

Compost Is the Key to Successful Plant Management

. . .and a personal contribution to saving the planet

by **Miranda Smith, et. al.**

***Editor's Note:** It has been said that compost can save the planet and maybe the human race. So we write this piece to not only distribute information on alternatives to pesticides, but do this in the broader context of reducing our "carbon footprint," by reducing synthetic chemical use, energy use, and practices that deplete soil, and pollute waterways. We recognize that this approach requires different cultural practices than the typical and hazardous "weed and feed" method in recognition of the fact that we just can't do things the way we may be use to doing them without thinking of their impact on health and the environment. Compost is the key to healthy soil, whether it is for your organic lawn or chemical-free garden. Decomposed plant material and organic fertilizers provide the basis for a humus-rich soil that nourishes plants and sequesters atmospheric carbon. Healthy plants can better ward off insects and disease, making chemical pesticides unnecessary. We thought that the best way to get information on composting to our readership is by reprinting the following article from Rodales' Chemical-Free Yard and Garden © 1995 by Rodale Press Inc. Permission granted by Rodale, Inc., Emmaus, PA 18098. Available wherever books are sold or directly from the publisher by calling (800) 848-4735.*



Compost: Nature's Black Magic

It may seem like magic – a pile of leaves, grass clippings, pulled weeds, and kitchen scraps turns into a wonderful, dark, uniform, organic soil amendment-compost. But making compost doesn't require a magician's tricks, just a little tinkering with the natural decay cycle.

In the soil, microorganisms, nematodes, and earthworms consume organic matter and break it down into simpler compounds. They require air, moisture, and heat to do so. The same process happens in a compost pile. It just happens faster (in an active pile) because the microorganisms have a diverse supply of raw materials to digest and optimal conditions for their work.

The Magic Formula

You can make compost one of two ways-by the active method or the passive method. The active method, of course, requires more work. With either method, the first step is to make a compost pile. You can build wooden or concrete block bins or buy a commercially made plastic bin to hold your pile in place. Or you can just layer the materials in a heap. An easy way to keep a passive pile contained is to set up a heavy chicken wire cylinder as a frame.

Follow these simple guidelines for successful composting:

Location: Select a shady, well-drained spot for your pile.
Season: It's best to compost when temperatures are above 50°F. At lower temperatures your pile will not be active, or may freeze.

Of course, you can restart the compost pile in spring by turning it and adjusting the moisture content.

Preparation: Clear away sod or other surface cover at the site, loosen the soil with a spading fork, and put down a base layer of brush or wood chips.

Materials: Materials you can use include garden wastes, grass clippings, kitchen scraps, manure, newspaper, and sawdust. Never include meat scraps or fats, which attract dogs and rodents. It's also best not to add kitchen scraps that are heavy with oil, as oils take longer to break down and can slow the composting process.

Layering: Alternate layers of plant material such as chopped leaves or straw with nitrogen-rich layers of kitchen scraps mixed with manure or blood meal. If you don't have nitrogen-rich materials, don't worry. Your compost will just take longer to finish.

Activating: Add an activator that contains microorganisms and growth stimulants to boost your pile's activity. You can use topsoil, fresh manure, or a commercial compost activator such as BioActivator.

Shredding: Shred materials to make better compost more quickly.

Moisture: Keep compost moist, but not wet; it should feel as damp as a squeezed-out sponge. Cover loose piles or open bins with plastic or a heavy canvas so they won't become waterlogged.

by rain. If your compost is too dry, use water with kelp extract added to moisten it; this will help stimulate biotic activity.

Minerals: Add the fertilizers your garden needs directly to the compost as you add layers of plant material to the pile. It saves a step in your garden work and makes richer humus. Try adding colloidal or rock phosphate and kelp or fish meal.

Size: Size can vary. A pile 3 feet square heaped 5 feet high can yield almost a ton of compost. The ideal size for an active compost pile is 4 feet by 4 feet by 4 feet.

Aerating: The microorganisms that drive the composting process need air. Fluff or turn the pile regularly to keep microorganisms active, and to prevent the pile from overheating.

Active or Passive?

If you want your compost to stay active, you must turn it every week or so to add oxygen and keep the decomposition rate high. The inside temperature of an active pile can reach 170° F. If you are composting diseased plant material or plant seeds, you must keep the pile at or above 160° F to kill disease organisms and weed seeds. Otherwise a range of from 140° F to 150° F is ideal. You can use a compost thermometer to monitor the temperature of the pile. Plan to turn the pile whenever the center of pile exceeds 140° F.

Of course, you can't just flip a pile like a pancake. Turning a pile means mixing and loosening the materials that make up the pile. If you have more than one compost bin, you can turn a pile by forking the material from one bin into another. Moving the pile in this way will let in air and remix the materials, which will stimulate a new flush of microbial activity. If you just have a single loose compost pile, you can turn it by using a spading or manure fork to lift material, shake it, and try to redistribute it in the pile.

If you don't want to worry about turning your compost, build a passive pile. A passive compost pile is simply a pile of organic material that is left to sit until the material decomposes slowly over time-usually one to two years. Making leaf mold is an example of this. Most homeowners have passive piles tucked somewhere in the far reaches of their backyards. This approach may not produce as much compost for the garden, but it does work, and at least it's a good method for recycling yard wastes.

Many communities now collect yard waste and compost it en masse. If municipal yard waste is available in your area, it can be an excellent source of organic matter. However, not all municipal

programs actually compost the yard waste; some just stockpile it. Keep in mind that unless your municipal maintenance department is turning and monitoring the material to keep it active, it may not be truly composted. If you collect some for your home garden, put it in an active pile to kill off any disease organisms it may contain. Active composting will also help break down pesticide residues that could be in the material.

Computing Compost Coverage

Recommendations for spreading compost or other soil amendments are often given in terms of spreading a layer of a given thickness. But how do you know how much material to spread to end up with such a layer? The ratio to remember is nine cubic yards of compost per 100 square feet of garden yields a one inch thick layer. Here's how to apply the ratio to your garden.

1. First measure the area you want to cover with compost and determine the total square footage.
2. Divide by 100.
3. Multiply by the thickness of the layer you want to spread (in inches).
4. Multiply that number by nine. This will tell you how many cubic feet of compost you need.

A handy "measuring cup" for compost is a 30-gallon garbage can. It holds about four cubic feet (or about 50 pounds) of finished compost. You can also measure the volume of your garden cart and use it as your measuring device.



Rich in organic matter and active microbes, high-quality compost is very dark - almost black in color.

Compost Tea: Brewing success in the garden

Editor's Note: Some of following text is reprinted from the International Compost Tea Council's website, www.intlctc.org.

Compost tea is an aerobically-brewed liquid extract made from good quality microbial foods. Compost tea properly made has only beneficial organisms and nutrients that are essential for plant and soil health.

What Is the Difference Between Compost and Compost Tea?

Compost, in simple terms, is a mixture consisting of decayed organic matter and microbial colonies, in a well-balanced ratio of carbon and nitrogen. Compost tea, on the other hand, is a liquid extraction of beneficial microorganisms and soluble nutrients from the compost that is reproduced during the brewing process.

Compost adds the organisms which build soil structure necessary to develop percolation, and allow air passage ways to be opened up as well as the foods to feed these organisms. Compost can be over-applied which means that water and air cannot penetrate

the soil, whereas compost tea cannot be over-applied, unless to the point where the soil is water-logged.

Many organisms grow in compost tea, resulting in higher numbers of organisms in tea than in compost. This therefore increases microbial activity in less time than compost. Coverage of plant surfaces with compost tea is necessary to block pathogen access to leaves in order to ensure greater efficacy. Compost tea can be applied to leaves, twigs, bark and soil, whereas compost can only be applied to the soil.

Ideally, both are very important tools to use.

What Are the Benefits of Compost Tea?

Benefits include improved soil structure, retention of nutrients, cycling of nutrients into plant available forms, and reduced plant stress. Disease organisms may be displaced by the normal set of soil or foliar organisms in the tea.

Compost tea also breaks down compacted soils with repeated use, letting roots grow into the soil more easily, allowing them

Compost Bins

Compost bins are ideal for urban environments as they save space and keep material out of reach from foragers. Composters or tumblers can reduce the time and effort needed to compost by turning the pile for you.

To buy a commercially made compost bin or composter, you can first try your local garden center or home improvement store. Some municipal organizations also provide compost bins for sale. The following websites provide different options to hold your compost.

Buy a Composter

Green Culture Composters (www.composters.com, 877-204-7336) compost bins, tumblers, electrically powered chipper shredders and wood chippers; **Gardener's Supply** (www.gardeners.com, 888-833-1412) many styles of bins, tumblers and more; **Urban Garden Center** (www.urbangardencenter.com, 866-923-1992) manufactures the Urban

Composter Tumbler that is primarily made of recycled materials; **The Compost Bin** (www.compost-bin.org/bins) manufacturer of the compost bin; **Compost Guide** (<http://store.compostguide.com>, 214-363-5170) compost bins, static composters, composting accessories; **Grow Organic** (www.groworganic.com, 888-784-1722) the Envirocycle Composter.



...Or Build Your Own!

Building your own bin is a great way to customize a system to fit your composting needs. There are a variety of composting methods. The method you choose depends on the material you're composting and how much effort you want to put into it. The Stop Waste Partnership provides useful instructions on selecting and building compost bins that best suit your needs. Choose from the E-Z Wire Bin, Plastic Worm Bin, Closed Air Composter, 3-Bin System, Urban All Wood Bin, 2 Person Wooden Worm Bin. View instructions at <http://www.stopwaste.org/home/index.asp?page=447>.

to find more nutrients, and letting air into the soil so conditions are not right for diseases to grow, or for toxic metabolites of anaerobic organisms to build up. All plants will gain health and vitality with continued use.

Compost tea puts the micro-biology back into the soil that we have removed because of our over-development and chemical application practices. This biology has co-evolved with plants for billions of years and is critical for plants to function within their environment.

When applied to the foliage of plants, compost tea covers the plant surfaces and prevents harmful material from reaching the plant, including disease organisms. Increased carbon dioxide from the respiration of the bacteria and fungi increases the time that stomates open and let foliar nutrients into the leaves. When tea is applied to the soil, it improves the soil structure, increases nutrient uptake, breaks down pollutants and reduces water use.



Compost tea provides tremendous benefits to organic gardens like this organic lavender garden in Shasta County, CA.

How Do I Use It?

Compost tea can be sprayed on foliage, twigs, branches and trunks (the entirety of the plant), drenched into the soil, injected into the soil for established roots, and used as root dip for bare root, juvenile plants and cuttings, and can be applied through established irrigation systems.

When using tea as a foliar application to leaves, twigs, and branches, tea must cover at least 70% of leaf surfaces. Apply until coverage is thick enough before it drips off the leaf. Finer mists will attain better coverage and a better spray pattern. Wetting and adhesive agents are available to assist in leaf coverage. When using as a soil drench, tea needs to be applied so it moves down into the soil to aid roots.

When using as a soil application, high ratios of water can assist in carrying the compost tea further into the soil. Deep root injections will need specialized injection equipment. As a root dip, use full strength. Application through established irrigation systems requires specialized irrigation injection systems.

Compost Tea for Your Lawn or Garden

Many landscaping companies are beginning to feed lawns and gardens with compost tea. If your local service providers are not using compost tea or if you prefer to do your own yard work, you will have to buy or build a compost tea "brewer."

Again, the best place to check is your local lawn and garden center. In addition, the following retailers also sell compost tea brewers.

Back Yard Gardener (www.backyardgardener.com/compost/compost-tea) provides instructions and sells various brewers; **Growing Solutions** (www.growingsolutions.com, 888-600-9558) manufacturers 10-500 gallon brewers; **Keep It Simple Inc.** (www.simplici-tea.com, 866-558-0990) sells 5-1000 gallon brewers; and **Clean Air Gardening** (www.cleanairgardening.com, 214-819-9500) sells a 5 gallon brewer.

You can build your own compost tea brewer with a large bucket and aquarium supplies. Brewing compost tea at home is a 2-3 day process. Instructions on building your own brewer are available from Tauton Press (www.taunton.com/finegardening/how-to/articles/brewing-compost-tea.aspx) or the Pennsylvania Department of Environmental Protection (www.dep.state.pa.us/dep/deputate/airwaste/wm/recycle/Tea/tea1.htm).

To apply compost tea, use it as a foliar spray with a backpack sprayer on your garden plants or lawn. You can also apply with a watering can directly to the roots. Apply in the morning or under cool, dry conditions. It may be done in the rain when applied to the soil/lawn. because active microbes are present, compost tea is most effective within four hours after the brewing process is completed.

For more information, contact *Beyond Pesticides* or visit www.beyondpesticides.org/lawns/compost.

