Integrating pucci with pigs

Case study: Geoff and John Kroemer
Location: Tumby Bay, Eyre Peninsula, SA
Property size: 1410 ha
Mean annual rainfall: 300 mm
Soils: Hard-setting red clays through to loams
Enterprises: Cereal cropping (wheat and barley); peas, wool, prime lambs, pigs

The Tumby Bay area has been through some tough times recently. Being in the rain shadow of the Koppio Hills it was hard hit by dry years in 2002–04. Then much of the area to the south of Tumby was devastated by bushfires in 2005 when nine people tragically lost their lives. However, Geoff Kroemer's never-give-up spirit is typical of the area. Geoff, who runs the farm in partnership with his brother John, spoke with Bruce Munday about his experiences in reclaiming saltland.

"Salinity is a major issue for our farm. I know some people tend to ignore their relatively small areas of salinity and just focus on the good land. But when you have 250 hectares of salt-affected land, about two-thirds of which only grows samphire, you have to take it seriously.

At Tumby we are at the very bottom of the catchment with a naturally shallow saline water table. Whilst there would have been salinity around the coastal estuaries long before settlement, we saw it spread through our property probably as a result of clearing the land for cropping in the 1930s–40s.

As more of our land was colonised by samphire we realised we had a real problem. The samphire would just keep sheep alive, then when it was grazed out we were left with bare soil that would blow. Whilst this land had some marginal value to us as drought reserve we realised that it would be given no value by a potential buyer, so clearly our asset was eroding away.

Photo: B Munday

Geoff Kroemer showing the next saltland site that he will be sowing to pucci

Taking on the salt

When I came home from Urrbrae (Agricultural High School) in 1973 I tried to clean up little bits of saline ground by planting salt-tolerant trees around them. That is what drove our initial interest in salinity — we just wanted to stop the spread. But I also learned a bit from playing around at the edges and seeing that there were some species that could cope with salinity.

The breakthrough for me was the SGSL Producer Network project taken on by the Tumby Bay Agricultural Bureau. This gave me an opportunity to try puccinellia with some good technical support from Rural Solutions SA.

Firstly we had to get rid of some of the saline surface water that would bog the ute even in February. So we ran a shallow drain alongside our trial site just so we could get on the ground to sow.

We sowed about 15 ha in 2003, having cultivated roughly and then towing a clover spreader behind the ute. But this was a disaster because the seed was not viable. Pucci seed is generally not certified and often not germination tested, so lesson number one was: always do a germination test!

In 2004 it all turned around. We had very good germination and a remarkable response to fertiliser. The fertiliser was an opportunity for us because we could use biosolids from our piggery. The land we are fertilising is quite flat, but nonetheless we take care that nutrients are not transported off the paddock via the drain and to the estuary.

Feed tests on the pucci (see Table 1.) show its value as a pasture plant. This is supported by our observation that 2.5 score wether lambs went onto the pucci in

Key points

- Even apparently worthless land can be brought back to productivity
- Puccinellia is like any other pasture — it will reward you if it is well managed
- There is a lot of personal satisfaction in successfully rehabilitating saltland

TABLE 1. Feed value of puccinellia on Kroemer property

Feed tests	Green	Dry
Protein (%)	20	3.4
ME (%)	10.4	7.2
Digestibility (%)	66	50

Photo: B Munday

John (back) and Geoff Kroemer have clearly impressed Dr Ed Barrett-Lennard and Glenn Gale (CRC Salinity) with their pucci pasture fertilised with piggery effluent

September last year when there was no other good quality feed on the property. Four weeks later they came off at 3 score.

We are now finding quite a bit of volunteer saltbush and bluebush coming up through the pucci and this should assist the protein levels when the pucci dries off.

When we began experimenting with pucci the aim was to provide drought reserve because at Tumby Bay we expect a 'drought' about every five years. Instead it has become our autumn fodder for when the stubble is finished.

Lessons learned

Timing of sowing is important, more so than than for dryland pastures because if you work up too early there is danger that the soil will blow, if you leave it too late the ground becomes too wet.

With all the other activities on the farm we find that 15 ha per year of new pasture is about all that we can handle, although ideally I would like to double that. But management is just as important and we are now subdividing our paddocks so we can graze them rotationally.

This year we have seen some recolonisation by samphire, partly because the sheep always graze the pucci for preference, but we should be able to control this by rolling the samphire and by rotational grazing. Blanket weed (*Verbascum thapsus*) has also appeared as a potential problem in one paddock and we will be experimenting with how to manage it in pucci this year.

Five years ago I would never have dreamed that we could turn such apparently useless land into something so good. Not only that, but we are now able to take sheep out of the stubble paddocks before they start to do damage there. I just wish we had started this 20 years ago, but I am pleased to be doing this now for the next generation.

Our success with saltland pasture has encouraged us to also fence off three lagoons and allow them to regenerate as wetlands for wildlife. We have also fenced off the drain, and whilst our first attempt at direct seeding trees in this area was not very successful, I am fairly confident that it will improve as more of the salt is leached from the soil.

The thing about this SGSL trial is that we have had so much success that we are now keen to invest our own money on rehabilitating the other ground. Our farm is typical of many on Eyre Peninsula and I hope they will have learned something from our experience."

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The science behind the story

By Jock McFarlane

Puccinellia is a versatile grass that withstands waterlogging and salinity. At present it represents the last chance for real grazing productivity on saline wet soils in a Mediterranean climate with mild to warm summers.

Some farmers are reluctant to invest in saltland pasture, perhaps because they fail to see its potential. However, puccinellia is a nutritious pasture and as Geoff has shown it responds very well to fertiliser. Research by the CRC Salinity, in the Upper South East of SA, has quantified the optimum fertiliser requirements and grazing management for pucci pasture and for animal productivity. Whilst the conditions in the USE are quite different to those at Tumby Bay, many of the lessons learned can be transferred.

Pucci also has a marked advantage over many other perennial grasses in that it does not grow rank when it matures. After going to seed the pucci maintains its palatability into autumn. This means that pucci pastures can be left to maintain cover over summer, reducing the evaporative losses from the soil and the accumulation of salt at the surface.

EM38 surveys at Geoff's property have shown that salinity in the top 60 cm of the soil profile has reduced within two years. Furthermore the soil under the pucci pasture has changed from being boggy in winter and like concrete in summer to being so friable that Geoff is joking that it looks good enough to crop.

A further advantage of leaving the pucci to go to seed is that this will encourage the pasture to thicken up. Alternatively there is also potential to harvest the seed.

In South Australia, because samphire is a native plant we can clear it only if has colonised farming land — if the samphire was the indigenous native plant on that land, it is protected.

• *Jock McFarlane is a senior consultant with Rural Solutions SA and contributes to the CRC Salinity as part of the SA Department of Water, Land and Biodiversity Conservation input into the CRC.*

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