



REAP A HEAP OF BENEFITS! GUIDE TO HOME COMPOSTING

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COMPOSTING AT HOME

Composting is a practical and convenient way to handle yard trimmings. It's easy to do, keeps useful materials from being disposed in landfills, and compost improves soil and benefits plants growing in it.

WHY DOES COMPOST MAKE SOIL HEALTHIER?

Improving soil is the first step to improving the health of plants. Healthy plants help keep air clean, conserve soil, and beautify landscapes. Compost returns organic matter to the soil in a usable form. The organic matter improves plant growth by;

- loosening heavy clay soils,
- allowing for better root penetration,
- improving the capacity of sandy soils to hold water and nutrients, and
- adding essential nutrients to any soil.

HOW DOES COMPOSTING HELP OUR ENVIRONMENT?

According to the United States Environmental Protection Agency (*Characterization of Municipal Solid Waste in the United States, 1997 Update, May 1998*), yard trimmings and kitchen scraps make up 20-30% of all household waste, take up space in landfills, and create landfill leachate as they decompose. Because of their high moisture content, yard trimmings also lower the efficiency of incineration systems (there are no incineration systems in Santa Clara County). By recycling these wastes naturally at home, folks can save money and improve the soil at the same time.

ESSENTIALS OF COMPOSTING

With these principles in mind, everyone can make excellent use of their organic waste

BIOLOGICAL PROCESS

The compost pile is really a teeming microbial farm. Bacteria, the most numerous and effective “composters,” are the first to break down plant tissue. Fungi and protozoas soon join the bacteria. Later in the cycle, centipedes, millipedes, beetles and earthworms do their part to convert materials into a beneficial soil amendment.

MATERIALS AND THE CARBON-NITROGEN RATIO

Anything growing in a yard is potential food for these tiny decomposers. Microorganisms use the carbon in leaves and woodier waste as an energy source. Nitrogen provides the microbes with the proteins to build their bodies.

Everything organic has a ratio of carbon to nitrogen (C:N) in its tissues, and a *C:N ratio of 30:1 is ideal* for the activity of compost microbes. This combination is the “backbone” of most compost systems and balance can be achieved by mixing two parts grass clippings with one part fallen leaves. The following table can help you judge the ratio of your compost ingredients.

CARBON NITROGEN (C:N) RATIO

- | | | |
|------------------------|---------------------|-----------------|
| • Alfalfa Hay 12:1 | • Fruit Wastes 35:1 | • Straw 80:1 |
| • Food Wastes 15:1 | • Leaves 60:1 | • Sawdust 500:1 |
| • Grass Clippings 19:1 | • Cornstalks 60:1 | • Wood 700:1 |

WHAT CAN I COMPOST?

Yard trimmings such as fallen leaves, grass clippings, weeds, and the remains of garden plants make excellent compost. Other good additions include sawdust, wood ash, and kitchen scraps such as fruit and vegetable peelings, egg shells, and coffee grounds.

WHAT SHOULDN'T BE COMPOSTED

Do not compost meat, bones and fatty foods such as cheese, salad dressing, and cooking oil. These foods will attract pests and slow decomposition. Grass clippings which have been treated with pesticides should not be used to make compost or mulch. Some of these chemicals take up to six weeks to break down, so treated grass clippings should not be composted or mulched.

SURFACE AREA

The more surface area the microorganisms have to work on, the faster the materials decompose. Chopping your garden waste with a shovel or machete, or running them through a shredding machine or lawnmower will speed their composting.

VOLUME

A large compost pile will insulate itself and hold the heat of microbial activity. Its center will be warmer than its edges. Piles smaller than 3'x3'x 3' (27 cu. ft.) will have trouble holding this heat. Piles larger than 5'x 5'x 5' (125 cu. ft.) don't allow enough air to reach the microbes at the center. These proportions are of importance only if your goal is fast, hot compost. Slower composting requires no exact proportions.

MOISTURE & AERATION

Life on earth, including compost microbes, needs a certain amount of water and air to sustain itself. Microbes function best when a 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.

HOW TO MAKE A COMPOST HEAP

Non-woody yard trimmings are the most appropriate for composting, and avoid composting diseased or infested plants. The following "recipe" for constructing your compost heap is recommended for best results. First, remove grass and sod cover from the area where you plan to put your composting bin, or pile. Be sure that the pile will have direct contact with the soil and its microorganisms. Next, starting from the soil, build the pile as follows:

- *1st layer:* 3"- 4" of chopped brush or other coarse material on top of the soil surface to allow for air circulation around the base of the heap.
- *2nd layer:* 6"- 8" of mixed kitchen scraps, leaves, grass clippings, sawdust, etc. Materials should be "sponge damp."
- *3rd layer:* 1" of soil to serve as an inoculant by adding microorganisms to the heap.
- *4th layer:* 2"- 3" of manure to provide 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.
- *5th layer:* Repeat steps 1-4 until the bin is almost full. Top off the heap with a 4'-6" layer of straw, and scoop out a basin at the top to catch rain water.

TIME & TEMPERATURE

A properly constructed heap will reach temperatures of 140-160 degrees F in four to five days. Keep in mind that the faster the composting, the hotter the pile. As the pile decomposes you will notice the pile settling, a good sign your heap is working properly. After 5 – 6 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. You shouldn't need to turn your heap a second time. The compost should be ready to use in 3 – 4 months. A heap started in late spring can be ready for use in the autumn. Start another heap in autumn for use in the spring.

If you use materials with a proper C:N ratio, have a large amount of surface area, a big enough volume, adequate moisture and aeration, you'll have a hot and fast compost and will probably want to use one of the turning bins discussed in the next section.

SPEEDING UP THE COMPOSTING PROCESS

You can make compost even faster by turning the pile more often. Check the internal temperature regularly; when it decreases substantially (usually in about one week), turn the pile.

WHEN COMPOST IS READY TO USE

Compost is ready to use when it is dark brown and "earthy" smelling. Let it stabilize for a few extra days, and sift it through a half-inch screen if you want the best product. Turn your regular soil, apply 1" - 3" layers of compost, working it in well, up to one pound (a heaping, double handful) per square foot.

COMPOST BIN OPTIONS

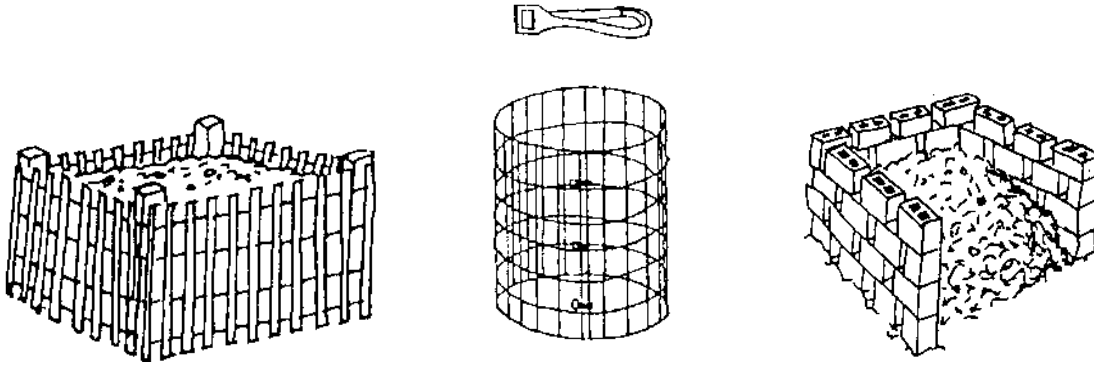


Holding Bins

Portable containers may be the simplest way to compost. Place the holding bin where it is most convenient. Deposit weeds, grass clippings, leaves, and garden trimmings as they are collected. This method will take from six months to two years to produce compost. Chopping or shredding wastes, alternating high carbon and high nitrogen materials, and keeping good moisture and aeration will speed up the process.

Pre-fabricated Bins

These convenient compost bins can be purchased through most gardening catalogues and home improvement stores—and cities sometimes offer special pricing and sales events. Or, for a lower cost, you can construct one of the following;



Woven Wire Bin

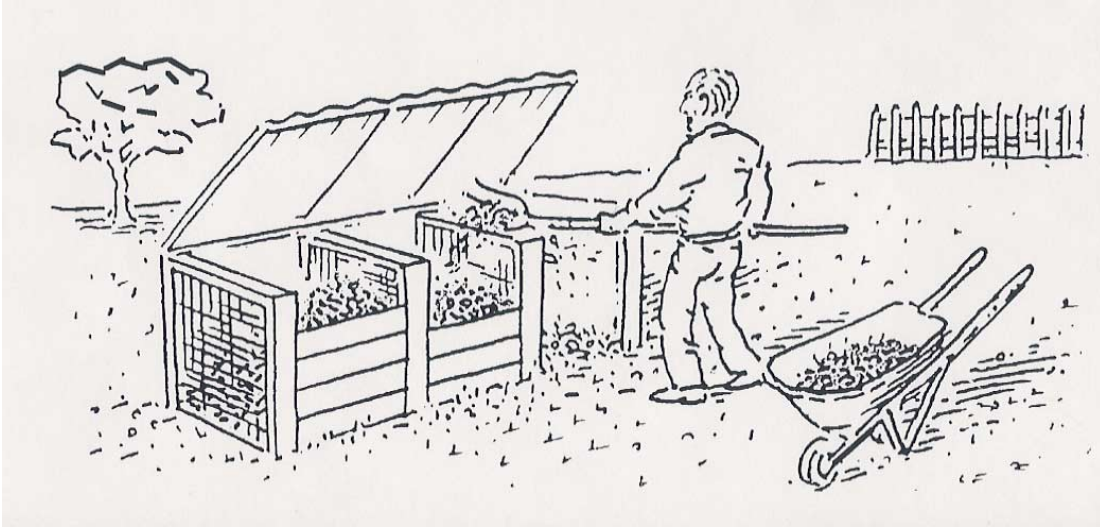
One easy to make, economical container requires only a length of woven wire fencing. Multiply the diameter you want for the compost heap by 3.2. That's the length of fencing you should buy. Fasten the ends with wire, or three or four small chain snaps (available at any hardware store) to make a circle.

Block or Brick Bin

Compost bins can be made with bricks, cement blocks, or rocks. Just lay the blocks without mortar. Leave space between each block to permit aeration. Pile them up to form three sides of a square container or a three-bin unit. This bin is sturdy, durable, and easily accessible.

Wooden Bin

Covered wooden bins allow convenient protection from pests and heavy rains. Construct bins with removable fronts and sides so that materials can be easily turned. Old wooden pallets can be used for construction. Wire mesh can be substituted for wooden sides to increase air flow.



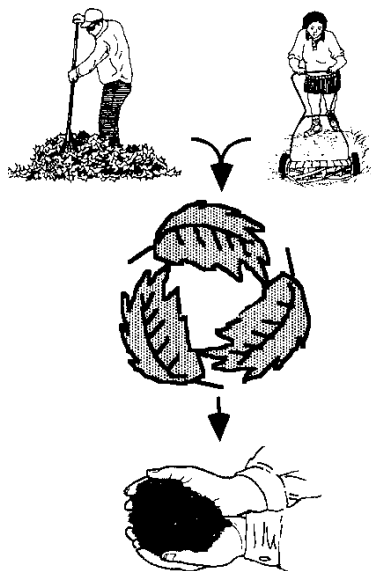
Turning Bins

A series of three or more bins allow you to make compost in a short time by turning the materials on a regular schedule. Turning bins are most appropriate for gardeners with a large volume of yard waste, and a desire to make a high-quality compost. You can also turn your compost with only one bin. Simply remove the bin from around the heap when it's time to turn it, set up the empty bin nearby, and fork the material back into it.



LOTS OF TRIMMINGS AND LARGE WOODY MATERIALS? TRY MULCHING!

All yard wastes can be first used as a mulch and then as a soil enrichment as decomposition proceeds. Woody yard wastes, leaves, and grass clippings can be spread beneath plants to control weeds and retain water. For woody materials up to 1" in diameter, rent or purchase a chipper/shredder, or cut materials with hand tools. These "chips" can also be used for informal garden paths.



TROUBLESHOOTING CHART

Use this as a guide to more efficient composting

SYMPTOM	PROBLEM	SOLUTION
The compost has a bad odor	Not enough air in the pile	Turn the pile, add dry material if the pile is too wet.
The center of the pile is dry.	Not enough water in the pile	Moisten and turn the pile.
The compost is damp and warm only in the middle.	The pile is too small.	Add more material and mix it all into a new pile.
The pile is damp and sweet smelling but will not heat up.	Not enough nitrogen in the pile.	Mix in a nitrogen source like fresh grass clippings, or manure.