

THE SOIL FOODWEB and COMPOST TEAS

Key points

- Soil microbiology can be manipulated by adding compost and compost teas which can improve soil conditions and improve disease resistance and crop production.
- Different plants require different ratios of bacteria and fungi.
- Nitrate feeders (grasses, vegetables and row crops) need higher levels of bacteria.
- Shrubs, kiwifruit, grapes, and deciduous trees such as pipfruit need higher levels of fungi.
- The benefits of compost tea can include reduced disease, increased crop production, increased shelf life and better taste, reduced plant stress, and less soil compaction.

Cherryle and Richard Prew presented a seminar on the soil foodweb and compost teas. Cherryle is the New Zealand Director of the Soil Foodweb Institute which has a soil-testing laboratory in Cambridge. The lab measures soil biology (bacteria, fungi, protozoa, nematodes and mycorrhiza) and recommends ways to improve the life of the soil through the use of compost and compost teas. This can reduce pest and disease problems and increase crop yields.

Ratios important

Specific ratios of bacteria and fungi are vital to the health of crops, and different plants require different ratios. Nitrate feeders (grasses, vegetables and row crops) need higher levels of bacteria, whereas shrubs, kiwifruit, grapes, and deciduous trees such as pipfruit need higher levels of fungi.

Protozoa are required for nutrient cycling and disease suppression, and, of course, larger animals such as earthworms are important for nutrient release from organic matter and maintenance of soil structure.

Manipulating soil ecosystems

Armed with this knowledge, we can manipulate the soil ecosystem. By introducing the appropriate fungi or bacteria to the root zone through application of compost tea, the root zone can be colonised by the “right” organisms for that particular plant type.

For instance, to convert pasture to an apple orchard, the ratios of bacteria to fungi would ideally be changed in favour of the fungi. The soil can be tested to see what levels already exist, then appropriate tea applied to the apple trees so that their roots are colonised by the right fungi.

Disease control

There is great potential for this use of soil microbiology

to benefit agriculture and horticulture, especially in organic systems. An example of this working is in the control of the disease **Armillaria**, a major disease of kiwifruit for which there is thought to be no control, either organic or conventional. However, some growers have used a good quality fungal compost tea to successfully control it.

Californian thistles have been controlled by a brew of molasses (which feeds the bacteria) which changes the bacteria: fungi ratios so that the thistles do not have the growing conditions they need. Frost protection can also be achieved with use of compost tea.

Phytophthora, a major fungal disease of asparagus, has been controlled with applications of compost tea which Richard believes successfully keeps the bacteria: fungi ratios at a level where the Phytophthora cannot get established.

Making compost tea

Use fungal compost (one that has white threads in it), vermicast, humic acid (fungal food), molasses (bacteria food). Place in a 400 micron cloth compost bag and immerse in a 1000 to 2000 litre container of water at 20 deg, which has air blowing into the water aerating the total brew. Brew for 24 hours at least.

Good results are achieved with applications of 150 l/ha. The tea must be applied within 6 hours because the organisms are extremely active, and should be applied before 10 am or after dark so that leaves are not scorched or the organisms killed by the sun. Rainy conditions are ideal.

For more information see www.soilfoodweb.com/

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