

CARRYING CAPACITY ON SALINE SOILS – GUNDAROO

SUSTAINABLE GRAZING ON SALINE LANDS

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The problem

The Yass Valley has had numerous outbreaks of salinity occurring in low-lying areas, although many low-lying areas still have ground cover. The problem farmers face is typically waterlogging with very mild salinity (< 2 dS/m). Many of these sites consist of naturalised pasture that remains unproductive for much of the year. It is these areas that are prone to developing into saline discharge sites.

The plan

The plan was to set up a grazing demonstration to compare the carrying capacity of fine-wool Merino sheep on two paddocks (3.5 ha each) located on low-lying, waterlogged, mildly saline land. One paddock consisted of a 10-year-old tall fescue and clover pasture and the other paddock was a naturalised mixed pasture.

The aim of the demonstration was to provide data on the potential livestock production possible on these problematic areas under two different types of pasture.

Actions taken at the site

The demonstration began in January 2004, with paddocks stocked with weaner sheep at 20 weaners/ha on the tall fescue pasture and 10 weaners/ha on the naturalised pasture. Animals were weighed every 4 weeks, and by May 2004 both paddocks had 14 weaners/ha. Pasture condition then deteriorated and supplementary feeding

occurred. These young trial animals did not handle the conditions of feeding very well, causing the animal results to be rendered meaningless for this first year. Extended dry conditions prevailed until mid 2005, hindering the collection of any results.

Both demonstration paddocks were re-stocked in November 2005 at 11.1 hoggets/ha on the fescue paddock and 11.4 hoggets/ha on the naturalised paddock. Data were collected until December 2006, by which time stocking rates had increased to 14.3 hoggets/ha on the fescue paddock and 14.0 hoggets/ha on the naturalised paddock. Again, drought (in early January 2007) necessitated destocking of the demonstration.

Single superphosphate fertiliser was applied to each paddock in autumn at a rate of 125 kg/ha. Molybdenum single super (0.05%) was applied in autumn 2004.

Pasture monitoring

Pasture composition was monitored 6 monthly over the period December 2004 to May 2006.

Tall fescue paddock. Tall fescue was the dominant perennial grass. The legumes present were sub clover and medic species. The annual grass species included soft brome, barley grass, vulpia and Yorkshire fog grass.

Naturalised pasture paddock. The dominant species included wallaby grass, ryegrass (both annual and perennial), windmill grass, couch, sub clover, suckling clover and knotted clover, as well as the annual grasses, barley grass, soft brome and Yorkshire fog grass. Dock and *Juncus* spp. were also present.

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Fiona Leech



Fiona Leech

(Left) The tall fescue pasture in November 2006. (Right) The naturalised pasture in November 2006. The grazing pressure applied to both paddocks has resulted in increased pasture utilisation, encouraging pasture growth, and hence greater soil water usage. In the naturalised pasture the tussocks are spike rush, a sign of waterlogging. The sheep have grazed around these plants.

Results

Pasture/grazing results

Date	Tall fescue paddock			Naturalised paddock		
	Average weight gain/loss (g/head/day)	Stocking rate (hoggets/ha)	Average weight (kg)	Average weight gain/loss (g/head/day)	Stocking rate (hoggets/ha)	Average weight (kg)
Nov 05	n/a	11.1	38.3	n/a	11.4	40.3
Dec 05	100	11.1	41.1	67	11.4	42.2
Feb 06	-37	10.6	38.6	-28	11.1	40.3
May 06	37	11.4	41.0	17	11.4	41.4
June 06	24	11.4	41.7	0	11.4	41.5
Paddocks spelled for 2 months and then restocked with new hoggets in September 06						
Sept 06	n/a	14.6	27.2	n/a	14.3	27
Oct 06	49	14.3	37	49	14.3	36.2
Dec 06	40	14.3	39.5	38	14.0	40.1

Because the dataset was limited no conclusions could be drawn regarding species composition changes.

There was minimal difference in weight gain or loss of animals between the two paddocks, indicating that both paddocks performed at similar levels.

Changes at the site

Some stark visual changes occurred simply as a result of fencing and the application of grazing pressure. Before we started the demonstration, the naturalised pasture paddock contained mostly tall, rank pasture. Following fencing and stocking, the cover in this paddock became a much shorter carpet of green growth. The tall fescue paddock also contained some tall, rank growth, but not as

much, because it had been subjected to greater grazing pressure in the past.

Conclusions

Extended dry conditions throughout the demonstration hindered the collection of a full set of results. However, the data collected suggest that just by fencing, fertilising, and using grazing management it is possible to turn a problematic area into a productive area. The animal weight data collected indicated that the naturalised pasture paddock proved to be as productive as the tall fescue paddock. Pasture establishment is very expensive; it is therefore encouraging to see that, with simple and much cheaper adjustments, existing naturalised pastures can be made productive and a sustainable outcome of increased water use by the pasture can be achieved in these areas. These low-lying areas often cover small parts of larger paddocks; they are usually covered in rank pasture because of the high moisture levels and because the stock preferentially eat out the rest of the paddock. Fencing provides the control to enable the potential productivity of these areas to be realised.

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APPENDIX*Soil data (sampled in January 2004)***Tall fescue paddock (0–10 cm)**pH_{CaCl2}: 5.7Soil salinity (EC_e): 0.8 dS/m

Sodicity (ESP): 3.1%

Phosphorus (Colwell): 25 mg/kg

Naturalised pasture paddock (0–10 cm)pH_{CaCl2}: 5.5Soil salinity (EC_e): 0.6 dS/m

Sodicity (ESP): 4.5%

Phosphorus (Colwell): 17 mg/kg

ESP, exchangeable sodium percentage

Salinity (dS/m): Slight 1.5–2; moderate 2–6; high 6–15;
extreme > 15

Non-sodic, ESP > 6%; sodic 6%–14%; strongly sodic > 14%.

Rainfall during trial (mm) (average annual rainfall = 650 mm)

	Jan	Feb	Mar	Apr	May	Jun
2004	51	19	6	6	7	22
2005	32	70	28	8	0	75
2006	68	18	32	13	11	78

	Jul	Aug	Sep	Oct	Nov	Dec	Total
2004	22	85	35	70	80	85	488
2005	119	75	110	75	95	40	727
2006	33	26	18	6	32	18	353

(2006 figures from Hall, ACT)

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