



## Compost for dairies – a case study from Whittings, Simpson, Vic

### Who

Andrew and Linda Whiting

### Where

Simpson, Western District of Victoria

### What

Dairy farm

### Aims

- increase pasture root depth
- reduce pasture re-sowing

### Outcomes

- increased root depth of pasture
- reduced pasture re-sowing (no longer re-sow)
- saved \$80,000 to \$100,000 annually in synthetic fertiliser costs
- reduced nitrogen use (more than half)
- improved microbial activity in soil
- reduced nutrient run-off
- increased number of cows that could be milked
- waste material turned into a valuable resource
- extremely low farm carbon footprint



### Andrew and Linda Whiting

Andrew and Linda Whiting run dairy cows on their 300 acre dryland farm at Simpson in the Western District of Victoria.

Annual rainfall in the region is approximately 760mm and the pastures, on sandy loam soils, are predominantly ryegrass and white clover with some sub-clover.

Back in 2009 the Whittings were heavily reliant on synthetic fertilisers and annual re-sowing of pastures to maintain the herd. Three years later they no longer re-sow pastures, hardly use any synthetic fertilisers and have turned their waste products into a resource.

### Why compost?

Each autumn, the Whittings went through the costly process of re-sowing pastures and still struggled to grow feed in the paddocks before winter set in. Cows often pulled the grass out during winter and the Whittings wanted to increase the root depth of pastures to reduce the need for re-sowing.

After seeing a presentation by Camperdown Compost Company the Whittings decided to try compost to improve soil health and structure and increase root depth.



## Year 1

### Compost application

The Whitings decided to trial a compost program on one third of their farm.

They broadcast commercially-produced compost from Camperdown at 0.4 t/ha and applied a compost tea extract to supplement the initial compost application on three occasions during the year. Urea was replaced with liquid nitrogen and a fish emulsion was applied in spring to provide trace elements. Synthetic fertiliser was applied to the rest of their farm as per their normal practice.

### Results

The root depth of pastures increased significantly in the first year of compost use and the cows could not pull out the plants. Grass grew faster in composted areas in the autumn break, whereas the plants were less mature and struggled in uncomposted areas. The benefits of compost seen during the first year convinced the Whitings to try compost on their whole farm.

### Results – Year 1

- Rooting depth of pastures increased
- Cows stopped pulling plants out, pastures survived better through winter
- Grasses grew faster and could take advantage of autumn rains
- Milked 300 cows on 300 acres

**“Compost has helped our pastures root depth and the cows don’t pull the plants out during winter.”**

Andrew Whiting



## Year 2

### Compost application

In the following year, the Whitings decided to make their own compost.

The feedstock for the compost was any organic material from the farm – effluent pond sludge, feed pad waste, damaged hay, straw or silage, waste milk and dead stock. Consultants from Camperdown Compost provided advice on heat and airspace requirements for compost piles, as well as the need for additives (e.g. lime or gypsum) or other organics to bulk out piles and ensure a good carbon to nitrogen ratio. The consultants made regular visits to assess the compost process and determine when turning was required – a service the compost company provided (technically the compost producer is the farmer). The consultants applied boron and calcium with the compost, based on soil test results from the property.

The Whitings made enough compost to apply 3 t/ha on all of their pastures. A compost tea extract and fish emulsion was sprayed in spring and a liquid nitrogen source was also applied. Effluent water from their on-farm water treatment system (second pond) was used to supply extra nitrogen and trace elements.

### Results

In the second year of using compost, the cost of re-sowing pastures reduced from \$27,000 per year to \$7,000 per year.

### Results – Year 2

- Annual cost of re-sowing pastures reduced from \$27,000 to \$7,000
- Five grazings on composted pastures compared to one grazing on uncomposted pastures
- Milked 320 cows on 300 acres dry land farming (this means no irrigation)

**“After one year of using compost our annual cost of re-sowing went from \$27,000 to \$7,000. After three years we don’t re-sow at all. We’ve turned our waste into a resource.”**

Andrew Whiting



## Year 3

### Compost application

The Whitings again made their own compost and had enough to amend all of their pastures, as well as their out paddocks, at 3 t/ha. They reduced the initial nitrogen application, based on the good results of previous years, but nitrogen was still applied during the year as a foliar spray along with the compost tea and fish emulsion sprays in spring.

### Results

After three years of using compost, pastures no longer needed to be re-sown and only a small amount of maintenance is required to keep them thriving. In mid-2009, before compost was applied, a soil microbial test of two paddocks showed no mycorrhizal (VAM) colonisation at all. In 2011, tests on the same paddocks showed the VAM had returned and was in good numbers.

Microbes in the soil also help unlock nutrients tied up in the soil after years of synthetic fertiliser use and make them available for plants. The Whitings have reduced their nitrogen fertiliser use by more than half, from 300 units per hectare to 120 units per hectare. Applying nitrogen as a foliar spray also means there is less volatilisation, so fertiliser efficiency is higher and the impact on the environment is lower. Phosphorus and potassium applications are no longer required and the Whitings have reduced fertiliser costs by \$80,000 to \$100,000 a year.

Applying less fertiliser also reduces nutrient run-off into waterways, which lowers the environmental impact of the farming operation. The majority of the nutrients that the pastures need are applied via the compost. As microbial activity in the soil is also increased, the nutrients are more stable and more available to plants.

After three years of compost use (and the addition of a feed pad), the Whitings milked 350 cows compared to 300 before compost use. This year conception rates have also increased significantly. The Whitings will monitor this closely in the coming year to see if this is a one-off event or a real trend.

### Results – Year 3

- No re-sowing of pastures
- Nitrogen use reduced by more than half
- Very little synthetic fertiliser used
- Activity of beneficial fungi increased
- Carbon footprint of farm extremely low
- Milked 350 cows on 300 acres with addition of a feed pad

**“We’ve reduced our fertiliser costs by \$80,000 to \$100,000 each year by using compost.”**

Andrew Whiting

### What are mycorrhizae?

Mycorrhizae are beneficial fungi on a plant’s root system that help plants access major nutrients like phosphorus as well as trace elements. Mycorrhizae also help protect plant roots from attack by nematodes and root pathogens. Along with other microbes, mycorrhizae help to improve soil structure by producing a range of substances that bind soil aggregates together. This improves soil structure and increases the water holding capacity of sandy-loam soils. Improved soil structure and the addition of organic matter encourages plants to develop deeper root systems.





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**Virtually all nutrients are being recycled back onto the farm through the use of compost.”**

Andrew Whiting

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### **The bottom line....**

The soils on the Whiting’s farm are healthier, which means that pastures are more productive with less input. Pastures are deep-rooted, more resilient and require no re-sowing and very little maintenance. Synthetic fertiliser costs have reduced substantially as they no longer apply as much – this lowers the carbon footprint of their farm.

A combination of compost application and the wettest summer on record has resulted in the Whiting’s having more feed than ever before. The pastures have grasses that can take advantage of any further rain over summer and the autumn break. The Whiting’s neighbours, who don’t use compost, still need to re-sow pastures every year and rely on high rates of fertiliser to grow enough feed just to get a herd through winter.

The Whiting’s save between \$80,000 and \$100,000 a year since they stopped relying on synthetic fertilisers and started using the nutrient resources on the farm. Large amounts of organic carbon are added to their soils through compost applications. This has increased microbial activity and improved soil structure and water holding capacity. The pastures are healthier and have larger root masses, which means that even more carbon is put back into the soil. By making their own compost the Whiting’s have turned what was a waste product on their farm into a valuable resource. Virtually all nutrients in the system are now recycled back into the farm.

Compost programs are quickly becoming the norm in the region as other dairy farmers catch on to the outstanding outcomes achieved by the Whiting’s.

### **Where to from here....**

The Whiting’s, with the help of Camperdown Compost consultants, will continue to improve the quality of the compost they produce and further improve soil health and pasture resilience. Conception rates will be closely monitored to see if the increases seen in the previous year are repeated.

Compost has become an integral part of the Whiting’s farming operation and helped them to break out of the costly synthetic fertiliser and pasture re-sowing cycle.

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**“It’s a simpler system on farm.”** Andrew Whiting

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For more information on the program contact:



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the resource for compost users