

Raised Beds for Increasing Grazing Productivity on Saline Land

Background

1. To evaluate the effectiveness of raised beds in increasing grazing productivity on saline land.
2. To determine if raised beds improve productivity sufficiently enough to justify the cost.
3. To determine if raised beds significantly impede day-to-day management.

What was done

The site comprised mostly sea barley grass ground, on the edge of a saline scald, and was subject to winter waterlogging. Raised beds were formed in early 2004 to help alleviate salinity and waterlogging conditions.

Beds and adjacent low-lying 'flats' were each sown to a range of pasture species/mixes including:

- "Saltland mix" comprising: puccinellia (10kg/ha), tall wheat grass (10kg/ha) & strawberry clover (1kg/ha);
- Tropical grasses: rhodes grass & glycine (2kg/ha);
- Tall fescue (7 kg/ha), perennial ryegrass (10kg/ha) & clovers (cv. Trikala and Gosse) [5kg/ha].

Seeding occurred after the opening rains in 2004, except the tropical grasses, which were sown in early summer.



The raised bed former (owned by the KI Grain Growers Association).

The site was reseeded in 2005 (due to patchy germination and high kangaroo/wallaby grazing impacts in 2004) and an electric fence was installed around the trial in summer 2005.

Fertiliser applications included:

- Nitrogen at 25kg/ha in spring of year 1.
- Annual applications of single super at approx 150kg/ha.

Species were monitored for persistence. Visual inspections were carried out at germination and then twice through the growing season, with estimates of plant densities undertaken.

Results

Raised beds are an option for managing saline and waterlogged land, however as with any drainage activity, care must be taken with saline water leaching from the site.

In general, plants persisted better on the raised beds than on the flats in both years. Puccinellia established well on both the beds and the flats but had higher numbers on the beds.

In 2004, tall fescue did better than the ryegrass, however this result was reversed in 2005. This suggests that seasonal conditions will influence which species performs best in any particular year.

The tropical grasses failed to germinate in either 2004 or 2005 but germinated and grew well in 2006. They were possibly grazed off by wildlife in 2004 and 2005 or the seasonal conditions may have prevented a good germination. By 2007 the puccinellia mix was performing the best on beds and flats, the rye grass and fescue was quite patchy as were the tropical grasses.

Given the potential for variation in conditions between years, the best bet pasture for this site will be a shotgun mix,

e.g. comprising puccinellia, tall wheat grass, clovers, tall fescue and perennial ryegrass.

Germination was patchy, highlighting some potential issues with raised beds:

- Unevenness in bed formation can bring difficulties in achieving correct seeding depth.
- Bed formation can bring saline soil from depth to the surface. This may mean a greater delay between bed formation and seeding may be required to enable rainfall to leach out salts.
- Prior to the beds the site could only sustain sea barley grass and annual volunteer species. It now supports a mix



Raised beds alleviate waterlogging and enable salts to be flushed from the profile.

of productive species. Stocking rates are estimated to have improved from 1-2 dse/ha/yr to 4-6 dse/ha/yr.

- Along with better drainage (via raised beds), fertiliser applications and installing a wildlife proof fence have been key factors in boosting productivity.

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Funding/Sponsors:

- Land Water and Wool
- Department of Water Land and Biodiversity Conservation
- Kangaroo Island Natural Resources Management Board

Take Home Message:

- Raised beds increase productivity on saline, waterlogged land along with fertiliser and fencing our wildlife.
- Potential issues: uneven bed formation can make seeding difficult, Saline soil may be brought to the surface, leached salts may cause damage