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Producer Research Support

Ponded pastures restore degraded land

Centralian Land Management Association

It takes at least three years, but degraded pastoral land in Central Australia can be transformed by ponded pastures.

The Centralian Land Management Association demonstrated the construction of ponding banks using laser survey in this Producer Research Support-funded project.

So successful has the project been that one pastoralist has laser surveyed 20 square kilometres for ponding. About 25 per cent of local land managers are now actively pursuing ponded pastures.

Key points

- Ponded pastures can be used to restore degraded land.
- Best establishment and persistence occurs when stock are excluded for at least three years.
- Harvesting seeds from local native plants is not easy.

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The project

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Objective

Aid the establishment of native plant species to increase the economic efficiency and sustainability of the pastoral resource.

What was done

In one of three initial demonstrations, 29 graded banks covering about 16 hectares of mostly bare and scalded clay loam soil were constructed on Palmer Valley Station.

Each bank was designed to pond 100 millimetres of water. The banks were direct seeded to evaluate the suitability of native grass and chenopod species for establishment and persistence behind ponding banks. Fences excluded cattle from the site.

An area 10 metres wide, extending from the base of the bank and along the length of the bank in the ponded area, was ripped to a depth of 20 centimetres using a two tined tractor-mounted ripper.

Seed was broadcast by hand onto the ripped area and then lightly covered with 1-5mm of soil using a piece of mesh towed behind a vehicle or a hand rake. In some cases where seed was sown onto the 'borrow' areas immediately adjacent to the bank, this area, was ripped afterward to incorporate seed with the soil.

What happened?

"The results have been very impressive, although little improvement was seen in the first three years," said association spokesperson Bob Millington.

He said that from the first year all ponded areas became covered by a "dense and mature mix of native grasses and chenopods".

In contrast, ground cover and botanical composition alongside the plot remained poor.

Mr Millington said it had proved a valuable demonstration site alongside the South Stuart Highway, where it drew the attention of passing pastoralists and visitors.

He said current interest now lay in how best to manage the site and maintain it in good condition, since fences had been removed and cattle were now grazing the site.

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Mr Millington said some time was needed for soil condition to improve before growth could start.

Water percolating through the soil following ponding, along with the growth of pioneer plants, progressively improved soil nutrition and condition.

Despite the slow start, which was affected by dry conditions, most sown species had established well in the first year.

The ponded water and exclusion of stock enabled the plants to reach their full potential and seed heavily.

Two years later the results were "very impressive" Mr Millington said, with high yielding perennial and annual grasses and chenopods "present in thick stands" behind and around the banks.

Estimated annual yield was between 5,000 and 8,000 kilograms per hectare while the control paddock remained largely bare with few desirable species.

On the second CLMA demonstration on Aileron Station, 19 graded banks covering 12 ha were established along similar lines.

The results were impressive on banks where cattle were excluded with 10 grasses and 13 chenopods well established and "entrenched". The results on banks exposed to cattle were less impressive although they contained higher cover and better yields of valued pasture species relative to the surrounding country.

Discussion

On Erldunda Station 30 ponding banks were now dominated by Buffel and Birdwood grass with Native Millet and Oat Grass the best established native species. Buffel and Birdwood grasses established well and were resilient to short periods of heavy grazing.

The estimated biomass yield of 5,000 kg/ha on Erldunda prior to one inspection in July 1998 was grazed down to 700 kg/ha. Outside the ponded area estimated yield was about 200 kg/ha.

Mr Millington said the project demonstrated the value of well designed ponding banks to harvest water and aid the establishment and persistence of valued native grasses and chenopods.

The project became a talking point for land managers in the district. Various implements had been used to trial different sized banks for different situations. The project also resulted in the development of a quad bike-mounted vacuum seed harvester to ensure a reliable supply of local native plant seed.

Twelve other Central Australian cattle stations established ponded pasture trials with assistance from the CLMA, while three that began prior to the PIRD were continuing with their efforts.