

# COMPOST TEA & MYCORRHIZAE

## 1. Why Use Compost Tea?

Compost tea is used for two reasons: To inoculate microbial life into the soil or onto the foliage of plants, and to add soluble nutrients to the foliage or to the soil to feed the organisms and the plants present. The use of compost tea is suggested any time the organisms in the soil or on the plants are not at optimum levels. Chemical-based pesticides, fumigants, herbicides and some synthetic fertilizers kill a range of the beneficial microorganisms that encourage plant growth, while compost teas improve the life in the soil and on plant surfaces. High quality compost tea will inoculate the leaf surface and soil with beneficial microorganisms, instead of destroying them.

### What is Compost Tea?

Compost tea is a liquid produced by leaching soluble nutrients and extracting bacteria, fungi, protozoa and nematodes from compost. The brewing process is performed at constant temperature, although the growth of the organisms may elevate temperature as a result of their reproductive heat produced.

Tea production is a brewing process, and as easy as making beer or wine. But we all know that wine or beer brewing isn't that easy. Brewing compost tea can be fraught with problems.

Benefits of using of compost tea containing the WHOLE foodweb include:

- Improve plant growth as a result of protecting plant surfaces with beneficial organisms which occupy infection sites and prevent disease-causing organisms from finding the plant,
- Improve plant growth as a result of improving nutrient retention in the soil, and therefore reduce fertilizer use, and loss of nutrients into ground- and surface waters
- Improve plant nutrition by increasing nutrient availability in the root system as predator-prey interactions increase plant available nutrients in exactly the right place, time and amounts that the plant needs,
- Reduce the negative impacts of chemical-based pesticides, herbicides and fertilizers on beneficial microorganisms in the ecosystem
- Improve uptake of nutrients by increasing foliar uptake as beneficial microorganisms increase the time stomates stay open, while at the same time reducing evaporative loss from the leaf surface,
- Reduce water loss, improve water-holding in the soil, and thus reduce water use in your system,
- Improve tillage by building better soil structure. Only the biology builds soil structure, and ALL the groups in the foodweb are required to be successful. You can't have just bacteria, you must have fungi, protozoa, nematodes and microarthropods as well!

## What is in compost tea?

Tea contains all the soluble nutrients extracted from the compost, but also contains all the species of bacteria, fungi, protozoa and nematodes in the compost. Not all the individuals in the compost, but representatives of all the species in the compost are found in the compost tea. Making sure only beneficial species are present in the compost is therefore critical.

## MYCORRHIZAE

Soils in natural settings are full of beneficial soil organisms including mycorrhizal fungi. Research indicates, however, many common practices can degrade the mycorrhiza-forming potential of soil. Tillage, fertilization, removal of topsoil, erosion, site preparation, road and home construction, fumigation, invasion of non native plants, and leaving soils bare are some of the activities that can reduce or eliminate these beneficial soil fungi. In many man-made landscapes we have reduced or eliminated the soil organisms necessary for plants to function without high levels of maintenance.

Most plant species exploit the soil with the help of beneficial microorganisms called mycorrhizal fungi. The fine threads that make up the fungus branch between soil particles, grow into decomposing organic matter, even explore the shells of dead insects, where they find phosphorus and other vital nutrients. The nutrients are then passed back to the roots of the plant.

The word Mycorrhiza comes from Greek roots (appropriately enough). It refers to any of several types of associations between plant roots and soil fungi.

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**A favorite habitat of microbes is near and in the roots of plants. Many microbes live in soil, but even more (up to 100 times more) live close to the roots of plants. This area near the roots is called the "rhizosphere" which is the thin layer of soil that sticks to the roots. The rhizosphere is a huge habitat in the soil, because plants have so many root fibers. An individual wheat plant, for example, may have a root surface area of 6 square meters (yards)!**

## Do I Need Mycorrhizae?

In today's man-made environments plants can be greatly stressed and the relationship between fungus and root is critical. Unnatural conditions such as concrete, asphalt, roadsides, sidewalk cut outs, trenching, drain fields, air pollution, shopping malls, business districts, and suburban developments adversely effect the presence and abundance of mycorrhizal fungi.

Man-made environments often suffer from disturbance, compaction, top soil loss, and the absence of quality organic matter, conditions which reduce the habitat necessary for the mycorrhizal fungus to survive and thrive. Artificial landscapes effect the mycorrhizal relationship in two fundamental ways. First, they isolate the plant from beneficial mycorrhizal fungi available in natural settings and, secondly, they increase plant stress and the need for water, nutrients, and soil structure mediated by their below-ground "partners". Many nursery and agricultural soils lack mycorrhizae due to excessive and long-term uses of chemical fertilizers and pesticides.

All of these factors contribute to the need for mycorrhizal inoculation.

