

How to Make Aerated Compost Tea – Mother Earth News

Leila Darwish — Read time: 9 minutes

How to Make Aerated Compost Tea

Earth Repair by Leila Darwish (New Society, 2013) is packed with simple, accessible, and practical tools for healing and regenerating damaged ecosystems from contaminated urban lots to polluted waterways and oil spills. Compost tea is just one of the tools that can help you bind and break down contaminants in the soil.

You can purchase this book from the MOTHER EARTH NEWS store: [Earth Repair: A Grassroots Guide to Healing Toxic and Damaged Landscapes](#).

Actively Aerated Compost Tea

According to the *Toolbox for Sustainable Living*, actively aerated compost tea is a “water-based oxygen rich culture containing large populations of beneficial aerobic bacteria, nematodes, fungi, and protozoa, which can be used to bioremediate toxins.” Good compost tea should contain thousands of beneficial microorganisms; this increases the chances that some of them will be able to bind and break down the range of contaminants on your site. Compost tea allows you to amplify a small amount of compost into a dispersible liquid form, helping a little compost go a lot farther.

Compost tea is relatively easy, cheap and fun to make — it is also a really great activity to do with kids. It requires an inoculant of beneficial bacteria and fungi, some key food sources, dechlorinated water, oxygen and agitation.

Inoculant for Compost Tea

Worm castings and aerobic compost are the best inoculant choices. Worm castings are a great inoculant because worms use bacteria instead of digestive acids in their stomachs to break down food. The castings are rich in beneficial microorganisms, some of which have been found to be effective in breaking down certain contaminants. Worm castings are also a source of humic acid, which is a good food source for your tea. Similarly, good aerobic compost (especially thermophilic compost) is a great inoculant; if made properly, it should be full of beneficial microorganisms.

The quality of the compost used to make compost tea is really critical. The tea can only amplify the biology already present in the compost. So you want an incredibly biologically active compost, ideally one that has at least both bacteria and fungi, to serve as your inoculant. Compost piles that have been curing for three to six months are more likely to be fungal-dominated, while piles that have been curing for one to three months, tend to be more bacteria-dominated. I've heard several compost tea experts say that it can be difficult to get a good amount of fungi. If you can use a more fungal-dominated compost pile as an inoculant, that could give you a bit of an advantage. If you also happen to be cultivating mushrooms, you could try adding spent spawn to your compost to increase its fungal load.

Bacteria are very easy to grow in your tea — they are easy to extract and they like growing in the water. If you test your tea and find it to be fungi deficient but strong in bacteria, it is still good for inoculating your site with beneficial bacteria. You will just have to find another way to get replenish the fungi in your soil food web.

Food Sources for Your Compost Tea

The food sources you add to your compost tea will determine the composition of microorganisms that grow in it, as bacteria and fungi favor different food sources. Different recipes I found called for different ingredients, and these different ingredients allow you to select for a more bacterial or fungal tea. A mixture of these foods will create a tea with both bacteria and fungi, which is ideal for the remediation of contaminants.

Food sources for bacteria include simple sugars, simple proteins and simple carbohydrates. The most commonly used food source in compost tea recipes

seems to be un-sulphured molasses. Some other bacteria food sources include fruit juice, cane syrup and fish emulsion. Food for fungi include complex sugars, amino sugars and complex proteins. The most commonly used compost tea food sources for fungi are fish hydrolysate, kelp/seaweed and humic acid. Some additional food sources include fulvic acids, soybean meal, oat bran, oatmeal, fish oils, cellulose, lignin, cutins, rock phosphate dust, fruit pulp (oranges, apples and blueberries) and aloe vera extract (without preservatives). The more types of food added, the greater the diversity of species of microorganisms likely to be present.

Some grassroots compost tea brewers I spoke with preferred to avoid purchasing commercial products (like humic acid) for making their tea, and instead felt that it was sufficient to use their compost and worm castings as an inoculant, along with some dynamic accumulating and nutrient/mineral rich plants, weeds and seaweeds.

Compost Tea Recipe

This is a simple and standard recipe for five gallons of compost tea. The proportions can be multiplied for larger batches.

Ingredients and Supplies

- five-gallon bucket (make sure it is clean!)
- un-chlorinated water (either rainwater, pond or if tap)
- 1 cup of inoculant (worm castings and/or aerobic compost)
- 1/4 cup of food: un-sulphured molasses, humic acid (1 tablespoon), fish hydrolase and kelp.
- 1 compost tea bag/stocking
- air pump
- plastic watering can or backpack sprayer (one that has never been used for chemical applications)

Your Compost Tea Bag or Stocking

Many grassroots compost tea brewers I know use a nylon stocking to hold inoculant. However, some compost tea brewers claim that nylon is not the best material to use, and recommend using a non-sticky compost bag (like a

polyester mesh screen) which will allow for more fungal extraction. The mesh should be at least 400 micrometers to allow fungi and nematodes to flow through. For optimal extraction, it is also important that you put your inoculant in the bag and not just directly in the water.

Aeration and Agitation

Use an air pump to keep your tea sufficiently oxygenated. Though there are many sources that say that some variation of an aquarium pump connected to some airstones could supply enough aeration for a five-gallon batch of compost tea, that is not necessarily the case.

What many folks don't seem to know is that you need both aeration and agitation for effective compost tea brewing. Lots of compost tea brewers have pumps or bubblers that provide good aeration, but they may not provide the necessary agitation you need to truly aerate the water and knock the organisms, like fungi, off the organic matter and into solution. Fine bubbles don't aerate water. It's the breaking of the surface of the water that gets oxygen into it. So instead of a lightly bubbling compost tea, you should aim for more of a rolling boil, or churning. To achieve this, you may have to play around with a few different air pumps or generative blowers. Some sources suggested using a high-pressure (3.9 psi), high-volume air pump (17 gallons per minute). Avoid using air compressors as they can damage microorganisms.

Remember, these pumps need a power source, and the tea needs to be aerated constantly – so make sure no one turns off the pump at night. In a post-disaster situation where power may be more difficult to come by – or if you live somewhere where electricity is a touchy thing – it may be harder to make compost tea properly.

How to Make Compost Tea

1. Pretreat your compost to increase its inoculant and fungal power. Take your compost inoculant and add some humic acid or fish hydrolase to it. Put it into a shallow tray and mix it up well. Then let it sit for two to three days. This encourages fresh microorganism growth in the tea. Many recipes don't require you to pretreat your compost: you can treat this as an optional step or you can see it as a way to increase the effectiveness of your brew.

2. Fill a bucket with non-chlorinated water. Water temperature is ideally between 55-80oF. If using tap water, leave it sitting and uncovered for 24 hours to off-gas any chlorine, or add humic acid to it to deal with chloramine.

3. Put the airstone in the bottom of the bucket, attach the air pump and let it start to bubble. Make sure there is enough oxygen and agitation moving through your liquid; if not, get a more powerful pump or move to the gang valve and three-bubbler approach. Remember, you are looking for more of a churning or rolling boil, not simply fine bubbles.

4. Put inoculant in the stocking or mesh bag, tie off the end and suspend it in the water.

5. Add the food.

6. Let the whole brew bubble for 24 hours and for no longer than 36 hours. After 36 hours, if the tea received insufficient oxygen or too much food, anaerobic organisms will overcome the beneficial aerobic organisms. It will be obvious if the tea went anaerobic, because it will stink! If that has happened, pour it out away from garden plants and start over. One thing to be aware of — just because your compost tea smells earthy and sweet (which is the smell you are going for), it does not mean that it packs a microbial punch, as that smell can also come from molasses. If possible, do a soil biology test of your first few batches to see if you truly are rocking the microbe production.

7. Pour the mixture through a strainer to remove large debris so that it doesn't clog your backpack sprayer or plastic watering can (supposedly bacteria can react with some metal cans).

8. Make sure to clean your bucket and pump for your next round of tea. Use a non-toxic, environmentally friendly, biodegradable cleaner.

Applying Compost Tea

Use your compost tea within four hours of turning off the bubbler, since after that amount of time without oxygen your aerobic microorganisms will begin to die. At this point, you can bring the tea to your site and apply it directly onto the contaminated and/or damaged land, a spill area or onto your phytoremediating

plants to increase their health. It is best to apply your tea to moist soil or after a rain, on a cloudy morning or in the evening as some microorganisms do not like baking in the hot sun. If you are applying your tea with a sprayer, make sure that the sprayer doesn't need too high a pressure and that the velocity of the spray is slow — the microbes you are working with benefit from gentle treatment. You can also take a digging fork or piece of rebar and make holes throughout your site to loosen soil and give the microorganisms a way to move more rapidly down to where the contamination may be.

With actively aerated compost tea, you can't really have too much of a good thing. Some sources recommend that you use a minimum of about one gallon of tea for 1,000 square feet of contaminated land. When you are using tea for remediation (drenching the soil instead of spraying plants) you do not need to dilute your tea. Finally, apply tea several times, waiting anywhere from two weeks to one month between applications.

If you are going to be making large brews of compost tea, you can use a rain barrel-sized container. Just make sure to adjust the proportions of inoculant and food and get a strong enough pump or two to ensure the barrel is properly oxygenated and agitated. You can also purchase pre-made compost tea brewer systems that ranges from a five-gallon system priced around US\$180 to a 1,000-gallon compost tea brewer for US\$7,000.

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