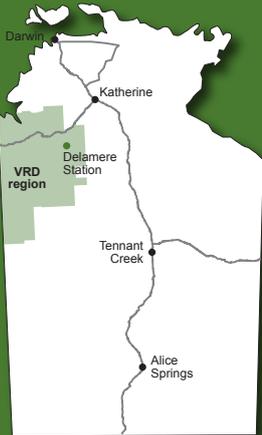




Case Study: Delamere Station



- **3,003 km² property**
- **Breeder operation**
- **Burning used to improve diet quality and pasture health**
- **Wet season spelling used to improve land condition**

Burning and wet season spelling for better pastures and business performance in the Victoria River District

The Australian Agricultural Company has owned Delamere station, 150 km south west of Katherine, since 2004. The property is primarily a breeder operation producing cattle for the live export trade. The former manager of Delamere implemented an early wet season burning program to remove rank grass and improve diet quality. He also commenced a wet season spelling program to increase the bulk of palatable grasses in his black soil pastures.

A research trial is now underway to study the land condition and production benefits of the burning and spelling practices used at Delamere.

Photo: Anthony Cox





“Grasses should be spelled for the first 6 to 8 weeks after the commencement of the wet season to ensure recovery from grazing or burning”

Burning early in the wet season improves pasture quality, but care needs to be taken to prevent overgrazing of the recovering grasses.

Photo: Department of Resources

Problem solving

The wet season burning and spelling regime at Delamere aims to solve two problems. The first of these is to improve the quality of grass that cattle haven't used during the dry season, and the second is to improve the health and bulk of palatable grasses in the pasture.

Improving pasture and diet quality

During the dry season cattle need to drink often (usually daily) and this restricts how far they can graze away from water points. Large amounts of grass beyond the grazing range of cattle thus become rank and less nutritious. During the wet season, these areas can be used by cattle due to the availability of surface water. The former manager of Delamere observed that burning this rank grass after the first rains of the wet season improved the quality of the regrowth, reduced supplement requirements and improved cattle weight gains.





Improving pasture composition and land condition

Early wet season burning, followed by full wet season spelling has also been used at Delamere to address the decline in preferred grasses and improve the composition and bulk of black soil pastures. Tussock grasses are very vulnerable to grazing in the first 6-8 weeks of the growing season. At Delamere, cattle are removed from the area to be spelled at second round and are only put back in at first round the following year.

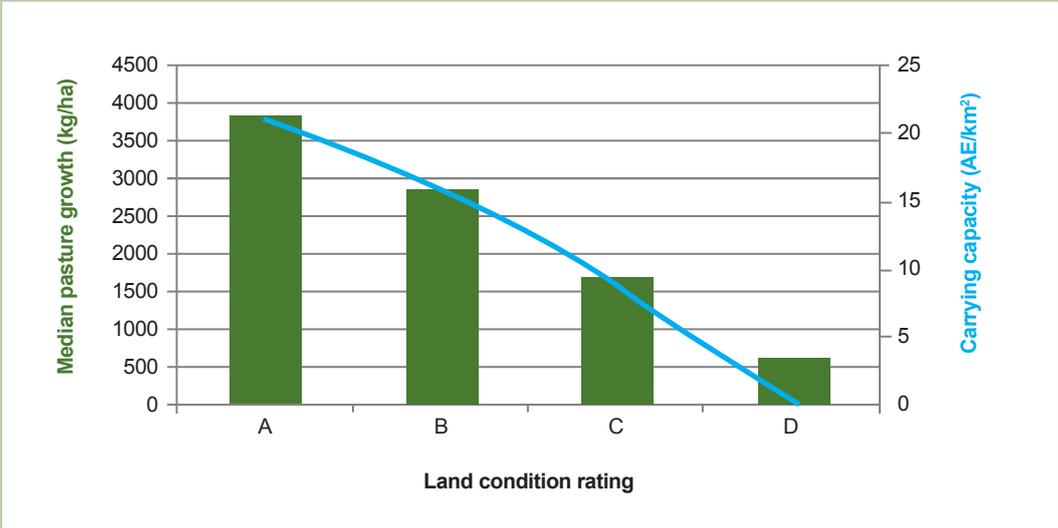
As land condition improves, the amount of palatable pasture that grows increases and this has a major impact on the number of livestock that can be carried.



Productive curly bluegrass pastures growing on black soil at Delamere station.

Photo: Department of Resources

Black soil pasture growth in the VRD





“The aim of the trial is to identify practical ways of wet season spelling (with and without burning) to improve land condition and pasture productivity”

Prescribed burn in the Victoria River District.

Photo: Caroline Pettit

Aims of the research trial

A research trial has commenced at Delamere to look at practical wet season spelling and burning practices for improving land condition and pasture productivity. AAcO, Greening Australia and the Victoria River District Conservation Association teamed up to commence the trial in 2010. The Department of Resources and Team Savanna currently manage the research activities at the site.

The trial is comparing the land condition and pasture productivity outcomes of the following practices:

- Continuous grazing with no burning
- Wet season spelling every two years
- Wet season spelling every three years
- Early wet season burning followed by wet season spelling every two years
- Early wet season burning followed by wet season spelling every three years.

Burning is conducted after the first decent rains of the wet season. In spelling years, the trial plots are spelled for the whole wet season and cattle are allowed to graze them during the dry season.





Delamere burn and spell demonstration site

The demonstration site is situated on black soil (Willeroo 1 land system) in No. 2 Paddock. When in good land condition, these black soils are dominated by curly bluegrass (*Dichanthium fecundum*), which is a productive native grass that grows on heavier soils across northern Australia. It is a valuable grass for pastoral production but declines under constant heavy grazing and is a good indicator of land condition. Anecdotal observations suggest that the longevity, growth, density and seed production of curly bluegrass are enhanced by early wet season burning followed by wet season spelling. The trial is measuring these factors to determine whether this is the case.



Curly bluegrass can respond vigorously after early wet season burning.

Photos: Sam Crowder



Demonstration site layout

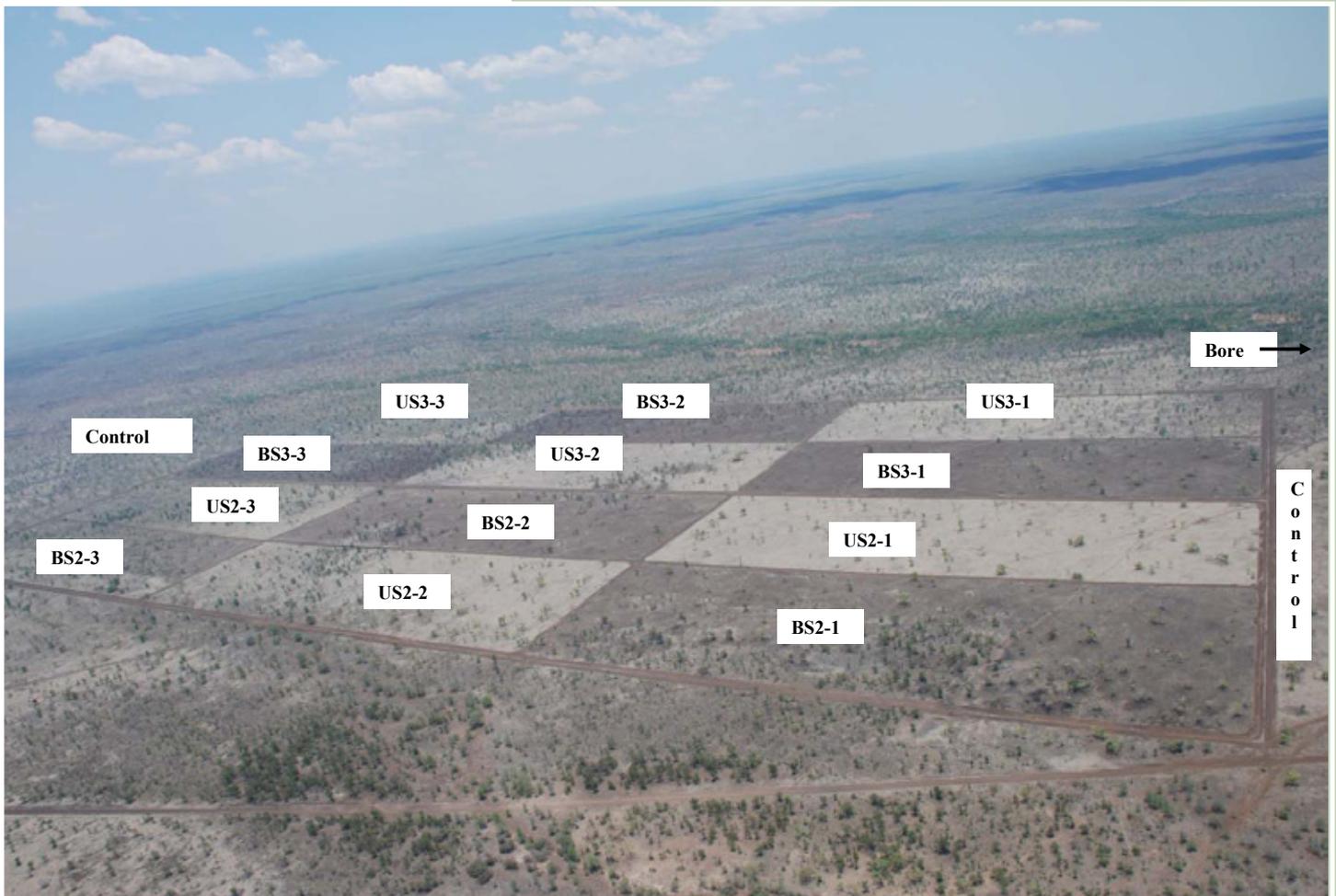
Two exclosures have been fenced, starting at 1km from No. 9 Bore and heading away from the bore for 1.6km. Each exclosure contains six treatment plots (each about 14ha in size). At the end of the wet season each year, the research team collects data on species composition, pasture yields, ground cover, seedling recruitment, plant size, deaths, seeding levels and grazing impact.

Plot Code Descriptions:

- Plots BS2-1, 2 and 3 are burnt and spelled every two years
- Plots US2-1, 2 and 3 are spelled (not burnt) every two years
- Plots BS3-1, 2 and 3 are burnt and spelled every three years
- Plots US3-1, 2 and 3 are spelled (not burnt) every three years

Aerial view of the Delamere trial site in late 2010. The darker plots are those that were burnt in November 2010. See text for descriptions of the plot codes. Note that the control areas are never intentionally burnt or spelled.

Photo: Boronia Sagers.





Early results

Measurements taken in April 2011 show that there was more curly bluegrass at 2 km from water than at 1 km from water. This reflects the historical pattern of preferential grazing of this palatable plant. The plots that had been burnt in November 2010 and then spelled for the whole wet season had slightly more curly bluegrass than the plots that had been spelled but not burnt. (see *Figure 1*)

It also appears that the seeding levels of curly bluegrass were highest on the plots that had been burnt and spelled. In coming years, the trial will keep monitoring these and other trends. (see *Figure 2*)

Figure 1

Average yield of curly bluegrass (95% Confidence Interval)

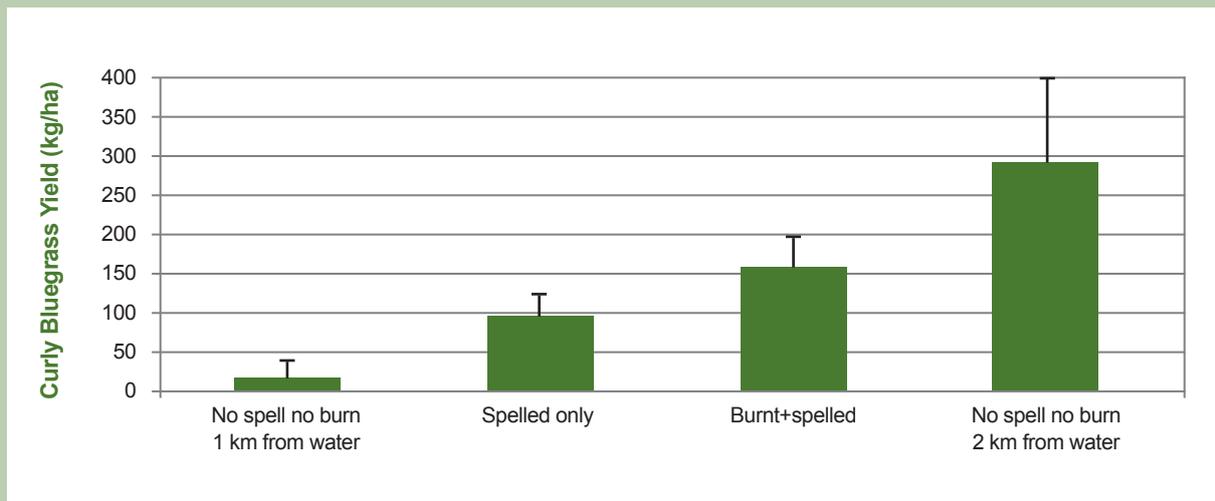
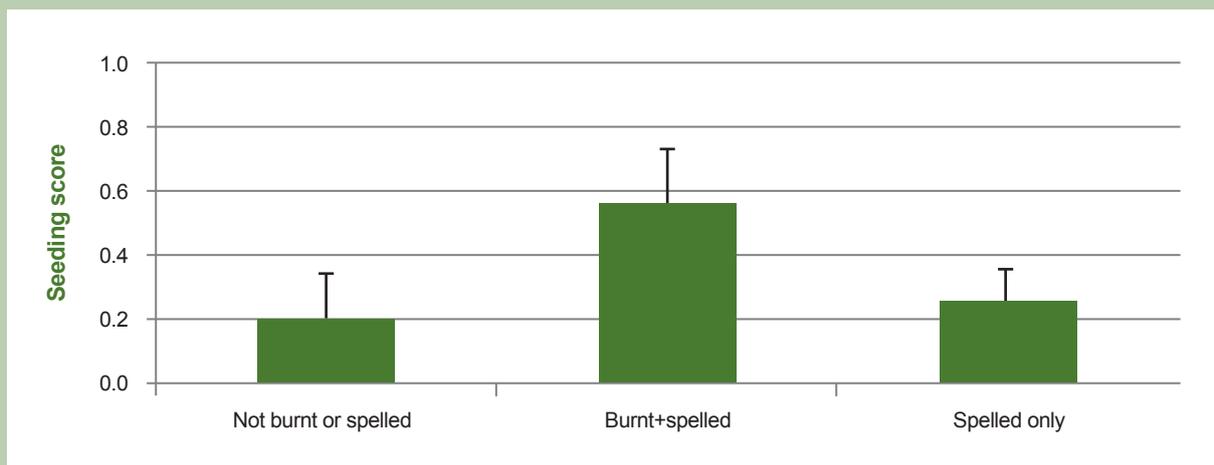


Figure 2

Average seeding score (0–3) Curly bluegrass (95% Confidence Interval)





Benefits of early wet season burning

Producer experience at Delamere indicates that early wet season burning can:

- Improve pasture quality
- Reduce supplement costs
- Increase cattle weight gains
- Improve the health and seed production of valuable pasture grasses such as curly bluegrass.

Benefits of wet season spelling

Producer experience and research across northern Australia indicates that wet season spelling can:

- Optimise the bulk and composition of pastures and keep them in good land condition
- Help to restore land that has declined in land condition when teamed with appropriate stocking rates
- Be used to accumulate feed or fuel for grazing or burning at strategic times
- Potentially improve live weight gain per hectare over the long-term by allowing sustainable increases in stocking rate and carrying capacity.

For more information

Contact the Pastoral Production team at Katherine on 8973 9739 or Berrimah Farm on 8999 2011.

Project Partners

Current research at the Delamere site is funded by the Australian Government's Climate Change Research Program as part of the Northern Grazing Systems project. Significant in-kind support for the trial is provided by AAcO's Delamere station.

