



South West  
NRM



# Case Study

Feeding the soil: orchardist's  
recipe for biological farming



# Introduction

Terms like biological farming and regenerative agriculture are used to encourage farmers to integrate soil life and environmental thinking into their decision-making.

But for bio-friendly practices to gain traction, farmers need examples from other farmers to appreciate how these concepts can be applied.

One innovative farmer who has been experimenting for the past twenty years is orchardist Jeremy Price. Over the past few years, he has begun to fully understand the importance of soil biology.

*“Getting the mentality that we aren’t just feeding the tree or the plant or the pasture – we are feeding the soil, we are feeding the organisms that live in the ground. Once I understood that, it made a big difference.”, said Jeremy.*

Jeremy has always monitored soil and leaf minerals and rectified imbalances. But in addition to this he is applying a simple system using compost and compost extracts. He spoke to South West NRM’s Regional Agriculture Landcare Facilitator in 2018 to outline his method.

*“We put compost out at four cubic metres per hectare in late autumn and at the start of the growing season in September. It doesn’t look like much but there’s good biology in quality compost.*

*The rain washes the biology into the soil. I’ve been amazed at the difference it can make. The pasture was dominated by kikuyu, but now medics and especially clovers are taking over.”*

Jeremy says that sourcing a good quality compost is crucial. In his opinion, a lot of composts on the market have “had the life cooked out of them”.

In addition to applying hard compost, Jeremy uses compost extracts to keep building soil biology.

*“Extracts are made by taking a portion of compost and washing the biology off into water. We use a 1000 litre tank with the top cut off and a big tea bag that holds 15–20 kg of compost. Vermicast can also be added to the bag for diversity. The biology in the compost is then gently washed of with a hose for about an hour.”*

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The heap can be 2.5 to 3 metres wide and probably no more than 1.5 metres high so you don't compact the material in the bottom of the heap. I will leave the heap to heat up for about two weeks and then turn it over. It's a matter of digging in one side and then flipping it over.

You need to have a thermometer to check the temperature. The ideal temperature is around 50 / 55°C. If it gets above 65°C, you will need to turn it or water it down.

Often by opening it up again you slow the process down. If it gets really hot, you need to add more water and if it is not getting hot enough you need to aerate it and turn it again.

You need to watch the moisture content. If it is too wet, it will move towards being anaerobic. In winter the issue we have is trying to maintain that right moisture level. If it becomes very wet, you need to cover the heap.

You can either use straw or plastic tarps. If it's too dry, I set up micro sprinklers and irrigate it until I can see the water almost pouring out of the pile. Then I start to mix it again and push it up into a pile.

Generally, the first 5–7 weeks is when you will get most of the heat and then it will slowly decline. You could turn it again at that point and you will see a slight increase. Then it will come down and sit around the 40°C mark for a long time.

### **How often do you turn the pile?**

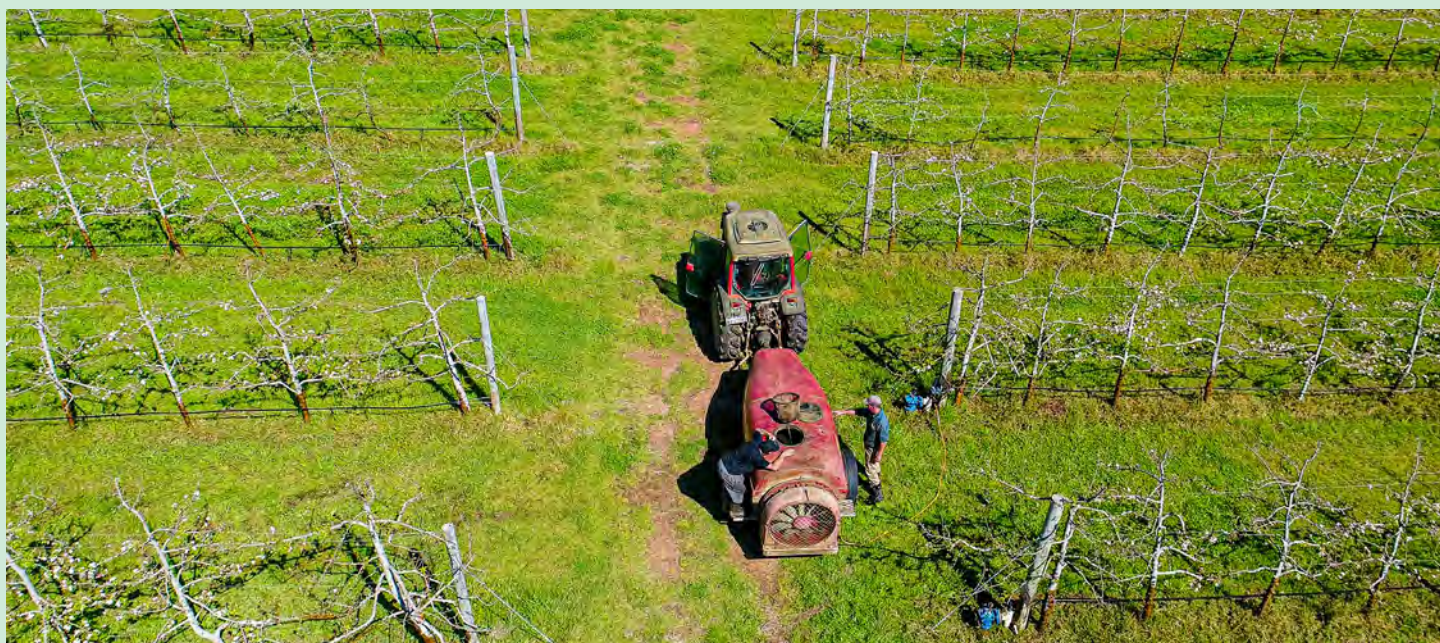
If you don't turn, the outside areas won't be exposed to that heat and won't break down properly. We turn at least three times, but my preference is to turn it as least as possible. If you turn a lot, you stimulate a more bacterial content by putting a lot of oxygen through it. I turn enough to get the process going, but later I like the compost to sit and allow the fungi to become active.

### **How long does the compost making process take?**

It's important to understand the different phases. There are three phases, but I will talk about the first two. The breakdown phase is usually about 12 weeks. What happens is that the organic matter decomposes and breaks down. A lot of people make the mistake of putting it out then. But it hasn't gone through the second phase.

By about 12 weeks all the microbes that have broken down the organic matter die, and then you enter the build-up phase. You get different levels of bacteria coming back in and building up.

A lot of the reasoning behind putting it out straight away is that when it breaks down, people say that you have lost that nutrient. But if you wait into the next stage, which roughly finishes at 26 weeks, then you will find that those nutrients have come back. So you end up with a stable nutrient base which isn't volatile to the atmosphere and slowly releases in the soil.







Some farmers use round stainless steel tanks with a paddle inside which gently keeps the water moving. Stainless steel is easier to clean to ensure hygiene is maintained, which is an important consideration.

*"We take about 60 litres a hectare of the compost extract and mix it with 10 litres per hectare of fish hydrolysate, half a kilogram of seaweed powder, which is dissolved before being added to the tank, and three kilograms of powdered potassium humate. We put it out at a rate of 500 litres a hectare with the rest made up with non-chlorinated water."*

The rates used mean that only one kilogram of compost is used to spray one hectare with extract.

The sprayer and other equipment used in the process is thoroughly cleaned before use to avoid contamination, particularly if fungicide has been used recently.

But rather than spraying, Jeremy connects the mix straight into the irrigation valve and applies at low pressure, which he thinks could benefit biology. After application, he runs the irrigation

for about an hour to wash the mix into the root zone without washing it through the profile.

Jeremy tries to be as active as possible with the extract during the warmer months.

*"In orchards we start in early spring when trees blossom and send out their feeder roots. Ideally, you would do it every two weeks for the first two or three applications and then go monthly. Regular amounts more often is better than a large amount at any one time."*

An alternative to making compost extract is brewing compost tea, but this process is more complicated.

*"You need to aerate the water for 12 to 24 hours and add feed into the tea as it is being aerated and the biology is activated. If it goes anaerobic, all the food (e.g. seaweed) gets used up and the biology ends up perishing."*

*"With a compost extract, food for the biology is only added to the extract at the time of application. It's a simpler process without the risk."*