

Home Composting



OREGON STATE UNIVERSITY
EXTENSION SERVICE

Master Gardener™ Program

WHAT IS COMPOST?

- Compost is organic material that can be added to soil to help plants grow. Food scraps and yard waste currently make up 20 to 30 percent of what we throw away, and should be composted instead. Making compost keeps these materials out of landfills where they take up space and release methane, a potent greenhouse gas.

COMPOST IS MOSTLY JUST 3 THINGS!

- All composting requires three basic ingredients:
- Browns - This includes materials such as dead leaves, branches, and twigs.
- Greens - This includes materials such as grass clippings, vegetable waste, fruit scraps, and coffee grounds.
- Water - Having the right amount of water, greens, and browns is important for compost development.

COMPOST IS MOSTLY JUST 3 THINGS! cont

- Your compost pile should have an equal amount of browns to greens. You should also alternate layers of organic materials of different-sized particles. The brown materials provide carbon for your compost, the green materials provide nitrogen, and the water provides moisture to help break down the organic matter.

3 THINGS MIXED TOGETHER WITH...

- **Air:** Air is essential for composting. If your compost pile needs air, it will tell you by its smell. Compost should not smell bad. If your compost smells, you need to turn your pile to introduce more air into the mix.
- **Heat:** Heat is a product of the decomposition process, but ambient temperature also can play a large roll in this process.
 - ◆ In winter, decomposition takes longer because outdoor temperatures are low; your pile will not have to be turned as often.
 - ◆ In summer, compost “cooks” much more quickly and must be turned frequently.
 - ◆ Your compost pile’s optimum temperature range is 135° -160° Fahrenheit. Temperatures above 160° F will kill the microorganisms that help with decomposition. Temperatures below 140° F will not kill pathogens and weed seeds. All your compost should be exposed to temperature of at least 150° F to be safe and sterile.

SIZE MATTERS ... FOR GREAT COMPOST!

- Your compost pile must be at least 3' - 4' high to reach high enough temperatures
- Size also matters with regard to the materials in the compost pile. Generally, the smaller the pieces, the more quickly and completely the material will decompose.

BROWNS AND GREENS...

THEIR CRITICAL C:N RATIO

When building your compost pile, keep in mind that you want to try to optimize the ratio of BROWNS (Carbon) to GREENS (Nitrogen)

- A **C:N** ratio of 20 is the upper limit at which there is no danger of robbing the soil of nitrogen. If a considerable amount of carbon is in the form of lignin or other resistant materials, the actual **C:N** ratio could be larger than 20. The **C:N** ratio is a critical factor in composting to prevent both nitrogen robbing from the soil and conserving maximum nitrogen in the compost.

THE CRITICAL RATIO: C:N, continued

CARBON NITROGEN (C:N) RATIOS IN FEEDSTOCKS

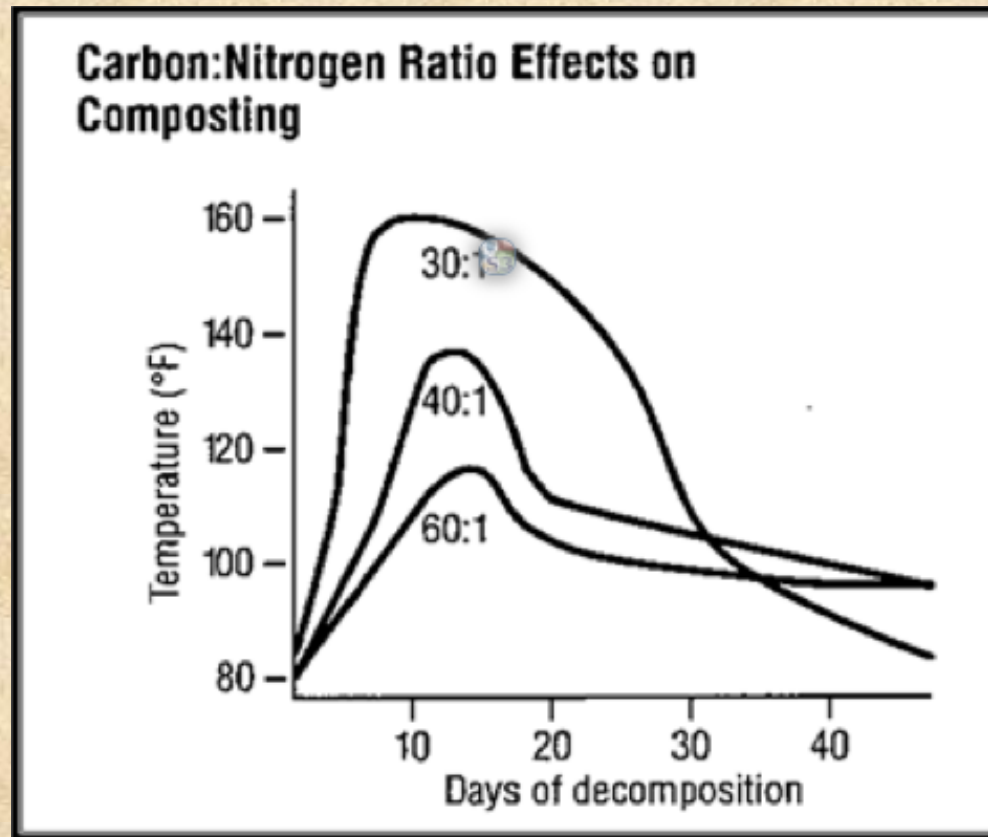
Plant residues are made up largely of the following:

- 1. sugar, starch, simple proteins (decompose rapidly)**
- 2. crude protein (decompose slowly)**
- 3. hemicellulose (decompose slowly)**
- 4. cellulose (decompose slowly)**
- 5. lignin, fat, wax, etc. (decompose slowly)**

Rate of decay and release of nutrients to the soil vary greatly. Likewise, demands of living soil microorganisms vary as they "break down" plant residue. Sawdust (made primarily of lignin and cellulose) uses vast amounts of energy to maintain the lives of microorganisms digesting it. A major product of plant decay is nitrogen (N) while the undigested portion is primarily carbon (C).

THE CRITICAL RATIO: C:N, continued

- The optimum C:N ratio for composting is between 20:1 and 40:1. The higher the ratio, the longer decomposition will take and the lower the temperatures.



C:N RATIOS OF SOIL ORGANIC MATTER

The optimum ratio in soil organic matter is about 10 carbons to 1 nitrogen, or a **C:N** ratio of 10:1. Following are some sample **C:N** ratios of organic matter:

"GREENS"

Sandy loam (fine) 7:1
Humus 10:1
Food scraps 15:1
Alfalfa hay 18:1
Grass clippings 19:1
Rotted manure 20:1
Sandy loam (coarse) 25:1
Vegetable trimmings 25:1

"BROWNS"

Oak leaves 26:1
Leaves, varies from 35:1 to 85:1
Peat moss 58:1
Corn stalks 60:1
Straw 80:1
Pine needles 60:1 to 110:1
Farm manure 90:1
Alder sawdust 134:1
Sawdust weathered 3 years 142:1
Newspaper 170:1
Douglas fir bark 491:1
Sawdust weathered 2 months 625:1

DO I NEED A BIN TO COMPOST?

You absolutely do not need a “bin” to compost. The simple compost pile is often the easiest method to use. A pile can be turned easily with a pitch fork or tractor when it’s on the ground and open on all sides. A critical factor is height: the pile must be at least 4-5 feet high to get it starting heating. If it rains and/or cool weather, it must be covered with clear plastic sheeting. To aerate your pile, just keep turning it over into other piles.



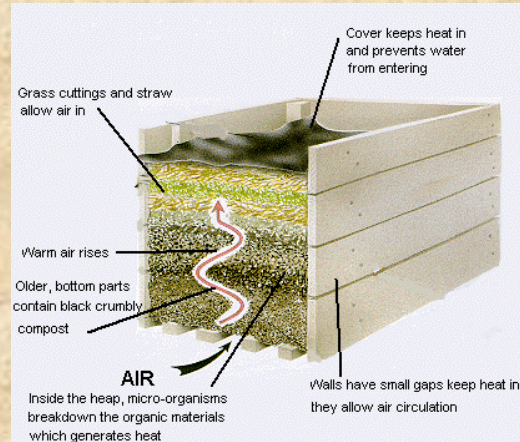
BIN COMPOSTING

DIY: COMPOST BINS

There are three basic designs for home composting: 1-, 2- or 3-bins!
Bins can be constructed easily from old pallets and/or scrap lumber, from fencing wire, bricks, or concrete blocks. The bin does not have to be “pretty” to work – microorganisms don’t care!



Wire-mesh bin



No-turn, sheet composting



One-, Two-, or Three-bin pallet system

COMMERCIAL BINS

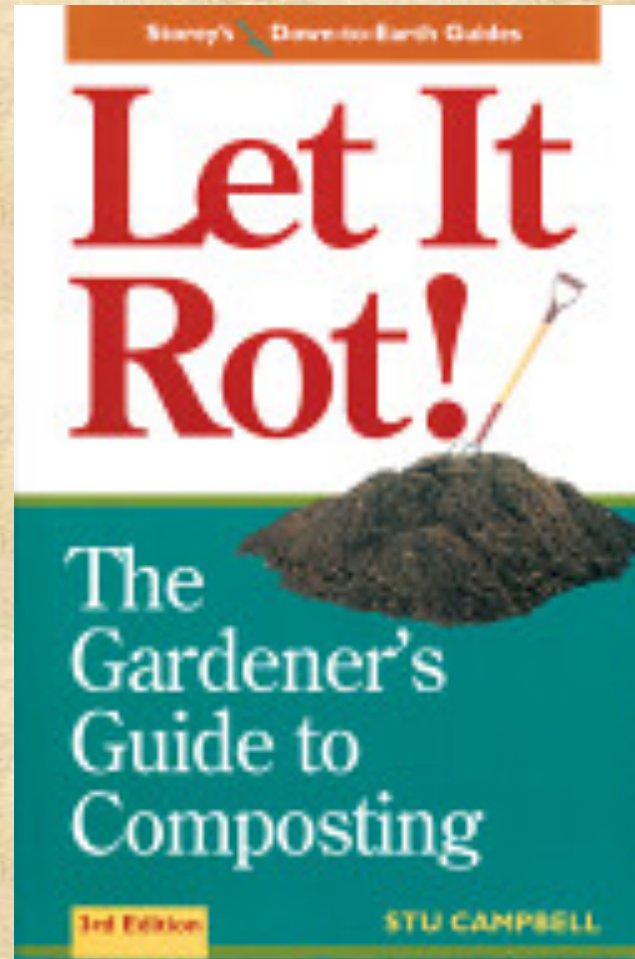
There are many commercial bins available. Our favorite at the Discovery Garden is the so-called, "Darth Vader" style. This bin is easy to turn with an aerator, a garden fork or, the bin can just be picked up and moved close by, the compost shoveled back into the bin at the new site.



Reference:

- **The best all-around, easy-to-read “How-To” for home composting is Stu Campbell’s respected little book.**

Let it Rot!
by Stu Campbell



Composting Info

Websites Used in this Presentation:

- Just “Google” for thousands more sites!
- http://whatcom.wsu.edu/ag/compost/fundamentals/needs_carbon_nitrogen.htm
- <http://www2.epa.gov/recycle/composting-home>
- <http://www.epa.gov/waste/consERVE/tools/greenscapes/pubs/compost-guide.pdf>
- <http://www.savvybrown.com/green-living-2/composting-for-dummies-pt-2-outdoor-composting/>

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