

# Compost Tea and Microbial Innoculants Offer an Alternative to Fertilizers

By Peter Felix



Applying compost tea.

As someone who has been exposed to the tree care industry since birth, I have closely observed its evolution during the past 30 years. I remember my father telling stories of using DDT and having mosquitoes die on his arm as they bit him 15 years later. I can also remember my older brother coming home from pruning work covered with tree wound dressing from head to toe. I recall my first experiences spraying trees during a gypsy moth outbreak, where people would run out in the street to get us to stop and spray their property. I remember dumping 50-pound bags of 30-10-10 fertilizer into 200 gallons of water and root fertilizing all of the trees and shrubs on a property.

Today, DDT is banned, tree wound dressing is only for cosmetic use, and we

have to notify neighbors 48 hours in advance of a pesticide application. However, we are still dumping 50-pound bags of 30-10-10 into 200 gallons of water and fertilizing all the plants on a property. Obviously, fertilization has been slower to change than other practices. The 1998 ANSI A300 standard for tree fertilization still calls for 2 to 4 pounds of nitrogen per thousand square feet. Yet the evolution has begun as certain states may make these rates illegal.

In the last decade, biostimulants have hit the market. For me, the transition to these products began in 1993. We began mixing 30-10-10 with biostimulants to “cover all bases” for general fertilization. When mycorrhizae came on the market, we began mixing it in for the clients who were willing to pay for it.

While we used these products, we did not really possess a specific philosophy on biostimulants. We did not have all of the information on these types of products, and we therefore could not educate our clients. What exactly was a biostimulant? If nitrogen was so bad, then why were we using it?

Biostimulants are basically bacterial and fungal food sources. Included are materials such as sea kelp and humic acid; soil conditioners, including yucca extract; species of nitrogen-fixing and phosphorus-solubilizing bacteria; beneficial fungi; and, sometimes, mycorrhizae.

These food sources exist naturally; the process began billions of years ago and remains the same today. On the forest floor, plant parts fall and are decomposed by microscopic animals and fungi. The activi-

ties of these microbes create available nutrients for plants to take up through their roots. This process works so well that individual plant species use energy to release exudates into the soil to keep a specific set of these microorganisms next to their roots. The result is an endless supply of nutrients and protection from soil pathogens.

Once we obtained this information, we began to explain to our clients that this complex food web exists in the forest, but does not thrive on our properties. Because we surround our trees with turf and rake our leaves away, the system is incomplete. We need to add biostimulants to rebuild the soil and try to recreate the forest floor environment. This process sounds simple until you add in other factors, such as compacted soils, infrastructure, pesticide and fertilizer use, and irrigation using chlorinated water.

As a plant health care professional, I was willing to fight for healthy trees and shrubs

in sustainable soils not addicted to nitrogen. For years we bought and injected thousands of pounds of biostimulants and sometimes mycorrhizae on client properties. Our best results with biostimulants came when plants were treated at least twice a year. If we could get all of our clients to pay for multiple applications, we could get the results that would keep us on the property.

During this dilemma, I kept hearing about compost tea. I wondered if soil biology was the real answer to soil fertility and pondered the possibility of inoculating soil with microbes found in a compost pile.

In order to get answers to my questions, I called James Sottilo of Treewise Organic Experts. Sottilo had been brewing his own compost tea since 1996. Our entire staff (four people at the time) met Sottilo at a restaurant where he gave us a presentation and showed us pictures of plants treated with compost tea. I then met Paul Wagner



*Mixing compost tea – 110 gallons of compost tea will make 1,100 gallons of useable material.*

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*Applying compost tea soil drench.*

of Soil Foodweb New York. Wagner runs a soil testing facility specializing in providing microbial analysis. Sottilo uses the analyses from SFNY to determine the essential microbes needed for the completely organic programs he provides to his clients using only compost tea and microbial foods.

We later saw Wagner's presentation and it made a great deal of sense. We learned that in addition to creating nutrition, the



*This compost tea brewer will make 110 gallons. The brewer has an air pump, an air diffuser inside the tank, and a heater.*

correct soil biology also provides soil structure, increased field capacity, pore spaces and competition to disease pathogens.

Actively Aerated Compost Tea is made from compost specifically mixed from decomposing plant parts, earthworm castings, sea kelp and humic acid. After agitating in an aerated brewer for 18 to 24 hours, the brew becomes a concentrate of beneficial bacteria, fungi, protozoa and beneficial nematodes. The protozoa and nematodes are the organisms responsible for feeding on bacteria and fungi, with their waste then cycling nutrients to plants. These organisms – protozoa and nematodes – are missing from bio-stimulants.

Since I have DDT in my DNA, it was impossible for me to think of going organic. I dealt with too many borers and leaf miners to think it possible. However, we were intrigued by the thought of brewing our own compost tea and being able to make multiple applications throughout the season, keeping it affordable to our clients.

Last year, we bought a 110 gallon compost tea brewer. The brewer is a cone shaped tank in a metal frame with an air pump, an air diffuser inside the tank, and a heater. The price for this machine is approximately \$2,200. The 110 gallons of compost tea will make 1,100 gallons of useable material, at 10 gallons of tea per

100 gallons of water. It costs about \$70 to make a 110-gallon brew, so it costs about \$6.36 per hundred gallons of useable material.

Those numbers sound incredibly affordable, but you also have to consider other factors. Brewing tea takes a whole day, so you have to plan ahead. It takes about 45 minutes to take the tea out of the brewer, put it in five gallon pails, and start the brew for the next day. The tea will last in the pails for about 10 hours before it goes anaerobic and spoils. It has to be used the day it is produced.

Our plant health care programs now use compost tea as another tool to treat trees and shrubs. In general, trees grow best in fungal-dominant soils, so we brew our teas accordingly. Our motto is "caring for plants from the soil up," and compost tea is a good fit for this philosophy.

Although research has proven that foliar applications of compost tea work like fungicides, EPA laws currently prohibit its use in this manner. Compost tea microbes out compete and inhabit places on leaves where fungal disease pathogens would like to reside. This use would subject compost tea to EPA registration as a fungicide. Thus, we use it only as a great biological soil amendment. Our clients love the concept and are very receptive to it. We still offer fertilization as a service, but we do it with new microbial inoculums and compost tea with a fungal food source such as liquid humus.

We will always continue to keep insecticides, fungicides and tree growth regulators in our toolbox. However, we would like to reduce their overall use while addressing all of a plant's environmental needs. If we can enable the plant to fend for itself as its ancestors have for millions of years, then we have achieved two goals: servicing our clients and helping the environment.

*Peter Felix is president of Tree Health Management Inc. in Farmingdale, N.Y., a TCIA member since 1993 and an ISA certified arborist.*

