NutriSoil®
Biological Solution

Case Study

Biological Farming Profile
Andrew & Linda Whiting

Who: Andrew & Linda Whiting, children - Harrison, Olivia, Cooper & Ellen.

Where: Simpson, Western Districts Victoria.

What: Dairy farmers, cofounders of Green Pastures milk company, 600acres, 800mm annual rainfall.

Background:

In the Beginning
- Dairy Self Starters
- Purchased a shutdown dairy farm
- Phosphorus locked up in soil
- Abundance of sorrel and fog grass
- Low potassium areas
- Total organic carbon 4% - 4.5% top 10cm
- Soil pH 4.3

Andrew and Linda Whiting were share farming when they decided to become self-start dairy farmers 18 years ago. They bought a dairy farm which had become run down and in fact had stopped milking. Everything the Whitings had was put into the purchase, finding themselves in a position with low equity they just put their heads down and worked hard.

An Aggressive Strategy
- 300 Units of N per Ha / yr
- 80 Units K per Ha / yr
- Nitrogen following cows, every 8 weeks then down to 3 weeks
- Achieved Industry benchmark of 1 tonne per 100mm rainfall of dry matter

The Whitings inherited soil with low pH (4.3 in places), and low potassium areas, their soils were high in iron, phosphorus was locked up, and there was an abundance of sorrel and fog grass. Lime was quickly introduced into the system.

To address these problems the Whitings put an aggressive strategy together; improving pastures, including adding perennials, turnips and rape among other crops. They soil tested every year and annually added 300 units of nitrogen and 80 units of potassium per ha. The Fertiliser contractor was following the cows out of a paddock and they were cultivating in the dry season.

Problem:

The Whitings pursued this approach for the first 4 or 5 years, they had high milk production averaging 10,000L of milk and 650kg of milk solids annually per cow.

While the Whitings may have been at the top of their field, there were cracks in the system. They felt the lime wasn't working effectively, soils would quickly run out of moisture and their paddocks were always the first to dry off in the warmer months. It was clear that their pastures were not able to utilise the nutrients applied quickly enough and their winter pastures did not meet feed gaps, leaving them having to bring in hay and silage.

Problems
- High Al levels
- Soil plugging
- Poor cattle health
- Low fertility
- Feed shortages in cooler months
- Buy in hay and silage
- Leeching of applied nutrients
- Poor soil health

On top of this Andrew and Linda felt they had a lot of sick cattle, including low fertility rates, early abortions, and other health issues. The cattle were pulling grass out of the soil while grazing, something wasn't right.

A slippery film formed over paddocks making it difficult for contractors to get spreading trucks across paddocks in wet conditions, and anerobic conditions started to develop in the soil. They were throwing big dollars at inputs and money seemed to be just going around in circles.

The Whitings were following industry best practice, and they were very close to achieving industry best practice of one tonne of dry matter for every 100mm of rain. What they realised was, best practice wasn't best for their farm.

The Journey:

In 2008 the Whitings started questioning what they were doing, Andrew attended an information day where Camperdown Compost were speaking about the benefits of compost in helping build organic matter in the soil. This was the light bulb moment which gave the Whitings confidence to transition their system in 2009.

Transition
- Set up own compost utilising own resources which were once thought of as waste
- Increase biological activity of soil 50:50 bacteria and fungi
- Reducing synthetic N to 11/12 Units per round
- Added 10% lime to compost
- Liquid N, biological stimulants, fish emulsion
- Sustainable Agriculture Course
- Joined Vic No Till

The Whitings started utilising their effluent and other waste products like wood chips and calf bedding to make their own compost, they set up windrows 2m wide by 1m high, sourcing as much carbon on farm as possible, allowing them to recycle nutrients back into their system.

The aim of spreading compost was to increase the biological activity of the soil, they knew they had bacteria in the soil but not enough fungi. The compost would be the fungal source to reach a goal of establishing a ratio of 50:50 of fungi to bacteria.

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See Over ➤

After a visit from Elaine Ingham (microbiologist) Andrew and Linda started adding lime to their compost, this is when they started seeing changes to soil pH. By adding no more than 10% lime to the compost mix on the last turn, their soil pH had significantly improved within 18 months.

Nitrogen was the limitation to becoming synthetic input free, nitrogen was still required in the system, especially in the colder times of the year. Nitrogen, predominately in a liquid form was added with a humate carbon source of 5%, other biological sprays were used in conjunction with compost following the cows out of the paddock. This got their units of N down to 11 or 12 units twice a year, however is was an extremely labour intensive process, leaving the Whiting's very time poor.

In 2011 Andrew and Linda attended the Graeme Sait Sustainable Agriculture Course, while they were left with information overload, it helped cement their vision of where they wanted to be as a farming system.

About 5 years ago the Whitings joined Vic No Till, exposure to experts provided them with confirmation that diversity was key to feeding their soil biology and cover crops were a tool to increasing diversity. The Whitings investigated how to utilise cover crops in a pasture based system, this got their synthetic addition of nitrogen down to 1 or 2 units in the coldest past of the year.

The Whitings wanted to move away from using fish emulsion as it was a time consuming part of their operation. Andrew and Linda knew they still needed fulvic acid and humates in the system and after learning that worm liquid was the richest source of humic and fulvic acids, they decided to give worm juice a go after coming across NutriSoil at a Vic No Till conference. The Whitings swapped fish emulsion and compost extract out for the NutriSoil, simplifying their system and reducing their workload.

Spreading effluent onto their paddocks using an umbilical hose from their settling ponds allowed the Whitings to keep nutrients on their farm, bringing them a step closer to achieving their simplistic biological system, but they weren't quite there.

Now

- Total Organic carbon = 5% in top 40cm
- pH = NEUTRAL
- Synthetic N input = ZERO
- Financially stacks up in a conventional environment
- Diversity of crops helps drive nitrogen cycle
- Biology is micromanaging the farm
- Last piece of the puzzle - Mulcher in front of tractor pulling the SoilKee
- Goal – 2 tonnes / 100mm rain

A bus trip to the Olsen's farm in Gippsland allowed Andrew to find the missing ingredient to reduce the Whiting's synthetic nitrogen input to zero. The addition of a SoilKee has allowed Andrew and Linda to sow directly into existing crops and pastures, it provided new crops access to nutrients from the previous crop and reduced the disturbance of soil biology. Crops now source their nitrogen needs from the atmosphere and their increasing organic matter.

Now:

Last year a soil test which was taken to a depth of 1m revealed the Whitings had increased their total organic carbon levels to 5% at a depth of to 40cm, Andrew feels this would equate to around 7% in the top 10cm. This is a significant increase and shows the role root systems play in increasing organic carbon levels. Additionally, the increased carbon has improved the moisture holding capacity of the soil and they are no longer the first farm to dry off and have no need to buy in extra feed. Soil pH is now neutral and they no longer require synthetic nitrogen inputs.

Andrew and Linda no longer micromanage their farm, their soil biology is doing that for them. They now concentrate on their core business and love, milking cows.

Fertility rates in their cows has improved and once pregnant, cows stay pregnant. They have not suffered a loss in production and with reduced input costs they feel no need to seek organic status. A regenerative approach means they can access herbicides for spot spraying of thistles or blackberries if needed, or if the circumstance requires, they can add nitrogen.

Andrew and Linda feel they have all the tools in place to realise their goal of achieving 2 tonnes of dry matter per 100mm of rainfall.

Key Messages:

- **Ask lots and lots of questions, even dumb ones!**
- **Find what works for you, every farm is different.**
- **It doesn't need to be complicated.**
- **Keep it simple.**
- **Plants are the key tool to putting carbon and nutrients back into the soil.**

New Podcasts Released

To get all the information and to hear the full Whiting story please go the to Biological Farming Roundtable Podcast sponsored by NutriSoil.

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