

The Regen Report : Diversifying Life on the Land # 3

Hello and welcome to The Regen Report – a podcast about taking regenerative agriculture to scale and diversifying life on the land. I'm Alexandra de Blas.

This podcast is produced on the land of the Yalukit Willam clan of the Boon Wurrung people of the Kulin Nation. We acknowledge the Traditional Owners of country throughout Australia and their continuing connection to land and community. We pay our respect to them and their cultures, and to their elders past, present and emerging.

In this episode we visit a worm farm in northeast Victoria supplying farms with worm juice across Australia, we look at government supports for building natural capital on farm, and talk with a paramedic, ecologist and policy wonk to hear why they're working in regen ag and soil carbon.

NutrISOIL is an organically certified concentrated worm liquid that is produced using a unique vermiculture recycling system. It is distributed and wholesaled direct to farmers across Australia. The family run business, is based at Baranduda near Wodonga in Victoria. It was established 26 years ago by Graham and Lyn Maddock, brother Ian Maddock and son Darren.

I visited the farm while on a bus tour as part of the Farming Matters Conference. We are standing in front of four vermiculture windrows and Darren is explaining how the system works.

Darren Maddock:

We got 18 of these beds. They're about 50 meters long. They can stretch out as far as four meters wide, but they're all very small at the moment because we've been harvesting the solid product out of them, which is the castings. They're a third of their normal size. That's what happens each year. We bring a lot of materials in. We use a lot of high nutrient waste, whether it's straw, manures, vegetables. We've got some rice bran last week, which was handy. And these are all weather damaged or high nutrient products that can't be used elsewhere, but that can be used really well in a vermiculture system or a composting system. As a vermiculture system, this is also our composting system. It's a cool composting system. It makes a similar product to your thermal compost, probably a superior product really due to the way the worms break and then convert the food into plant available liquid and solid straw.

Darren Maddock:

And manure is just the base of what we feed, a variety of straw, but generally weak. At the moment, we're using barley just for convenience. It was handy, local and the manure's mostly cow manures and horse manure. It was actually fed out some goat manure last week as well. That was from an organic farm locally [inaudible 00:01:14] that was a little bit rare, but still a good manure to use. Sheep manure's good, but it's just a little bit hard to get it in bulk.

Group Member:

Are worms worms?

Darren Maddock:

They're not really. These worms are compost worms, so reds, blues, tigers. They got a bunch of different names, too. They're all got two or three different types of names. So they're not really fishing worms at all. They don't go underground. They don't burrow into the ground, these type of worms. Even though they're an earthworm, you won't find them in the soil. You'll find them in the organic matter in the soil in the top few inches maybe, but generally, they're going to be in sort of compost where there's a lot of organic material and moisture.

Group Member:

So the worms in your veggie garden are these worms?

Darren Maddock:

It's likely they would be, yeah.

Group Member:

Right.

Darren Maddock:

Might be the same variety, but certainly, they'll be more of a compost type worm for sure.

Alexandra de Blas:

You've got four wind rows here.

Darren Maddock:

Yep.

Alexandra de Blas:

How do you set the whole situation up and then how do you add to it?

Darren Maddock:

Yeah, we're got four here. We've got 18 all up, with another four to get put in shortly with dump. We build drainage in below all these beds. They flow out through pipes and down and they collect in collection tanks. We'll catch them in tanks obviously at a lower point. We've got three catchments. This is the catchment one. And the tanks for these catchment are just the black tank sort of to the left there. All the liquid that comes out of these catches in there and automatically pumps into some recycling tanks beyond the warehouse here, which we'll probably have a look at shortly. So we set up, it'll be like a clay base, and then plastic in the [inaudible 00:02:46] matting and heavy rock ballast.

Group Member:

So how long will this row last here?

Darren Maddock:

You get a good five or six years out of them generally.

Group Member:

Right, right. So you just keep on building this row up [crosstalk 00:02:58] all the time?

Darren Maddock:

Yeah. This will build up with feed and then it'll shrink down once we harvest the solid granular castings or the worm poop out of it.

Alexandra de Blas:

How often do you do that?

Darren Maddock:

It's probably every 18 to 24 months. It takes a while. Once you're starting from scratch, it'll be at least 12 months before I harvest anything out of these again. We don't like to harvest it out. We've got to tear up their home a bit.

Group Member:

Are the castings on the top surface or are they within?

Darren Maddock:

Probably the top foot would be mostly feed and the rest is castings yeah. We've got our feed mixer here. We drive along, we'll feed one side and we carry just the worms to move out to that one side. And then, that's a quarter of it, and then we'll take the other three quarters away once all the worms have moved to the one side, and then we just-

Lorraine Gordon:

How long do they take to move to the other side?

Darren Maddock:

Oh, you can physically move a lot of them with an excavator. They're living in that top sort of few inches. You won't find many worms deeper down, unless it gets really hot.

Dr Maarten Stapper:

What additives do you use? I seem to recall you put some lime in?

Darren Maddock:

Yeah. I didn't even get that far. I got as far as straw, manure, lime and vegetables, fresh minerals, rock phosphate, seaweed, either liquid seaweed or a sort of a granular seaweed cake that we get as well. That's all mixed up with the straw and manure and fed out just in smaller amounts because too much of those rich nutrients can kill.

Group Member:

The product you sell is the castings or is it the wee that's gone up into the tanks?

Darren Maddock:

It's both, yeah, mainly it's the liquid that we're capturing. The castings are a small part of the market for us. Yeah. It's probably the better product, but it's very hard to freight and costly to freight. And it's hard to apply in the rawest form. A belt spreader will do the job, but it won't go through fertilizer spreaders or combine seeders, that sort of thing. All of our castings go to worm Hit in the last few years, 90% of it, at least. And they make that into pellets, which can then go out through the seeder or the fertilizer spreader. Yeah.

Alexandra de Blas:

Once you've got the worm juice, do you concentrate it down at all before you sell it? And how do you treat it to make sure that it lasts or it doesn't change structure?

Darren Maddock:

Once it ends up in the catchment tanks, it automatically pumps into the recycling tanks and then it gets recycled back over the beds. So that increases the nutrient and the potency of the liquid.

Group Member:

How often do you increase the concentration of it?

Darren Maddock:

We're doing it regularly. It'll get circulated back through three times.

Alexandra de Blas:

How alive is the worm juice when you sell it?

Darren Maddock:

It goes dormant fairly quickly once it's bottled and sealed up.

Group Member:

We might just keep moving. We've got some walking to do, and then at the end, I can talk a bit more about what the product actually does and how you use it.

Nakala Maddock:

You've got to go back to what you are actually collecting. So you're collecting all the mucus off the outside of the worm. It's like a vermi-wash and we're collecting all the microbes that have come out of back of the worm. When we feed a real diversity of food, what we're attracting is the diversity of microbes. So the worms are going to break down that broken down food because they eat the soil. And then you're going to have this worm's gut workout what microbes should come out. They're like a composting machine, their gut, is a bioreactor, so they can increase good micros by thousand fold and they can cull the bad ones, but you're going to have some bad ones in there because there's a reason why those bad ones are there in nature. And we call them bad, but they're only bad when they get into a monopoly when they've got power, basically.

Nakala Maddock:

So if you can have that balance right, which the worm gets it right, then you've got a good product. So if you're just putting that liquid back over it again, you're collecting more of that. And also what you're

collecting is everything's in amino acid form. Your nitrogen, a lot of it is in amino acid form. And that's what your plant wants. Amino acids are what create proteins. If we started thinking about things that are non-nutrient factors, so you're thinking of hormones and enzymes, a protein folds, according to what the plant says, into a hormone, an enzyme or an auto-inducing type of compound. So we're getting into the compound chemical reactions that a worm liquid can make, and they're really important.

Nakala Maddock:

They create immunity in the plant. What can denature a protein is urea and heat. So if you have bare ground, you've got your proteins. They can't turn into hormones and enzymes and things, or if you've got a lot of urea, they can denature it as well. So what's happening in conventional agriculture is we've got nutrients out there, but we don't have these other non-nutrient factors. And you know, if your thyroid's not working, what can happen to you. All of these autoimmune diseases are affecting us and that's what's actually affecting agriculture as well. So when we're talking about nutrient integrity of the grain, we've got these grains that they do have high nutrients. We're pumping nutrients into them, but it's these other non-nutrient things, like antioxidants, secondary metabolites. So they're doing studies where biological system, the secondary metabolites around the root system are much higher in a biological system than during a chemical system.

Nakala Maddock:

And we just don't value that because we still don't totally understand it. So that's what a worm liquid does. It increases immunity. It increases these non-nutrient factors that a plant can do. And your synthetic fertilizers pumps nutrients into it, , but we also know that when you inoculate a seed with Nutri-Soil and you have a seed that has a pesticide, a fungicide or has been sewn with MAP, the root system in the natural system is bigger. So the root system initially you'll find covered with soil and it will put a lot of energy into the ground first. And then it will, next to the conventional system, come up later. Your super phosphate's going to pop it up first, but it's not going to have that bigger root system.

Nakala Maddock:

So then that's what people see. So people are like, "Yes, it's a great inoculant," and it is, but when you go past that, that's when we're running into soil that might be compacted or it might have other deficiencies. So trying to see what the foliar application does sometimes is a little bit more difficult, but it is doing things. We just can't quite see that instant reaction that we love to see that we can at the seed inoculant stage. So it's used as a seed inoculant, five liters per ton. And it's used as a foliar application, five liters per hectare. You can add a small amount of nitrogen with that, like five units of nitrogen, if you would like to. It tickles the system. I mean, microbes love nitrogen. They live and grow from it. That's what nitrogen tie up is. They hold it in their bodies if there's not enough around.

Nakala Maddock:

And that's when the farmer can't get their nitrogen, because the microbes aren't going to give it back. Any extract, be it the Johnson-Su, be it a worm liquid, they're all bacterial based. So you're not going to find a lot of fungi when you do an analysis of it, but you'll find lots of different bacteria and all sorts, nutrient cycling, bacteria that break down chemicals, bacteria that fix nitrogen, bacteria that solulise phosphorus, all these different types of bacteria that have different roles. They've even got bacteria that communicate. They form packs and they communicate with each other. So we're finding out lots of different things, but people might be concerned that, "Oh, but I want fungi in my soil." It increases the fungi in your soil when you actually add this bacteria.

Nakala Maddock:

So you've got to always be looking at what happens to my plant, what happens in my soil, so when you put Nutri-Soil under a microscope, you actually don't see a lot. It's really hard to see. You've got to have a very good microscope, but you'll see mainly bacteria. So when you put a plant applied by NutriSoil under a microscope, that's when you'll start to see what's actually happening.

Group Member:

The bacteria that comes out of the worm and the bacteria that comes out of Johnson-Su process?

Nakala Maddock:

They're very similar.

Group Member:

They're very similar.

Nakala Maddock:

When they have the worms in the system, yeah, it's very similar. We've got comparison studies of the Johnson Su, ours and another extract. And it was Terry McCosker that did it for us.

Group Member:

Yes?

Nakala Maddock:

Yeah. But I mean, they all had really good things about them. And I can say the one good thing about Nutri-Soil, but there's another good thing about the Johnson Su, so Nutri-Soil's big win out of that was it had the most diversity of bacteria in there, and we're like, "Yeah, that's awesome." And then someone else will look at the test and it'll say, "But it has the most of this in there." And I think Lorraine, your principles, the one of ambiguity is the best. What happens with the worm liquid is it's just got the intelligence. You put it out there and the plan instructs these microbes to do what they have to do.

Nakala Maddock:

So we know that microbes now are absorbed through the leaf of the plant. The plant takes them in, or it's absorbed through the root system of the plant. And the plant actually codes those microbes and tells them what they want, spits them back out into the community, and then they've got this quorum sensing happening where they start going, "This is how we're going to live with this plant." So we're going to get fed by this plant and they're going to help us if we help them. So they get an understanding of each other. A worm liquid knows the intelligence with the plant. You've got to always have a seed or a plant with the worm liquid. Together, they work out what microbes need to switch on and what microbes need to switch off. So we're constantly working with Ash Martin and we'll say, "Ash, we need to find out if we've got this microbiome in it," and he'll be like, "It's in there. I just need to culture it." We're like, "Okay, thanks."

Nakala Maddock:

So it's about creating the right condition for that microbe to come. So if we put a microbe in a contaminated soil, we'll have all these bio-remediation microbes become active. So it's stepping back. It's accepting that we can't control it, but we can help it. We can help the system.

Dr Maarten Stapper:

And that's the problem, like when you first use it and then you are disappointed because it doesn't work and you do something else again. That's the worst thing for an ecosystem because the ecosystem has to rebuild. So what Nakala is saying about the contaminated sites, like in the first season, the whole system is being decontaminated. All the negatives are taken out, and then slowly the positives are coming back as well. And in my experience, it's like a period of three years. Every farm had one paddock that goes very well straight away. And then two are average and one never gets there. Five years is too long. So it's always, every ecosystem is different. Every soil has only history, even on the same farm.

Group Member:

Nakala, what about adding fulvic or humic acid to pump up the fungi component?

Nakala Maddock:

It does have fulvic and humic acid in it. And we actually add half a percent of humic to it for storage, so that they can be stored correctly. And there was that question about storage. So yes, over time the microbes can use up the nutrients in it and the pH can change in it. So yeah, 12 months is probably point of using it. And if you haven't used it after that, you can refresh it. You can put some more Nutri-Soil in it. You could put a little bit of molasses in it. It's about food.

Dr Maarten Stapper:

With that resting phase, it's also like all the active microbes take the food out of the liquid, but also they remain in spore stage. And in a spore stage, everything is sleeping. Everything is just sitting there. So then we put it out and we have oxygen and life in the soil, then the spores multiply. If you're spray Nutri-Soil on a paddock that's dry, like before the rain, then it just sits there in spore stage and waits for the first rain drops and then it kicks on.

Group Member:

Really? Oh wow, that's interesting.

Nakala Maddock:

It acts like a seed inoculant. You can put it out when it's dry. It just waits.

Dr Maarten Stapper:

The break of the drought again is a typical example. As soon as the raindrop hits the soil, then the whole paddock becomes green. They immediately wake up from a spore stage to active stage.

Nakala Maddock:

Your holistic system, you guys, that grazing management, it's gold. And I'm under selling our product here. I would put fences and water before I would go using a biological stimulant. That can help you along after that, but if you're sewing, I would absolutely be coating the seed. It's so, so cheap, and it really kicks off your biology. So I had someone yesterday, Kate, who's one of the holistic grazers that the

buses are going to, and they're talking about their farm. And I was like, "I've been to your farm. You've got an abundance of grass. You've got good grazing management. Do you really need this?" Yeah. And we're like, "Well, maybe not, but if you're a more intensive or you didn't have enough grass, there's definitely holistic people who come to us and say, 'It's not working.' And we go, 'Right, okay. This is where we can help.'" But if it's working, that's your ideal, if you get that right.

Dr Maarten Stapper:

Well, like after yesterday as well, all the talks and comments, the farms have been like a holistic management, with 20, 25 year experience, good system, oh, this is so good. But then when you go into the paddocks, you see deficiencies. And like one property, it was all grass, no broadleaves. So then you ask, "Why only grass? Why not broadleaf?" This is not the final point. Another property, you see barley grass, etc., and that's like with ecosystems, and you have a goal like with the holistic management. You have a goal and you want to go through the goal. But then the ecosystem goes at that level, sits there. And then the management continues. It keeps sitting there, but then you change your goal again. Then you can force your ecosystem to go up another level, and then you get rid of the barley grass.

Dr Maarten Stapper:

You get rid of the grass only. You get some broadleaves, etc. So with holistic management, never be satisfied in what you have because we create a new top soil with the growing plants, so it's all carbon. And we can create a system which is the best in the world, aiming higher all the time. And the higher you aim, you get there depending on the rainfall cycle, of course. Never be satisfied [inaudible 00:18:34] get. Always aim for more. Always keep learning.

Dr Maarten Stapper:

... from current practices to not having to need chemicals and less fertilizers is to my recommendation always like the budget stays the same. It's not more expensive, but then the first year you can take 30% of that budget and spend that 30% on biological fungi, like the Nutri-Soil and with seed coating, etc. And then you see at the end of that season, that the results are as good as you expect, and certainly not lower yields. And you see the soil improving, and that soil improving, the top soil improving, the top inch improving is the critical factor. Then you do a second year. You can go half. And then as you go along, you can end up, and I've had many farmers that do that, and then they happily end up with 50% of the fertilizer use in small amounts, but no chemicals.

Nakala Maddock:

This is the warehouse, as you walk through.

Alexandra de Blas:

So what happens here in the warehouse?

Nakala Maddock:

So this is where we fill the Nutri-Soil. We can have this warehouse full at certain times of year. So WA are probably our biggest cropping clients, and then New South Wales and Victoria are more our pasture clients. So mainly we sell them in 1000 liter tanks. We're big with dairy too. And we've just started working with sugarcane up in Queensland. It was created for pasture, but then the cropping industry worked out how well it worked for them as well. We connect people in the local area who use Nutri-Soil, who are 1000 liters or more. And the reason we do that is so that they can have farmer-to-farmer

connection. We have Zoom calls with them, and we ask people what they did last year, did they have any issues, what they're going to do this year. And farmers help each other out.

Nakala Maddock:

So it's just a little bit different to traditional agronomy. So farmers find that they don't have anywhere to go in a safe place to try and ask these questions. So the hubs that we've created a really safe place, but it also means that people can get bulk prices. So we used to encourage farmers to contact each other and buy together. So now all of our hubs, bar a few, are at the 20,000 liter rate. So instead of buying a shuttle for 4,950, I've got all the people together and connected them and they're buying them for 3,850. So it's a huge saving and they've got mates, so it's pretty good.

Group Member:

Can I just say something? Emotional grandmother here, but I just wanted to say thank you so much. And you've just got such a wonderful family that's worked so hard through so much adversity, and you're all doing it so well and so happily. Well done.

Nakala Maddock:

Thank you.

Consumers and farmers are becoming increasingly aware of the connection between the soil health, food production, the gut microbiome and human health. The opportunity to adopt regenerative farming practices to sequester more carbon in healthy soils makes a lot of sense.

To find out what is drawing new people into this space I spoke with three women working with AgriProve.

Tasmanian Soils Ecologist Theresa Chapman, soil carbon project officers Melanie Addinsall from Victoria and Kate Carmichael from NSW were in training with Jamie Olsen in West Gippsland. They were learning to drive AgriProve's new tractor and Soilkee Pasture Renovator and I pulled them aside to talk about their work. Theresa Chapman.

Theresa Chapman:

Well prior to this, my tractor experience was on some super old Iseki on a bush block that I used to live on. So driving a modern tractor and operating a modern tractor was really interesting to me. And we're lucky enough to have the Olsen family who are also a bit new to that tractor. So between the sales rep and the Olsen family, we've all been having a fun time just playing with the buttons and seeing the job that it does. And most delightfully seeing the other paddocks around growing up their diverse pasture species on this place has been really lovely.

Alexandra de Blas:

So you've been working in Tasmania. What are your impressions coming onto the Olsen's farm and seeing the first property to receive soil carbon credits in Australia?

Theresa Chapman:

Yeah, it's pretty inspiring. It's not dissimilar to a lot of the Tassie landscape that I work in, and it feels really exciting that there's a proof point to the whole carbon story.

Alexandra de Blas:

How do you feel about learning to actually drive the Soilkee, so you can do demonstrations and sow trials yourself?

Theresa Chapman:

Well, I'm a bit more ambitious than just demonstrations and trials. I'd like to sow all of Tasmania pastures to diverse forage crops. But yes, it feels really good to have that capability and upskill in that area because I do think there's something magic going on with the diverse plant groups.

Alexandra de Blas:

Why do you want to sow diverse forage crops into all of Tasmania? What's the thinking behind that for you personally?

Theresa Chapman:

There's a pretty strong academic connection between plant diversity and soil biodiversity. And soil by diversity is really important for many, many ways in which the soil functions. It's not a material. It's a living system. It's more like an organism than a material. And so there's something really important I think about just keeping that diversity in the system, and then walking around yesterday in one of these paddocks and we were being covered in these tiny little spiders that were all on threads and just landing on us everywhere. And you could see multiple different species of moths. And Jamie was telling us about some people observing the bird species diversity here, which is higher than you would expect.

Theresa Chapman:

And no doubt that's reflected across many of the other creatures that we can't see, let alone the soil biology, because that is diverse in the worst paddock. I can imagine what we're working with here. So I really think we need to get diversity back into our farming systems. And a lot of our land area is covered in pasture, so if we can introduce plant diversity back into pastures... Three and four species is pretty different to 12 to 16 species I think.

Alexandra de Blas:

So, Mel, how do you feel about doing the training here and skilling up in terms of the Soilkee and the tractor?

Melanie Addinsall:

It's been great to actually learn how to use the Soilkee and the nitty-gritty and the specifics around how the Soilkee actually functions, and yeah, how to change your seeding rates and the rotating blade system. It's good to see how it actually functions and the depth it goes to.

Alexandra de Blas:

What else have you found interesting, Mel? You've worked in cropping. You've also worked in Landcare. How do you feel about now working in soil carbon?

Melanie Addinsall:

Let's go for the big ones. Yeah, it's really exciting because soil carbon is the connector piece between all of the industries, in terms of building soil health. When I worked in Landcare, the key aim of what we were trying to do was increase soil health in productive systems. And we would promote that through things like grazing management and pasture cropping, but multi-species pastures is a huge part of that. And the Soilkee provides a really great system to do that. So when I was working with Landcare, we actually had a lot of farmers build their own drills that were like pasture renovation drills, and they were able to sew multi-species pastures. And so these are homemade, home-engineered type systems, but five years later we discovered the Soilkee and it is a really great system that does that green manuring effect and a bit of aeration.

Melanie Addinsall:

It enables the seeding of multi-species pastures. And through the conveyor belt system, it enables a seeding of different shaped and size seeds. In terms of cropping, the cropping industry, it's a little bit less applicable, but I hope that the use of cover crops and multi-species cover crops in cropping to fill those gaps that were previously kept as fallow, 100% green growing ground cover 100% of the time is what we're aiming for to build soil health and support. So microorganisms and fungi populations, if we can do it in pasture, make it mainstream in grazing systems. Then the next step is getting it into cropping systems.

Alexandra de Blas:

Theresa, what are your thoughts on cropping systems?

Theresa Chapman:

Well, I'm currently commencing a PhD project in just this area, looking at diverse plant assemblages as cover crops. It's a lot of differences, but the main difference? Can multi-species do the job in the small window that croppers have to do cover crops, because there's also approaches like intercropping or relay cropping where you can introduce more diversity into a cash crop scenario. So in a three-month window, you can definitely get good growth and good root growth, and presumably boost your soil carbon and your soil biological functioning, but is it worth worrying about diverse species in a cropping context? If you grow a really great rye grass cover crop, is that just as beneficial because it's actually a lot easier to then manage that cover crop to terminate it and get your next cash crop in? So that's the question I'm looking into for my PhD. I don't know the answer yet. I'll let you know.

Alexandra de Blas:

So this is basically you grow a crop and then you sew in a cover crop after that?

Theresa Chapman:

That's generally the way cover crops are used in the cropping industry. In hotter places, it happens over the summer, in cold places, over the winter, or anywhere there's a gap. And a lot of farmers are on board with that now. Heaps of people are doing it. Although then you get that feeling working in this space and then you drive around in the winter in Tasmania and you see heaps of bare paddocks. So there's reasons for that, disease carry over, that kind of thing, but it would be great, as Mel has just said, to see lots more cover lots more of the year, even sewing just before you harvest or those sorts of ideas where you just, every time you can, have that living root in the ground. It's just so worthwhile I think.

Alexandra de Blas:

It was interesting watching Declan McDonald's series and the degree to which soil carbon decreased when you went from a pasture to a cropping scenario.

Melanie Addinsall:

Cultivation really increases oxidation of that soil organic carbon. It supports bacteria to flourish and the breakdown of soil organic carbon. So we believe that our Australian cropping systems are in continual decline in terms of their organic carbon from the initial cultivation still. So in America, they've seen the base of that decline and now they're quite consistent in terms of their cropping systems. But in Australia, because we've only been going 150 years, we're still declining from the initial cultivation.

Alexandra de Blas:

So we've got a sense how much we can increase carbon with pastures, but do we know how much we can increase carbon with cropping?

Melanie Addinsall:

Depends on rainfall.

Theresa Chapman:

And lots and lots of other variables. So many. No, I think the answer to that is no, we don't really know.

Jamie Olsen:

There is a lot of people doing cropping and doing companion planting and all that sort of stuff that is doing really well and getting good results with irrigation. So they've got a lot of water that they can have nine months of continuous improvement, and when they can have something covering the ground for nine months, it's a lot better than most cropping, being aware what plants work well with each other and what different plants can do to bring out different minerals and stuff like that.

Alexandra de Blas:

So, Kate, I'm really interested to know what brought you into this space because you were previously a paramedic, but you did grow up in Western Queensland on a property in Tambo.

Kate Carmichael:

Yes, absolutely. I grew up in a beef cattle property between Augathella and Tambo. I studied nursing and paramedics at university and then was working in the United Kingdom and came back and I didn't have my registration in Australia. So in the interim, I took a job with an ag tech company up on the Sunshine Coast and realized that actually I was just enjoying that far more than I had been enjoying being a paramedic, and decided to transition fully into a career change when I was still quite early on in my paramedics career. But I have to say that being involved in building soil organic carbon and enabling farmers to access soil carbon projects with the Emissions Reduction Fund is quite rewarding in its own way, sort of differently than healthcare, but still I think with a lot more longevity perhaps.

Alexandra de Blas:

And it is a form of health care in another way, isn't it? It's healing the soil.

Kate Carmichael:

Yes, absolutely. I mean, there's a lot of parallels between how we treat our landscapes and how we treat these physical bodies that we exist in as well, drawing parallels between the variety of bacteria in your gut versus the variety of that also within the soil and how we can use those too to compliment each other rather than engaging in practices which diminish both at the same time.

Theresa Chapman:

We were just talking about cultivation being a strong part of the decline in soil carbon, and yet we're here learning how to use a machine that cultivates to a certain extent. But this machine turns over 15% of the paddocks area and introduces a whole bunch of new species that wouldn't kick off the ground, if we didn't do that little bit of digging. And the way other people renovate pastures is to spray off the entire pasture and then reseed the seeds, and that leaves a gap of living roots as well as using glyphosate, which is potentially a problematic agricultural chemical. We might even lose it. We're losing some of our herbicides and pesticides in agriculture as Europe becomes more cautious and safety measures become more intense.

Theresa Chapman:

So this is completely chemical free. And another great thing is that this farm doesn't use any synthetic inputs anymore. You can see the evidence that it really works, and the bit of digging, even if you don't drop seed, I've heard anecdotally that that bit of digging and the aeration that it does, and potentially Jamie's compost theory, is a real boost to the perennial pasture that's already there. And perennial pasture plus annual roots from aerating seems to do something really interesting where the roots compete, and they're also different shapes and different strategies. And that level of diversity in the root architecture and the way the roots behave and what the roots are putting into the soil is a really important part of the picture, combined with the soil fungi and the other biological processes. And that's what I mean when I say something magic. It's not really magic. We just know very little about it.

Alexandra de Blas:

When we were driving up here, I noticed you had a couple of paddocks with sunflowers growing in them. And I've been coming here over a few years and I haven't seen sunflower crops here like that before. Tell me what's the situation with the sunflower.

Jamie Olsen:

Last couple of years have been going really well because we've got our soils to a level where they can support them really well and actually get up and grow to their full potential. Before they could do that, they would only get a couple of foot and have a little head on them and that would be it. But now we've got enough nutrients in the soil naturally that they can grow to their full potential. Generally, if you growing a crop of something like that, they need a big food source to grow, so you need to put fertilizer with them. But by doing that, you're actually stopping the natural systems in the soil from mining what it needs itself. So we've got to the point where it's doing all that for us without any inputs and we can grow them now. So that's why there's more of them.

Alexandra de Blas:

And they're looking good.

Jamie Olsen:

Yeah, no, that's good.

Alexandra de Blas:

And the cattle love them, don't they?

Jamie Olsen:

Yeah, the cattle love them, and they just thrive on it and they go around and pick them off first most of the time. And you just notice their coats just turn inside out, as soon as you start putting them into a few paddocks with sunflowers in them, so yeah, nice and black and shiny.

Theresa Chapman:

I like that phrase. I've not heard that before their coats turn inside out.

Alexandra de Blas:

Well, I think we'd better turn some paddocks inside out.

Theresa Chapman:

You might just want to just say a sentence on the types of soil that soilkee works on and works best on.

Jamie Olsen:

Everything? Any soil can be improved. If you can grow something, you can improve it. I've done plenty of different soil types, salty stuff, red stuff, black stuff, gray stuff. Yeah, everything, rocky stuff. It's just, if you feed the natural system, it'll improve.

Alexandra de Blas:

Well, I know Sam Trethewey has had a few problems with the rocks on his property. How do rocks go with the soilkee?

Jamie Olsen:

First time in, if you're moving a bit quick and take a big chunk out of the rock with the blade, it can either knock the blade back or spit the clutch out. But if you go a bit slower the first time through, loosen it with a little knock of it and then the next bite will come around and kick it out, it's generally not too bad. Second time planting, most of it's pretty soft and just been moved six months ago, so then you can come through at a normal pace. And then once you get your soil aggregated and everything, it generally just pops the rocks off on top and that's it. You can either pick them up or go around them next time.

Theresa Chapman:

Jamie, what are your thoughts? If people felt like it was too expensive to do it twice a year or even annually over the whole place, would you still get the effect if you did it once every few years?

Jamie Olsen:

It's hard to say because I haven't really done many places every few years, because when they see the results, if they understand what they're looking at, they're straight back in the next season or the next opportunity. Some places with irrigation go three and some even four plantings a year. So the more you

do it, the more benefit you get sort of thing, so it sort of almost becomes addictive to the farmers when they see it growing how it is, they 're all over it. And I haven't had the opportunity to do it every three years.

Alexandra de Blas:

The Regen Report is supported by AgriProve and Managing Director Matthew Warnken gives us a update on recent developments in the Regen Ag and soil carbon space.

The Qld Government has just announced the 2nd investment round of its Land Restoration Fund which follows positive announcements from the Federal government in the budget – Matthew Warnken.

Matthew Warnken:

The budget was very encouraging for soils in general and soil carbon in particular, with the government adding support for soil carbon farming and environmental markets. I mean, we saw a real build on last year's low emissions technology statement where soil carbon was identified as one of the five key techno priority areas for government in emissions reductions. And now what we're seeing in some of the detail in this year's budget is the piloting of financial incentives for good environmental management at the national level, so really encouraging signs in our budget.

Alexandra de Blas:

Tell me a bit about the Carbon Plus Biodiversity Pilot Program. It's worth 23 and a half million dollars. How will that work?

Matthew Warnken:

The Carbon Plus Biodiversity Pilot Program is an incentive program to reward farmers for improving on-farm biodiversity with carbon projects, so improvement of biodiversity attached to the carbon project under the Emissions Reduction Fund. And here, what we're seeing is we're taking the theory and applying it in practice in six key regions across Australia, in areas such as Burnett Mary and Queensland, Tasmania and areas in West Australia, so a good diverse range of areas where these are the programs being piloted, really building on some of the early leadership work that the Queensland government was doing under the Land Restoration Fund in demonstrating that there is opportunities to monetize a whole bunch of these co-benefits that arise from undertaking carbon projects.

Alexandra de Blas:

It's Carbon Plus Biodiversity, so the carbon element is based on an Emissions Reduction Fund project as per usual. And then you get paid extra on top for the biodiversity, but there's also a trading element. Can you tease that out how it works?

Matthew Warnken:

There is a trading element and this would be some of the detail that emerges as part of the pilot. So where this will become really fascinating is in terms of actually codifying up what that biodiversity benefit means and looks like, and then translating or piloting as a tradable commodity, so like a biodiversity credit. So that's where a lot of the innovation is coming from. And what we're looking for is a similar pathway of development that the carbon credits program has demonstrated. By that, I mean, there'll be a framework around the measurement. There'll be some initial markets in terms of incentives

and actual market for that, but it will kickstart how do you go about measuring that biodiversity aspect, and then what the kind of value is around improvement of biodiversity values on operational farms.

Alexandra de Blas:

May was a busy month with Beef 2021 in Rockhampton and AGFest in Tasmania. What were the biggest takeaways from those events, from your perspective?

Matthew Warnken:

Once again, we're just seeing a large number of leading edge farmers that are already changing practice to access benefits of building soil carbon. So we see that in terms of some of those young leading farmers and minimized by Jacynta and Adam Coffey, near Miriam Vale. So I caught up with Adam at Beef Week. I was on a panel talking about monetising natural capital, which effectively biodiversity and other environmental code benefits, caught up with Adam and they had a great profile of their project on Landline. But they're embracing building soil carbon by changing grazing management and implementing multi-species pasture cropping, chasing those improved productivity gains, and also looking at the resilience of their farm and resilience to drought and also resilience to flood. Again, great examples of the kind of leadership and caliber of these farmers who are changing their enterprises, and seeing those motivations around not only the environmental aspects, but very much commercially oriented and focused.

Alexandra de Blas:

It's interesting because they've got an Emissions Reduction Fund project, but they've also got a project under the Land Restoration Fund, which is a bit similar to what we were talking about with Carbon Plus Biodiversity, which is happening at the federal level. So what are the benefits for them of having an LRF project on top of their carbon project?

Matthew Warnken:

There'll be a number of benefits for the Coffees in terms of participating in that Land Restoration Fund. Firstly, the co-benefits, those environmental and social co-benefits that the Land Restoration Fund is framing up and improving the measurement regime and the narrative, that'll be paid out at a different cadence or different interval to soil carbon. So what that means is earlier recognition of cash flows coming into the farm sooner than the measurement regime, which is a big improvement. It's a good complementary mechanism. The other benefit that we see is, as we get more sophisticated at articulating the co-benefits associated with improving soil health, improving water quality, improving biodiversity, that will have a large follow on benefit in terms of access to markets and improving the way that they're able to talk about their landscape management, a lot more sophistication, and a lot more to detail.

Alexandra de Blas:

Queensland has led the way, but we're also seeing new programs in Tasmania. And I believe the Western Australian government is also looking at new programs. What's happening in those two locations?

Matthew Warnken:

Yeah, so here we see a continuing theme around managing biodiversity and environment now becoming integrated and material to the business of farming. So with that leadership in Queensland, the Land

Restoration Fund, that was a \$500 million initiative. Now, Western Australia is running their own Land Restoration Fund with the similar potential payments for environmental co-benefits, biodiversity, water, other social benefits. It's a smaller program, just concentrated on the intensive land use zone in that south west corner of Western Australia.

Matthew Warnken:

But importantly, setting up that framework and demonstrating that these co-benefits can be measured and can form part of that additional revenue stream. And even down to at a smaller level, but still noteworthy, is Tasmania and the Tasmanian government putting up potential assistance packages to allow farmers to evaluate carbon farming opportunities on their own enterprise. And I think there's packages of around \$10,000 to help that shift. So certainly at AgriProve, we're seeing that elevation in interests in terms of potential co-benefits and participation in these projects. And our pipeline continues to increase as more and more farmers are coming on board. They're looking for opportunities to access at the bedrock the soil carbon fundamental opportunity, getting paid to improve soil organic carbon, as well as other opportunities around making those other biodiversity aspects bankable.

Alexandra de Blas:

One of the things that's interesting about this is the speed at which it's happening. Month by month, we're seeing new developments.

Matthew Warnken:

That's a really good point, Alexandra. And we often talk about in terms of climate and natural systems, this concept of tipping point. We're certainly seeing a tipping point from a policy level and a market level and a participation level in farmers, in terms of the needs to take action and the opportunity that soils presents to see how these opportunities can be mainstream and bedded down into the day-to-day practice. It's not just the phenomenon located around Australia. We're seeing these pressures around those global challenges. Climate change, biodiversity loss is also being seen in markets like the European Union, and a lot of those companies that are internationally based with Australian operations. So there's that flow on in terms of supply chain pressure, looking at improved environmental outcomes, and how they can be demonstrated. So soil organic carbon is a great proxy. It's a great analog. It's a great single point indicator of general environmental outcome, which is why we're seeing that uptake in interest in terms of participating in soil carbon projects.

Alexandra de Blas:

This is the final episode in series One of the Regen Report.

It has been a pleasure putting these podcasts together and working with Matthew Warnken and the AgriProve team. They're a wonderful and inspiring bunch.

If you have enjoyed this podcast why not share it with your friends and colleagues on social media. The link to the transcript is in the show notes and on the Agriprove website at www.agriprove.io.

In the meantime take care and stay healthy.

I'm Alexandra de Blas and This is the Regen Report.