

What is Compost Tea?

Compost Tea is a water-based oxygen-rich culture containing beneficial microorganisms extracted from compost or vermicompost (worm compost) and multiplied by the millions and billions.

Microorganisms are extracted into aerated water and provided with a food source such as black strap molasses, fish hydrolysate, kelp meal, etc. that enables them to multiply. Aeration helps to ensure the multiplication of mostly aerobic microbes (desirable). Agitation breaks the microbes free from binding spots on the compost. Multiplying bacteria provide the 'food' for other microbes (protozoa) that multiply, in turn, and so on. This feeding cycle or microbial nutrient cycle cultures microbes over a period of 12 to 72 hours, after which the liquid is applied to the soil and plants. Basically the same nutrient cycle is present in the soil and rhizosphere, the area immediately around plant roots.

The major microorganisms at work in Compost Tea are bacteria, protozoa (flagellates, ciliates and amoebae) and fungal hyphae **if present** in your compost. It is best to have a wide diversity of each of these microbes present. Nematodes found in compost and soil are sometimes extracted into Compost Tea but they do not grow nor multiply in the tea.

Fungal hyphae, are long branching strands which grow through the soil and serve to: bind soil aggregates together, help retain moisture, store certain nutrients, provide a source of food to certain other microbes, provide pathways for nutrient and moisture delivery, decompose organic material and displace disease causing fungi.

Note: Mycorrhizal fungi do **not** grow in compost or Compost Tea.

Why use compost tea?

1. **to provide a quick nutrient boost** to the root zone (rhizosphere). This works mainly because as the flagellates (protozoa) consume the bacteria they utilize only 10 to 40% of the energy intake for their sustenance and the remaining 60 to 90% is expelled in ionic form, as nutrients that are directly bio-available to the roots of the plants. This boost does not necessarily equate to increased yields overall.
2. **to start a process of inoculation of the soil with a microbial population and improve nutrient cycling.** Many of these microorganisms will go dormant until called upon later, as conditions change, to fulfill their purpose.

A healthy, diverse microbial population of beneficial bacteria and fungi in the soil will

- Immobilize nutrients (e.g. N, P, S, Ca, Fe) within microbes' bodies (biomass), this prevents loss through leaching e.g Boron, Sulphur
- Prevent erosion by glueing and binding soil particles to form aggregates – particularly important in sandy soils
- Build soil aggregate structure, allowing oxygen diffusion and maintaining aerobic conditions
- Assist with water-retention in soil spaces and water also embodied in living biomass
- Allow roots of plants to grow deep into soil
- Compete with disease organisms (pathogens) for food, space and infection sites on plant surfaces; fungi tend to occupy 5-20% leaf surfaces
- Reduce need for pesticides, herbicides and fertilisers
- Fungi are responsible for decomposition of plant-toxic materials

Within a very diverse compost tea there will be free living nitrogen fixers, anti-pathogens and a few of the anaerobic and facultative anaerobes which also have a positive role in a living soil.

3. to **provide the microorganisms which may assist in protecting plants from pathogens**. E.g. compost tea helps develop a biological barrier around roots that suppresses disease. Proven effective against some fungal infections.

4. allows the use of **less compost over a given area**.

How to Use

- As a soil drench = 1litre of tea per 10cm seedling x1 application
- As a foliar spray = 50 litres per Hectare every 2 weeks- to create a physical barrier and direct absorption of nutrients through leaves

Making Compost Teas

The goal is to extract, multiply and grow mostly aerobic microorganisms in as large a diversity as possible of three basic groups: bacteria, protozoa and fungi.

A good temperature range is usually 18° to 22°C over 12-72 hours. The composition of the brew will depend on the original compost; whatever aerobic organisms present will be multiplied.

Making compost tea is not about putting in ingredients which directly benefit the plants. The 'food' additives **are strictly to feed or benefit the microorganisms and encourage them to multiply**. Adding a handful of soil will further increase microbe diversity.

Ingredients: sufficient to make 5 gallons

Unchlorinated water (rainwater or allow tapwater to stand to gas off chlorine overnight)

1 cup of inoculant (compost or vermicompost)

¼ cup of food: unsulphured molasses, humic acid (1 tablespoon), fish hydrolase and kelp

You will need a 5 gallon bucket, an airstone and air pump plus tubing (aquarium supplies), power source and, to apply, a PLASTIC watering can or backpack sprayer. You can use a 400micron nylon mesh bag to contain compost if available.

Add water to bucket, add inoculant and food. Switch on pump and let whole brew bubble for 24-36 hours (by which time the food will be depleted and anaerobic microorganisms may become dominant). Strain the mixture into a **plastic** container for spraying. Clean bucket and pump and tubing for next brew. Apply within 4 hours of completing the aeration. 'Over application' is not a problem.

Bacterial-dominated v. fungi-dominated composts and compost teas

Choosing the right 'tea' for the plants you wish to grow:

Use a bacteria-dominated compost tea to mimic 'Bacterial' soils. These are 'early succession' soils supporting **fast-growing annuals**, annual crops, vegetables, herbs, cereals, pastures. (Lower C:N ratio)

Use a fungi-dominated tea to mimic fungi-dominated soils (equivalent to 'late succession' forest soils, with 'woody' perennials, trees) if you are planting shrubs and trees (Higher C:N ratio).

Different additives will promote growth of bacteria over fungi, or a balanced tea. Bacteria use simple carbon sources such as amino acids, proteins and organic acids to multiply (so add sugar, corn syrup) whereas fungi require complex 'foods' to multiply such as complex amino acids, proteins, hormones, carbohydrates, phenols, tannins and humic acids (so add ground oatmeal, fish hydrolysate); for a balanced brew add molasses, kelp, fruit pulp, humic acids.

More info and free to download e-books from
http://www.microbeorganics.com/#What_is_Compost_Tea_