

Building soil health

The effect of round plant



Pemberton farmer, Glen Ryan, was the South West Soil Health champion at this year's Talkin' Soil Health Conference. Here we find out how he has been improving his soil over the past 10 years.

How long has your family farmed in the Pemberton region?

My father started here in the mid 1960s. I've been farming with my brother Dean and father Tony for 35 years. We're a family operation where everybody is involved and all on the same page.

We've grown potatoes for a long time and also run beef cattle. Just recently we diversified into seedless lemons, avocados and kiwifruit.

What issues were you having that changed the way you farm?

We noticed about 10 years ago that the quality of our potatoes was starting to deteriorate and so were our soils. So, we started to focus on trying to rebuild our soils. We came across a good soils advisor, Deb Archdeacon, who helped put us on the right path.

How have you tried to turn that around?

Soil carbon had been stripped from the soil a fair bit. So, we started using compost. We also got our pH right, which got out of balance. Then as we started growing pastures, we were introduced to green manure crops to amend the soil.

What we wanted was to have plants that would grow all year round. Obviously, summer gets pretty warm, so that was our challenge. So, we started a trial with support from South West Catchments Council where we tried to source and test out as many pasture species as we could.

I think we started with 16 different species, and we're down to six now, maybe seven, that will survive in our environment, and that's really exciting.

Selecting the species to trial and sourcing the seed wasn't too hard, but we seeded the trial in about February which made things challenging. So, we used travelling irrigators. It was also after potatoes and the ground was quite compacted, so it was also a challenge to get the ground into a reasonable condition.

We prepared the ground as best we could, but then we had issues with different sized seeds in the seeder. We had to broadcast some and did the best we could and ended up with a really good germination.

The sorghum and millet came through magnificently and probably put everything else to shame to some degree. But over time, other things started to come through like chicory, sunflowers, lucerne, serradella, cocksfoot, arrowleaf and storm (white) clover. Others, like Gatton panic and plantain we didn't see at all.

year-growth



Farmer	Glen Ryan
Location	Pemberton
Size	70 acres
Enterprises	Potatoes, lemons, avocados, kiwifruit & beef

► L-R: Pemberton farmer, Glen Ryan.
Arrow-leaf clover flower.
Brown manure of Saia oats.
Arrow-leaf clover.
Seedless lemons with a chicory dominated inter-row.



When the crop got to a reasonable height we put the cows in. It was only a small trial in a large paddock and the cows went straight to the normal oats, rye grass and clover. They barely touched the trial patch, which didn't surprise me. Then we irrigated and got it going again and the cows came back about three weeks later. They had a little go at it and then wandered off. But by the fourth graze in late autumn, they virtually went straight to the chicory and eat it right down, especially in late spring and summer and autumn. I think these new species add something to their diet that they need or lack at certain times of the year.

What benefits are you seeing?

I am very confident that we are seeing benefits in the cattle. They are healthier, quieter and more content. They seem to have less calving issues than they did 10 or more years ago.

We are also seeing benefits in the soil, potatoes, pasture and in other crops.

We were putting some seedless lemons in a pretty rough paddock that is very clayey, so we gave it about three years of these pasture species beforehand and it has turned that paddock around. It has turned into really good soil and that's really encouraging. We also incorporated biochar prior to planting the lemons.

We are finding that if you get your soil right and you've got something to host soil microbes all year round, then your soil is pumping all year round and the advancement happens much quicker than if you only had growth for eight or nine months of the year like we used to have.

How do you rotate back to potatoes?

We are on a five-year rotation with potatoes. The year before potatoes we take all the perennial pasture species out, which is a bit unfortunate, but we have to put a break crop in to cleanse the soil. So, around April or May we seed down to Saia oats.

The oats grow massively tall and we don't graze until it dries out in summer. The cows then smash it all down to create a mulch.

The cows go out and they don't come back in. Then the oats self-sow in autumn and winter and all the trash breaks down a little bit. Then before we put the potatoes in, we mulch and incorporate it all into the soil as a brown manure. The ground just softens right up and the soil becomes alive with microbes.

Has the practice of growing pastures all year round had any effect on your weeds?

Weeds were a huge problem for us with potatoes because we are working the ground. Capeweed was a big problem, as was deadly nightshade, fat hen, and Prince of Wales feather. Capeweed was also a problem in pastures and we used to spray it all the time. Since we have remedied our soils we don't see much capeweed here at all.

The other weeds are on the periphery and just not as common as they used to be. I have been told, and I am assuming that it is true, that weeds are there to do a job, and if your soil deteriorates then they proliferate to try and bring the nutrient from the sub soil up. As soon as the soil has come good, then the weeds don't have a role anymore.

How has your fertiliser use changed?

We were really heavy fertiliser users 10 or so years ago. We were probably over-catering, putting a bit extra on just to make sure, without much science behind it. The mentality probably stems from the early days when the soil was traditionally low in nutrients, especially phosphorus. We used to see a huge response, but as time passed and phosphorus banked up, you didn't see a response, but we carried on with that strategy.

We've conducted a few trials with Deb Archdeacon looking at fertiliser inputs and have been able to reduce them quite significantly. We found that we had to use them more frequently, but with the overall output of fertiliser less than it has been in the past. We have very high phosphorus-buffering soils and have found that applying phosphorus to pastures two to three times a year has made a huge difference to their growth. We are also using slow release fertilisers on the tree-crops.

Microbes don't like excessive fertiliser, so we wouldn't have got the benefits from the green and brown manures if we'd continued with extremely high fertiliser rates.

Have you done a cost benefit analysis?

Perennial pastures are costly and that's where we had to quickly weed out the species that weren't going to perform for us. We had to get our cost back. You know how much it costs but what cost do you put on having healthy soil? How do you cost the increased health of the cattle? It's extremely difficult to put a value on.

We just think it's a "no brainer". We think the benefits far outweigh the cost of the seed and getting them established.

We are working the ground all the time with the potatoes on a rotation so it's easy enough for us to seed those paddocks down, but to go through and do the whole farm, which is 600ha, the costs would be significant. We are lucky that we only need to do about 50ha each year in paddocks that have just come out of potatoes. Those paddocks are getting renovated every five years. The other paddocks where we haven't actively sown perennials are getting seed transported through the cattle, so species like chicory and some of the other species are popping up in those paddocks too.

Has going down the road of improving soil health made you more content with farming?

I am the sort of person who thrives on a bit of a challenge. It puts a bit of fire in my belly. My brother Dean and father Tony are the same, always keen to try different things. It is exciting when you've got something to look forward to, like seeing if applying compost with fertiliser reduces the phosphorus locked up in the soil, or trialling biochar on the tree crops. Those sorts of things give you a little bit of excitement because you can see the potential. If you do the same thing day in day out, things get pretty dull and boring.

We need farming to be a bit exciting to keep our workers interested and to get kids back to the farms. Education is paramount, and with technology changing rapidly, our younger adults need to go to the cities to educate themselves, up-skill and experience different aspects of life. But we need them to come back and bring their new skills with them.

Farmers are a bit of a dwindling commodity, so we need to make farming more attractive and exciting. 

MORE INFORMATION ►

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