Measuring plant roots during a Visual Soil Assessment

Learning to use penetrometers

SGLN's Enhancing Soil Biology Project

You can watch all the training videos from the Enhancing Soil Biology project and learn how you can improve soil health on your own farm.

Thirty farmers from across South Gippsland participated in this on-ground and education project, run from 2019-2022.

The project raised awareness and built local knowledge about the important role soil biology plays in creating healthy, resilient farming systems and how farmers can improve the health of soil biology on their farms.

Farmer education

The farmers were trained by soil microbiologist Dr Mary Cole on what makes up soil biology and how to enhance it. They learnt how to monitor their soil using a Visual Soil Assessment (VSA) and penetrometer, and to measure plant sugar levels with a brix meter.

Onground trials

Participants also set up a 1 hectare demonstration site on their farms. Across the four 0.25Ha plots they trialled the following:

- aeration with a Yeoman's Plough.
- aeration plus mycorrhizal fungi.
- aeration plus humate/seaweed mix (Rhizovator).
- a control plot.

The year 2 farmers also trialled an additional plot with aeration and a multispecies pasture crop.

Aeration and a treatment from the list above being applied to a demonstration plot

Australian Government | National Landcare Program

This project is supported by South Gippsland Landcare Network and funded through the Australian Government's National Landcare Program.

South Gippsland Landcare Network

We acknowledge the Traditional Owners of the land on which we work and meet.

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Demonstration site monitoring
Soil tests were done including biology, chemistry and soil carbon. These were taken before any treatments were applied, and then at the end of the one year demonstration.

The farmers also monitored their plots with a penetrometer and brix meter, and by doing Visual Soil Assessments.

Results
The farmers each had a 1:1 session with Dr Mary Cole to interpret the soil test results, and discuss recommendations for managing their site. This involved explaining the components tested in the soil biology tests, as most participants had not done soil biology tests before.

These included levels of fungi and bacteria (including whether they are active or dormant), protozoas, nematodes, and mycorrhizal fungi. It also includes nitrogen cycling potential (the nitrogen that becomes available to plants when bacteria are eaten by protozoa).

While each site was different, there were some similarities in results across the entire project. For example, aeration provided a benefit to all sites. This is because soil microbes require oxygen and cannot survive in anaerobic conditions.

Some sites had high levels of cilliates which indicates soil is anaerobic, either from compaction or waterlogging. When cilliate numbers were high further aeration was often recommended.

In most cases the levels of active fungi and bacteria were lower than ideal for healthy soil function. A key recommendation was to feed the soil biology with a combination of molasses, compost tea, and fish and kelp hydrolysates. The levels of these were adjusted depending on the individual soil biology and chemistry results.

Overall results
The majority (87%) of the participating farms found that aeration and the treatments applied led to improved soil biology and soil chemistry.

Further training and more information
Additional training provided through the project included field days on regenerative grazing, and online sessions on how to establish multispecies pastures and carbon farming. Farm open days were also held.

Videos from these sessions, along with those from Dr Mary Cole's training sessions, are available at www.sgln.net.au.

Project participants at the regenerative grazing field day.

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