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Improving performance through adaptive grazing: Beetaloo Station

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Abstract

Uneven utilisation of pastures is an issue facing extensive cattle properties in the Northern Territory. During the dry season most cattle need to return to water points to drink at least once a day. In large paddocks with few waters, this results in areas close to water being overgrazed and areas beyond the walking range of cattle being ungrazed. The subsequent decline in feed levels close to water is detrimental to animal production and land condition. The under-utilised pastures far from water are also an untapped resource that, if made accessible, can improve the profitability of a property.

A demonstration project at Beetaloo Station in the Barkly Region aims to evaluate how a more intensive rotational management system compares to “traditional” extensive, low development, continuous grazing pastoral management typical in the Barkly area.

The management changes implemented at Beetaloo have been selected specifically to increase agricultural productivity as well as protect and enhance conservation values. Key principles of the management approach are increasing carrying capacity by increasing watered area, and using high intensity short duration grazing with long periods of pasture rest.

The adaptive grazing demonstration has been gathering scientific evidence of what the pastures and biodiversity were like in the initial stages of the management program and how they are changing over time. Animal live weight gain and economic performance are also being evaluated. The aim is to ascertain the potential for sustainably and profitably intensifying production through grazing practices that give greater control of livestock distribution, grazing pressure and pasture utilisation.

Concept and design

One of the problems typically seen on extensive cattle properties is uneven utilisation of pastures. During the dry season most cattle need to return to water points to drink at least once a day. In large paddocks with few waters, this results in areas close to water being overgrazed and areas beyond the walking range of cattle being ungrazed. The subsequent decline in feed levels and land condition close to water is detrimental to animal production. Impacts include poor rates of live weight gain, the loss of body condition in breeders, and reduced branding rates. The under-utilised pastures are also an under-utilised resource that, if made accessible, can improve the profitability of a property (Walsh & Cowley, 2014).

Several years ago the owners of Beetaloo became concerned that the traditional set stocking regime was impacting on their land condition and animal performance. Previous experience in both temperate and tropical environments convinced them that a rotational grazing system would allow them to achieve greater control of the herd and improve the performance of the pastures and animals. When they purchased the property aggregation in 2002, there were only about 40 watering points across >10,500 km². In order to realise both the carrying capacity and production potential of the leases, a substantial infrastructure development program was undertaken. There are now more than 500 watering points and thousands of kilometres of new pipelines and fencing on the properties.

A partnership between the Barkly Landcare & Conservation Association, the Dunicliff & Armstrong families and DPIF was formed to conduct a project comparing a more intensive management system to “traditional” extensive, low development, continuous grazing management typically practiced in the Barkly region. The management practices have been selected specifically to increase agricultural productivity as well as protect and enhance conservation values. Key principles of the management approach are increasing carrying capacity by increasing watered area, and using high intensity short duration grazing with long periods of pasture rest.

The adaptive grazing demonstration has been gathering scientific evidence of what the pastures and biodiversity were like in the initial stages of the program and how they change over time. The project is evaluating practices that have the potential to:

- increase herd productivity
- improve and maintain land condition and contribute to soil carbon sequestration
- maintain biodiversity values within a productive native pasture ecosystem
- increase water use efficiency

The Peabush demonstration site is located on the Mungabroom lease. The site is predominantly open Mitchell grass plains with some scrubby red soil country encroaching on the western edge. When the family took over in 2002, this was an area of approximately 1,800 km² with only nine watering points and carrying about 2,300 head of cattle. Significant water and fencing development in the Peabush area was completed in 2009, resulting in 33 tanks, three dams and an average paddock size of ~16 km². In 2012 the eastern side of the Peabush rotation area was further subdivided to create 36 paddocks of 4 km² and ten paddocks of 16 km². Each paddock has access to two waters, in diagonally opposite corners. These paddocks are used for grazing young, entire (non-castrated) bulls in an informal rotation prior to live export. Weaner bulls are grouped into a mob in November or December each year. The intention is to run relatively large mob sizes (average 5,500 head) in a short duration rotation (e.g. 3-4 day moves) depending on season.

The demonstration aims to measure the potential for sustainably intensifying production through grazing practices that give greater control of livestock distribution, grazing pressure and pasture utilisation. Research questions being investigated at this demonstration site are:

- To what extent has the change in management improved and maintained land condition?
- What impact has the change in management had on biodiversity?
- What impact has the change in management had on the productive potential of the land under management?
- What impact has the change in management had on the economic performance of the production enterprise?

With regard to the pasture-related questions that are being tested, it is hypothesised that greater control of livestock distribution, grazing pressure and pasture utilisation will:

1. Stabilise or improve land condition compared to “traditional” continuous grazing.
2. Achieve more even pasture utilisation and improve the annual management of the pasture supply compared to the traditional grazing approach.

Data collection commenced in 2012 and will continue until 2016. The demonstration is still in its early stages and it is still too soon to detect changes in land condition. However, the first two years have provided an excellent set of baseline data for future comparisons. For example, the data from 2012 to 2014 showed:

- The carrying capacity of the Peabush area has increased from 2,300 mixed head per year to at least 9,000 adult equivalents per year as a result of the infrastructure development.

- Average ground cover at the start of the dry season has been quite high (>70%) in all years.
- Average ground cover was slightly higher in the rotation paddocks compared to the adjacent continuously grazed paddocks in all years but was not statistically significant.
- The rotation paddocks averaged slightly higher levels of pasture yield than the continuously grazed paddocks in both 2012 and 2013, but this was reversed in 2014. None of the differences were statistically significant.
- The most common pasture species recorded have been feathertop wiregrass (*Aristida latifolia*), bull Mitchell grass (*Astrebla squarrosa*), Flinders grasses (*Iseilema* spp.), downs/annual sorghum (*Sorghum timorense*), weeping Mitchell grass (*Astrebla elymoides*) and Queensland bluegrass (*Dichanthium sericeum*).
- Palatable, perennial, productive (3P) grasses made up 18% of the pasture yield across the site in 2012, 26% in 2013, and 48% in 2014.
- The rotation paddocks averaged almost twice as much 3P yield as the continuously grazed paddocks in 2012 and 2013 but this was not statistically significant.
- Palatable species made up a similar percentage of the pasture regardless of grazing system in 2012. In 2013 and 2014, the continuously grazed paddocks had a higher percentage of their yield made up of palatable species than the rotation paddocks, however this was not statistically significant.
- Feathertop wiregrass (a relatively unpalatable increaser species) made up more than 40% of the pasture yield in 2012 and 2013, however, in 2014 this dropped to 25%.
- Weeping Mitchell grass (a 3P species that is dominant in pastures in good land condition) averaged only 5% of the total yield in the rotation paddocks and 3% of the yield in the continuously grazed paddocks in 2012. In 2013 it made up 10% of the yield in the rotation paddocks and 3% of the yield in the continuously grazed paddocks. In 2014 it dropped back to 5% of the yield in the rotation paddocks, and 3% in the continuous grazed paddocks.
- The 2014 drop in percentage yield for Feathertop wiregrass and weeping Mitchell can be attributed to an increase in annual species due to a better wet season.
- Annual species made up 30% of the pasture yield across the site in 2012, 25% in 2013 and 48% in 2014.

Conclusion

A final report presenting the full pasture, biodiversity, production and economic analyses of this demonstration will be produced in 2016.

Reference

Walsh, D. and Cowley, R.A. (2014). 'Best-bet practices for managing grazing lands in the Barkly Tableland region of the Northern Territory.' Technical Bulletin No. 350. Northern Territory Government, Darwin.