EVALUATING THE EFFECTIVENESS OF RAISED BEDS IN INCREASING GRAZING PRODUCTIVITY ON SALINE LAND

KI NRM Board, Eleanor River, Kangaroo Island

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

The Trial
- 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 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.

Fast Facts
Location: Eleanor River, south coast KI
Soil Type: Sand/ loams over clay, calcareous at depth
Rainfall: 600mm
Pasture Base: Mix of pastures trialled (as listed)
Landscape: Creek flat
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.
- In 2007, the puccinellia was reasonably well established on both the flats and beds but with little evidence of the tall wheat grass. The tall fescue and rye grass had thinned out considerably but were still evident in patches.
- Given the potential for variation in conditions between years, the best bet pasture for this site will be a shotgun mix, eg. comprising puccinellia, tall wheat grass, clovers, tall fescue and perennial ryegrass.
- Germination was patchy in 2004, 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.
- The tropical grasses failed to germinate in either 2004 or 2005 but grew well in 2006 and were still evident in 2007.
- Prior to the beds the site could only sustain sea barley grass and annual volunteer species. It now supports a mix of productive species. Stocking rates are estimated to have improved from 1-2 dse/ha/yr to 4-6 dse/ha/yr.

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

- Along with better drainage (via raised beds), fertiliser applications and installing a vermin proof fence have been key factors in boosting productivity.
- Future work will look at stock impacts on the beds.

Rushes and sea barley grass are indicators of salinity and waterlogging at this creek flat site.

Want to know more?

Participating Host Farmer:
Brenton Putland

Technical Support:
Lyn Dohle, Tel: (08) 8553 4949