



Phalaris vs perennial ryegrass — Bombala trial

Which pasture system (Phalaris versus perennial ryegrass) is optimal in terms of improving sheep enterprise resilience to drought?

Introduction

Selection of pasture species needs careful consideration in order to improve the resilience of a farm business under drought conditions. This trial considered various aspects of phalaris vs perennial ryegrass pasture production at Bombala. Factors such as pasture growth rates, digestibility, economic impacts and livestock production, such as weaning weights of lambs, have been investigated.

Modelling (using GrassGro software) has been conducted to demonstrate longer-term impacts of pasture management in response to variable climates. The data used in the modelling analysis by Dr Susan Robertson analysed pasture and seasonal data from 1970–2019 for the Bombala region.

Key messages

The monthly pasture growth rates for Phalaris and perennial ryegrass were similar in poor seasons however perennial ryegrass maintained slightly higher growth rates than Phalaris into summer and autumn.

Perennial ryegrass pasture systems overall are associated with a higher digestibility resulting in a higher condition score of ewes providing resilience against periods of low feed availability.



Site statistics

Location: Bombala

Enterprise: Self-replacing fine wool Merino (5.1 sheep/ha)

Pasture Species Compared:

1. Phalaris
2. Ryegrass

Years simulated: 1970–2019

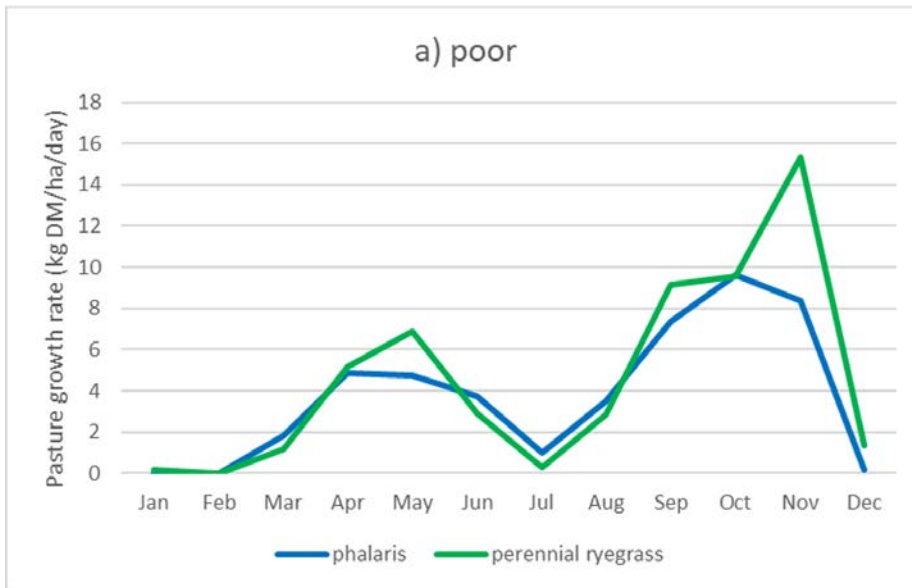


Figure 1: Mean monthly pasture growth rates for a Phalaris and perennial ryegrass pasture in a poor season at Bombala 1970–2019.

Table 7: Mean gross margin and key income and cost variables in poor, average and good seasons for a self-replacing Merino enterprise grazing Phalaris or perennial ryegrass pasture at Bombala 1970–2019.

Pasture	Season	Gross margin (\$/ha)	Total income (\$/ha)	Total Expense (\$/ha)	Net Wool Income (\$/ha)	Sheep sale income (\$/ha)	Maintenance supplement (\$/ha)	Production supplement (\$/ha)
Phalaris	poor	386	961	622	559	405	122	150
	average	712	1115	390	618	501	36	0
	good	863	1219	346	649	568	0	0
Perennial ryegrass	poor	451	1013	558	577	429	78	153
	average	750	1133	366	623	509	10	0
	good	880	1256	341	659	591	0	0

The gross margin for perennial ryegrass was \$65, \$38 and \$17/ha higher than Phalaris in poor, average and good seasons, indicating a small advantage for perennial ryegrass in poor seasons. This benefit was mainly due to differential feeding costs (Table 7).

Note the analysis assumes both pastures will persist and require re-sowing at the same frequency, whereas Phalaris is expected to have better persistence and the ryegrass production

simulated may only represent productivity in the first 5 years after establishment (D. Alcock).

In drought years growth rate decline was similar on both pasture systems but **perennial ryegrass allowed higher weaning weights of lambs than Phalaris as well as higher wool production**. This again could be a result of the higher feed quality associated with ryegrass.

Overall, Perennial ryegrass may produce higher pasture growth rates in autumn and summer than Phalaris and provide a higher quality diet for sheep in suitable regions, increasing sheep production.

The persistence of sown pastures impacts on profitability. Pastures with lower persistence ie. ryegrass may become less productive over time and require more frequent re-sowing which increases costs and dilutes the simulated short term, gross margin advantages.

Table 8: Production from a self-replacing Merino enterprise grazing native pastures with low or high soil fertility in drought or other years.

Pasture	Season	Lambs weaned/ewe joined (%)	Wether weight at weaning (kg)	Weaner growth Jan to May (g/day)*	Production supplement (kg/ewe)	Clean fleece weight (kg/ewe)	Fibre diameter ewes (µ)
Phalaris	drought	88	17.7	85	36	3.0	17.4
	other	90	22.8	95	5	3.5	17.8
Perennial ryegrass	drought	89	18.7	85	33	3.2	17.5
	other	91	23.8	97	6	3.5	17.9

*Wether weaners

References

Moore AD (2014) The case for and against perennial forages in the Australian sheep-wheat zone: modelling livestock production, business risk and environmental interactions. *Animal Production Science* 54, 2029–2041.

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