



Challenge of rehabilitating a saline site ultimately rewards

Case study: Colin and Jenny Young
Location: Yarrawa Creek, Hunter Valley, NSW
Property size: 208 ha
Rainfall average: 480 mm
Enterprise: Cattle, sorghum



Colin and Jenny Young own a grazing property in the Yarrawa Creek catchment in NSW. A small saline area on the property is being rehabilitated using earthworks and tree planting. The recent drought and poor soils on the property have created a harsh environment to begin remedial works. Colin Young describes his story to *Lisa Gray*.

Salinity has been a problem in this district for many years. The hills surrounding our property are sandstone-based and the soils on the mid-slopes are solodic and sodic. These soils are naturally saline.

The hills are heavily timbered and the slopes are covered with native grasses. However, trees have been cleared from the lower slopes and valley floors as well as the creek lines. The grasses are also annuals and lack vigour, which has contributed to groundwater recharge. So the salinity is mainly due to rising groundwater that is influenced by local rather than regional factors.

I suspect the creek bed on our property is also lowering, cutting into the saline sub-soils and reaching the saline groundwater.

When I bought the property 10 years ago, I didn't notice any obvious signs of salinity. Now there are patches of salinity spread over an area of about 20 hectares.

The most obvious sign of salinity is the Spiny Rush, which covers the creeks and flow lines. Salt is also visible on the ground where some of the flow lines are badly eroded.

I was concerned about the problem spreading and contacted the NSW Department of Land and Water Conservation to try and work out what to do. The main thing I wanted to do was to lower the water table and improve the mix and vigour of grasses to get better pastures for the cattle.

To start off, structural earth works were used to divert the flow of water away from the eroded flow lines. Erosion control



Photos: Lisa Gray

works were specially designed to reduce erosion and prevent further lowering of the creek bed.

The eroded area was fenced off and the gully was filled with soil and replanted with a variety of native trees to help stabilise the soil and increase biodiversity.

Since June last year, 2500 trees have been

planted including river red gum, swamp sheoak, swamp mahogany and a variety of paperbarks.

Despite the harsh conditions the trees are surviving well. I think that's because we used good quality tube stock and are keeping the cattle out of the area until the trees are properly established. The native

long stem tube stock appear to be more resilient to frost and drought.

The next step will be to establish pastures on the new drainage line and to improve the pastures on some of the recharge areas. Because the soils are poor, we'll have to use a 'trial and error' approach to work out the best mix of species. I am also planning to try alley farming on the slopes.

Hopefully this will help reduce recharge in the catchment and reduce salt loads in the region. The Yarrawa Creek drains into the Goulbourn Catchment, which is a major contributor to salinity in the Hunter Region. So the area is a high priority for managing salinity.

Most of our neighbours belong to the local Landcare group and we have all been planting trees and fencing out creeks. A network of piezometers has been installed throughout the region, and we will monitor any changes in groundwater and salinity levels to see what works.

It's still a bit too early to see the real benefits of what we have done. Hopefully, further down the track, we will be able to slow down or stop the spread of salinity while improving the overall condition of our farm.

I think one of the best ways to improve your farm is to find out what's happening on other properties in the area. Seeing how things work gives people a lot of encouragement to try something themselves.

• *Colin and Jenny Young spoke with Lisa Gray, NDSP Communication Co-ordinator (NSW).*

Key points

- Seek professional advice to find out the best options for your situation
- Use good quality tube stock and select plants that are native to the area
- Monitor your actions so you can find out what does and doesn't work



Opposite page: Colin Young has planted 2,500 native trees using long stem tube stock and a water jet gun.

Top: Before the drainage line was diverted the flow line was badly eroded.

Above: The same area following earthworks and replanting.

Right: The saline area is characterised by spiny rush and salt scalds.



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Photos: Bruce Munday

Avoiding salinity is cheaper than repairing it

I don't have much saline land on 'Lowandale', but there is enough in the district that I can see that it is a threat. I have also seen how difficult it can be to reclaim and repair salt affected land, so my farming system is designed to keep that threat at bay and at the same time improve the overall productivity and sustainability of the farm.

'Lowandale' is in the landlocked Agery Weetulta catchment that was studied by hydrogeologists in the 1990s. They found that the groundwater system is recharged locally, mainly through the permeable sandy rises, also that and the highly saline groundwater appears as valley floor seepage as it drains towards a series of salt lakes.

The study also found perched water tables

Case study: Bradley Hicks, 'Lowandale'
Location: Arthurton, Yorke Peninsula, South Australia
Property size: 648 ha **Rainfall average:** 480 mm
Soil types: Heavy clay loams, sandy clay loams, siliceous sand dunes, sand over clay with some sodic clay (pH: 6.5-7 on sand; 8.5 on heavy soil)
Enterprises: Wool, prime lambs, triticale, wheat



that gradually seep through the clay layer into the saline groundwater.

On my property, the sandy rises were cleared in the 1960s, not because they were potentially productive, but because the scrub harboured rabbits. When I read the report on how the groundwater system operates in the catchment I decided to put a lot of effort into returning perennial vegetation to these sandy rises to help

reduce recharge as insurance against salinity.

Salinity first appeared on 'Lowandale' in the 1980s after a very wet year. This became a couple of hectares of bare scald, wet for about six months of the year and surrounded by a couple of hectares of sea barley grass. To me this was the unmistakable warning sign that I could not ignore.

In 1989 I fenced this area off and began planting a range of salt-tolerant trees and shrubs that have now successfully colonised the site. Instead of being wet and eroding due to stock pressure, the site has now dried out and the trees and shrubs look very healthy. This has been very satisfying, but I realised that I was really just covering up the symptom, not dealing with the problem.

'Lowandale' is essentially a two-enterprise farm, cropping and grazing on a one-year-in, one-year-out rotation. The grazing phase uses medic based pastures along with perennial fodder crops that help balance the water table.

Over the years I have done a number of trials with perennials to see what best suits my farm. I now have about 30 ha of saltbush established across several sites, lucerne on a couple of sites, 3 ha of agroforestry and I have also trialed broombush and tagasaste.

Saltbush is important because it helps fill the feed gap in autumn. I allow sheep to access it ad lib from stubble paddocks at this critical time. This arrangement means that I don't have to provide separate water for small saltbush paddocks.

I allow most of my ewes to lamb in the saltbush, which provides excellent shelter whilst they still have access to an adjoining pasture paddock. Gradually I am pushing my lambing back later in the year to match feed demand more closely to feed supply.

Mustering out of the saltbush takes some practice. The rotation of stock has to be carefully planned to allow the saltbush and the inter-row pasture to recover from grazing.

Key points

- Moderately affected saltland can be reclaimed
- Perennial vegetation on recharge sites is good insurance
- Perennials fit well into the farming system



Opposite page: Saltbush with a volunteer groundcover of vetch makes excellent use of sandy rises.

Above: Sugar gums have thrived in the 480 mm rainfall, making use of every drop.

The saltbush has worked very well in my farming system. Although I have not monitored the impact on recharge I have read reports that it is very effective and I have noticed that where water would once seep out of the sandhills in a wet winter, this no longer happens.

Of the saltbush varieties I have tried, I found old man the best bet for me as it seems more palatable than river saltbush and more durable than wavy leaf. All my saltbush has been planted as speedlings into a weed-free environment with an application of MAP fertiliser to help it get away. To prevent the mature plants from 'mushrooming', they need to be grazed at about 15 months, but this is impossible if replacement planting is necessary to fill gaps, in which case the older plants need to be slashed.

In 1999 I planted a trial woodlot of 1 ha with *Eucalyptus cladocalyx* (sugar gum) and *E. occidentalis*, again planted on a sandy rise. These have performed extremely well so far and this year I have extended the sugar gum planting by a further 1.5 ha. I have also planted windbreaks of native vegetation along several fence lines and these of course also help manage recharge and contribute to biodiversity.

Lucerne has worked well for me on a couple of sandy rises and I will be planting much more over the next few years, using electric fences for strip grazing. I have not yet ventured into phase farming or companion cropping with lucerne, but I am watching trials with interest, particularly those on Yorke Peninsula that are part of the 'Million hectares' project*.

Our sodic soils on the flats have created waterlogging problems for barley in the past, so I suspect that lucerne will not like those conditions. On the other hand, lucerne's de-watering ability just might help us with that issue, so I am interested to see if it is an option.

Over the years I have trialed broombush (*Melaleuca uncinata*) and tagasaste as further perennial options. The tagasaste grew extremely well on the sandy rises but was too difficult to manage with sheep, soon outgrowing their reach and becoming too heavy to harvest. The broombush, despite being native to this part of Yorke Peninsula, was very variable in performance and overall something of a disappointment.

I have learned a lot from the trials I have done on 'Lowandale' and now feel confident that I am simultaneously managing the potential salinity threat whilst at the same time making my farming system more versatile and profitable.

* 'A Million Hectares for the Future' is an NDSP project funded by the Grains Research and Development Corporation (GRDC).

• Bradley Hicks spoke with NDSP Communication Co-ordinator (SA), Bruce Munday

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