

Soil Nutrient Analysis Laboratory

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Backyard Composting

Composting is the most basic form of recycling; a way to turn garden and kitchen wastes into a rich, crumbly soil supplement that will provide nutrients for your plants, attract earthworms, and improve soil structure and drainage. It is also a most practical and convenient way to handle yard wastes and easier and cheaper than bagging these wastes, or taking them to the landfill or transfer station for disposal. If you have a garden, lawn, tree or shrub plantings, or even planter boxes, you have a use for compost.

What is Composting

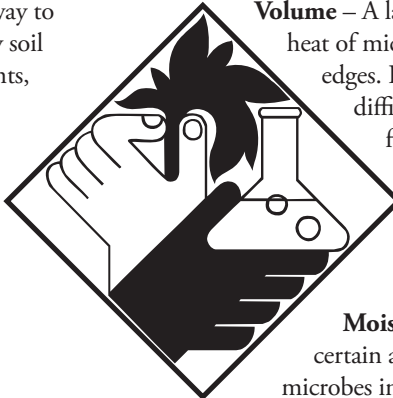
While the decomposition of plant and/or animal wastes by soil microbes occurs naturally, by composting, this process is enhanced and encouraged to proceed more rapidly turning organic wastes into a valuable soil amendment.

Composting Principles:

Biology – The compost pile is really a teeming microbial farm. Bacteria start the process of decaying organic matter. They are the first to break down plant tissue and also the most numerous and effective composters. Fungi and protozoa soon join the bacteria and somewhat later in the cycle, centipedes, millipedes, beetles and earthworms do their parts.

Materials – Anything growing in your yard is potential food for these tiny decomposers. Carbon and nitrogen, from the cells of plant, animal, and microbial debris, fuel their activity. Everything organic contains carbon and nitrogen. The proportion of these two elements is known as the carbon to nitrogen or C:N ratio. It may range from 500:1 in the case of sawdust to 15:1 for kitchen vegetable wastes. A C:N ratio of 30:1 is ideal for the activity of compost microbes. The microorganisms use the carbon in leaves or woodier wastes (brown stuff) as an energy source. Materials higher in nitrogen, like grass clippings* and spent flower stalks (green stuff), provides the microbes with this essential element to build proteins for their bodies.

Surface Area – The more surface area the microorganisms have to work on, the faster the materials are decomposed. It's like a block of ice in the sun – slow to melt when it's large, but melting very fast when broken in to smaller pieces. Chopping your garden wastes or putting them through a shredding machine or running them over with a lawnmower will speed decomposition.



Volume – A large compost pile will insulate itself and hold the heat of microbial activity. The center will be warmer than the edges. Piles smaller than three feet cubed (27 cu. ft.) have difficulty holding sufficient heat while those larger than five feet cubed (125 cu. ft.) may not allow enough air to reach the microbes at the center. These proportions are of importance only if your goal is a fast, hot compost pile. All organic debris will decompose eventually.

Moisture and Aeration – All life on Earth needs a certain amount of water and air to sustain itself. The microbes in the compost pile are no different. They function best when the compost materials are about as moist as a wrung-out sponge and are loosely packed to provide for many air passageways.

Time and Temperature – The quicker the pile heats up, the faster the composting process occurs. Piles will heat up because of the activities of the microorganisms. A pile will decompose in a few months if you use materials with a proper C:N ratio, chop them into small- to medium-size pieces, begin with a big enough volume, turn regularly, and see that moisture and aeration are adequate. If you are not in a rush to make compost, just add materials as they become available, turn occasionally, and eventually, in 1 to 2 years, the materials will decompose.

Compost Ingredients

Yard wastes such as fallen leaves, grass clippings, hedge trimmings, weeds without seed heads or sprouting roots, and spent garden plants all are suitable to add to the compost pile. Kitchen wastes, like outer cabbage leaves, carrot peelings, melon rinds, coffee grounds, tea bags, and eggshells can also be composted.

Materials not recommended for composting are diseased garden plants, grass clippings if the lawns are treated with herbicides or other pesticides, meat, bones, cooked foods containing oils (may attract animals or flies or cause odors), and dog or cat droppings (may contain pathogens harmful to humans).

Woody yard wastes like large sticks, logs, or large amounts of sawdust should not be added to the regular compost pile. These take a longer time to decompose and can be set in a separate pile to eventually break down, used as burning material for fireplaces or wood stoves, or in the case of sawdust, used in garden paths. Logs and large sticks can be shredded



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and used as path materials or left whole and used to delineate garden beds.

Compost Bins

A compost pile can be built without any type of enclosure. Typically some system is used to contain the compost pile as it looks neater, keeps the compost pile together, and makes it harder for curious animal visitors to explore. A single bin can be purchased or made from available materials such as lumber, fencing, cinderblocks, or pallets. It is also possible to make compost in large garbage barrels (with added air holes), plastic commercial composting bins, and rotating drum units. Leaf compost can be made in large leaf bags after collection each fall.

Where large quantities of materials are available, three bin units are often constructed. One bin is for compost making, another for turning the compost into, and the third is used as a holding unit for organic materials like leaves or garden debris.

In the fall leaves and grass clippings picked up while mowing the leaf-strewn lawn can be composted by using them to mulch garden beds or by turning them into the soil once vegetables are harvested and beds are cleared of spent plants. This last practice is often referred to as sheet composting. Kitchen wastes can also be buried in holes or trenches in the garden and covered with soil. This keeps animal pests away if this is a concern and over time the kitchen wastes will decompose and add nutrients and organic matter to the soil.

Selecting a Compost Site

Locate compost piles preferably on a partially shaded site where there is access to water. Site them where they will not be objectionable to look at, and also close enough to the house so that adding collected kitchen wastes on a regular basis year-round will not be difficult. Compost piles should not be located in poorly drained areas where water would accumulate. Water should not stand in or around the bin. Odors can develop when too much water is present.

Starting the Pile

Novice composters usually build their first few piles in layers. This gives one a sense of the proportions of brown to green material to use and recipes can then be adjusted according to the types of organic materials available. Begin the bottom layer of a 4-foot by 4-foot pile with a coarse material like cornstalks, half-inch branches or other item that is somewhat irregularly sized and able to let air into the bottom of the pile. Then add 8 to 10 inches of a 'brown' material, like leaves, 2 inches of a 'green' material, like grass clippings, kitchen/garden wastes, or horse manure with bedding. Follow that with a shovelful of good garden soil or finished compost, and repeat these layers until the pile is about 4 feet high and wide. Check to see that each layer is slightly moist and add water if necessary.

Sometimes large amounts of just one type of material, like leaves, are available. This is a great source of carbon but nitrogen would need to be added to hasten decomposition. An organic or inorganic nitrogen fertilizer such as bloodmeal, cottonseed meal or urea could be added at the rate of about one cup of the organic materials per 6- to 8-inch layer of leaves or 1/3 of a cup of urea per 6- to 8-inch layer of leaves. Spread the fertilizer evenly over slightly moist leaves.

Maintaining the Compost Pile

If made with regards to the C:N ratio and all at one time, the interior of a 4' by 4' by 4', or larger, compost pile will reach a temperature somewhere between 130 and 160 degrees F within 3 days or so. As the microbes use up the available nutrients, decomposition slows and the center of the pile will cool. Once it reaches 100 degrees F, it is time to turn the pile. To speed the composting process, the pile needs to be thoroughly mixed. Turning will also help to more thoroughly combine the materials and physically break them into smaller pieces.

Using a spading fork or pitchfork, turn the pile once or twice a month, if not measuring the temperature, and every time the temperature declines to 100 degrees F if the temperature is being measured with a compost thermometer. Keep the pile slightly moist but not soggy. Another way to turn the pile is to use a compost aerating tool that has 'wings' on its end that open and close. This compost aerating/turning tool is available by mail order and at some garden centers.

If you follow these steps, your compost should be ready to use in about 2 to 4 months if made during the warm growing season. An unattended pile can take a year or longer to decompose. A tumbler or drum-type composter, turned on a daily basis, will make smaller amounts of compost in 1 to 2 months.

The final product will have less than half the original volume of the compost pile. It should be dark brown in color and have a pleasant, earthy smell. The original materials, that were used to create the pile, should be unrecognizable.

Compost Uses

Compost can be used to enrich the soil of flower or vegetable gardens, to improve the soil around trees and shrubs, as a soil amendment for house plants and container plants, and when screened, as part of a seed-starting mix or top-dressing for lawns. Compost helps improve the structure of heavy, fine-textured soils, adds water and nutrient holding capacity to sandy soils and also adds essential nutrients. It is important to monitor the amounts of nutrients added to soil from compost additions because excessive nutrients contribute to poor plant growth as well as environmental problems.

*It is recommended that grass clippings typically be left on the lawn but they may need to be occasionally collected if the grass is allowed to grow too long between cuttings.

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