MILKING REGENERATIVELY

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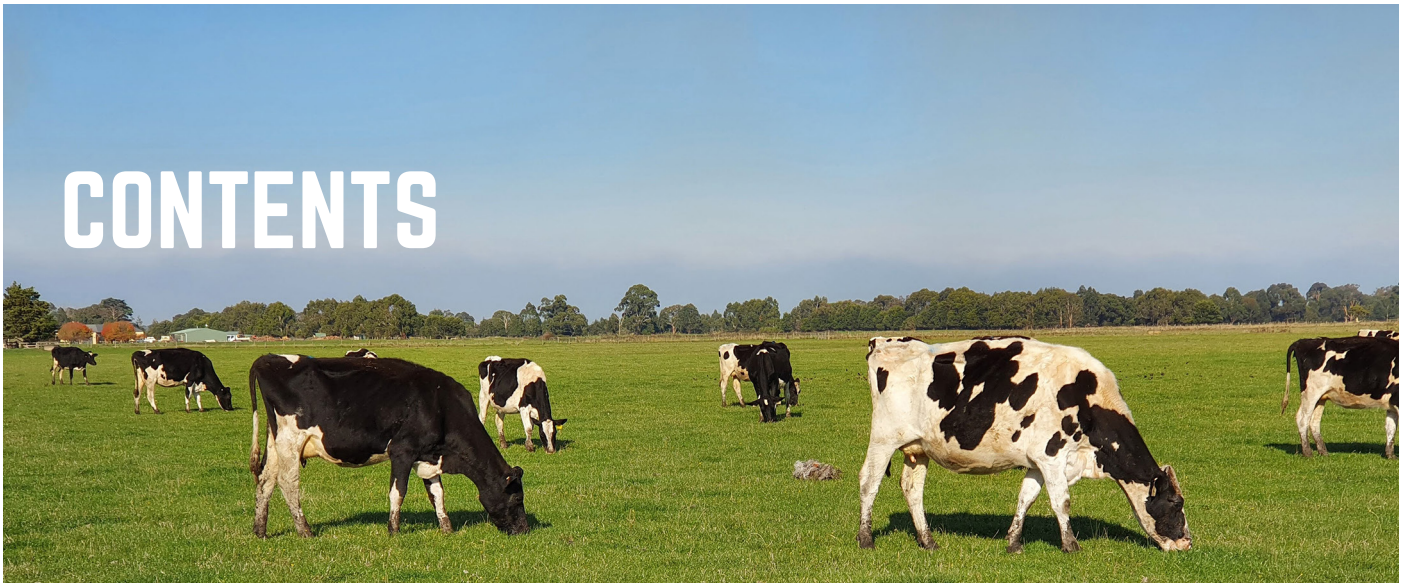
SOIL LAND FOOD — ECOLOGICAL AGRICULTURE —

GOULBURN BROKEN CATCHMENT MANAGEMENT AUTHORITY



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Acknowledgement: Goulburn Murray Landcare network, goulburn broken CMA, Luke Harrington and the regenerative dairy farmers who have shared their experience.

WHAT IS REGENERATIVE DAIRY FARMING?

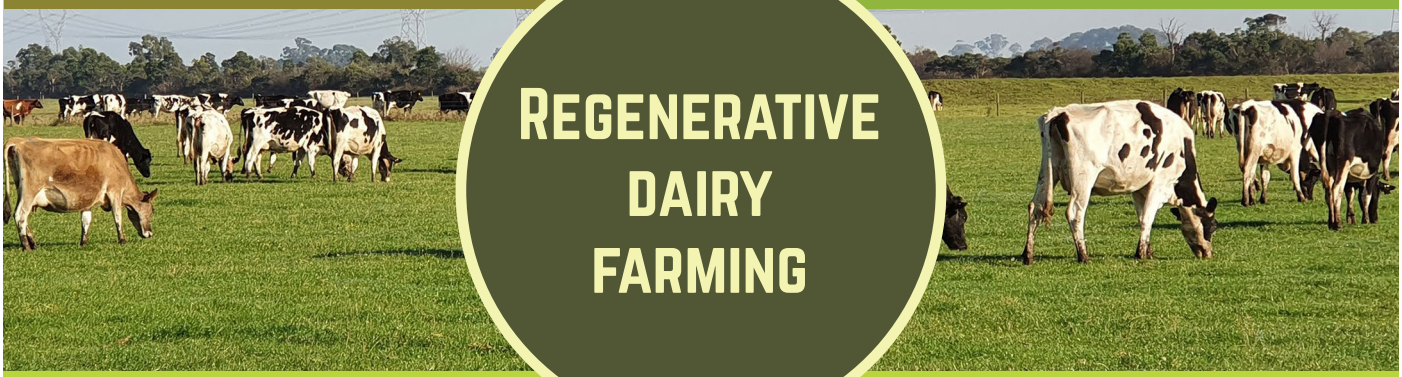
A regenerative dairy system is based on four Pillars of Health

SOIL HEALTH

maintaining a high functioning soil system that has no major soil constraints and that cycles nutrients efficiently.

PASTURE HEALTH

a productive, diverse and long-term resilient pasture base is the foundation for feeding the herd. Forages and supplements provide minor support for the system.



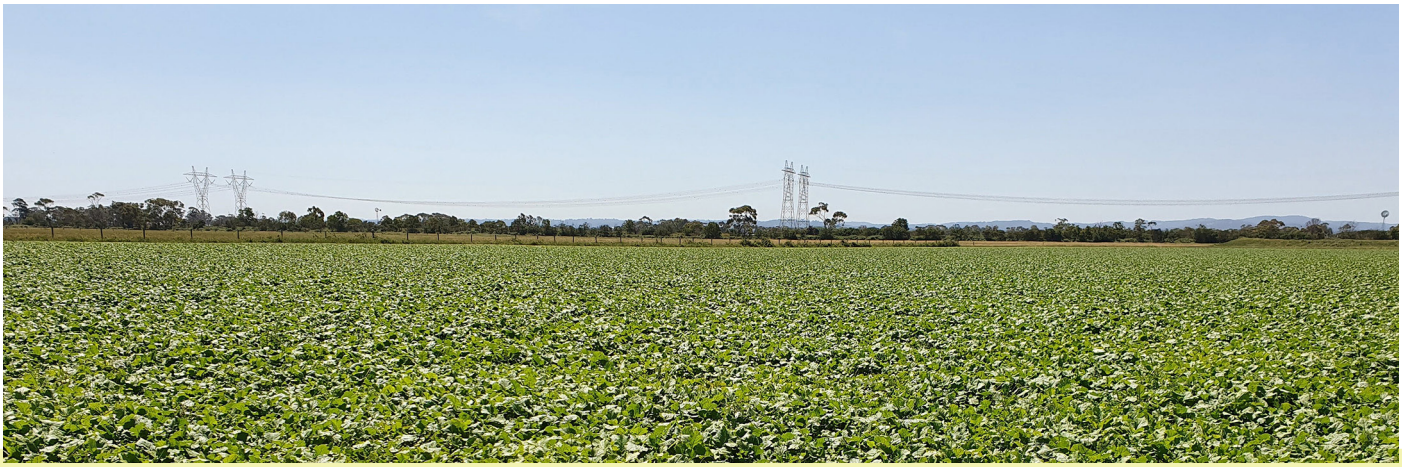
REGENERATIVE DAIRY FARMING

ANIMAL HEALTH

maintaining healthy animals through breeding, nutrition and providing a good environment that results in minimal veterinary treatments.

HUMAN HEALTH

maintaining a work-life balance for the farming family - that is profitable.



A REGENERATIVE DAIRY SYSTEM IS PROFITABLE.

The profitability of a dairy business is driven by the profit equation below:

PROFIT = YIELD X PRICE - COST

A farmer manages four types of capital to achieve profitable production:

NATURAL, AGRICULTURAL, HUMAN, FINANCIAL

5 STEPS TO CHANGE

Do a business plan

Your business should generate enough net cash flow to meet your family financial needs, including paying down any debt.

1.) Identify a family net profit target (how much do you need after tax to meet family goals?).

2.) Include profit to put to servicing long term debt.

3.) Optimise your bank situation to minimise interest repayments.

4.) Do a cash flow budget and plan for servicing any short-term debt as you transition.

5.) Use a conservative milk price when planning your budgets.

Determine optimal farm carrying capacity

The farming system should be able to grow its own feed in an average to poor year.

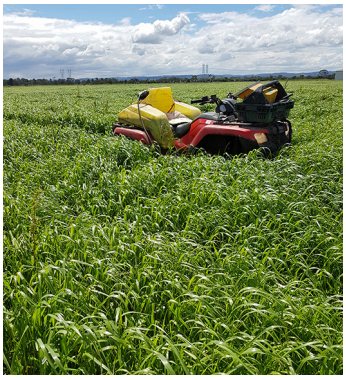
1.) Estimate total potential farm production: pasture + forage crops + fodder grown in a below average year (think about climate variability).

2.) Allocate at least 2 tonnes of dry matter/hectare/year of your pasture for soil and pasture health (maintaining your natural capital).

3.) Calculate your optimal farm carrying capacity (herd size = milkers plus others) based on potential available farm feed.

4.) 80-20 rule: 80% of production is based on the farm's natural capital and 20% is based on supporting inputs.

5.) Feed production from a good year is the cream on the top – it's a buffer!



Implement ecologically-based grazing

Maintain a productive and diverse pasture base through planned rotational grazing and over-sowing plant diversity.

1.) During grazing events, graze pastures to an optimal level dependent on pasture stage and seasonal conditions.

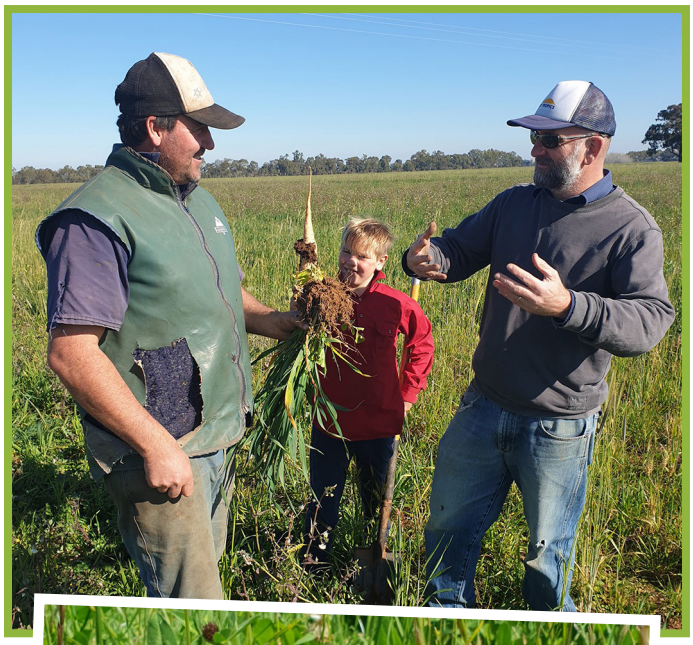
2.) During grazing events, use stock density to build soil function.

3.) Leave 100% ground cover at all times – non-negotiable!

4.) Leave at least 2 tonnes of dry matter/ hectare/year for soil and pasture health.

5.) Allow sufficient pasture recovery depending on pasture stage and seasonal conditions.

6.) Over-sow plant diversity, including legumes, to maintain optimal feed quality.



Fix soil constraints and optimise soil fertility

A productive and healthy soil increases efficiency of water and nutrients and maximises potential for pasture growth.

1.) Identify and fix any soil constraints like compaction, low carbon, aluminium, soil acidity, etc.

2.) Identify any limiting nutrients and address these.

3.) Manage nitrogen with legumes in the pasture. Soluble nitrogen fertilisers should be used in low amounts, if needed (less than 100kg/hectare/year).

Optimise herd management

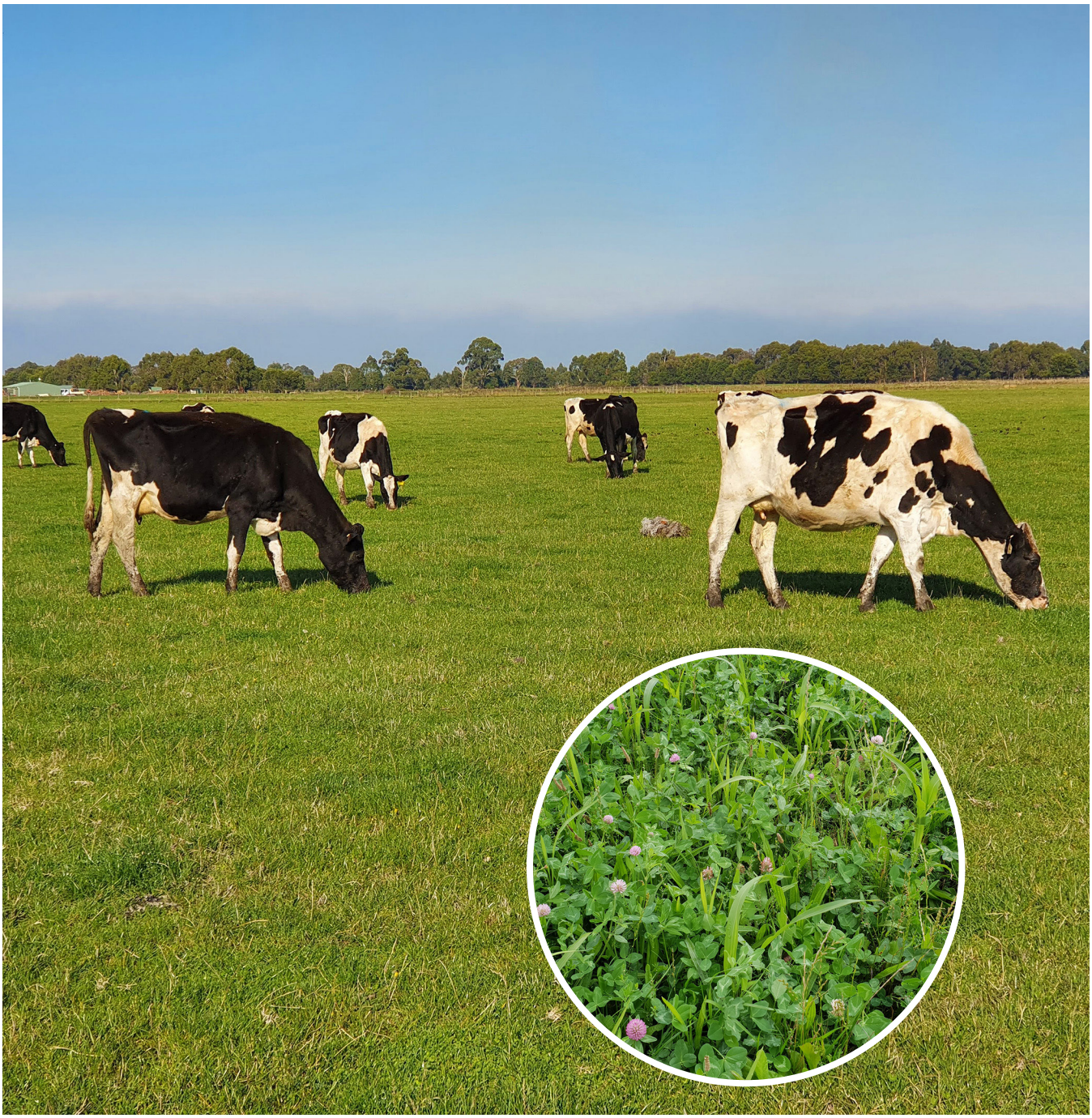
Maintain healthy, well-adapted cows through nutrition, genetics and seasonal timing of herd operations.

1.) Use genetics to breed locally-adapted cows.

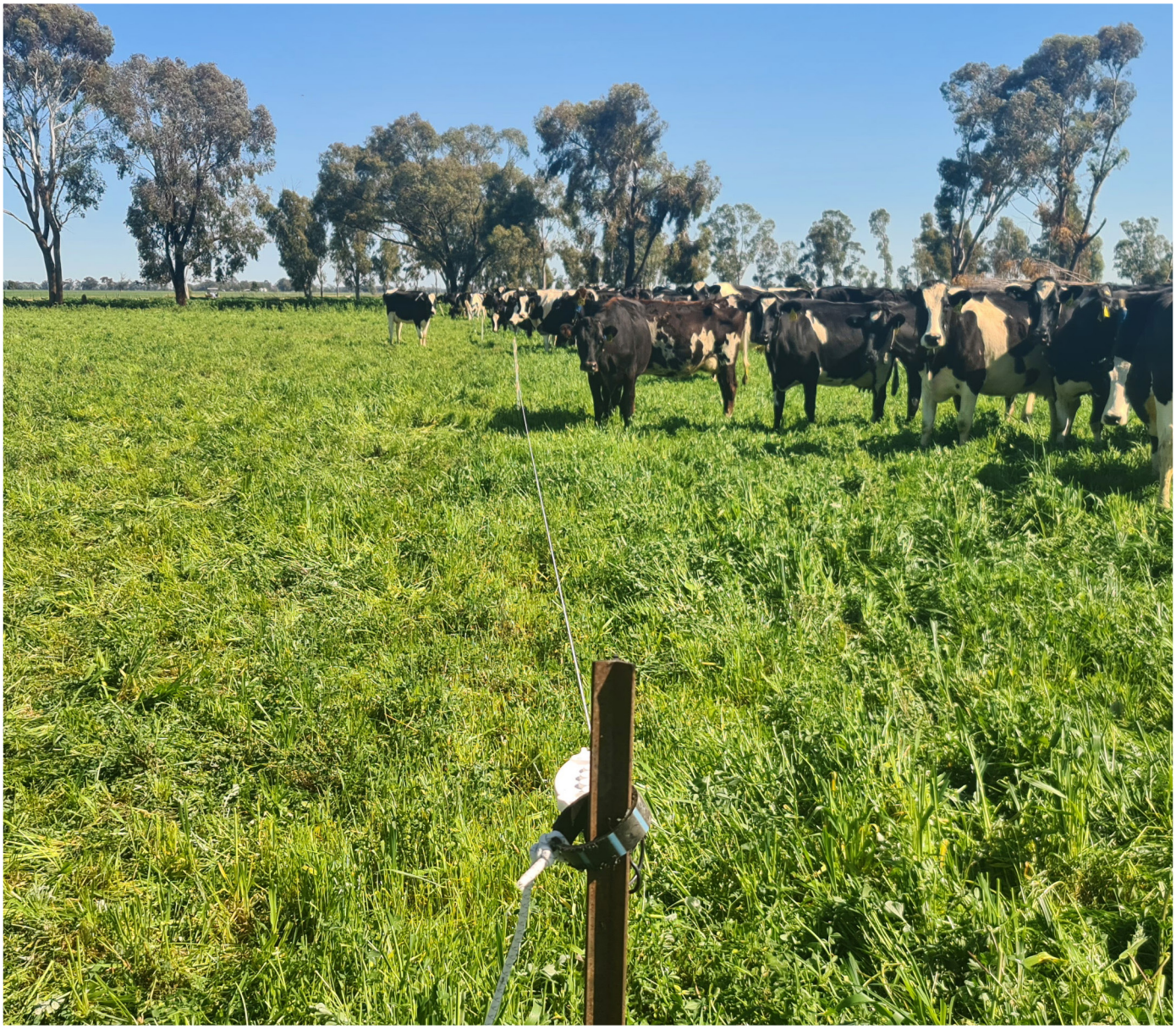
2.) Use diverse pastures to optimise nutrition and health.

3.) Time calving to minimise nutritional stress on the herd and cost of feed production.

4.) Choose a milking strategy that minimises stress on the herd and minimises costs.



CASE STUDIES



WHAT WHY HOW? JOHN HAY'S STORY, TOLD BY LUKE HARRINGTON

Farmer	John Hay
Regenerative agriculture advisor	Luke Harrington
Location	Blighty, Finley, NSW
Rainfall	350mm/yr
Area managed/no of cows milked	1000acres, 400 cows - looking to increase to 500
Current system of pasture management and milking shed	Regenerative, irrigated pasture, with 60-unit rotary dairy

HISTORY

John's parents moved here in 1989. They were farming up north at Taree before that. John came home on the farm in the mid 90s.

TRIGGER EVENT

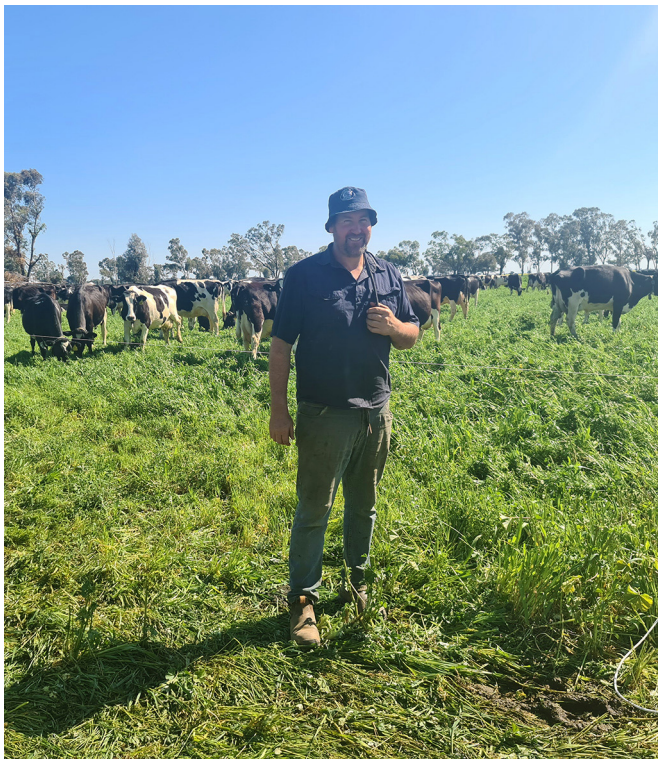
Making a living was the main issue.

After deregulation, like a lot of farmers, John was losing money. In the end, it was a financial driver to change - he just didn't have enough money to keep buying fertiliser, paying for water in the Murray-Darling, and the cost of vet bills and feed.

He cut back from 800 cows to 300.

CHANGES

Going cold turkey on pulling fertiliser was not a good thing to do, but John basically had no choice. Over a period of about five years, he went in search of knowledge about soil health from Arden Andersen and Graeme Sait, among others.



He reduced his herd from 800 to about 300 cows. He started making his own compost, but that only took him so far. And his thinking was still linear.: "inputs=outputs". He was still using a monoculture in the pasture (ryegrass/ shaftel mix).

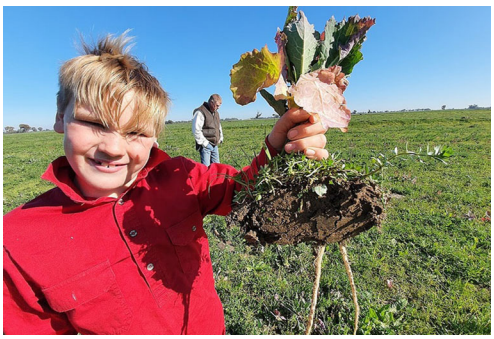
He started to work with Luke Harrington about five years ago, who introduced him to Gabe Brown's approach. He took him through the transition from monoculture to multi-species in his pasture and changing his grazing regime. He started to direct drill annuals and perennials each year. It took a while for the perennials to become evident. He still has a summer and winter crop, but around six to eight species hold on, year on year. This year (2021/22) is the first year he's had consistent 100% ground cover.

Luke and John work together with a range of tactics to stimulate the soil's biological function. As well as the plant diversity (root diversity), John puts out foliar fertiliser (for example, he'll dissolve 15-20kg/ha urea and spray it out with a carbon source such as molasses, fulvic acid, or vermicast), and he uses TM Agriculture and Nutrisoil bio-stimulants on the pasture - a more holistic approach.

He does an approximately 50-day rotation that varies over the year (can be up to 65 days, but that's tricky). His innovative grazing management system splits the daily 8ha paddock into four sections and the cows graze 2ha at a time, moving four times a day, instead of free ranging across 8ha all day.

John also realised that, as his pasture improved, his animal health also improved. He hadn't realised it had been an issue! He still feeds a bit of his own farm-grown grain to get the cows onto the platform.

Luke says that John loves seeing new things in the paddock - a new grass or flower or insect. He finds the regenerative system more challenging, stimulating and enjoys that. And his work-life balance is better.



BENEFITS

Soil health.	The soil allows water to infiltrate and holds it better. Nutrients are cycling well.
Pasture health.	Most farms in the area water every 7-14 days. John waters once in summer and once in winter and grows feed even in a dry year. Multi species crops are sown once in spring and once in autumn. This is cheaper than applying the amount of fertiliser he used to. He feeds on the pad quite a lot, but as his soil has got better, he's been able to go back to pasture-based feed.
Animal health.	John's general animal health is improving and vet bills are 20% of what they used to be. His mineral supplement budget has dropped considerably, too. "My cows just look good," he says.
Bottom line (human health - both mental and physical).	His milk solids continue to increase with soil and pasture improvement. Luke says John is a "happy person". His fertiliser bills are down from around $200K to $60K per year now. Production is up and he is thinking about increasing the herd again. He made a profit during the drought!

TOP TIPS!

Cold turkey hit John hard, but he had little choice. His productivity halved. It's almost back to milk productivity per cow as he was at the beginning.

He removed fertiliser and started making own compost, but the soil was not ready for that to happen.

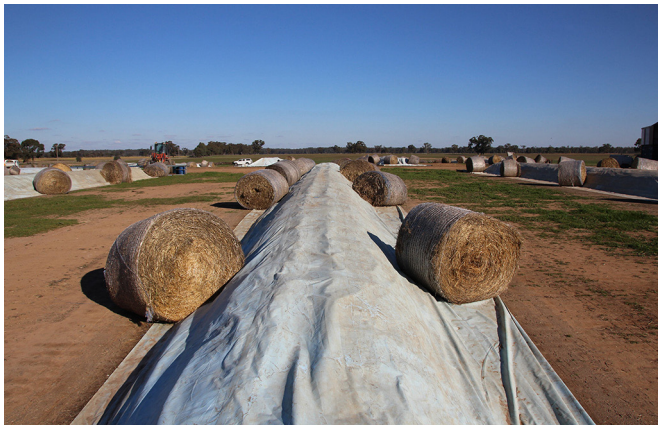
He still uses herbicides for persistent weeds, but it's a more considered, holistic, approach to farm management.

His biggest challenge has been peer pressure (his mum, his dad and neighbours).

John says: If it's not working for you, change something.

And always think about:

WHAT'S THE GOAL/PROBLEM? WHY DO WE HAVE IT? HOW CAN WE DEAL WITH IT?

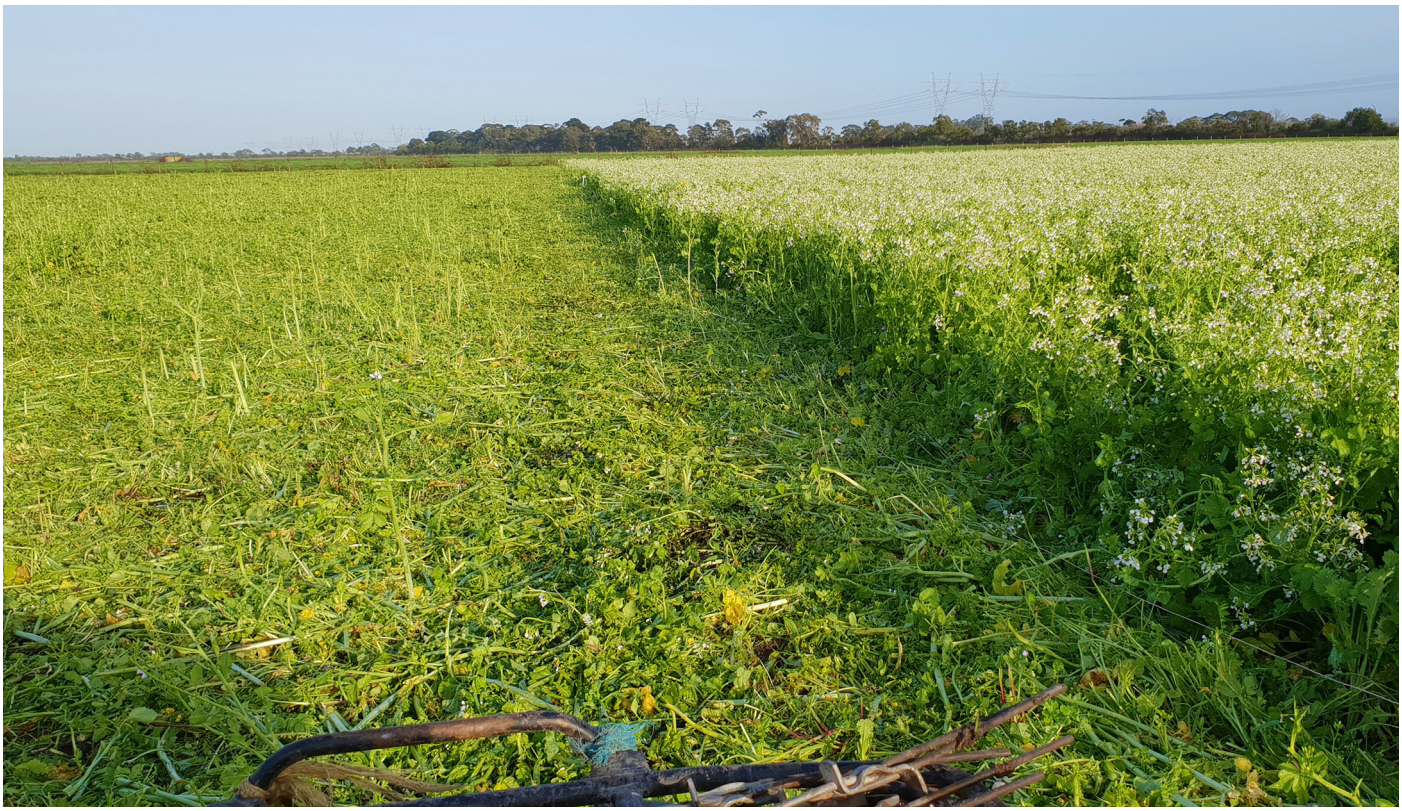


PERPETUAL MOTION DAIRY FARMING WITH BRENDAN CUNNINGHAM

Farmer	Brendan Cunningham
Location	Koo Wee Rup, VIC
No of ha managed/no of cows	320ha, 750 cows
Pasture management and milking system	Organic, regenerative with rotary dairy

HISTORY

It's a swamp area. I took over the farm in 1980 as the 4th generation, as a share farmer. I started with 73 heifers and worked up to 400 cows. By 2005 I had 750 cows, I'd bought the neighbouring property and scaled up. I had high stocking rates, high N input, high grain feed. I had 4.3 cows/ha - and then the problems started!



TRIGGER EVENT

I started to notice a change in my **soil**. It had gone from soft peat to concrete. It would dry out in summer, and the rain would run off.

We had to resow the **pasture** each year. We were applying 300-400kgN/ha. Too much!
I tried to get the extra growth into the pasture before the cows went in (three days ahead).

We had problems with **animal health** – I couldn't get them in calf, we had mastitis and lameness. It was an ongoing battle. I was using 1.8-2t grain per year.
It was a very high production system with 1800kg solids/ha - but **not a lot of money** in the bank.

I was on a treadmill, running flat out - and I saw the same thing everywhere I looked – animal health, feed, fertility, turnover. Chasing, chasing.

CHANGES

A dairy tour in Canada introduced me to a couple from Tasmania who told the same story and had gone into biological farming. I started studying and learning as quickly as possible.

Soil health

It takes a while for the soil to heal under a monoculture. You have to get the diversity into the pasture to get the soil to heal and you need to understand the bacteria, fungi, etc, the network under the soil. I started harrowing the paddocks and tried to introduce chicory, plantain, and red clovers.

Compaction was a problem and the weather has changed. 20-30 years ago, we had a long steady drizzle. Now, we get heavy downpours.
I stopped all products – I realised it was creating a dependency. We now have no soil inputs. Basically, we harrow the paddocks.

Pasture health

Grazing management? I didn't change until I met David Hardwick. I was stuck in a "fast rotation- maximum leaf" mindset. We've lowered herd size and reduced inputs.

We now encourage what is there to keep going - ryegrass etc plus a few weeds. **Rest time** is critical for recovery. We now have high stock density for the 24-hour period. It leaves lots of dung on the ground. We hold a (long) rotation to allow the plants to come in. It's 60 days between grazing and no more than 30 days in spring. We had to supplement while that was getting established.

Production
I maintained per cow production with grain supplements, which didn't help profit but it helped the ego!

In the lean years, we can't change the milk price and it sometimes doesn't cover the cost of production. In the end, I turned the grain off and dried the cows off. I explored organic certification to get a margin to make up the difference in smaller production. The production dropped more than I thought it would.

BENEFITS

We now have a mimimalist farming system where the sunlight does the work.

Soil and pasture health	I now have up to 32 native species that have come back in – they want to grow there. Dung beetles are present and active. Diversity has come in naturally through grazing management. Native seed comes in through hay. Soil porosity is the biggest change - my infiltration rate has improved and the water disappears into the ground. The pasture is now thick and dense, with 100% ground cover and no topping this year. We've had green feed, although 2021/22 is the driest Dec and Jan ever, and the pastures are holding on.
Animal health.	No vet bills! I haven't treated mastitis for three years. We don't need antibiotics. We don't get inflammatory mastitis any more. The animals are a lot calmer, their udders soft and they milk down well. They're enjoyable to work with, very settled. I use molasses now to get them come up into the dairy. We don't have dry matter but there's more diversity in the feed. Their heads are down and they're keen to feed on what's in front of them. They each have their own preferences, and have a diverse diet.
Profitability	Milk solids at 8-9%

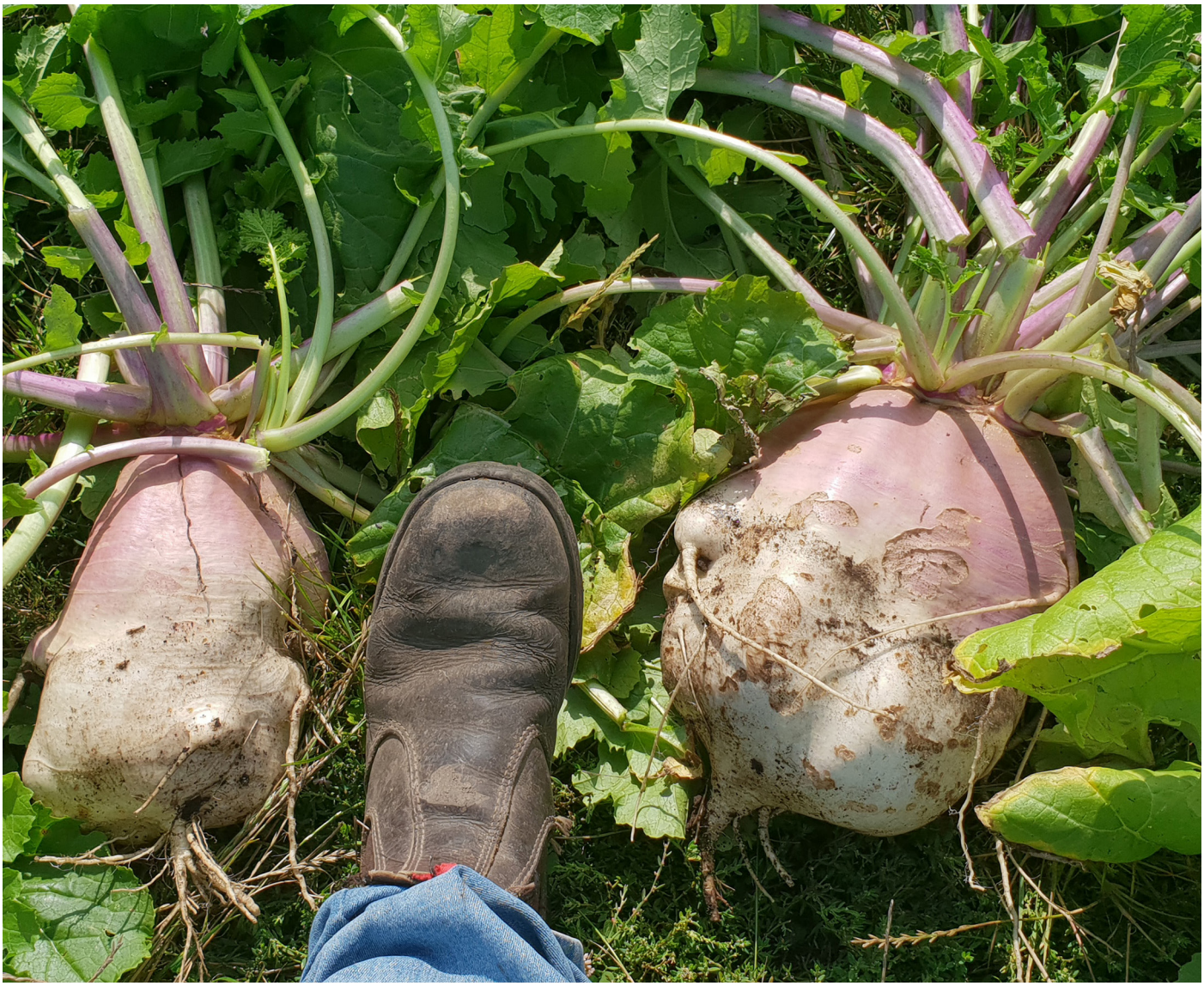
TOP TIPS!

Don't go cold turkey - it's a gradual transition. You can't buy bugs in a bottle. Heal the land.

Harrow after each rotation, if you can. It spreads dung evenly across paddock, loosens the soil on the top and releases CO2, which triggers mineralisation gently and you see a plant response. It also spreads seed around – over-sowing is free! And it doesn't knock around the perennial pastures – you need good strong roots.

Try autumn rather than spring to establish multi species mix in the pasture as there's less competition. And change your grazing management at the same time.
Getting rid of grain made a huge difference to animal health and profit. If you're not getting the production benefit from the grain, then it's not worth it.
Get your head around **the profit vs the production**.

OPTIMUM HERD SIZE: 75-85 KG LIVE WEIGHT PER HA PER T OF FARM-GROWN FEED GROWN. This was the formula 30 years ago and at the 2015 conference in NZ, it was the same formula!



ENJOYING WHAT WE DO - JO AND SIMON DOOLAN

Farmer	Simon & Jo Doolan
Location	Kyabram, northern Victoria
Area managed/no of cows milked	180ha, milking 90 cows year round
Current system of pasture management and milking shed	Organically managed pastures and herd health, pasture-fed with home-grown and bought hay. Mix of flood irrigation and dryland, diverse species pastures: rye, clover, chicory, paspalum, fescue and clover, lucerne, sub and rye, shaftel and rye, native grasses and saltbushes, volunteer good and bad herbs (or weeds). Rotational grazing with aim of maintaining cover at all times. Mixed herd with bull and AI used, calves kept and grown on. 12 swing over herringbone dairy

HISTORY
We've been here for 10 years; Simon has been farming 30+ years.

TRIGGER EVENT
Jo had a background in natural resource management (NRM) and wasn't liking the conventional/industrial system and the constant/repetitive issues with regard to animal and soil health. We wanted to get off the treadmill of input=output.
We had poor calf health, we didn't enjoy the conditions of work, didn't like applying sprays or feeling like we were fighting against nature.

The moments in learnings about soil health and how the natural systems work all fitted with our observations. We started enjoying the work environment and meeting like-minded people.

BENEFITS

Soil health.	We have soil that is rain ready, ready to soak up moisture and provide habitat for soil biology which cycles nutrients for plant growth. Dung beetles are awesome!
Pasture health.	We have mixed species pastures that can cope with a variety of conditions, and are resilient and productive.
Animal health.	Healthy animals are good to work with, we have reduced vet bills, and we're proud of our product.
Bottom line (human health - both mental and physical).	Dairy farming is hard work so why not make it as enjoyable as possible (not that anything can make a cold dark winter early morning better!)

TOP TIPS!

Don't rush into changing - seek information and trial management changes to feel confident. In hindsight, staging the changes would be less stressful.
Choose the right parts of the farm to start - don't start with the worst paddocks.

It's about changing how you see your farm and business. It's not replacing product A for product B.

Try to gain an understanding about how the natural systems work and what they require to function efficiently. It will bring success in productivity and animal health.

There is no quick fix. Having strategies and management options to choose from allows for flexibility in a naturally changing world.

There is always more to learn.