

Composting

What Is Compost?

Compost is decomposed organic material. Composting is controlled aerobic (oxygen-using) biological decomposition of moist organic matter, producing a soil conditioner.



Why Is Compost So Good?

Compost improves the soil, which in turn supports healthier and more productive plants. Compost provides virtually all of the essential nutrients for healthy plant growth, and it almost always releases those nutrients over time to give plants a slow, steady, consistent intake of the elements essential for growth. Compost also improves the soil's structure, making it easier for soil to hold and use the right amount of moisture and air. Compost will improve the texture of both clay and sandy soil; compost is the best additive to make either clay or sandy soil into rich, moisture holding, loamy soil. And, as an added benefit, compost improves plant vigor and provides for improved immunology from diseases.

Successful Factors for Composting

Love your Microorganisms! Make sure there is a large population of bacteria, actinomycetes, fungi, yeast, algae, protozoa, and other organisms. This can easily be accomplished by adding a couple of handfuls of sifted compost from a warm outdoor compost pile. A scoop of rotting forest leaves is another good way to bring these precious beasts into your compost.

Aeration. If there is an oxygen deficit, the aerobic bacteria will die and anaerobic bacteria will replace them. These critters produce hydrogen sulfide, ammonia, and methane gas (smelly stuff). So, the system must be aerated. There are many ways and means of doing this. Ways to ensure this include adding 'brown material,' described below, to increase pore space, and the

addition of earthworms. It is a balance, because too much air flow can remove too much heat and moisture.

Moisture Content: Ideally, the composting material would have the moisture content of a wrung-out sponge – 45 to 70% moisture. If the moisture level drops too low, the material will dry out, but not decompose, leaving active pathogens. If the moisture content is too high, the microbes will drown, once again leaving anaerobic bacteria.

Temperature: The temperature needed for efficient effective decomposition is 68 to 112 degrees. The decomposition process releases heat, so often compost piles create their own heat source. Steaming compost piles can be found surrounded by snow in the winter time, and people have even found ways to capture this to heat the water for their homes!

The right Carbon to Nitrogen ratio. Microorganisms require digestible carbon as an energy source for growth, and nitrogen as well as small amounts of phosphorus and potassium, for protein synthesis to build their cell walls. The optimum C:N ratio is 4 to 1.

‘Green’ materials are high in nitrogen, while brown materials are high in carbon. The green materials provide protein for the micro bugs, while the brown materials provide energy.

Typical green materials are:

Fresh (green) Grass clippings
Fresh manure (horse, chicken, rabbit, cow – even human!)
Kitchen scraps (fruit, vegetables, coffee grounds, tea bags)
Weeds
Green leaves
Leftover fruits from the garden

Typical brown materials include:

Brown, dry leaves
Dried grass
Cornstalks
Straw

If you have more browns, you’ll still get compost. it’ll just take a little longer. If you are on the side of too much green, you’ll likely have a smelly garbage heap.

"Hot" vs. "Cold" Composting

As noted earlier, decomposition occurs naturally. But, decomposition doesn’t necessarily occur efficiently.

When we provide the micro bugs with a good mixture of browns and greens, as well as some water and air, decomposition can be very efficient. This is known as “hot” composting, sometimes call “aerobic” composting, because the microbes that require air have sufficient air to live, eat, and reproduce quickly. The compost pile can attain temperatures as high as 160 degrees Fahrenheit, which will kill some weed seeds, make most of the microbes very active, but will deter worms and some other critters. As the pile cools, the worms will return to assist in the decomposition. Hot composting is fast, and a well maintained compost heap can fully decompose in several weeks. "Cold" composting is slower, primarily because the environment is hospitable to some of the micro bugs, but it's hardly ideal. This is the form of composting that almost always occurs in the forest, where the mix is often comprised of dry leaves and dead wood. It will decompose over time, but the temperature never gets very high, and the process can take years.

Our goal is to create a composting environment that is "hot," at least during the late spring, summer, and early fall.

Worms can significantly improve your composting effectiveness, just as worms in the garden can improve soil tilth. Some farmers and gardeners deliberately introduce worms, however, they will come to your compost naturally.

Turn

While not necessary, you'll maximize your composting efforts if you turn, or mix, the heap. Mixing your heap will help to keep the browns and greens in balance, will distribute moisture, and add essential air (oxygen) to the mixture. The core (the inside) of the compost heap is always hotter and is the center of activity. The outside is generally less active and much cooler. To increase the efficiency of the composting process, mix the heap to bring more of the raw materials from the outside to the core. Bring more food and water to the busy little micro bugs on the inside.

Open versus Closed Composting

There are two basic kinds of compost piles: open bins or piles and enclosed containers.

Open bins can be constructed with wood, chicken wire, or recycled plastic.

Enclosed containers for composting usually consist of one of two designs: upright box-like containers, and rotating drums.

Advantages of Open Bin Composting

Open bins easily collect rain water

Open bins are very convenient for adding materials

Appropriate for all sizes of gardens or farms

Disadvantages of Open Bin Composting

Open bins can attract rodents, flies, bees, and bears
Open bins can become too wet, if not covered
Open bins may be more difficult to mix (more on that later)

Advantages of Compost Containers

Compost containers will rarely attract pests
Rotating drums are usually easier to mix or turn

Disadvantages of Compost Containers

Enclosed containers usually require you to add water
Upright containers may be very difficult to mix or turn
Inappropriate for larger farms



Two Chambers are Always Better than One

Whether you choose to use an open bin or a compost container, two chambers are always better than one. In fact, if you are really serious about composting, having

two chambers is a necessity. Because the composting process takes at least several weeks under the best conditions, you cannot add additional materials to the heap without “resetting the clock” to day one. To create an ideal batch of fully composted material, your mix needs to “cook” for at least several weeks; if you add additional material, you’ll have a mix of fully decomposed material, partially decomposed material, and fresh materials. It’s simply much easier, and much more desirable to use a consistent mixture of fully decomposed compost for gardening purposes.



Be Careful When Adding These Ingredients!

Sawdust

Because of its very high carbon content, and its very small particle size, sawdust can overwhelm a compost pile. Avoid using sawdust that came from Black Walnut wood, as it contains a chemical that will stunt or prevent the growth of some plants, tomatoes in particular. And, NEVER use sawdust from processed or treated wood. It is full of carcinogens.

Wood Shavings, Chips, and Bark

Like sawdust, the carbon content can overwhelm, and shut down, an otherwise good compost mix. Set them aside, if possible, and let them decompose the old fashioned way, over time ("cold" decomposition).

When and How to Use Compost

Soil Building

Compost is the single best additive for good, even great, garden soil. It improves tilth, fertility, water retention for sandy soils, water drainage for clay soils, and improves your soil's disease fighting characteristics. Add compost in spring and fall, and till it in.

Garden Fertilizer

Compost can be used throughout the season as a garden fertilizer. Simply side dress vegetables and flowers for a slow-release food source and improved disease prevention.