

2013 Paddock Case Study Grazing

Reef Water Quality Protection Plan

Grazing in the Burdekin region - achieving better returns and saving soil

Background

The Reef Water Quality Protection Plan (Reef Plan), a joint initiative of the Australian and Queensland Governments, focuses on the threat posed by diffuse source agricultural pollution. It is designed to reduce the amount of pollutants flowing into waterways and the Great Barrier Reef in order to build the resilience of the reef to impacts of other stressors.

The Paddock to Reef Integrated Monitoring, Modelling and Reporting (Paddock to Reef) Program measures and reports on progress towards Reef Plan and Reef Rescue goals and targets. Funded jointly by the Australian and Queensland Governments, it is a collaboration involving governments, industry bodies, regional natural resource management bodies, landholders and research organisations.

Paddock monitoring and modelling are important components of the program. This work is funded by the Australian Government's Reef Rescue initiative with significant support from the Queensland Government. The program conducts paddock trials in various regions in partnership with other organisations to assess the water quality benefits of different land management practices.

About this case study

Grazing management and stocking rate relative to seasonal pasture growth influence the profitability of and water quality from North Queensland Dry Tropics grazing lands. A trial funded by Meat and Livestock Australia and the Paddock to Reef program in the Burdekin has investigated animal performance, pasture composition, land condition and runoff water quality for 14 years. This includes periods of drought and wet years.

The objective of this project is to assess the relative performance of different grazing strategies in terms of profitability, pasture condition and runoff.

Key findings

- Having a heavy stocking rate makes the least profit and causes degradation of pastures.
- The heavy stocking rate also increases runoff and sediment loss compared to a range of improved grazing management strategies.

Methods

This long-term grazing trial is located at Wambiana Station near Charters Towers. The land condition of the site at the beginning of the trial in 1997 was fair (B condition, using ABCD condition assessment).

Five grazing strategies are being tested:

1. Heavy stocking rate, at twice the long term carrying capacity.
2. Moderate stocking rate, at the long term carrying capacity of eight hectares per animal equivalent (AE).
3. Variable stocking rate, with stocking rates adjusted in May based on available forage - stocking rates ranged from four to 11 hectares per animal equivalent.
4. Southern Oscillation Index (SOI), with stocking rates adjusted in November based on available forage and southern oscillation index based seasonal rainfall forecasts (ranging from four to 11 hectares per animal equivalent).
5. Rotational wet-season spelling (R/Spell), at 1.5 times the long term carrying capacity.

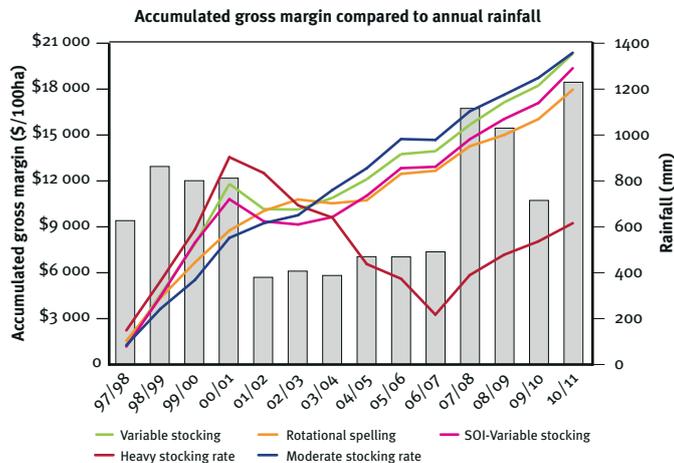
The paddocks contain a mix of soil types typical of the region and are on a low slope. Data is collected annually on cattle weight gains, pasture condition change, and runoff and sediment loss. Measurement of runoff and water quality occurs via flumes on one hectare plots located on a texture-contrast (Sodosol) soil type.

Results

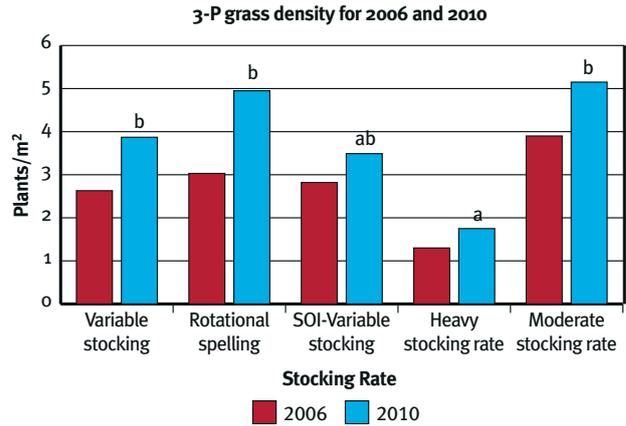
There were only small differences in the sediment concentration in runoff between the management strategies, possibly due to the low slope of the trial area or the relatively high percentage ground cover. However, there were noticeable differences in the runoff volumes and number of events. As the total loss of sediment is a result of the sediment concentration times the volume of runoff, this means there were differences observed in the total sediment lost between treatments.

The heavy stocking rate made the least profit and caused degradation of pasture to C land condition with increased runoff and sediment loss. The moderate stocking rate (at long term carrying capacity) was far more profitable than the heavy stocking rate and maintained pasture in B+ condition. This resulted in fewer runoff events and less overall sediment loss. The variable stocking rate and Southern Oscillation Index based rate were also as profitable as the moderate stocking rate, but were economically riskier with greater income variability; these strategies also resulted in slightly poorer (B-) pasture condition. Rotational wet season spelling (with moderate stocking) was almost as profitable as the moderate stocking rate and also maintained pastures in B+ condition. The number of runoff events was also reduced compared to the higher stocking rate.

Cattle production was good under all management strategies but the overall profitability of the heavy stocking rate strategy is still far behind that of the other treatments.



Although groundcover is high in all treatment paddocks, land condition (indexed by the density of 3-P - palatable, perennial and productive - grasses) is still poorest on the heavy stocking rate strategy.



The heavy stocking rate resulted in significantly worse pasture condition compared to other treatments except the southern oscillation index variable stocking rate, as shown by the superscripts above 2010 values (bars with the same letter above (i.e. b, ab, a) are not statistically significantly different at a 95 per cent confidence level).

Measurements will continue to be taken at this site using industry funding from Meat and Livestock Australia until at least 2013.

Acknowledgements

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Authors

Peter O'Reagain and John Bushell (Queensland Government Department of Agriculture, Fisheries and Forestry).

References

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