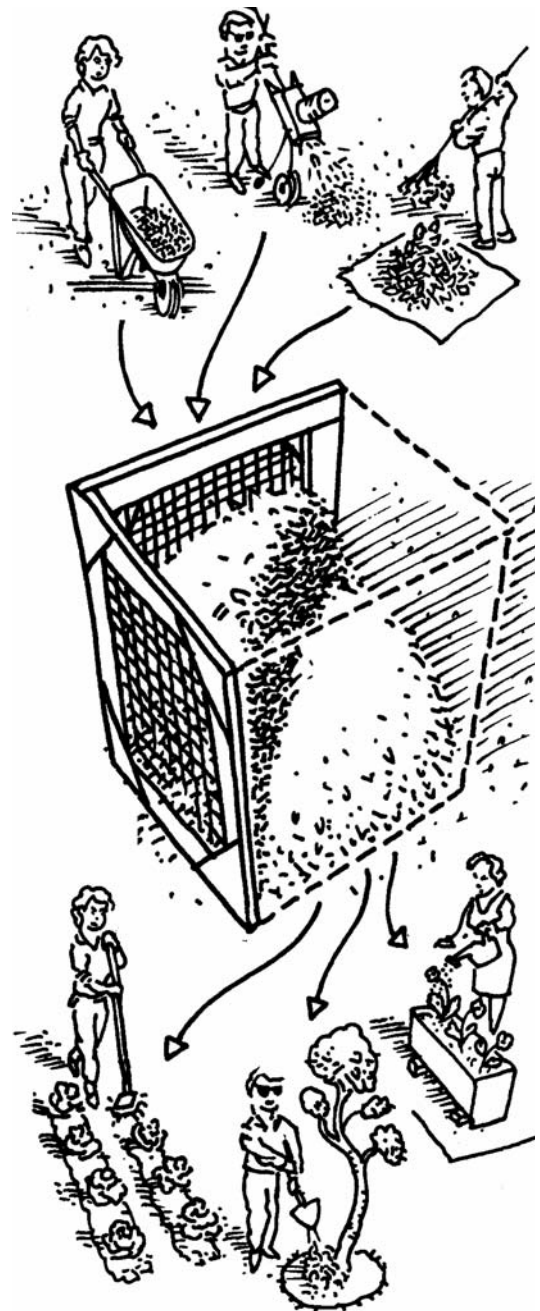


HOME COMPOSTING



COMPOST FLOW CHART

What is Compost?

Compost is a dark, crumbly, and earthy-smelling form of decomposing organic matter.

Why Should I Make Compost?

Composting is the most practical and convenient way to handle your yard wastes. It can be easier and cheaper than bagging these wastes or taking them to the transfer station. Compost also improves your soil and the plants growing in it. If you have a garden, a lawn, trees, shrubs, or even planter boxes, you have a use for compost.

By using compost you return organic matter to the soil in a usable form. Organic matter in the soil improves plant growth by helping to break up heavy clay soils and improving their structure, by adding water and nutrient-holding capacity to sandy soils, and by adding essential nutrients to any soil. Improving your soil is the first step toward improving the health of your plants. Healthy plants help clean our air and conserve our soil, making our communities healthier places in which to live.

What Can I Compost?

Anything that was once alive can be composted. Yard wastes, such as fallen leaves, grass clippings, weeds and the remains of garden plants, make excellent compost. Woody yard wastes can be clipped and sawed down to a size useful for the wood stove or fireplace or they can be run through a shredder for mulching and path-making. Used as a mulch or for paths, they will eventually decompose and become compost.

Care must be taken when composting kitchen scraps. Compost them only by the methods outlined in this brochure. Meat, bones and fatty foods (such as cheese, salad dressing, and leftover cooking oil) should be put in the garbage.

How Can I Use Compost?

Compost can be used to enrich the flower and vegetable garden, to improve the soil around trees and shrubs, as a soil amendment for houseplants and planter boxes and, when screened, as part of a seed-starting mix or lawn top-dressing. Before they decompose, chipped woody wastes make excellent mulch or path material. After they decompose, these same woody wastes will add texture to garden soils.

The Essentials of Composting

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



Biology

The compost pile is really a teeming microbial farm. Bacteria start the process of decaying organic matter. They are the first to break down plant tissue and also the most numerous and effective composters. Fungi and protozoans soon join the bacteria and, somewhat later in the cycle, centipedes, millipedes, beetles and earthworms do their parts.



Materials

Anything growing in your yard is potential food for these tiny decomposers. Carbon and nitrogen, from the cells of dead plants and dead microbes, fuel their activity. The micro-organisms use the carbon in leaves or woodier wastes as an energy source. Nitrogen provides the microbes with the raw element of proteins to build their bodies.

Everything organic has a ratio of carbon to nitrogen (C:N) in its tissues, ranging from 500:1 for sawdust, to 15:1 for table scraps. A C:N ratio of 30:1 is ideal for the activity of compost microbes. This balance can be achieved by mixing two parts grass clippings (which have a C:N ratio of 20:1) with one part fallen leaves (60:1) in your compost. Layering can be useful in arriving at these proportions, but a complete mixing of ingredients is preferable for the composting process. Other materials can also be used, such as weeds and garden wastes. Though the C:N ratio of 30:1 is ideal for a fast, hot compost, a higher ratio (i.e., 50:1) will be adequate for a slower compost. Table 1 provides an estimate for the C:N ratio of common materials.



Surface Area

The more surface area the micro-organisms have to work on, the faster the materials are decomposed. It's like a block of ice in the sun-slow to melt when it's large, but melting very fast when broken into smaller pieces. Chopping your garden wastes 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 feet cubed (27 cu.ft.) will have trouble holding this heat, while piles larger than 5 feet cubed (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 a fast, hot compost.



Moisture & Aeration

All life on Earth needs a certain amount of water and air to sustain itself. The microbes in the compost pile are no different. They function best when the compost materials are about as moist as a wrung-out sponge, and are provided with many air passages. Extremes of sun or rain can adversely affect this moisture balance in your pile.



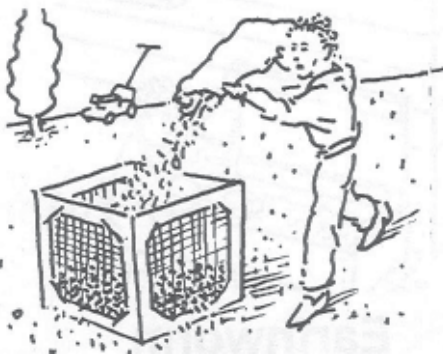
Time & Temperature

The faster the composting, the hotter the pile. If you use materials with a proper C:N ratio, provide a large amount of surface area and a big enough volume, and see that moisture and aeration are adequate, you will have a hot, fast compost (hot enough to burn your hand!) and will probably want to use the *turning unit* discussed in the next section. If you just want to deal with your yard wastes in an inexpensive, easy, non-polluting way, the *holding unit* (also discussed on the next page) will serve you well.

Material	C:N Ratio
Sawdust	200-750
Peatmoss	50
Straw	50-150
Cow manure	20
Poultry manure	3-15
Horse manure	20-50
Leaves from oak	40-80
Sun-dried grass clippings	20
Fresh grass clippings	15
Fresh garden debris	20
Vegetable wastes	~12
Garbage (food waste)	~15
Hay from legumes	15-20
Hay-general	15-32
Corrugated cardboard	~560
Newsprint	~400-850

Table 1
Some Typical C/N Ratios
(based on dry weight)

Composting Yard Wastes



Holding Units

These simple containers for yard wastes are the least labor and time-consuming way to compost.

Which wastes? Non-woody yard wastes are the most appropriate.

How? Place the holding unit where it is most convenient. As weeds, grass clippings, leaves and harvest remains from garden plants are collected, they can be dropped into the unit. Chopping or shredding wastes, alternating high-carbon and high-nitrogen materials, and keeping up good moisture and aeration will all speed the process.

Advantages & disadvantages For yard wastes this is the simplest method. The units can be portable, moving to wherever needed in the garden. This method can take from 6 months to 2 years to compost organic materials, so you need to be patient. Because it does not get hot, weed seeds (and pathogens if present) may persist in the compost.

Variations Holding units can be made of circles of hardware cloth, old wooden pallets, or wood and wire. Sod can also be composted with or without a holding unit, by turning sections of it over, making sure that there is adequate moisture, and covering it with black plastic.



Turning Units

This is a series of three or more bins that allows wastes to be turned on a regular schedule. Turning units are most appropriate for gardeners with a large volume of yard waste and the desire to make a high-quality compost.

Which wastes? Non-woody yard wastes are appropriate. Kitchen wastes without meat, bones or fatty foods can be added to the center of a pile if it is turned weekly and reaches high temperatures.

How? Alternate the layering of high-carbon and high-nitrogen materials to approximately a 30:1 ratio. These should be moistened to the damp sponge stage. The pile temperature should be checked regularly; when the heat decreases substantially, turn the pile into the next bin. Dampen the materials if they are not moist, and add more high-nitrogen material if heating is not occurring. Then make a new pile in the original bin. Repeat the process each time the pile in the first bin cools. After two weeks in the third bin, the

compost should be ready for garden use. See the *Rodale Guide to Composting* in your library for more information on hot composting.

Advantages & disadvantages This method produces a high-quality compost in a short time utilizing a substantial input of labor.

Variations The unit can be built of wood, a combination of wood and wire, or concrete block. Another type of turning unit is the barrel composter, which tumbles the wastes for aeration.

The following troubleshooting chart is a guide to more efficient composting using a turning unit.

Sympton	Problem	Solution
The compost has a bad odor	Not enough air.	Turn it. Add coarser materials.
The center of the pile is dry.	Not enough water.	Moisten materials while turning the pile.
The compost is damp & warm in the middle, but nowhere else.	Too small.	Collect more material & mix the old ingredients into a new pile.
The heap is damp and sweet-smelling but still will not heat up.	Lack of nitrogen.	Mix in a nitrogen source like fresh grass clippings, fresh manure, bloodmeal or ammonium sulfate.

Composting Food Wastes



Mulching

Yard wastes can be used for weed control and water retention.

Which wastes? Woody yard wastes, leaves, and grass clippings.

How? You can simply spread leaves or grass clippings beneath plantings. For woody materials up to 1" in diameter, rent or purchase a chipper/shredder. Tree services, if they are in your neighborhood, often will deliver wood chips free.

Advantages & disadvantages All yard wastes will work first as a mulch and then, as decomposition proceeds, as a soil enrichment. A disadvantage of mulching with woody yard wastes is that you may have to buy or rent power equipment or make arrangements with a tree service.

Variations Use chipped materials for informal garden paths.



Soil Incorporation

Burying your organic wastes is the simplest method of composting.

Which wastes? Kitchen scraps without meat, bones or fatty foods.

How? Everything should be buried at least 8 inches below the surface. Holes can be filled and covered, becoming usable garden space the following season.

Advantages & disadvantages This is a simple method, but because of the absence of air, some nutrients will be lost. Rodents and dogs can become a problem with wastes buried less than 6 inches deep.

Variations Using a posthole digger, wastes can be incorporated into the soil near the drip line of trees or shrubs and in small garden spaces.



Earthworm Compost

Feeding earthworms in wooden bins is a good way to make high-quality compost from food scraps.

Which wastes? Kitchen scraps without meat, bones, or fatty foods.

How? Fill a bin with moistened bedding such as peat moss for the worms. Rotate the burying of food wastes throughout the worm bin. Every 3-6 months the worm population should be divided and moved to fresh bedding. Refer to *Worms Eat My Garbage* by Mary Appelhof (available at some library branches) for more information.

Advantages & disadvantages This is an efficient way to convert food wastes into high-quality soil for houseplants, seedling transplants, or general garden use. The worms themselves are a useful product for fishing. However, worm composting is more expensive and complicated than soil incorporation for dealing with food wastes.

Variations A stationary outdoor bin can be used in all but the coldest months, or a portable indoor/outdoor bin can be used year-round.

This brochure is available on our "Small Scale or Backyard Composting" site:

<http://cwmi.css.cornell.edu/smallscalecomposting.htm>

For More Information

For more information about composting, contact your county Cooperative Extension Office.



Adapted by the Cornell Waste Management Institute, Dept of Crop and Soil Sciences, Rice Hall, Ithaca NY 14853
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from the Seattle Tilth Association.