CASE STUDY

RAIN READY RANGELANDS - MT DENISON PADDOCK CHALLENGE

INTRODUCTION

Alan, Terry and Robert Martin are third generation beef cattle producers on Mt Denison Station, located approximately 300km north-west of Alice Springs in the NT. The brothers took on the role at a young age however, they have been guided by the wise words of their late father who would say, 'The way we do things here is just how we do it but it doesn't mean it's the best way'. In recent years, they have been making the most of opportunities to expand their knowledge. 'I've always liked learning' says Terry, 'I think there is always room for improvement. I'm really interested in making things more efficient and looking at our production system to see where we should invest.' It's this mindset that encouraged the Martin family to undertake a significant research project, the Rain Ready Rangelands Paddock Challenge, with the Department of Industry, Tourism and Trade (DITT). The project was in collaboration with TNRM and funded through the Australian Government's Future Drought Fund.

AT A GLANCE

Key takeaways

- Creating more from less.
- The value in data and knowledge transfer for implementing change.
- Building resilience to environmental change and challenges.

Challenges

- Climate Variability.
- Collecting meaningful data.

"I think that will help get more stability in our production system and help reduce the impact of drought'"

Terry Martin
Cattle Producer, Mt Denison Station

The Rain Ready Rangelands Paddock Challenge is taking the learnings from the DITT research station near Alice Springs, into the real world situation of Mt Denison's grazing business. For the past 14 years, DITT have run long-term grazing trials on the Old Man Plains Research Station. These trials have demonstrated that grazing strategies based on the long-term carrying capacity can significantly improve land condition and stabilise high levels of production in a highly variable climate (Materne et.al. 2021). The aim of the Paddock Challenge was to work with commercial producers to design tailored grazing strategies, based on recommended long-term carrying capacity, which would optimise production at a station scale.

The Martins were particularly interested in working out a realistic long-term carrying capacity for their property. 'I think that will help get more stability in our production system and help reduce the impact of drought', says Terry. The drought years of 2018 to 2020 were particularly hard for Mt Denison. 'We really want to reduce the impact of drought. It was a key reason for us getting involved with the Rain Ready Rangelands project', he says.

Getting the stocking rate right is a large part of the challenge and is strongly linked to both herd production and profitability. 'When we looked at the results from the Old Man Plains Research Station grazing trials, we were particularly interested in the steer performance; they were consistently turning off heavy steers at a much younger age (30 months) than what we were experiencing (between 4 and 6 years)', says Terry.

An important part of the Rain Ready Rangelands project has been collecting, analysing and reviewing data on climate variability, water quality and supply, cattle nutrition and breeder management. Just before the project began, the Martins completed their goal of having all cattle tagged and scanned, setting themselves up to capture performance data to drive decision making.

The Paddock Challenge was designed to compare two paddocks; a 'business-as-usual' paddock and a 'challenge' paddock

Top Image: L-R Allan, Terry and Robert Martin

Bottom Image: Mt Denison front gate

THE PADDOCK CHALLENGE

The Paddock Challenge concept arose from the successful Quality Graze Steer Challenge, a Meat and Livestock Australia (MLA) funded, Producer Demonstration Site conducted on the Old Man Plains Research Station (Materne et.al. 2017). Steers from 7 properties across Central Australia were incorporated into grazing trials on the Research Station and participants were able to see how their animals met requirements to access premium markets through applying a grazing strategy based on modelled long-term carrying capacity. The results showed that environmental conditions exert a greater influence on steer growth rates than genetics. This is a powerful message that emphasized the importance of grazing land management.

As a result of the Steer Challenge, participants gained improved knowledge and appreciation of how to manage the Central Australian feed base however, designing and implementing a change in grazing strategy on a commercial property was still a big step. The success of the Steer Challenge prompted the design of the Paddock Challenge; if steers from various properties could succeed under the Quality Graze strategies, could we test the Quality Graze strategies on properties? To do this, the Rain Ready Rangelands Paddock Challenge was developed to test the Quality Graze principles of long-term carrying capacity and herd management. The Paddock Challenge was designed to compare two paddocks; a 'business-as-usual' paddock and a 'challenge' paddock. The stocking strategy identified for the challenge paddock was based on estimated long-term carrying capacity from GRASP modelling, seasonal analysis and forage budgeting. Both paddocks were monitored for pasture and herd performance over the life of the project and the two systems compared economically and sustainably.

An important component of the Paddock Challenge was to investigate how grazing distribution and cattle behaviour changes in response to stocking rate. GPS collars were used to monitor cattle movements in both of the Mt Denison research paddocks.

There are relatively few fences on Mt Denison Station so the Paddock Challenge was adjusted to assess the pastures within grazing distance of several permanent watering points. On Mt Denison, the goal was 'business-as-usual' in the watered areas of 18-mile Bore and Baystone Bore, and Quality Graze recommended practices implemented in the watered area of 8-mile Bore and 2-mile Dam.

HOW THE PROJECT UNFOLDED…

When the project began in 2023, Mt Denison was looking pretty good after 3 exceptionally high rainfall years. It was the perfect time to start recording land condition and get some good quality data to inform decision making in the future. Grazing exclosures were constructed for about 1 to 2km from watering points to provide a visual reference of pasture response without grazing. The Martins have been looking at satellite based pasture assessment tools but they are also very aware that it's not just about the quantity of feed that's on offer; quality is also important. Baseline pasture and herd performance data was collected between April and August 2023. This data provides critical long-term reference for determining the impact future management decisions have on both long-term pasture and cattle production. It's also showing up areas where gains could be made in the short-term.

KNOWLEDGE TRANSFER

An important part of the project was to support the Martins attending several Meat & Livestock Australia EDGEnetwork courses. 'These courses have been very important,' says Terry, 'Grazing Fundamentals was valuable because it showed us how to calculate Animal Equivalents and carrying capacity which is directly relevant to our business.' Getting the long-term carrying capacity right is critical to the Martins goal of becoming more resilient to drought impacts.

BreedingEDGE was especially valuable, providing a clearer understanding on how to achieve an efficient herd. Like many producers in extensive production systems, the Martins have historically culled cows based on temperament and conformation. Targeting fertility traits in large herds is harder because activities such as pregnancy testing are very time consuming. As part of the Rain Ready Rangelands project, a sub-sample of the Mt Denison herd was pregnancy tested in August 2023 and the results showed that pregnancy rate was lower than had been estimated. 'We had also often assumed that fat cows weren't pregnant when in actual fact they often were', says Terry. 'Pregnancy testing also opens up new markets for us; selling pregnant cows. Preg testing gives us the option to keep working on improving our breeder efficiency.'

The Martins also took part in a Low Stress Stock Handling course held by Bruce Maynard on Mt Denison. It was an opportunity for the brothers to learn new management techniques for working cattle in the yards. Allan, Terry and Robert all spent time working one-on-one with Bruce, learning more about how their behaviour and direction of energy influenced stock behaviour. The concept of low stress stock handling is to make stock handling easier, safer and more efficient. It can also create a more resilient herd by reducing the stress on the animals; allowing them to display behaviours such as eating and drinking sooner after processing.

FIRE

By summer 2023, after 3 above-average rainfall years, much of Central Australia was covered in very high fuel loads and large bushfires were becoming more frequent. In late October, several large fires impacted Mt Denison and after several weeks of intense firefighting effort, the Martins were once again facing the challenge of severe feed shortages. 'It was very demoralising,' says Terry, 'We felt like we were straight back in the dry times of 2019.'
Chris Materne and Dr. Robyn Cowley, are key rangeland researchers for the Rain Ready Rangelands project. Using satellite imagery and pasture growth modelling, they were able to provide the Martins with an estimate of forage remaining on the property. 'It was really tough,' says Chris, 'The data showed that there was probably only enough feed for one fifth of the herd.' Destocking plans were put in place and markets were investigated. Luckily, in November and again in March 2024, the station received good pasture growing rains and the urgency to destock diminished. 'It did reinforce our need to get a good understanding of our long-term carrying capacity and to get our herd more productive. We really want to build more resilience into our business', says Terry.

CARRYING CAPACITY

Working out the long-term carrying capacity was a primary goal for the Paddock Challenge. Chris and Robyn modelled the long-term carrying capacity for Mt Denison using the pasture growth model, GRASP, and calibrated it using actual on-station data. 'While the long-term carrying capacity calculated by Chris and Robyn seems quite low to us, it is more due to that fact that our herd efficiency probably isn't that great', says Terry, 'It will be interesting to see if we can create an efficient herd, one water at a time and see how our profitability changes'.

> **"It will be interesting to see if we can create an efficient herd, one water at a time and see how our profitability changes"**
>
> **Terry Martin**
> Cattle Producer, Mt Denison Station

PUTTING IT ALL TOGETHER

As well as the formal courses the Martins attended, there were a number of key learnings gained from the project work such as getting a better understanding of long term carrying capacity, learning to evaluate land condition and estimate feed coverage, observing indicator grass species, and using tracking collars to gain an understanding of where cattle are grazing. 'The data we collected and the information learnt at the courses, showed that our business could be more productive and resilient. When we met with Christophe we worked how to make it happen,' says Terry.

Christophe d'Abbadie is an economist with the Western Australia Department of Primary Industries and Regional Development. In recent years, Christophe has been modelling the economics of the Quality Graze project to demonstrate the potential of implementing similar grazing strategies in Western Australian production systems. His familiarity with the project goals and the business models of rangeland beef production meant that he could provide a valuable analysis of Mt Denison's options for growing their business.

Typically, collecting pasture and herd performance data becomes more valuable as the years go by and managers can look at trends, identify areas where improvements could be made and assess the benefits of implementing new management practices. However, in the first year of data collection, managers gain insight from evidence-based observations and identify areas of potential concern. Sometimes assumptions are proved to be true and other times the data tells a different story. For the Martins, cattle performance data, in particular weaning rates, suggested that there was considerable scope for improving the productivity of their breeders.

'In the past few years we've been working towards having all animals tagged and recorded. Looking at our data we were able to see that our turnoff suggests there is scope for our breeders to be more productive,' says Terry. 'Our goal is to make the same money – or more – with less cattle. We need to make the herd more efficient and to do that we need to get better control of them. Looking at our economics with Christophe has shown us how we can fund that infrastructure development and we now have a 5-year plan to get there.' The Martins found that Christophe's knowledge of Australian rangeland cattle economics was very applicable to Central Australian conditions.

THE FUTURE

The Martins are looking forward to getting stuck into their 5-year plan. Robert laughs wrily, 'Musters now take longer and happen more frequently!' The extra work is done with a clear purpose in mind - they are collecting data that will help them make informed decisions on herd efficiency and ultimately profitability. There are plans to invest in preg-testing technology in the near future as the Martins believe this information is very important in achieving a more productive breeder herd. They are also looking forward to continue the use of tracking collars to see where cattle prefer to graze and guide paddock design and rotational grazing strategies.

As they work towards maintaining and improving their productivity and land condition, Terry hopes that the project can continue well into the future. 'When you look at long-term grazing trial data, it goes for 30 years or more and you can really see the benefit. If you stop after 4 years you might get the wrong answer.' They are interested in taking samples to determine soil health and what effect that has on the growth of grass per mm of rain.

Terry believes the project has been really useful. 'We wanted to implement some changes but we weren't really too sure about how to go about it and how to achieve that. So when Chris asked if we wanted to get on board it seemed like a good opportunity to try new things and have someone help you out', he says.

Ultimately, one of the most important outcomes of the project has been establishing relationships and sharing knowledge between the Martins, researchers, economists, grazing land management advisors and cattle husbandry educators. When visiting interstate relatives in southern agricultural areas, Terry had noted the abundance of specialist consultants available to farmers and wondered why that wasn't as readily available for the northern beef industry.

Everyone involved with the Paddock Challenge agrees that one of the most exciting parts of the project has been identifying the process of knowledge sharing and benchmarking required for producers to plan and then implement change in their management practices and business strategies. 'Being involved in the Paddock Challenge has been really good. The knowledge we gained from the courses was excellent and, combining that with our own data and economic analysis, means we now know HOW we are going to get there,' says Terry 'An efficient and profitable herd, one water at a time.'

In recent years, the Martins have faced the very hard drought years of 2018 to 2020, been restored by a series of exceptionally high rainfall years, and then faced sudden and extensive loss of feed after wildfires in 2023. Good rain in the summer of 2023/24 has allowed pasture recovery to occur and the Martins are once again looking to a brighter future, armed with their newfound knowledge and skills. It's not an uncommon trait of pastoralists in this region, to pick themselves up and have another go. Documenting their experiences is a little more unusual and we would sincerely like to thank them for their participation and willingness to share their story. Learning with others, collecting pasture and herd data, and being willing to adapt can be the key to increasing sustainability and profitability.

Written by Alison Kain
Livestock.Extension@nt.gov.au
Livestock Industries
Department of Industry, Tourism and Trade

Australian Government Department of Agriculture, Fisheries and Forestry
Future Drought Fund
NORTHERN TERRITORY GOVERNMENT