Composting

Compost returns organic matter to the soil in a usable form. Organic matter in the soil improves plant growth by:

- Stimulating the growth of beneficial microorganisms
- Loosening heavy clay soils to allow better root penetration
- Improving the capacity to hold water and nutrients particularly in sandy soils
- Adding essential nutrients to any soil

Improving your soil is the first step toward improving plant health. Healthy plants help clean air, conserve soil, and beautify landscapes.

How Does Composting Help the Environment?

Yard trimmings and kitchen scraps use up valuable space in landfills-space that is running out fast! These materials make up 20-30% of all household wastes. Because of their high moisture content, grass clippings also lower the efficiency of incineration systems. The use of compost can also reduce the use of pesticides and chemical fertilizers in your yard.

What Can I Compost?

All yard trimmings will work, but do not use diseased or infested plants without composting them first. Yard trimmings such as leaves, grass clippings, weeds, thatch, and the remains of garden plants make excellent compost. Other good additions to a compost pile include ground brush, wood ash, and kitchen scraps such as fruit and vegetable peelings, egg shells, and coffee grounds that would otherwise be thrown in the garbage. Care must be taken when composting kitchen scraps. Do not compost meat, bones, and fatty foods such as cheese, salad dressing, and cooking oil. These foods ferment or putrefy, cause odors, and can attract rodents and other nocturnal animals that can be pests.

One concern with composting is the fate of lawn care pesticides. Grass clippings and leaves treated with these products should not be used as mulch immediately after application and mowing, but should be composted. The most widely used pesticides degrade rapidly during composting or become strongly bound to organic matter in the compost.

Biological Process

Bacteria, the most numerous and effective microbes, are the first to break down plant tissue. Fungi and protozoans soon join the bacteria. Often, a white layer forms just beneath the surface of the compost. This is usually due to fungi and actinomycetes, a class of filamentous bacteria. Springtails, mites, and other small insects, as well as earthworms, also play a role in decomposition once the compost has cooled.

Volume

A large compost pile insulates itself and holds the heat of microbial activity. Its center will be warmer than its edges. Piles smaller than three feet cubed (3-4' tall) have trouble holding this heat in the winter, while piles larger than five feet cubed (5-6' tall) do not allow enough air to reach the microbes at the center. These proportions are of importance if your goal is fast, high temperature composting. Large piles are useful for composting diseased plants or trees as the high temperatures will kill pathogens and insects.

Moisture and Aeration

Microbes function best when the compost heap has many air passages and is about as moist as a wrung-out sponge. Extremes of sun or rain can adversely affect this moisture balance. Generally, the moisture content of the compost should be 50-60% on a total weight basis. Wet piles that leach water are deficient in oxygen, and can ferment and cause odor problems. Never cover compost piles with plastic because this does not permit introduction of air. Cured composts can be covered, but this can also cause problems. Compost blankets allow for air exchange but shed rainwater from piles.

How to Prepare and Use Compost

- **1st layer:** 3-4" of chopped brush or other coarse material on top of the soil surface. This material allows air circulation around the base of the heap.
- **2nd layer:** 6-8" of mixed scraps, leaves, grass clippings, etc. Materials should be "sponge damp."
- **3rd layer:** 1"of soil serves as an inoculant by adding microorganisms to the heap.
- **4th layer:** (optional) 2-3" of manure to provide the nitrogen needed by microorganisms. Sprinkle lime, wood ash, and/or rock phosphate over the layer of manure to reduce the heap's acidity. Add water if the manure is dry. Add one pound of urea fertilizer or 10 pounds of composted poultry manure per yard of leaves or ground brush if organic sources of nitrogen are not available. Soak these high carbon materials with water before composting. Manure generally should not be used in cities to reduce the potential for fly problems.
- **5th layer:** Repeat steps 1-4 until the bin is full. Scoop out a "basin" at the top to catch rainwater under summer conditions.

A properly made heap will reach temperatures of about 140° F in 4-5 days. At this time, you will notice the pile "settling." This is a good sign that your heap is working properly. After 3-4 weeks, fork the materials into a new pile, turning the outside of the old heap into the center of the new pile. Add water if necessary. It is best to turn your compost a 2nd or 3rd time. The compost should be ready to use within 3-4 months. Compost is ready to use when it is dark brown, crumbly, and earthy-smelling.

Troubleshooting

- Bad odor = Not enough air
  - Turn the pile and add dry material if too wet
- Center of pile is dry = Not enough water
  - Moisten and turn pile
- Compost is damp and warm only in middle = Too small
  - Add more material and turn pile
- Pile is damp and sweet smelling, but not warm = Lacks nitrogen
  - Add grass clippings, blood meal
- Bad odor = Not enough air
  - Turn it and add dry material if too wet

Compost Bins that Can Be Used at Home

Snow fence bin, Woven wire bin, block bin, wooden pallet bin, turning bins, rotating drum bins can all be used. Prefabricated plastic compost bins can also be purchased at hardware stores, gardening stores, and from catalogs. These are sometimes available from your town or city at below market cost**.**

Source: OSU Ext., Frederick C. Michel, Jr., Joe E. Heimlich, Harry A. J. Hoitink