

Salt trial reaps rewards in Great Southern

For 25 years, Chris Walton has tried almost everything to control salinity. As he explained to Natalie Lee, he reached a critical point during the mid-1990s when, alarmed by the worsening problem, he spent \$100,000 in three years on salinity.

“I reckon about a third of it was wrong,” Chris said.

“We have to find better, more accurate solutions because its too expensive.”

Chris’s became involved in a five-year, on-farm Land, Water & Wool research trial aimed at boosting the sustainability and profitability of wool growers.

Chris is excited by trial results and claims for every dollar spent, a seven-fold return is achievable through timely intervention on salt-affected land.

An emerging issue

“The first signs of salinity emerged on our farm during the late 1970s, and a 600 hectare block on the valley floor is currently at risk of being severely salt-affected.

From the 1980s, we implemented salt management measures including deep drains, trees and saltland pastures, all of which have met with varying degrees of success.

During 2002, we became involved in the Land, Water & Wool trial carried out on two 26 ha sites in the affected area, with one site acting as a control.

The aim was to assess the impact of establishing a saltland grazing system on livestock, plants, and the water-salt balance.

Case study: Chris Walton

Location: Yealering, upper southern region, Western Australia

Property size: 3024 ha

Mean annual rainfall: 350 mm

Soils: Duplex soil types, grey cracking clay in the valley

Enterprises: Prime lambs, grain



Photo: Hayley Norman. Inset: Natalie Lee

Saltbush has boosted animal production on saline areas. INSET: Chris Walton on areas of bare salt scald at the control site

During 2003, earthworks were completed at both sites including deepening and widening two drains, and segregating the sites from outside water influences by constructing grader banks. Monitoring bores, flumes to measure water flow from the sites and weather stations were installed.

During 2004, we sprayed the site twice with a knockdown before seeding. Using a combine and a seeding rate of 8 kg/ha, pastures including Santiago medic, Caliph medic, Nungarin subclover, Frontier balansa clover, Prolific persian clover and Prima gland clover were sown during mid-July.

We planted Old Man and River saltbush in rows during late July at a rate of 670 plants per hectare using a one-pass Chatfield planter.

Superphosphate was applied at sowing, and the site was sprayed for lucerne flea later in the season.

We lightly grazed the site during 2004 and 2005 and measurements were taken from

January 2006, when 350 Merino weaners were grazed across both sites for 1200 days grazing days equivalent.

The trials revealed that a profit of \$60 to \$100 per hectare was achievable across the grazing trial site, compared with zero profit from the control site.

There has been phenomenal dry matter growth — about 8 t/ha during 2005 — largely because of the understorey.

Additional profits could also be achieved by farmers using their productive land more effectively.

I now better use my productive country knowing I have this feed source available on my salt-affected land.

The trial has also resulted in increased water usage at the grazing site, compared with the control site, where salinity was still spreading.

On the trial site, there is colonisation by medics and pasture on the more salt-affected areas — some of which are quite bare.

Key points

- Saltland grazing systems can increase productivity and profitability from salt-affected areas of land
- Increased water use from saltland pastures can reduce the spread of salinity.

Lessons learned

We found it better to plant higher numbers of saltbush on a given area, and triple rows of saltbush were better than double rows.

In future, we would use wider spacings, about 15 metres between the saltbush rows, to allow easier machinery access.

I think better saltbush, pasture and grass varieties are needed for saline land, and correct establishment is critical, particularly on heavy soils. It is not country you can easily get back on to.

Apart from making farms more productive, establishing saltland pastures have benefits

for the broader environment by keeping waterways fresh.

From an environmental point of view, it's a win-win situation — the water is being trapped by the saltbush and pastures, and it's not going into streams."

- *Land, Water & Wool was a joint investment by wool growers through Australian Wool Innovation Limited and Land and Water Australia, with support also coming from Meat & Livestock Australia, Australia's National Dryland Salinity Program, CSIRO, the WA Department of Agriculture and Food, and FFI CRC. For further information, visit www.landwaterwool.gov.au.*

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Future Farm Industries CRC is developing new and adaptable farming systems for Australia by creating new land-use practices which will make agriculture more productive, diverse, adaptable to climate variability and sustainable. The use of perennial plants is a primary focus of the CRC's research because of their adaptability to climate variation and ability to lower water tables in low-lying, saline areas.

Do you have a story to tell about your experiences in new farming practices, or using perennial plants? If so, *SALT Magazine* wants to help spread the news. Contact the Communications Manager or your nearest state FFI CRC Node Manager:

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The science behind the story

By Dr Hayley Norman

When this project was started during 2001 it was unclear if saltbush-based pasture systems produced enough feed of sufficient quality to justify costs of establishment. There also was little information concerning water use by halophytic shrubs in saline soils and the ecological value of saline land. The challenge was to construct pasture systems that allowed producers to profitably utilise saline land while improving the health of the environment.

Overall, the revegetation of saline land in the low to medium rainfall zone of south-western Australia offers benefits to producers in the form of economic returns from animal production systems and environmental health. Our data quantifies the feeding value of saltbush-based pastures and the environmental impact of saline grazing systems on salt and water movement and biodiversity at paddock scales. Through whole-farm economic modelling we have estimated the returns from these systems to producers.

At Chris's site we have demonstrated that revegetation with saltbush and annual legumes supported 2.8 to 4.6 times more sheep during the autumn feed gap than unimproved saltland. Saltbush-based pastures had their greatest relative value after a poor growing season. This equates to 500-1200 autumn grazing days per hectare of salt-affected land and 2-5 kg/ha of clean wool.

This study found some evidence that saltbushes use more water than unimproved saltland. The saltbushes at Yealering have enhanced evapotranspiration within plots and the soil under the saltbush at Yealering appears to be showing an increased drying period, and a decline in shallow water table.

The economic return from improving a saline site will be largely dependant on the level of understorey biomass which can be grown. At a similar research site in Tammin, where the soil was too salty for burr medics, saltbush and volunteer understorey is not profitable.

While each of the individual benefits were not overly large, however when combined, there is a positive case for producers in the low to medium rainfall zone of WA to invest in revegetation of saline land with saltbush-based pasture systems. The data indicates that the greater the degree of salinisation, the smaller the benefits.

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