



Managing Phalaris pasture for resilience to drought — Boorowa

Does rotational grazing rather than set stocking for a phalaris pasture impact on productivity and resilience to drought at Boorowa?

Introduction

Perennial pastures may increase the length of the pasture growing season while retaining a higher level of groundcover to protect soils. Their deeper root system enables access to soil moisture which annual species cannot utilise. The use of perennials suited to a location and production system to support persistence has the potential to impact on the resilience of pasture-livestock systems to drought.

GrassGro software was used to compare the impacts of rotational grazing and set stocking on phalaris pasture's productivity and to determine the effects on the resilience of a Merino x Dorset enterprise to drought.

The data used in the modelling analysis by Dr Susan Robertson analysed pasture and seasonal data from 1970–2019 for the Boorowa region.

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.

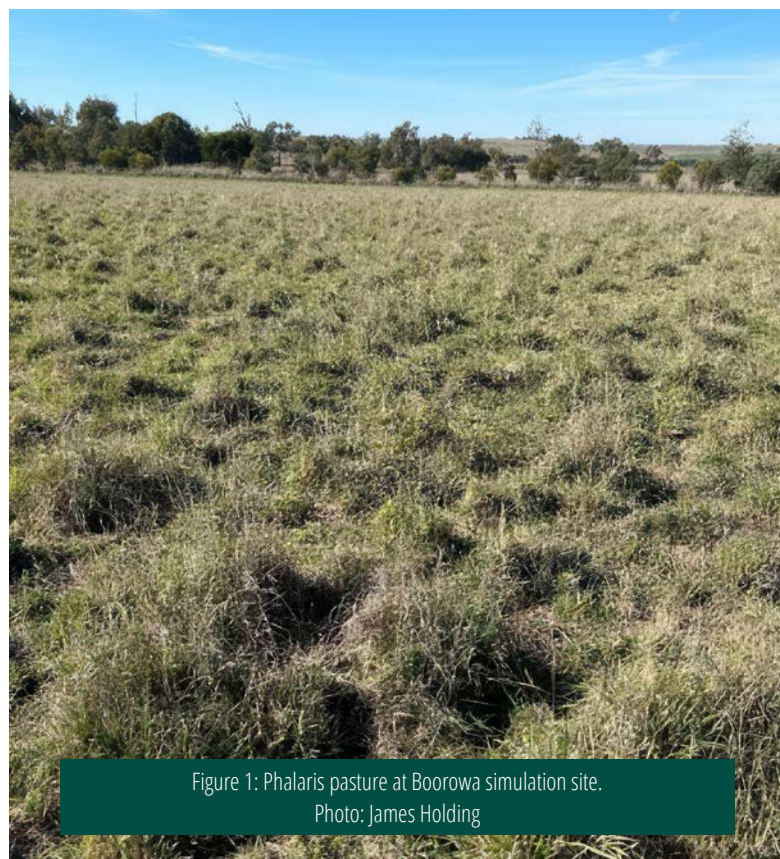


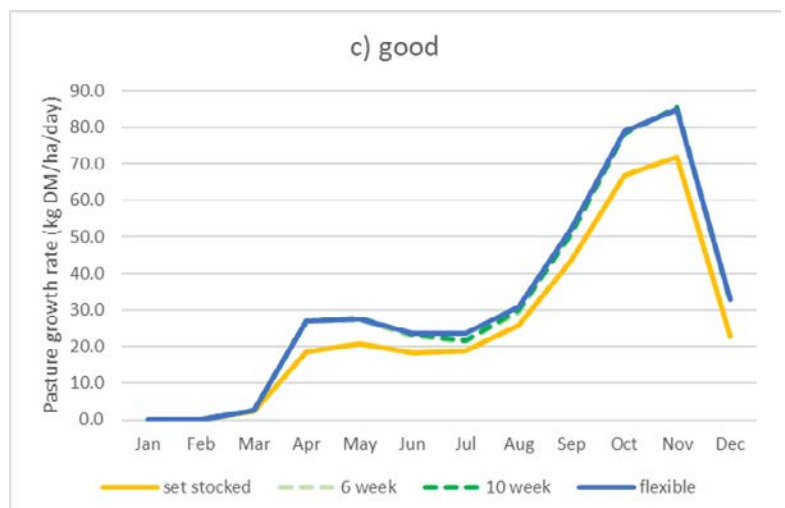
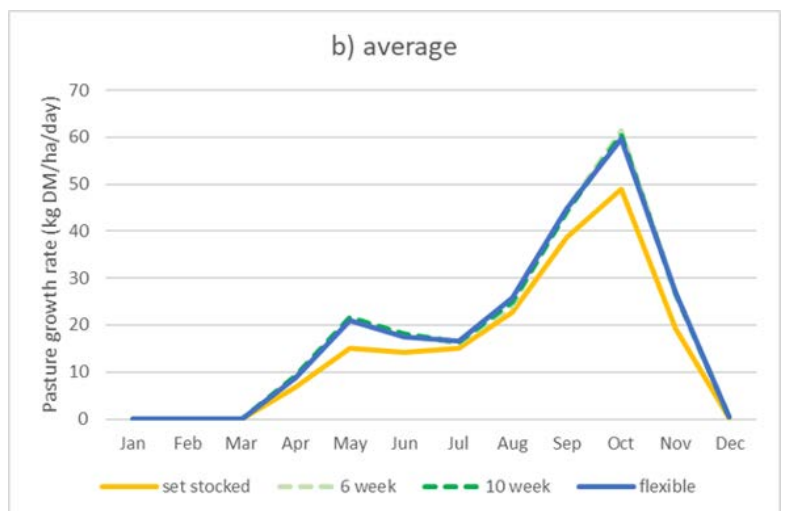
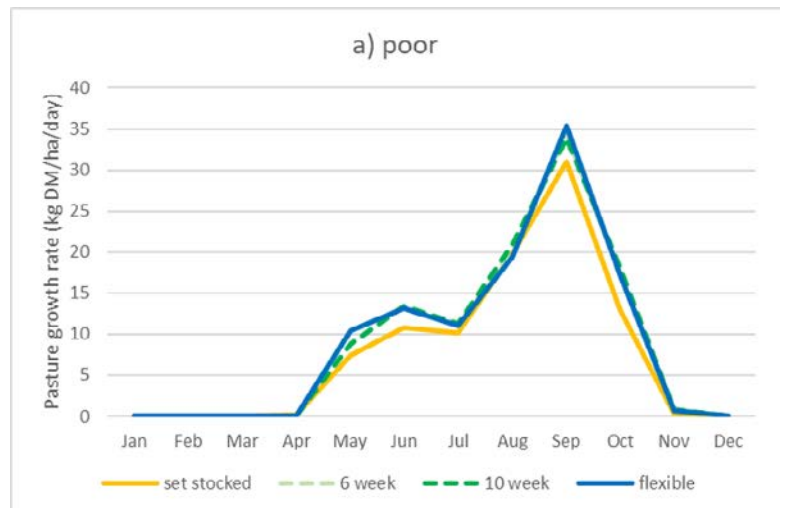
Figure 1: Phalaris pasture at Boorowa simulation site.
Photo: James Holding

Long-term growth rates of phalaris pasture

The pasture growth rates for phalaris were up to 12 kg DM/ha/day higher in spring when rotationally grazed rather than set stocked, with growth also increased during autumn.

Pasture growth rates were similar for all types of rotational grazing in poor, average and good seasons (Figure 2), and rotational grazing did not extend the growing season for Phalaris.

Figure 2: Average monthly pasture growth rates for phalaris when set stocked or rotationally grazed for 6 or 10 weeks or a flexible grazing rotation at Boorowa in a) poor, b) average and c) good seasonal conditions when stocked at 5.0 ewes/ha. Note varying y-axis between graphs.



Rotational grazing increases the growth rate of phalaris pasture during the growing season (Robertson, 2024).

Rest periods or rotational grazing are needed for the persistence of phalaris pastures (Robertson, 2024).

Impact on sheep enterprise resilience to drought

Supplementary feeding

Pasture utilisation was 4% higher when phalaris was set stocked. This was associated with a higher risk of low pasture biomass between January and April, and a higher risk of supplementary feeding the June lambing ewes when stocked at 5 ewes/ha.

The flexible rotation system increased pasture utilisation while reducing the risk of low pasture availability and supplementary feeding.

The flexible rotation also had a higher gross margin, largely due to reduced supplementary feeding costs, with the average sale weight of lambs at least 0.4 kg higher.

A longer duration of grazing, 10 weeks rather than 6 weeks, increased the requirement for supplementary feeding to levels similar to the set stocked system.

Condition Score

The monthly condition score of ewes in average seasons declined during late summer/autumn but was increasing after May until November in all grazing systems (Figure 3).

Condition score declined to a lower level and further into late pregnancy (May) for set stocked ewes although these ewes were able to increase condition during spring to a similar level as the 6 and 10 week rotationally grazed ewes.

Ewes grazed in the flexible system maintained a higher condition during early pregnancy than the other rotational systems and regained condition more rapidly during spring.

The differences in condition scores between grazing systems did not result in differences in the percentage of lambs marked per ewe.

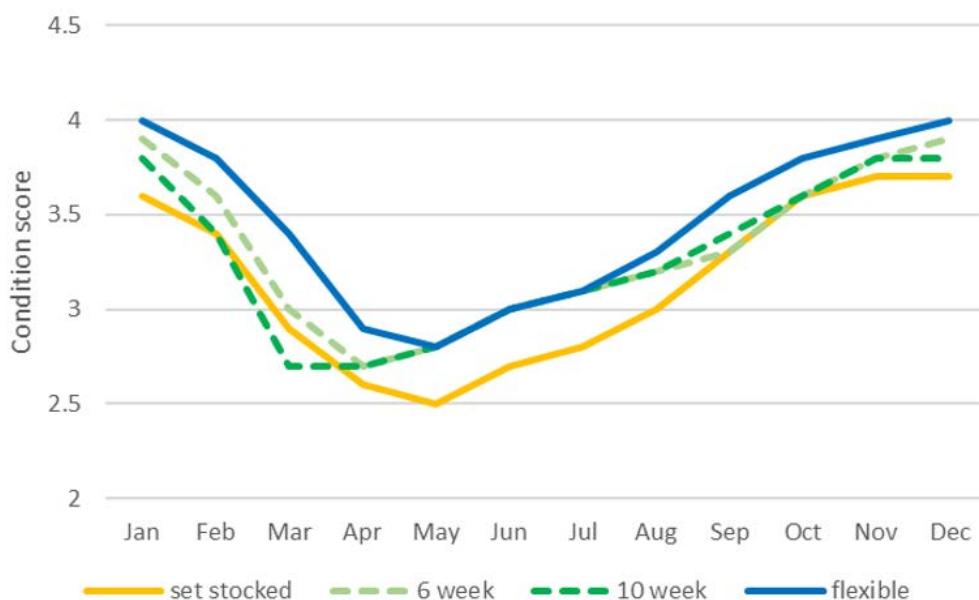


Figure 3: Monthly mean condition score of ewes in average seasons for a Merino x Dorset enterprise when set stocked or rotationally grazed for 6 or 10 weeks or using a flexible grazing rotation at 5 ewes/ha at Boorowa 1970–2019.

Rank pasture of low nutritive value reduces lamb growth rates (Robertson, 2024).

A flexible rotation with stock moved on pasture availability reduced supplementary feed costs compared with fixed time rotations or set stocking (Robertson, 2024).

Enterprise performance

The gross margin, income from stock sales and supplementary feed for set stocked and 6- or 10-week rotational grazing were similar in poor seasons. The flexible rotation did not increase sheep sale income in poor years, but reduced feed costs by at least \$34/ha.

In average and good seasons, rotational grazing enabled a small increase in sheep sale income

in comparison to set stocking but did not consistently reduce expenses. Sheep sale income was increased by \$18/ha to \$39/ha by the flexible system in average seasons while also reducing feed costs. The cash flow as shown by annual gross margin over the long term was similar for set stocked and fixed-time rotational grazing systems, while the flexible system was generally higher (Figure 4).

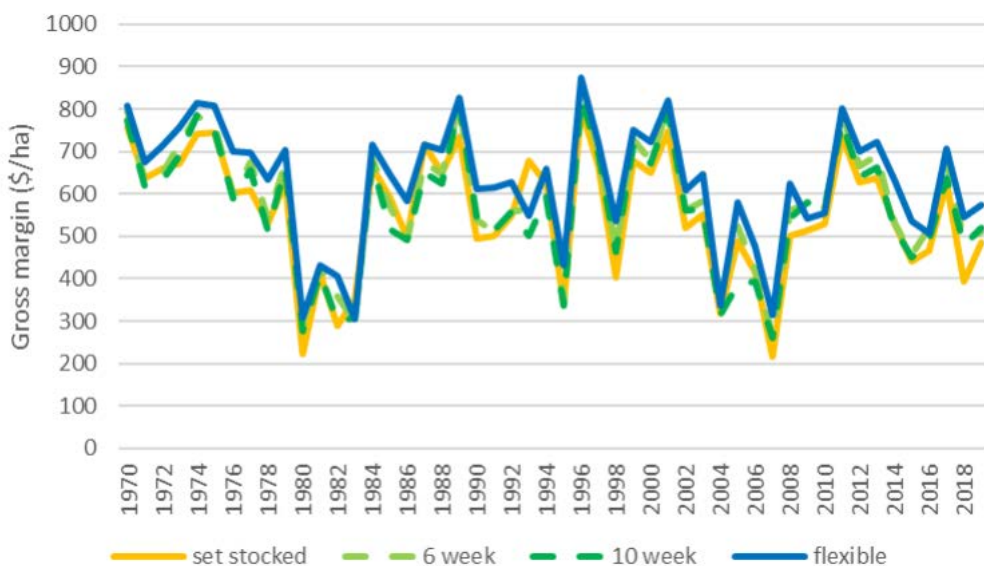


Figure 4: Annual gross margin (\$/ha) for a Merino x Dorset enterprise when set stocked or rotationally grazed for 6 or 10 weeks or using a flexible grazing rotation at 5 ewes/ha at Boorowa 1970–2019.

Performance in drought years

Drought was classified in 12 years in the period 1970-2019. The weight of lambs at weaning and growth rate from weaning to sale on 1 November were similar for set stocked and rotationally grazed systems during drought and other years. However, the quantity of supplement required for confined feeding was approximately halved by all types of rotational grazing compared with set stocking.

Strategic sale of stock in response to dry seasons may reduce the impact on pasture persistence, risk of low groundcover and requirement for supplementary feeding (Robertson, 2024).

For more information

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