

Have a yarn

talking salt with Cameron & Teresa Tubby

"Grazing saline land with perennial grasses"

A run of bad seasons around the Morawa district has reinforced Cameron and Teresa Tubby's commitment to livestock production within their mixed farming enterprise.

The couple, together with Cameron's parents, Ian and Betty, crop up to 4000ha and run 5000 Damara ewes 40km north of Morawa.

Cameron's great grandfather took up Bundaleer in 1911 and traditionally the family has produced grain and wool, but with wool prices in decline, the switch to Damaras was made in 1998.

"Damaras are one thing we think we can consistently make money on," Cameron explained.

Annual rainfall has traditionally been 325mm but is becoming increasingly unpredictable. With a 2006 growing season rainfall of only 55mm to September, the family decided not to proceed with their regular cropping

program, making it the first time in 95 years they had not put a crop in.

The 8000ha farm covers some broad red sandy loam valley floors and encompasses a string of salt lakes. About 250ha of the total farm area is salt-affected.

Cameron believes he can make much better productive use of these salt-affected areas, and with the Morawa Farm Improvement Group designed a Sustainable Grazing on Saline Lands trial to establish which perennial grasses would be best planted between rows of saltbush on 3ha of the 5ha site.





Prior to the project's works, the site varied in condition with a small proportion still croppable, but about 30 per cent of it adjacent to a 2m deep drain was badly degraded and bare, white and crusty.



This particular paddock had been cleared about 70 years ago and cropped until 20 years ago. More recently the predominant vegetation was volunteer bluebush.

Old man saltbush and Rivermor (selection of river saltbush) seedlings were planted in 6m wide rows in 2003, allowing Cameron to come back and sow perennial grasses in the alleys.

Cameron sowed Evergreen Saltland mix in 2003 which included the subtropical perennial grasses Bambatsi panic and Rhodes grass as well as puccinellia and tall wheat grass.

He first treated the site with the knockdown herbicide, Spray Seed.

"We needed the right combination of soil moisture and temperature for the subtropicals to germinate and sowed too late," he said.

"Little of the grasses sown in 2003 survived but the plants that did germinate survived through some dry years since then."

The following season, 2004, was too dry to sow grasses, but in June 2005 and May 2006 Cameron again tried to establish tall wheat grass and puccinellia.

No rain fell for six weeks after the 2005 sowing but the tall wheat grass did get to tillering stage.

The site was ploughed prior to sowing and the soil was friable and weed-free.

"We have given up on the subtropical perennial grasses," Cameron explained. *"They are high risk."*

There is little evidence of the perennial grasses and creeping saltbush sown in 2006.

Cameron is determined to get the perennial grasses established and in the meantime has had limited grazing from his saltbush which established

extremely well, looks uniform across the site, and is now 1.5m high.

An economic analysis of the Tubbys' SGSL site did not look

favourable in terms of return on investment, largely because of the costs associated with establishing perennial grasses over three seasons.

However, Cameron is convinced of the potential of saltland for out-of-season feed.

"Alleys of saltbush are a renewable hay stack," he said.

"The saltbush seedlings on this 3ha site cost \$1,100 to establish but it is here forever."

"And given the good establishment that Ian Pulbrook achieved here in a tough year, we would go with seedlings rather than direct seed."

Cameron said if he had not been worried about grazing the newly established perennial grasses, he'd have put 500 ewes on the site for 10 days earlier this year.

"This would have equated to \$800 worth of hay," he added.

"The salt affected areas could be some of our best grazing country."

"The salt-affected areas could be some of our best grazing country.

"There is another 80ha nearby that I'd like to set up for grazing with rows of saltbush and alleys of perennial grasses with access to adjacent stubbles when funds allow."

In hindsight, Cameron said he would plant double rows of saltbush and leave the alley wide enough to allow access with the spray boom and airseeder for grass establishment in the inter-row.

"It has been too difficult to get into the 4m wide alleys with the boom," he explained.

"And the Chamberlain combine is not particularly precise when it comes to sowing depth."

Despite the disappointment with grass establishment, the excellent stand of saltbush has transformed the site and convinced Cameron of its productive potential.

Unwavering in his determination, Cameron said he would give the grasses one last go in 2007 with the use of a mini Ausplow DBS seeding unit which would have better depth control and the added benefit of press wheels.

"Alleys of saltbush are a renewable hay stack."

QUICK FACTS



Location: Canna, 40km north of Morawa

Rainfall average: 325mm

Enterprise mix: Sheep and cropping.

Trial size: 5ha

Trial aim: The project will aim to achieve a cost effective grazing system for saline soils that will regenerate with low inputs thus making the land both productive and profitable. Gypsum will also be tried in strips to improve pasture production.

Treatments: Five different drainage treatments, installed in January 2004. Revegetation costs: \$333/ha (without fencing)

Saltland pasture mix: Old man and river saltbush seedlings, and Evergreen saltland mix.

Original vegetation: York gum

Paddock cover before trial started: Volunteer bluebush, barley grass and iceplant.

Soil type: Red clay with secondary salinity

Watertable: -1.5m

Water salinity: 2900mSm (half seawater)

Water pH: 6.5

Clearing date: 1945





A word from the gate...

The majority of soils affected by secondary salinity in Western Australia are sodic or have sodic (sodium saturated clay) subsoils. Most sand over clay or duplex soils within the state fall within this category.



Sodic clays are characterised by high concentrations of sodium ions relative to calcium and magnesium. They are typically tough, poorly structured, sticky when wet and have a greasy feel when moulded, which is indicative of clay dispersion.

Clay particles that go into solution, during dispersion, clog or reduce the size of soil pores resulting in slow infiltration rates, compaction and reduced aeration.

Sodic loams and clays have the added limitations of being extremely hardsetting and develop surface crusts that restrict seed germination.

General recommendations for managing sodic duplex soils are:

- Maintain ground cover to reduce the risk of capillary rise of salts.
- Practise minimum tillage to protect fragile sandy topsoils from wind and water erosion.
- Avoid deep cultivation practices that incorporate subsoil clay.

The soils at Cameron Tubby's trial site are red clay loams and clays that have extremely saline and sodic topsoils, with salt crusts and bare areas apparent over 50% of the area.

Subsoil horizons below 30cm are moderate to highly saline and highly sodic.

A saline watertable at about 1.5m depth is the main factor responsible for salt accumulation at the site while red-brown hardpan layers and fine textured soils are also contributing factors.

The drain is unlikely to have major impact on the saline groundwater table beyond 20m, however it does provide an outlet for surface drainage.

Surface salt concentrations would have to be reduced before pastures can be established.

Shallow drains should be installed to eliminate surface ponding and areas of potential salt concentration. This would be best achieved by mounding planting strips or developing raised beds that incorporate furrows.

Gypsum ($\text{CaSO}_4 \cdot \text{H}_2\text{O}$) can be used to ameliorate saline-sodic topsoils. Gypsum saturates the soil solution with calcium ions and replaces exchangeable sodium. This process can develop and stabilise soil structure and improve internal soil drainage provided there is sufficient rainfall.

Henry Smolinski is a Research Officer and has made a career in DAFWA of describing and analysing soils. He is particularly keen to help farmers identify key soil solutions.

"The Sustainable Grazing on Saline Lands program (SGSL) aims to support sheepmeat producers and woolgrowers profitably manage by dryland salinity on their farms.

SGSL involves building a network for testing and exchanging information, providing farmers with useful, timely and relevant information and conducting on-farm research into saltland production options.

The program operates in WA as a producer network of regional farmer groups undertaking individual sustainable grazing projects on local salt-affected farms as well as a Research & Development project through the CRC Salinity of which CSIRO and DAFWA are principal contributors.

The SGSL is a National program initiated and funded by Australian Wool Innovation, MLA and the Federal Government's Land, Water and Wool agency. In WA the project is co-funded, administered and delivered by the Department of Agriculture and Food WA, in conjunction with the CRC Salinity and CSIRO."

Further products in this series available at www.landwaterwool.gov.au

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