

BENEFITING FROM OPTIMUM GRAZING MANAGEMENT

A large-scale AWI-funded grazing management trial has delivered the facts farmers need to boost productivity and secure healthy landscapes.



- NSW Department of Primary Industries researchers explored the optimum stocking rates, paddock numbers and rotation cues to increase sheep and wool production.
- The trials were run on both native and introduced pastures, and were subject to the same challenging seasonal conditions farmers have faced over the previous two years.
- Matching stocking rate to grazing management offered the greatest potential to boost production. There was a higher optimal stocking rate for intensive rotational grazing than continuous grazing.
- The stand-out result from this study was that a fast rotation (with an average grazing cycle of 60 days) was the most profitable and sustainable at a high stocking rate (averaging 13 DSE/ha), while continuous grazing at a lower stocking rate (7 DSE/ha) was nearly as profitable and sustainable (Figure 1).

An AWI-funded research trial carried out by the NSW Department of Primary Industries (DPI) has provided knowledge of optimum grazing management options to boost production with the potential to lift long-term environmental gains. The project was developed from questions that came up in the EverGraze project, particularly from the farmer involvement in EverGraze Regional Group steering committee.

The large-scale trial ran for three years, comparing rotational options with continuous grazing while exploring how to best manage stocking rates and paddock

numbers for introduced and native pasture systems. The research was carried out at Orange Agricultural Institute with introduced pasture (cocksfoot, average rainfall 920 mm) and native-based pasture at Panuara (Microlaena and wallaby grass, average rainfall 810 mm). The Panuara site previously ran an EverGraze project.

Rotational grazing options were assessed at an average cycle of 60 or 120 days between grazing in each paddock and a flexible period based on the growth stage of the plant (gross margins could not be developed for this treatment) and compared with continuous grazing. The

introduced pasture site had a high stocking rate (averaging 13 DSE/ha) and a lower stocking rate (7 DSE/ha) comparing 15 and 30-paddock rotational grazing systems.

The trial used Merino wethers. Intensive and wide-ranging measurements – including animal growth rates, condition scores, wool weight and micron, along with pasture quality and quantity – were taken.

NSW DPI research agronomist Warwick Badgery said the trial has delivered solid facts that sheep and wool producers can use to improve their on-farm profitability.

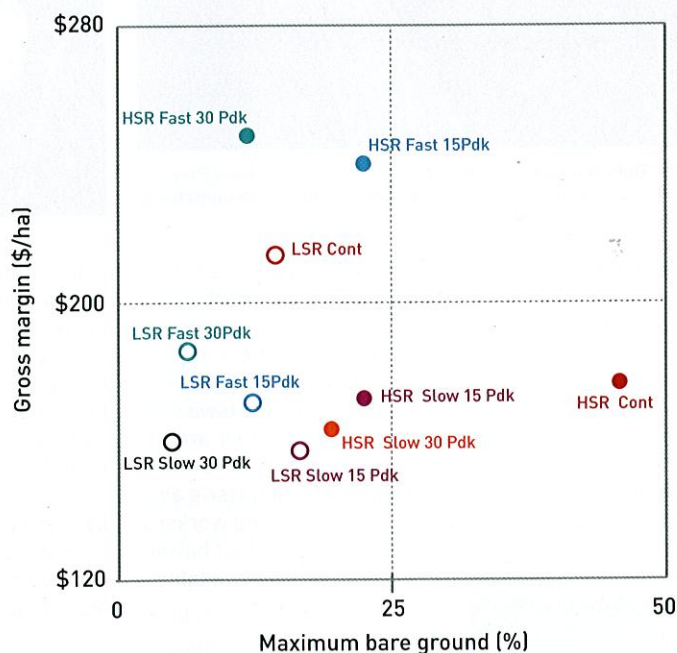
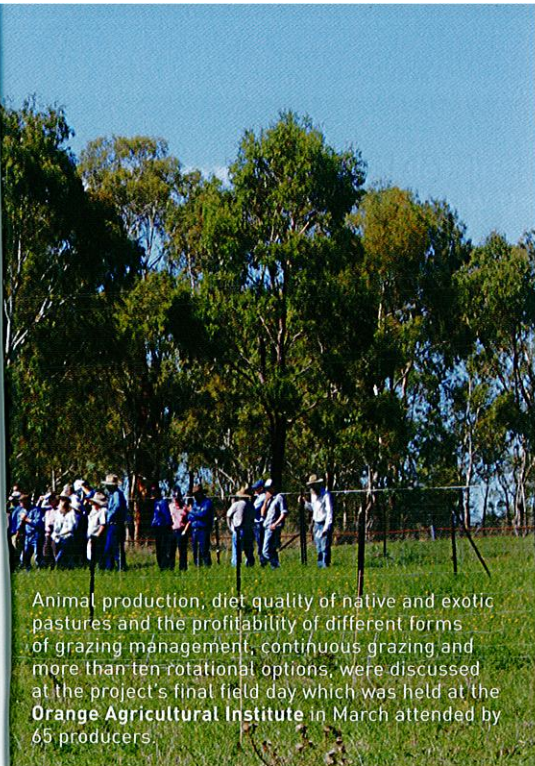


Figure 1. Comparing the profitability (gross margin) and sustainability (maximum bare ground) of grazing management options for a simulated Merino x terminal sire system on a cocksfoot pasture at Orange.

High and low stocking rates (HSR and LSR) were run with 15 and 30 paddock rotational grazing systems and continuous grazing (15 Pdk, 30 Pdk and Cont). The rotational grazing systems were run with slow (120 day grazing cycle) and fast (60 day grazing cycle) rotations. High stocking rate, fast rotations had the highest gross margins and maintained low levels of bare ground. The continuous grazing at low stocking rates performed nearly as well. These comparisons were made in 2012 and 2013, when there were failed springs.



Animal production, diet quality of native and exotic pastures and the profitability of different forms of grazing management, continuous grazing and more than ten rotational options, were discussed at the project's final field day which was held at the Orange Agricultural Institute in March attended by 65 producers.



Dr Warwick Badgery: "With science backing the study, our focus has been on helping increase sheep and wool producers' profit and long-term environmental gain."

"While farmers are limited to what they can try on their own properties and observe over the fence of their neighbours, this trial has fully explored as many options as are practical in terms of stocking rates and grazing rotations," Dr Badgery said.

"We replicated a spring lambing system to explore how management decisions can influence animal production for both meat and wool, and the effect on natural resources in the system. A great deal of detail has been extracted, right down to analysis of faecal samples to work out exactly what sheep are eating and how feed quality impacts on production."

Matching stocking rate to grazing management offered the greatest potential to boost production.

"The fast rotation (with an average grazing cycle of 60 days) was the most profitable and sustainable at a high stocking rate

INTRODUCED PASTURE TRIAL RESULTS

- Stocking rate had more influence on diet quality. High stocking rates in rotational grazing generally delivered poorer diet quality because pastures were grazed down to a lower herbage mass. In continuous grazing scenarios, high stocking rates restricted feed intake.
- High stocking rate with fast rotations performed well, while slow rotations often struggled to meet the maintenance requirements of animals.
- How far the pasture is grazed down in a rotation affects quality and animal performance. Budgeting feed using a green herbage allowance of >1.5 kg/DSE/day in spring and >3.5 kg/DSE/day at other times of the year may be used as a management strategy to maintain higher levels of animal performance.
- Rotational grazing maintained higher herbage mass (average 2.3 t DM/ha versus 3.8 t DM/ha) and ground cover (maximum 22.5% versus 45.8%) under a high stocking rate than continuous grazing.
- Increasing paddock numbers from 15 to 30 had little added benefit for pastures.
- Cumulative effects of treatments on pastures are still being developed and will continue to change as grazing systems continue to influence the proportion of legumes and nutrient cycling.
- Changes in soil carbon are yet to be determined because the treatments have not been running for long enough.

(averaging 13 DSE/ha), while continuous grazing at a lower stocking rate (7 DSE/ha) was nearly as profitable and sustainable (Figure 1). The results of this project and previous EverGraze research show that there are higher optimal stocking rates with intensive rotational systems than continuous grazing. While neither the high or low stocking rate were likely to be optimal for the different grazing management options, it highlights how important it is to get the stocking rate right.

"The trial was subjected to the same dry conditions farmers have experienced for the past couple of years and we've seen the higher stocking rates have done it pretty tough during the summer. This has resulted in conservative management being profitable for continuous grazing. We see a need to assess the systems across a greater range of seasons to deliver more robust data to producers."

NATIVE PASTURE TRIAL RESULTS

- A slow rotation consistently had the lowest pasture quality measured by the organic matter digestibility (OMD) grazed by animals.
- Fast rotation and flexible management had the highest quality pasture and were often higher than continuous grazing.
- There was also a strong positive relationship between green herbage mass prior to grazing and metabolisable energy (ME) intake at the native site. There was an extra 1 MJ/head/day for every 100 kg/ha increase in green dry matter (DM) between 0.5 and 2 tonnes of green DM/ha.
- Landscape position had a greater influence on pasture composition and growth than the grazing system.
- Bare ground increased under continuous grazing (maximum 22.5%) compared to the rotations (average maximum 17.8%) but levels were still relatively low.
- There was no change in soil carbon due to grazing management over a four-year period. However, landscape influenced the amount of soil carbon. There were higher soil carbon stocks (0-30 cm) in more productive areas of the landscape. Landscape also influenced the processes that store soil carbon, such as biomass production, respiration from the soil and the composition of soil microbes. A better understanding of paddock scale variability and soil processes is needed.

Some practical management rules were developed from this trial. Feed quality consumed by animals was lower when there was a less green feed available per head over the grazing period. At higher stocking rates and for slower rotations, animals graze more of the available forage at each grazing, which restricts them from selecting a higher quality diet. Budgeting feed using a green herbage allowance of >1.5 kg/DSE/day in spring and >3.5 kg/DSE/day at other times of the year should maintain higher levels of animal performance. This can be achieved by changing the length of grazing in a paddock or altering animal numbers for rotational grazing systems.

MORE INFORMATION

Dr Warwick Badgery, (02) 6391 3814, warwick.badgery@dpi.nsw.gov.au