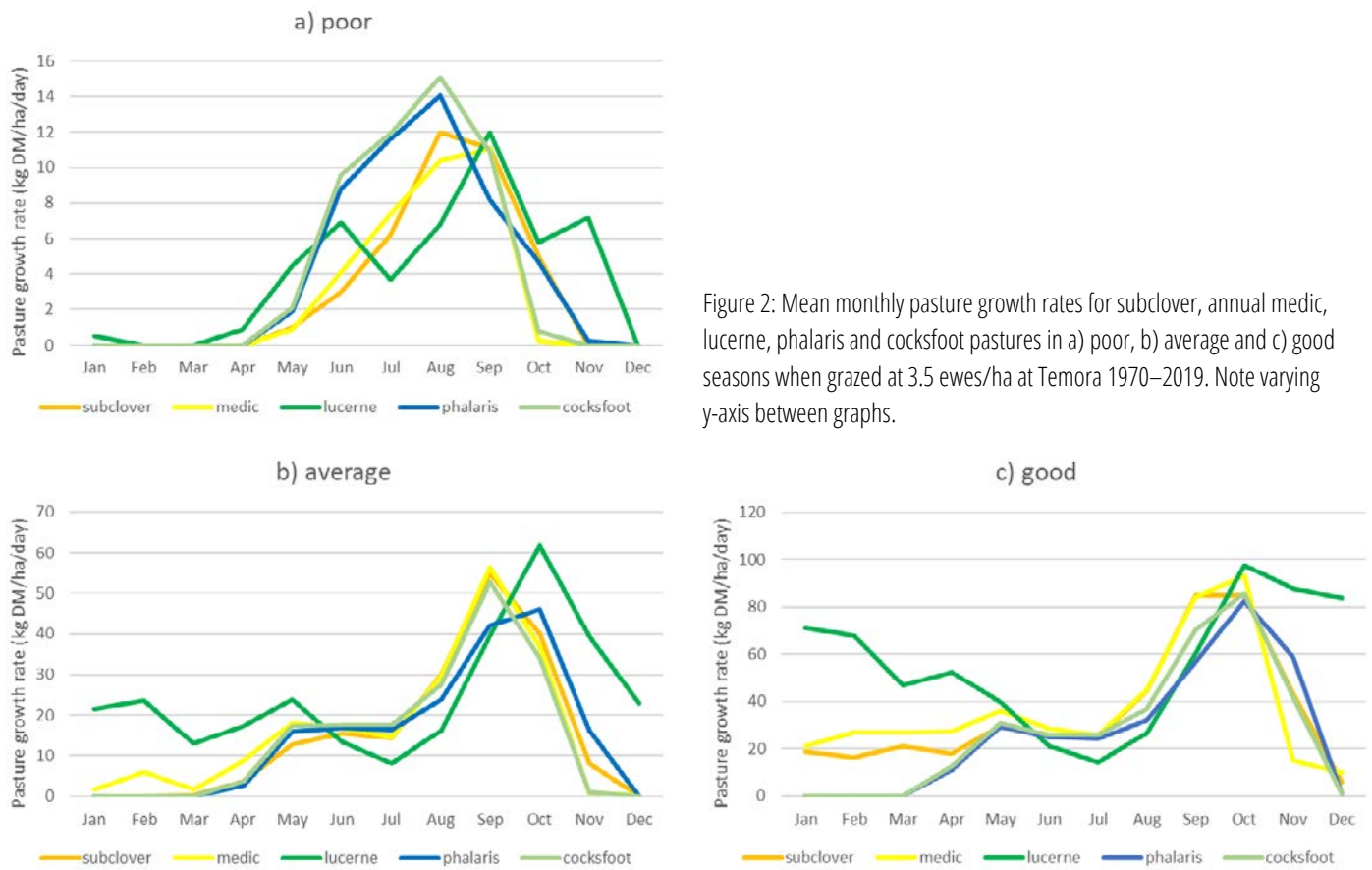


Figure 2: Mean monthly pasture growth rates for subclover, annual medic, lucerne, phalaris and cocksfoot pastures in a) poor, b) average and c) good seasons when grazed at 3.5 ewes/ha at Temora 1970–2019. Note varying y-axis between graphs.

Due to lower feeding costs and higher weight at selling, the Lucerne median gross margin was \$154/ha higher than any other pasture species (Figure 3). Subclover and medic pastures produced sheep enterprise gross margins greater than phalaris and cocksfoot in average and good seasons (Figure 3).

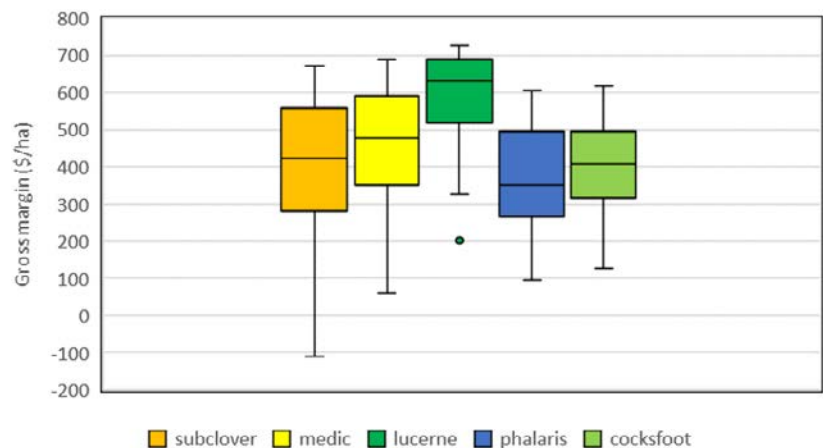


Figure 3: Box plots of gross margins for a Merino x Dorset enterprise grazing subclover, annual medic, lucerne, phalaris or cocksfoot pastures grazed at 3.5 ewes/ha at Temora 1970–2019. Boxplots represent median, range and interquartile range, and o indicates extreme values.

Table 1 - Mean sustainability variables for subclover, annual medic, lucerne, phalaris and cocksfoot pastures grazed at 3.5 ewes/ha at Temora 1970–2019.

	Sheep per ha	Annual DSE/ha	July DSE/ha	% years <800 kg DM/ha in Jan–Apr	% years supplementary feed >30 kg/ewe	Long-term pasture utilisation	Long-term average ground cover %	Months per year <70% groundcover at 30th percentile
<b>Subclover</b>	3.5	6.9	10.3	47	88	26	85	2
<b>Medic</b>	3.5	7.2	10.9	42	80	28	88	1
<b>Lucerne</b>	3.5	7.6	11.0	25	44	20	88	0
<b>Phalaris</b>	3.5	6.8	10.1	25	98	28	89	1
<b>Cocksfoot</b>	3.5	6.9	10.2	34	96	29	87	2

## Performance in drought

The annual species subclover and annual medic resulted in a higher percentage of years with pasture biomass < 800 kg DM/ha between January and April than for phalaris and cocksfoot, but lucerne rarely fell below this quantity (Table 1).

The effect of pasture type on sheep enterprise cash flow as shown by annual gross margins over time is shown in Figure 4, where lucerne was generally higher over the long term, although differences between subclover, phalaris, and cocksfoot were small.

Lucerne pastures allowed greater resilience of the sheep enterprise to drought.

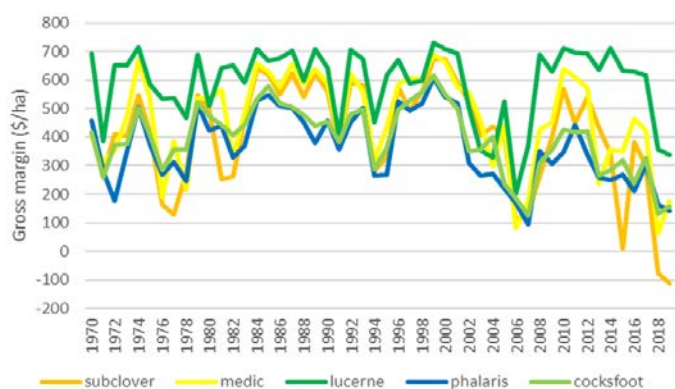


Figure 4: Annual gross margin (\$/ha) for a Merino x Dorset enterprise grazing subclover, medic, lucerne, phalaris or cocksfoot pastures at 3.5 ewes/ha at Temora 1970–2019.

### For more information

Read more about the Creating landscape-scale change through the promotion of resilient pasture systems project.

[farmlink.com.au](http://farmlink.com.au)



## Key messages

- Productive pastures with longer growing seasons support faster weaner growth, increased ewe condition and reduce supplementary feeding.
- Cocksfoot and phalaris had a similar growing season as annual medic and subclover, but increased winter growth in drought years.
- Lucerne pasture allowed higher ewe condition, lamb sale weight and reduced supplementary feeding, hence produced the highest sheep enterprise gross margins long-term
- Lucerne has slower winter growth than common temperate pastures, creating a feed gap at that time of year.

**Lucerne reduced the percentage of years where more than 30 kg grain/ewe was fed to 44%, whereas all other pastures required ewes to be fed above this quantity in most years.** (Robertson, 2024).

**Acknowledgements:** Creating Landscape-scale Change through Drought Resilient Pasture Systems, otherwise known as ‘FDF Resilient Pastures’ is a project funded by the Australian Government’s Future Drought Fund Drought Resilient Soils and Landscapes Grants Program, secured by Southern NSW Drought Resilience Adoption and Innovation Hub. The project is led by Holbrook Landcare Network and partners include Central West farming Systems, Monaro Farming Systems, Riverine Plains, FarmLink, Local Land Services, NSW DPI, CSU and The Southern NSW Resilience, Adoption and Innovation Hub, with a project period of June 2022 – June 2024.

Robertson, S. M. (2024). *Final Report: Resilient Landscapes: Simulation modelling of pasture species and practices for drought resilience*. Commissioned by Holbrook Landcare Network.