



SGLN's Enhancing Soil Biology Project Actions to improve soil biology

Are you interested in improving the health of your soil?

Here are some on-farm activities you could try.

South Gippsland Landcare Network's Enhancing Soil Biology project included on ground trials and education. Dr Mary Cole provided recommendations for participating farmers to improve their soil health based on their soil test results.

The individual recommendations varied from property to property. However, there are some common activities that Dr Mary Cole suggests to improve soil health and enhance soil biology.

The rates and timing given below are general. Ideally it would be best to get personalised advice based on current soil test results to create your own plan based on your soil and its current state of health.

Aeration

Traditional ploughing methods cultivate and turn over the soil, and destroy soil biology by exposing it to sunlight. Using something like a Yeoman's Plough opens up the soil instead of turning it over. The thin shanks lift and aerate the soil, while minimising disturbance. This provides oxygen to the microbes who cannot live in anaerobic conditions, and maintains the existing mycorrhizal fungi.

Rock dust

Australia has some of the most nutrient poor soils on earth. Applying a basalt or granite paramagnetic rock dust can help provide minerals, nutrients and trace elements. Basalt contains the highest number of elements, and Granite is higher in calcium and potassium.

The rock dust is decomposed by microbes, making the nutrients available to the pasture plants. Ask for less than 5mm screenings, and the finer the dust the better.

It's best to apply rock dust with multispecies crops, or follow it with a compost tea or fish hydrolysate. It breaks down slowly so only needs to be applied every 4-5 yrs (depending on the chemistry test results).

On-farm Actions to Improve Soil Biology

Feeding the soil biology

Using synthetic chemical fertilisers is expensive, and studies have shown that most of what is applied can end up locked up (when the nutrients are present but plants cannot absorb them), converted into greenhouse gases and lost to the atmosphere, or leached out of the soil and into waterways.

An alternative approach that is healthier for soil biology is to use natural fertilisers to feed the fungi and bacteria, and re-establish the soil food web. The soil biology will then make nutrients available to the pasture.

Natural fertilisers include molasses, fish and kelp hydrolysates, and compost tea.

How to do it

After the stock have been moved to a new paddock, any uneaten grass in the grazed paddock can be mulched/ knocked down. If the paddock is compacted aeration can be done, and then the natural fertilisers applied.

The treatments should be diluted in water, and sprayed onto the paddock using a clean spray tank with a straight boomless spray nozzle. The straight nozzle is important as it ensures the microbes in the compost tea aren't destroyed as they pass through. This should not be done in the heat of the day or in hot weather.

Molasses

Unsulphured molasses provides a source of nutrients which will increase the fungi and biology in the soil, and increase nutrient cycling. This can be applied at a rate of approximately 7l/ha.

Fish and kelp hydrolysates

These can each be applied at the rate of approximately 5l/ha. They increase fungal and bacterial growth in the soil, water holding capacity, the utilisation of locked up nutrients and plant growth.

Compost tea

This can be applied at approximately 200l/ha. It encourages microbial activity, helps break down organic matter and releases nutrients for plants.

Soil testing

When doing chemistry tests it is a good idea to choose the extended suite of tests which also include the total nutrient pools (not just the plant available nutrients). This will show the nutrients present which can become plant-available once the soil biology is activated.

Soil biology tests can measure levels of fungi and bacteria (including whether they are active or dormant), protozoas, nematodes, and mycorrhizal fungi, along with nitrogen cycling potential (the nitrogen that becomes available to plants when bacteria are eaten by protozoa).

More information

Videos and more information from the project are available at www.sgln.net.au.



Yeomans Plough with tank for applying treatments