



Compost Guide - Composting Fundamentals

How to Compost

This information about composting fundamentals for those interested in an introduction to composting. In addition, a set of composting questions and answers provide information about how to tell if compost is finished, how to use compost, and how compost benefits the soil.

As a composter, you can put as much effort as you like into your composting system, but at its heart composting is really a very simple process that needs only minimal maintenance. Once you understand the basics, you will need to choose a bin system and build or purchase it (of course, binless compost piles can work just fine as well). With an understanding of the fundamentals, a spot set up for composting, and a few ingredients, you'll be ready to build a compost pile.

Composting Fundamentals

Good composting is a matter of providing the proper environmental conditions for microbial life. Compost is made by billions of microbes (fungi, bacteria, etc.) that digest the yard and kitchen wastes (food) you provide for them. If the pile is cool enough, worms, insects, and their relatives will help out the microbes. All of these will slowly make compost out of your yard and kitchen wastes under any conditions. However, like people, these living things need air, water, and food. If you maintain your pile to provide for their needs, they'll happily turn your yard and kitchen wastes into compost much more quickly. Keep in mind the following basic ideas while building your compost piles:

AIR

Composting microbes are *aerobic* -- they can't do their work well unless they are provided with air. Without air, *anaerobic* (non-air needing) microbes take over the pile. They do cause slow decomposition, but tend to smell like putrefying garbage! For this reason, it's important to make sure that there are plenty of air passageways into your compost pile. Some compost ingredients, such as green grass clippings or wet leaves, mat down very easily into slimy layers that air cannot get through. Other ingredients, such as straw, don't mat down easily and are very helpful in allowing air into the center of a pile. To make sure that you have adequate aeration for your pile and its microbes, thoroughly break up or mix in any ingredients that might mat down and exclude air. You can also *turn* the pile to get air into it, which means completely breaking it apart with a spade or garden fork and then piling it back together in a more 'fluffed-up' condition.

WATER

Ideally, your pile should be as moist as a wrung-out sponge to fit the needs of compost microbes. At this moisture level, there is a thin film of water coating every particle in the pile, making it very easy for microbes to live and disperse themselves throughout the pile. If your pile is drier than this, it won't be very good microbial habitat, and composting will be slowed significantly. If your pile is a great deal wetter, the sodden ingredients will be so heavy that they will tend to mat down and exclude air from the pile, again slowing the composting process (and perhaps creating anaerobic odor problems). If you are using dry ingredients, such as autumn leaves or straw, you'll need to moisten them as you add them to the pile. Kitchen fruit and vegetable wastes generally have plenty of moisture, as do fresh green grass clippings and garden thinnings. Watch out for far-too-soggy piles in wet climates (a tarp may help to keep rain off during wet weather). In dry climates, it may be necessary to water your pile occasionally to maintain proper moisture.

FOOD

In broad terms, there are two major kinds of food that composting microbes need.

'Browns' are dry and dead plant materials such as straw, dry brown weeds, autumn leaves, and wood chips or sawdust. These materials are mostly made of chemicals that are just long chains of sugar molecules linked together. As such, these items are a source of energy for the compost microbes. Because they tend to be dry, browns often need to be moistened before they are put into a compost system.

Flagg's Garden Center & Landscaping, LLC
4320 Bridgeboro Road Moorestown, NJ 08057
Phone: (856) 461-0567 www.flagsgardencenter.com

'Greens' are fresh (and often green) plant materials such as green weeds from the garden, kitchen fruit and vegetable scraps, green leaves, coffee grounds and tea bags, fresh horse manure, etc. Compared to browns, greens have more nitrogen in them. Nitrogen is a critical element in amino acids and proteins, and can be thought of as a protein source for the billions of multiplying microbes.

A good mix of browns and greens is the best nutritional balance for the microbes. This mix also helps out with the aeration and amount of water in the pile. Browns, for instance, tend to be bulky and promote good aeration. Greens, on the other hand, are typically high in moisture, and balance out the dry nature of the browns.

OTHER THINGS TO CONSIDER

If you live in a cold climate, your compost pile will probably go dormant in the winter. No problem -- it'll start back up again when the springtime thaw comes.

A common misunderstanding about compost piles is that they must be **hot** to be successful. This just isn't true. If you have good aeration and moisture, and the proper ingredient mix, your pile will decompose just fine at temperatures of 50 degrees Fahrenheit or above.

Hotter piles *will* decompose a bit faster, however. One way to understand why this is so is to realize that the heat in a hot pile is the result of the collective body heat of billions of microbes that are busy digesting the ingredients in the pile. Generally speaking, a hotter pile means more microbes or conditions that allow the microbes to have faster metabolisms, and therefore a faster composting process. If you'd like to keep your pile as warm as possible, consider the following:

For a pile to get hot and stay hot for a long period of time, the typical minimum size for the pile is one cubic meter (a cube one meter, or about three feet, on a side). A pile this size has plenty of mass in which those billions of heat-generating microbes can live, yet is also large enough that the center of the pile is well-insulated by the material surrounding it. Smaller piles just cannot insulate themselves well enough to remain hot for long, if at all. You can also provide additional insulation to a pile by stacking bales of hay or straw, or bags of dry autumn leaves, around your bin system. Some people even used stacked hay bales to *make* bin systems (this kind of bin will slowly compost itself, of course).

Composting Questions and Answers:

When is my compost finished?

Finished compost is dark in color and has an earthy smell (like the smell of soil). Usually, it's difficult to recognize any of the original ingredients, although bits of hard-to-decompose materials (such as straw) sometimes can be seen.

There is no single point at which compost is finished -- it's a bit more subjective than that. For many outdoor garden applications, for instance, it can be fine to use compost that still has a few recognizable bits of leaves or straw -- it will finish rotting in the soil. If you plan to use compost in seed-starting mixes, though, you're best off having a well-finished compost, because seedling roots may be attacked by decomposer microbes if the roots contact unfinished compost.

How can I use my finished compost?

To tell you the truth, well-finished compost looks so fine that I'm tempted to eat the stuff sometimes. However, there are several more common ways that compost can be used, on gardens, lawns, landscapes, and houseplants:

COMPOST AS SOIL AMENDMENT: Many people put compost into their garden soil by digging it in prior to spring planting. The image shows a potato harvest by apprentices at the UCSC Farm and Garden in 1990. Due to the use of copious amounts of compost, the potato beds yielded about one pound of potatoes per square foot, or about 1000 pounds total from these four beds, each 80 feet long.

Others actually **do** their composting in the soil, by burying kitchen wastes and other materials in trenches in the garden. Compost can also be used as a 'top dressing' on the soil during the growing season -- in this case it is added in around the bases of plants, where irrigation and soil animals will slowly incorporate it into the soil. On lawns, many people sprinkle/broadcast sifted compost as a top dressing in the spring -- I have been doing this on a 'problem area' of a lawn for several years, in an attempt to improve the soil there for better grass growth. It is also fine to top-dress houseplants occasionally with small handfuls of finished compost.

COMPOST AS MULCH: Compost can be left on the surface as a mulch around landscape and garden plants. This is essentially the same as a 'top dressing' application, described above, but mulches are typically meant to cover all of the soil around the plants that get mulched. Mulches protect the soil from erosion. They also save water by shielding soil from the drying effect of the wind and sun. As they decompose, mulches add nutrients to the soil, and if composed of small-enough particles, worms may slowly eat the mulch and incorporate it into the soil.

COMPOST AS TEA: Compost tea is made by combining equal parts of compost and water and letting it sit for a while. The liquid can help to provide a 'quick boost' to ailing houseplants or young seedlings and transplants (I recommend diluting it quite a bit for use on seedlings). Stu Campbell, in *Let it Rot*, says that the same compost can be used to make several batches of tea (2). When you're finished making compost tea, use the mucky dregs as a mulch in the garden or landscape.

How does compost improve the soil?

Compost does several things to benefit the soil that synthetic fertilizers cannot do. First, it adds organic matter, which improves the way water interacts with the soil. In sandy soils, compost acts as a sponge to help retain water in the soil that would otherwise drain down below the reach of plant roots (in this way, it protects plants against drought). In clay soils, compost helps to add porosity (tiny holes and passageways) to the soil, making it drain more quickly so that it doesn't stay waterlogged and doesn't dry out into a bricklike substance. Compost also inoculates the soil with vast numbers of beneficial microbes (bacteria, fungi, etc.) and the habitat that the microbes need to live. These microbes are able to extract nutrients from the mineral part of the soil and eventually pass the nutrients on to plants.