Fact Sheet

SAVING SOUTH AUSTRALIA'S MID NORTH GRASSLANDS

PROJECT DETAILS

Near Clare in South Australia an innovative project run by farmers, community leaders and researchers is showing how conserving native grasses can boost farmers' productivity.

In 1999, the South Australian Department for Environment and Heritage received $683,490 funding from the Australian Government's Natural Heritage Trust to demonstrate that appropriate grazing management can both allow native pastures to be grazed for production and result in improved conservation of native grasslands. The project was administered by a community group, the Mid North Grasslands Working Group. Since 2003 the Group has been supported by further funding from the Land, Water & Wool program run by Land & Water Australia, the Natural Heritage Trust, and the Northern and Yorke Agricultural District Integrated Natural Resource Management Committee.

General information on the project is contained in the leaflet 'Native Grasses – a Boon to Graziers'. This Fact Sheet outlines further details of project results.

Project design

- Interested landholders were approached to gauge their interest in participating as demonstration farms.
- With the help of Natural Heritage Trust funding a project was developed in 1999 aiming to demonstrate the benefits of sustainable management of native grasses as part of an overall grazing system.
- Scientific expertise was obtained from Agricultural Information and Monitoring Services in Armidale, New South Wales to design a credible monitoring program, collect data and evaluate results.
- A 32 hectare experimental site at 'Anama', Clare, was established with the co-operation of local landholders, Ryves and Tom Hawker, where trial paddocks were set up to compare different grazing rotations against common district practices.

The treatments included:

1. Summer rest from grazing with continuous grazing at all other times (district practice).
2. Autumn and summer rest from grazing with slow rotational grazing at all other times (seasonal grazing).
3. Spring and summer rest from grazing with slow rotational grazing at all other times (seasonal grazing).
4. Spring, summer and autumn rest from grazing during 2001-2002 and spring and summer rest from grazing during 2002-2003-2004, with slow rotational grazing at all other times (seasonal grazing).
5. Cell grazing based on plant growth rate which could be applied throughout each year. Cell grazing can be defined as grazing according to plant growth, using as many sheep as possible (for example, 370 dry sheep equivalent per hectare) for a short time period such as one to three days.
6. No grazing.

A range of measurements was taken in the different grazing rotations and included stocking rates, the number of native perennial grasses, water use efficiency, ground cover, pasture growth rates, herbage mass and certain soil physical, chemical and biological properties.

Participants in the project received training to increase their understanding of the merits and pitfalls of changing their grazing systems and to support them in the transition to a new grazing system.

Results

The results of these tests to date have shown that a clear increase in stocking rates can be achieved through cell grazing.

At the property 'Anama'

- A 79 per cent increase in stocking rate has been achieved in the cell grazing treatment. This grazing practice has resulted in an average stocking rate of 4.2 per hectare, compared with an average stocking rate of 2.3 dry sheep equivalent per hectare in areas using the regional grazing practices over the five year period of the trial.
- Major reductions in bare ground can also be achieved. Bare ground increased from 2.3 per cent to up to 26 per cent under the regional grazing practices, while bare ground in the cell grazing treatment has remained at about 5 per cent.
- Reductions in selective grazing resulted in significant increases in the biomass of perennial grasses. The quantity of perennial grasses in the total herbage mass has also increased over time, with the largest increase being 96 per cent in the cell grazed paddock, compared with an increase of 19 per cent with regional grazing practices.
- Cell grazing also resulted in greater efficiency in the use of water, as well as improved soil porosity. Adelaide-based business Soil Water Solutions carried out initial measurements in 2001, when both the district practice and cell grazing treatments recorded an infiltration rate of 0.6 millimetres per minute. By 2005, the district practice treatment was measuring an average water infiltration rate of 3.7 millimetres a minute while the cell grazing treatment had increased to a high of 15.4 millimetres a minute.

Demonstration farm sites

- The most significant changes recorded on the demonstration farm sites were increases in average pasture growth rates and water use efficiency, which resulted in an increase in stocking rates.
- Pasture growth rates have increased by an average of 14 per cent in the subdivided paddocks which are being rotationally grazed. These have averaged 6 per cent improvement in water use efficiency, compared with the set stocked control paddocks.
- The average pasture growth rate of the rotationally grazed paddocks is 13.5 kg of dry matter per hectare per day, compared with 10.8 kg of dry matter per hectare per day in the control paddocks.
- Water use efficiency is measured in terms of the amount of pasture produced in kilograms of dry matter per hectare per millimetre of rainfall recorded. Across all sites water use efficiency in the rotationally grazed paddocks is averaging nine kilograms of dry matter per hectare per millimetre of rain, while the control paddocks are recording an average of 8.5 kilograms of dry matter per hectare per millimetre of rain.
- These combined effects of rotational grazing have also resulted in an increase in stocking rates on the demonstration farms. The average stocking rate of the rotationally grazed paddocks is 30 per cent higher than the set stocked control paddocks. The average stocking rate of rotationally grazed paddocks during the trial has been 3.0 dry sheep equivalent per hectare, but varied among different paddocks and farms from 0.2 — 7.7 dry sheep equivalent per hectare. In the control paddocks the average stocking rate has been 2.3 dry sheep equivalent per hectare with a range from 0.5 — 5.4 dry sheep equivalent per hectare.

Lessons learnt

- Reduction in selective grazing

  Placing limits on the time which stock have to access and graze individual pastures through rotational grazing, limits the selective grazing of pastures and increases the overall diversity and quality of pastures.

  With the traditional set stocking practices, the sheep favoured north facing slopes, leaving an average of 30-50 per cent of these slopes bare to the elements. The combination of smaller paddocks with rotational grazing based on plant growth, forces sheep to use south facing slopes, while also giving the north facing slopes a chance to recover from the impact of grazing.

- Reduction in weeds

  Before the introduction of controlled grazing forcing animals to use the south facing slopes, these slopes suffered from invasion by Saffron Thistle. Once grazing was managed, the thistle was reduced by 25 per cent. There are also indications that annual weeds are less prolific if there is good ground cover at the autumn and spring break.

- Pastures with perennial native species which are given adequate resting periods from stock are producing more feed, because individual plants are larger and healthier and have more time to set seed.
- Annual stocking rates have, on average, increased from 2.3 dry sheep equivalent per hectare, up to 3.0 dry sheep equivalent per hectare. This has resulted from an increase in pasture growth rates of around two kilograms of dry matter per hectare per day from all the paddocks that had rotational grazing.
- In the high sheep stocking density and short duration grazing trial, there was an increase in the carrying capacity up to 4.1 dry sheep equivalents per hectare, taking it to around 70 per cent above the district average.
- The high sheep stocking density and short duration grazing trial also showed the greatest improvement in water infiltration. On the district practice trial site there was a gradual decline in infiltration rate to 0.5 milemetres per minute whereas on the rotational site the infiltration rate rose to 8.5 milemetres per minute.

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Rosella: Andrew Tatnell. Eucalyptus bark; Trevor Preston. Hand; Andrew Tatnell. Spinifex Grassland; Andrew Tatnell. Brush-tailed Rock Wallaby; Andrew Tatnell. Antarctic Beech Forest; Hank Bower.

A case study

Rowan and Andrew Cootes own and lease a 1,600 hectare property near Spalding, about 50 kilometres north of Clare. The Cootes family crop about 1,200 hectares of mainly wheat and barley. A further 400 hectares, just over 60 per cent of which is hill country unsuitable for cropping, is used to run a self-replacing merino flock of 2 500 ewes. The ewes graze in the hill country during the winter months, from about April to December and move onto the crop stubbles in summer. The property's annual average rainfall is 430 millimetres.

According to Rowan Cootes, they became involved in the project because they were concerned about the detrimental impact set stocking was having on their hill country.

He had observed large areas of capped soil developing, weeds such as thistles were increasing and patch grazing by the sheep resulted in some parts of the paddock not being fully used.

During 2001, through the Mid North Grasslands Working Group, Rowan was able to access funding to subdivide large paddocks and make improvements to stock watering systems. He says this was a big incentive for getting involved in the project.

One 36 hectare paddock was initially subdivided into five paddocks and became a demonstration site. Rowan says that with confidence gained from this initial subdivision and with support from the Mid North Grasslands Working Group, a further 80 hectares were subdivided into 13 paddocks. The water system was also re-arranged by installing a new pump, tank and troughs.

The Cootes are now rotationally grazing each paddock according to pasture growth, working on the principle of high density, short duration grazing. For example, they might run 2,000, dry sheep equivalent in a six hectare paddock about four times per year.

The minimum rest period target for each paddock is about 30 days, but during winter when pasture growth rates are slow, they use a longer rest period of about 50-90 days, depending on when the autumn rains occur.

After four years of being involved in the trial, Rowan and Andrew believe the change in grazing management has had a range of benefits, including improved native pasture biodiversity and production, a reduction in bare ground and increased water-use efficiency with more grass grown per millimetre of rain.

Rowan says currently they are achieving a water-use efficiency of about eight kilograms of dry matter a hectare per millimetre of rain on the northern slopes and up to 15 kilograms of dry matter a hectare per millimetre of rain on the southern slopes, but he believes there is potential to significantly increase water-use efficiency. Rowan says that the water-use efficiency is poorer in years following high use where less organic litter remains on the soil. He believes there is potential to significantly increase efficiency through further changes in stock management.

Initially the focus was on increasing stocking rates, to justify the capital expense of fencing and relocating watering points. In reality, the fencing has enabled additional control over access to pastures and increased stocking rates. Rowan says the previous maximum stocking rate would have been 2.5 dry sheep equivalent per hectare. Through rotational grazing the annual stocking rate has increased to about 3.7 dry sheep equivalent per hectare.

Now the focus is on returning more dry matter to the soil surface in an attempt to improve the water and mineral cycles which he hopes in turn will result in more native grass.

Photo credit: Rowan Cootes; Clive Palmer.