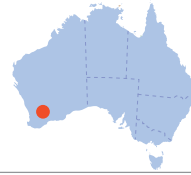




Saltbush – ‘like money in the bank’

Case study: LJ and O Dawes, ‘Rutherglen’
Location: via Yealering, Western Australia
Property area: 4000 ha
Rainfall average: 300 mm
Enterprise: Grains, wool production, Merino stud



The Dawes family first planted saltbush to help overcome salinity about 15 years ago. Saltbush now covers about 200 hectares and because of its value may be extended to 1000 ha over the next five years, as Buster Dawes explained to Georgina Wilson.

Quailbrush and wavyleaf saltbush were the first saltland pastures tried at ‘Rutherglen’ at the instigation of son Tim, but after 15 years, those two varieties aren’t high on the shopping list.

“Quail is easy to grow and very palatable to the sheep, but just won’t persist here. If you have to replant every five years, it’s just not worth it,” Buster Dawes said.

Wavyleaf has persisted but is not very palatable, similar to old man saltbush. Top performer to date among the seven varieties tried is river saltbush – very palatable with the important bonus of natural regeneration, meaning minimal management effort after establishment.

“We look to see what’s eaten first and it is always river saltbush,” Buster said. “In the wet years we don’t use it, but it’s like a bank. It’s there when you need it in dry years – a reserve that you have to have.”

That saltbush proved a godsend for stock in summer 2002-03, following a dry winter when crops yielded about a quarter of normal on only 160 millimetres of rain. Buster also estimates a 10 per cent better wool yield from saltbush compared with other paddocks and useful prevention of wind erosion on formerly bare ground.

Stocking rate is more than a sheep to the acre (0.4 head/ha) for five months of the year. But it is important not to graze the plants too hard as some leaves must be retained to help plants survive the winter.

Soils on the Dawes property are very variable ranging from heavy clay to sand, and salt has appeared on both ‘dry’ and ‘moist’ areas affecting about a quarter of the land. Saltbush will survive on the drier



Buster Dawes admires a good source of river saltbush seed. Buster says saltbush must be supplemented with a ‘mixed grill’ of straw and good water to maximise stock productivity on salt country.

uplands but prefers the lower moist areas – country now unsuitable for crop but which supports barley grass, local bluebush and samphire.

Like many Western Australia wheatbelt farmers, the Dawes tried drains to remove salinity, but found they didn’t work well because of soil variability. Oil mallees were also tried, but with 11,000 thriving plants in the ground and no market, they have halted further plantings.

Instead, the saltbush plantings will be extended gradually to where salt scalds are growing and crop yields are lower over the next few years.

River saltbush produces seed in January, but in some years only. Seed collecting is tough – hard on the back as well as the hands in stripping off the branches - so the family normally collects some of its own seed and buys some in.

Palatability is unquestioned: sheep will even stand on their hind legs to reach it and Buster has seen them come down the hill in late afternoon, graze the saltbush for an

Key points

- Saltbush is a really useful reserve for stock in dry years, as well as helping to reclaim land
- Choosing the best variety is a trade-off between palatability and natural regeneration
- River saltbush is the best performer found yet for this location



Saltbush has been a good source of sheep feed in tough seasons such as 2002 and 2003.

Photos: Georgina Wilson

hour or two and then return to the dry pasture.

"But you can't feed all saltbush. You've got to have sources of straw and pure water," he warns. "Give them a mixed grill!"

A farm lay-out of paddocks that are not all saltbush but include some high ground which can grow other pasture while providing a refuge in times of sudden

flooding is recommended.

"You would do nothing with this country if you couldn't grow saltbush on it," Buster says. "On salty country you still have to pay some rates. This way you get a return."

• *Buster Dawes spoke with Georgina Wilson, NDSP Communication Co-ordinator (WA)*

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Sustainable Grazing on Saline Land research commences

Saltland pasture has been a recommended response to salinity in WA for nearly 60 years but experience has shown that it does not work in all situations.

The grazing value of saltbush pastures is now being investigated as a Sustainable Grazing on Saline Land (SGSL) project, part of the wider Land, Water & Wool initiative.

Land, Water & Wool is a partnership between Australian Wool Innovation Limited (AWI) and Land & Water Australia that focuses on sustainable and profitable wool production.

The project involves staff from CSIRO, the Western Australian Department of Agriculture and the Co-operative Research Centre for Plant-based Management of Dryland Salinity.

Dr Ed Barrett-Lennard is co-ordinating a team working on the use of supplementary feed sources with saltbush to supply the energy needs of stock, and how to prevent sheep eating out the more palatable components of pasture while ignoring the rest.

He said recent farm modelling indicated that 'moderately' saline land could benefit more than 'mild' or 'severe' situations from revegetation.

"This autumn we will begin a trial on the Dawes' property to compare animal performance on pastures that are supplemented with grain and/or low quality forage such as hay," he said.

"While saltbush is a good source of protein for stock, its low digestibility, high

ash content and low energy levels make it less than ideal if fed on its own. Understorey plants such as annual herbs, grasses and legumes can help provide a balanced diet, or it may be worth bringing in extra grain or hay with dense stands of saltbush."

With trials on several properties over the next few years, scientists should gain a much clearer understanding of where saltbush can work most efficiently.

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Old and new plants underpin this system

We took over this property in 1990, recognising that it would present major challenges. Ten per cent of the land is visibly salt-affected and most of the remainder is low fertility sandy country. We immediately set about designing a management system that would at least stabilise the salinity, and protect the sandy rises from wind erosion. This is all underpinned by extensive use of well-managed lucerne.

Our beef enterprise is vertically integrated with 2200 breeders, an AusMeat accredited feedlot with capacity to finish 1000 head, a wholesale beef brand (Coorong Angus Beef) and two retail butcher shops in the Adelaide Hills.

About 3600 hectares of sandy ground is now under lucerne (mainly Hunterfield and Flairdale) and we aim to sow about 400 ha each year. Low fertility non-wetting sand is a real challenge, so we generally sow a cleaning crop with a chicken litter mulch the first year, then next year drill lucerne into the stubble for wind protection and follow with a roller.

Lucerne is the critical component of this property and it must persist. We manage the lucerne by cell grazing, moving mobs of 200–250 head through 14 paddocks, 40 ha in size in each cell. We also cut all our hay and silage for the feedlot.

The property still has about 240 ha of native scrub now entirely fenced off from stock, partly thanks to National Heritage Trust (NHT) incentive funding delivered through the Coorong District Local Action Plan. This same program has assisted with some of our lucerne planting.

In our 13 years here we have not consciously monitored the extent of salinity, but there appears to have been some reduction as we now have volunteer lucerne growing further down the slope than we were initially able to establish. So, by reducing the recharge lucerne seems to be colonising a new niche.

With almost 700 ha of salt-affected land it is very tempting to look for profitable plants to grow there. Part of the problem is that the saline flats are under water for much of the winter making it very difficult

Case study: Richard Gunner, 'Wanderribby'

Location: Coorong District, South Australia

Property size: 6600 ha

Rainfall average: 450 mm

Soil types: Deep non-wetting sandy rises, saline flats

Enterprise: beef cattle



Photos: Bruce Munday

to sustain puccinellia or saltbush. Because we are completely landlocked, drainage is not an option either. The plant we really want is one that can withstand winter inundation, tolerate groundwater saltier than the sea and is palatable and nutritious for cattle.

Over the past few years we have become very interested in a clone of *Distichlis spicata*

that comes from Florida and has been selected for its forage qualities. We heard about some promising trials in Western Australia and decided it would be worth having a go here.

Distichlis, which is the same genus as the native Australia salt grass, seems to meet many of our requirements. It can tolerate being under water for several weeks in

winter; it is a true halophyte, thriving on saline conditions; and cattle actually select it in preference to lucerne (perhaps attracted by the salt).

With all these virtues you would think that *D. spicata* was the answer to all our salinity problems, but there are still many hurdles to get over. All the plants in Australia are males and must be propagated vegetatively and planted individually, making broadacre establishment an impossible task. We use a broccoli planter on our trial plots which is very laborious, but at this trial stage we are mainly interested in how well the plants establish and persist, the conditions they prefer, and their value as stock feed.

We have planted distichlis into several saline sites and monitored the results. Establishment has generally been patchy, but better on the sandier soils, whereas persistence seems to be favoured by heavier soils. We have not yet achieved the results they are getting at Wickepin in WA, but that could be because these C4 plants do better in their warmer climate.

It is often difficult to identify the cause of significant variations in success rate across a particular site. In WA they found a strong correlation between performance (establishment and growth) and levels of soil salinity as revealed by an EM38 (see caption), and this is something we are going to follow up here.

What we have found is that the plants respond well to fertiliser, with feed value testing out in January at 12-15 per cent crude protein, 60-70 pc digestibility and 8-9 pc metabolisable energy. As well, the



Opposite page: Salinity surveys using an EM38 (an apparatus for rapidly measuring soil salinity through electromagnetic induction) might help explain why distichlis is thriving only at the edge of the saltpan.

Above: Groundwater is readily available for irrigation of distichlis.

Below: Lucerne on higher ground, distichlis recently planted in saltpan.

cattle really like distichlis and it responds well to controlled grazing, but we have not grazed large enough areas yet to work out the stock's fresh water requirements.

Being rhizomatous it needs heavy grazing pressure to perform at its best and also seems to benefit from a degree of soil disturbance, which stimulates it to put out new runners. It will be a huge advantage to us that we can graze the salt pastures as part of our general grazing, rather than having to fence it out, and in that regard it will suit our rotational grazing system.

Distichlis will not be the answer to all our saline land, but it could be a valuable component. It should fit very nicely with puccinellia, providing green feed in summer whereas the pucci kicks away in autumn. As we learn more about the 'likes and dislikes' of both these plants we will have a much better feel for where to establish and manage them together.

This year we are trialing irrigation to see if we can improve the establishment by giving the plant a start. We have abundant groundwater 'at the doorstep' and it doesn't matter that its salinity is > 20,000 milligrams per litre. Once the plants get their roots down 1.5 m to this groundwater they should be able to survive any drought.

We are always conscious of the weed

potential of new plants and we are aware that distichlis has attracted some attention. From our experience it spreads so slowly that is difficult to see it ever becoming a weed in this region. However, we agree that there should be protocols for where it can and should not be planted and suitable herbicide treatments should be developed for removing it.

• Richard Gunner spoke with Bruce Munday, NDSP Communication Co-ordinator (SA).



Key points

- Distichlis shows promise on saline ground
- Lucerne is a profitable key to recharge control
- We are still learning how to manage saline land

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Drainage, pasture management triples production



Left: The concept of a 'neighbourhood group' has allowed John Carr and his neighbours in the Woody Yaloak Catchment Group to focus on networking and solving environmental problems - and not be distracted by paperwork!

Photos: Jo Curkpatrick

John Carr at Rokewood in Victoria is an active Woody Yaloak Catchment Group member and has tackled an unproductive discharge area on his property. As he explains to Jo Curkpatrick, 'South Hills' is a low lying wet, salty paddock where only a few salt tolerant plants grew and when grazed, the stock camped on the saline areas leaving the soil exposed to wind erosion and the accumulation of salt.

"Historically the area had always been a bit swampy, however the lack of vegetation caused by the ponding of surface water, stock grazing and changes to the drainage on a nearby road seemed to compound the problem. The extent of salting varies across the paddock from being marginally saline to extensively salt-affected.

When we began monitoring the paddock in 1997 the water table was within two metres of the soil surface and the situation didn't look like improving. In April 2000 we used a laser-guided rotary drainer to form 25 beds which were sown in the spring of 2000 to a mixture of salt-tolerant pasture species including tall wheat grass and strawberry clover.

We applied 2.5 tonnes per hectare of gypsum and sprayed with Roundup at 1.5 L/ha to kill any remaining vegetation.

Analysis	September 1999		August 2002	
	Marginally saline	Extensively saline	Marginally saline	Extensively saline
Salt (EC)	0.23	0.51	0.11	0.28
Soil texture	Loam	Clay loam	Loam	Clay loam
Phosphorus (Olsen)	10.2	11.0	18.2	13.3
Potassium (Colwell)	156	249	226	298
Sulphur (KCL40)	22.0	34.7	17.9	51.3
pH (CaCl ₂)	4.7	4.8	5.5	5.1

Table 1. Changes in key soil parameters at drain installation and three years later.

The paddock was direct sown with Dovey tall fescue, Dundas tall wheat grass and Palestine strawberry clover at a rate of 11 kg/ha with single superphosphate at 225 kg/ha. This year we top-dressed the area with 190 kg/ha of single superphosphate.

My estimate is that we have had a three-fold increase in production due to better drainage and improved pastures. The drainage created by the 25 m beds has allowed the salt to leach from the surface soil and the pasture species to establish successfully.

The salt level in the base of the drains has also reduced to below pre-drainage

concentrations and are currently between 0.32 and 0.36 dS/m (EC).

The depth of the water table since the beds have been installed has remained fairly constant at about 3 m, despite the 2001 rainfall being above the annual average. It was anticipated to see a marked increase in the water table but it appears the drainage has prevented surface water from soaking in.

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Woody Yaloak Catchment Group goes for innovative solutions

Case study: John Carr
Location: Rokewood, Victoria
Property size: 570 ha
Rainfall average: 525 mm rainfall
Enterprise: Merino sheep, wheat, canola, lupins



Since its establishment in 1992, the Woody Yaloak Catchment Group has consistently turned to innovation in its quest to achieve sustainable land and water resource management.

Formed to tackle dryland salinity and other local catchment problems, the Woody Yaloak Catchment Group now involves over 120 landholders in 28 neighbourhood groups covering 65 per cent of the catchment from Haddon to Cressy, south of Ballarat.

The neighbourhood groups have been developed with advice from Alcoa's Landcare Manager Ted Rowley who is based in Western Australia. They involve between three and 12 landholders with common interests and concerns and in most cases with adjoining properties.

The neighbourhood group approach enables landholders to share information and planning, and approach funding sources as one organisation through an executive committee representing groups, sponsors and agencies. The approach minimises paperwork, administration and funding processes, and streamlines the management of on-ground works. It also improves progress monitoring and the reporting of outcomes to funding bodies.

Neighbourhood groups are provided with facilitation support to plan five-year programs which are then presented to the executive committee to access appropriate funding for the activities proposed.

"The approach lets the groups get on and do their work without having to worry about all the paperwork," said Project Manager Cam Nicholson.

"This way people tend to stay interested, we can get others in the community



Drainage and improved pastures has resulted in a three-fold increase in production on a discharge area of John Carr's property.

involved and importantly, we are able to keep our sponsors."

Farmer John Carr believes there are a number of reasons why the Woody Yaloak group is successful.

"We took a practical approach and that is reflected in our motto 'Productive Catchment Management' - it's about being green in the black," he said.

"We've always tried to do the things people want to do on their own land and that builds involvement.

"You've got to bring the theory back to reality and show people the benefits."

• *John Carr spoke with Jo Curkpatrick, NDSP Communication Co-ordinator (Victoria)*

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