South West NRM

Case Study

Enriching forage shrubs

In 2005, a group of researchers challenged themselves to come up with a new grazing system that would:

- Make marginal land productive;
- Fill feed gaps;
- Reduce risk;
- Increase profit; and
- Reduce inputs for animal health.

The result was a potential game-changer for farm productivity, profits and sustainable agriculture. The Enrich project is a system of mixed Australian perennial forage shrubs with inter-row pasture. In 2014, South West NRM supported a demonstration of the Enrich system at Pingelly. We spoke with one of the lead researchers, formerly with CSIRO, Dr Dean Revell.

Why did you target native forage shrubs?

Our focus was to look at Australian native shrubs that were already adapted to our difficult and variable climate. The key is the unique contribution that perennial shrubs can make that is missing from an annual-based system. That's not to say that we replace what we have but rather add to what we have already.

So, they bring in a source of nitrogen and a source of minerals that is lacking in late summer and autumn and indeed feed supply generally in early winter when other options are not so strong. And it's the complementarity between our existing forage options and the new perennial shrubs that together provide a functional whole. Collectively, they provide a year-round feed supply with minimal risk to minimise the downsides when seasons go against you, but also an opportunity to capitalise when seasons go with you.

It was important to have a system that doesn't restrict you from the good times when they do occur, and there are two components to that. One is the shrubs themselves will respond to a good season like any plant will, and their productivity will treble easily if you have a favourable set of conditions. But also, they're just a component of the whole system, you haven't put all your eggs into one basket. So, you are really about managing variability by having different components in the feed base that collectively have reduced your risk and maximised your chances in almost any given set of conditions, with the exception of the really extreme events.

What are the benefits of the system?

There's really been two major benefits that we've been able to identify. The first is the reduction in supplementary hand feeding.

At a time of year when there would normally be a lot of money spent on supplementary feed and a lot of time spent hand-feeding livestock, we've been able to show quite respectable and often impressive weight gains that would be starting to resemble what you would be expecting in spring. So that opens up all sorts of opportunities around how you manage animals and how many you can run on your place. There's no value in having a goal for building your livestock enterprise if you then hit a feed-gap because that ultimately sets the limits on what is possible. So, if we can start filling that gap and achieve weight gain cost-effectively, then opportunities are open.

We see the shrubs as a living source of supplementary feed that brings with it a suite of other benefits: a reduction in wind, integrated pest management, soil management, groundwater management, all of those other components as well. They are the standing supplement that mean you are not feeding as much supplementary grain, and in some cases none at all.

But of approximately equal value and often of greater value is the financial return of deferred grazing on other parts of the farm. When you're able to graze in autumn through the break of season on these perennial-based systems, you're not grazing annual-based systems that need that early start (deferral), and they are considerably more productive for the rest of the year, and as a whole farm, you're much better off.

Pingelly case study

An interview with host farmer, Garry Page

Between 2015 and 2017, Pingelly farmer Garry Page planted approximately 80 hectares of his farm (10% of arable land) with almost 60,000 forage shrubs and a diverse inter-row pasture. With funding support from South West NRM, Garry used 12 species of shrub that were analysed in the Enrich research project.

South West NRM spoke to Garry in 2017 to find out what he learned from the project.

How does the future look for a combined shrub and pasture forage system?

Well, I think it's tremendous. As time goes by, I can't see how I could do without them really. In a tough year like 2017, we've rotated all the mobs through there and kept their condition up.

What are the benefits for animal health?

Three or four of the varieties were selected for their anthelmintic attributes to control worms. So, you can rotate sheep through to keep the worms at bay without losing any productivity. It reduces the amount of supplementary feeding you need to do. You can get green feed and vitamin E into young sheep through the summer without having to get them in and top them up. So, it eases management there. And it's good shade and shelter at lambing or shearing time.

Do you think it's giving you an economic benefit?

It will do. We don't run a feed lot as such or feeders, but we've been able to trail feed and finish cross bred lambs with the shrubs. The reduction in supplementary feeding – we still supplemented them in conjunction with the shrubs – we were able to finish lambs at a much cheaper rate than just supplementary feeding, and we turned them off out of season and got a higher price. So, there's the cost-saving and the extra price that we got. I can't remember the numbers but about 400 sheep, we were able to get about $15,000 back in the first year.

Have you deferred grazing from other paddocks to allow them to bulk up?

Yeah, it's brilliant. In winter and spring time you can lock some paddocks up and put the sheep onto the shrubs. We had one patch in 2017 stocked at probably 25 DSE (dry sheep equivalents) to the hectare for about 6 weeks while we locked up some pasture paddocks to try and get some bulk growth into them. Those sheep stayed in good forward condition, they didn't go backwards. The shrub paddock was bulked up prior to grazing so there was a lot of feed there. The chicory was like a shrub. We still gave them some supplementary feed – some hay and a few pellets trail-fed.

Like most farmers, we were reluctant to put them on good land. So, we focussed on patches of a paddock that you don't crop and fenced them off.

We selected rocky ridges, South-West slopes that are frost-prone, areas we couldn't get seeding gear into for trees and rocky outcrops, and saline areas that already had some shrubs. We selected areas that were spread out across the farm and accessible by laneways, so at any time of the year, you could get in and out of them and we could rotate two or three mobs through each patch.

Shrubs planted and their traits

Adapted from: Perennial forage shrubs providing profitable and sustainable grazing: Key practical findings from the Enrichproject).

Scientific name	Common name	Some highly rated traits
Atriplex amnicola	River saltbush*	Edible biomass, regrowth, crude protein, digestibility, mineral content (Ca, Mg, S)
Atriplex nummularia	Old man saltbush*	Edible biomass, regrowth, digestibility, mineral content (Ca, Cu, Mg, S, Zn), shelter
Atriplex rhagodiodes	River Murray saltbush*	Edible biomass, regrowth, crude protein, mineral content (Ca, Cu, Mg, S, Zn), shelter
Chamaecytisus profiler	Tagasaste (exotic)	Palatability, digestibility, calcium, magnesium and zinc content
Chenopodium nitrariaceum	Nitre goosefoot	Crude protein, bioactivity (reducing methane, ammonia and gut parasites), calcium, magnesium and sulphur content
Enchylaena tomentosa	Ruby saltbush*	Regrowth, calcium, copper, magnesium, sulphur (also good bioactivity)
Eremophila glabra	Tar bush	Palatability, reduced methane production, calcium and magnesium content
Maireana georgei	Satiny bluebush*	Regrowth, crude protein, calcium and sulphur content
Rhagodia candolleana	Sea berry saltbush	Reduced methane production, calcium, magnesium and sulphur content
Rhagodia preissii	Mallee saltbush	Regrowth, calcium, copper, magnesium and sulphur content, digestibility, shelter
Rhagodia spinescens	Thorny saltbush	Crude protein, calcium, magnesium and sulphur content

Notes: 1. Two cultivars of Old man saltbush used (Eyres Green and Anameeka). * – species planted in saline area.

How have the different species performed?

Pretty much all of them have performed pretty good. I wouldn't say that there were any duds in there. They've all got a purpose and they all survived and with a wet summer, we had a good strike rate too.

What are the key tips and tricks for using forage shrubs?

We've waited until there is a good moisture profile to plant them. You've got to be mindful that you plant them early enough, so they have enough moisture to get the roots down and established to get through that first summer. Mixing the varieties up and not sowing individual varieties in a row. We mixed the whole 12 species that we used one for one. It was a bit time-consuming, but we did it in the tray so they were all mixed up. I think that has been really beneficial to training the sheep to eat them, they are not selecting one and overgrazing it. And you've got to have a good bulk inter-row of pasture around it. If you just had shrubs on bare land, you wouldn't get the benefit – the two go hand in hand. It's not just saltbush. You've got to have the bulk of feed to fill them up and keep them satisfied, and then they nibble and selectively graze what they want from the shrubs to get the benefit. Select good pasture varieties that perform in your area.

What pastures did you sow in the non-saline areas (tall wheatgrass and puccinellia were already present in saline areas)?

We've planted plantain, chicory, yellow (Santorini) and pink serradella (Margurita), bladder clover, prima gland clover and a sub clover that suits our rainfall and district. We tried to get some medics too but couldn't source them.

How soon after planting were you able to graze?

We were extremely lucky, with the summer rainfalls. We planted them in late August 2015; we were able to get a light graze in late Autumn 2016. We'd grazed all our patches probably twice by the end of 12 months without any damage.

How have the sheep adapted to the grazing system?

Well most of the time they're looking for extra feed when you put them in there so they've gone in and eaten them straight away. Probably one or two of the Rhagodias in the summertime are a bit slower. They might be a bit bitter at that time of the year. But, if you put enough numbers in there and you graze them long enough, they seem to have evenly eaten everything by the time you take them out.

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So before you started, you would have had some reservations. How do you feel now? Are you glad you went through with it?

Absolutely. I was relatively confident because we have saltbush plantings from years ago – Old Man River, bluebush, tall wheatgrass and puccinellia, but there was no inter-row with that. It was basically a bit of reveg on saltland.

I went and worked in the wheatbelt and learnt a fair bit from some old timers that were terrific stockmen that had run high production sheep on basically salt country where it was all saltbush. I could see the benefits of it and I suppose the biggest fear was the investment that we had to spend. We were lucky enough to get a good grant but we sort of spent more than our dollar for dollar, and you are wondering, well I hope it does what we think – and its done all of that so there's no qualms about getting your money back over a reasonably short period of time. The highest part of the cost is in the new fencing and putting water to that paddock and that sort of thing. Yeah, you get it all back.

It's a no brainer once you experienced it. It keeps a more even health profile with your sheep and a more even production cycle. It levels out the troughs. Any good stockman would just about instantly see the benefit of it.

What's the minimum area that you would want allocated to this system on the farm?

I think that is up to the individual environment and how many sheep you run, but the Enrich program reckon 10 -15%. Any more was overkill and any less than 10% you are not going to get the maximum benefit from it. We aimed at 15% and we would have 15% of the farm fenced off into paddocks but we would only have 10% planted to shrubs.

Has it helped a lot with your flexibility and stress as a farmer?

Yeah, absolutely. For managing animals in a year like 2017 at a high stocking rate, yeah terrific.

Australian Government | National Landcare Program

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