

## Successful Composting Made Easy

**B**ackyard composting takes advantage of the natural cycle of plants living, dying, and then decomposing to pass their vitality to new generations of plants. The end product — compost — is a tremendous source of nutrients for plants that also dramatically improves the texture and fertility of your soil.

- Compost improves soil structure, texture, and aeration, and increases water-holding capacity. Your plants will grow stronger, deeper root systems for better drought and disease resistance.
- Compost adds beneficial organisms to the soil. These microorganisms and soil fauna help break down organic materials and convert nutrients into a more available form for plants.
- Compost is a disease-free and weed-free soil amendment. The heat generated during the composting process destroys most weed seeds, perennial roots, and pathogens.
- Compost is a superior mulch. When you mulch with compost, you're adding about twice the nutrients of an uncomposted mulch (like straw or bark chips).

### What You Need to Make Compost

The whole composting process starts with the natural interaction of organic materials and microorganisms. Since it's the microorganisms that do the work to decompose your materials, you'll want to provide the best possible environment for them to work in. There are four basic ingredients in any good compost pile:

#### Carbon

Carbon provides the energy food for microorganisms, just like carbohydrates provide energy food for us. Most of the materials you'll be trying to turn into compost are high in carbon. They include dry, tough, fibrous plant materials like leaves, straw, sawdust, shredded paper, and cornstalks.

#### Nitrogen

High nitrogen materials provide the protein microorganisms need to break down the carbon.

Fresh weeds, grass clippings, over-ripe fruits and vegetables, and kitchen scraps are probably the primary high-nitrogen materials that you will have on hand. Other high-nitrogen materials like kelp meal, manure, or blood meal can also be added to provide additional protein for the microorganisms.

#### Water

Moisture is an important part of the composting process. Too much moisture will force out the air and suffocate the microorganisms. Too little moisture will slow the decomposition process. The best way to determine if your pile is moist enough is to squeeze a handful of the material from your compost pile. It should have the moisture content of a well-wrung sponge. If you need to add water, (unchlorinated water is best because chlorine slows the bacterial activity), insert your garden hose into the middle of the pile in several places. If you're using a compost tumbler, simply sprinkle water into the barrel, turn it to mix the materials, and then water again. Take care not to saturate your materials too much. As a general rule of thumb, water your materials thoroughly when you're first putting them together and then check the moisture content occasionally.



## Oxygen

To do their work most efficiently, microorganisms require lots of oxygen. Aerating (turning) your pile is the best way to introduce fresh oxygen, but there are several other ways to do it. Building your pile on top of a wood pallet will allow air to reach the pile from below. Inserting pieces of ventilated pipe into your pile is another way to increase air flow or use a compost aerator tool to poke holes in the pile. Adding bulky materials like corn stalks, leaves, and wood chips also help to create air channels because these materials don't compress easily.

### Putting It All Together

There are many different recipes for making compost. Your own concoction will depend upon what materials you have on hand. Because some materials degrade more quickly than others, the rate at which the materials in your compost pile decompose will also vary. When nature accumulates leaves, grass, and other

organic materials on the ground, the rate of decomposition is relatively slow — often a year or two. But a field of freshly mown grass will heat up and decompose quickly in just a few weeks.

Most avid composters try to blend specific materials in their compost pile to get the fastest decomposition possible. If that's your goal, the key is to create the right balance of carbon materials to nitrogen materials so that the microorganisms will work efficiently and quickly. (If speed is not the driving factor, you

can be confident that mother nature is on your side and everything will gradually decompose anyway — with or without your help!)

This relationship between carbon and

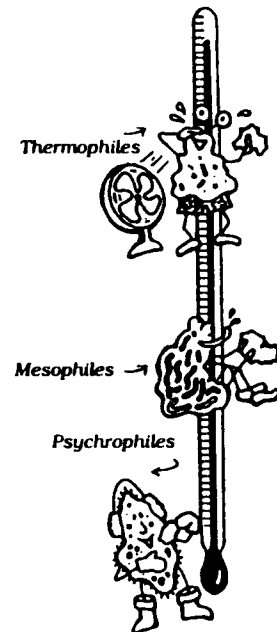
nitrogen in a compost pile is called the carbon to nitrogen ratio. Although every organic material contains both carbon and nitrogen, materials that contain a high percentage of carbon (like straw, wood chips or sawdust) are considered "carbon". Materials that are high in

### CARBON-NITROGEN RATIOS OF COMMON COMPOST PILE INGREDIENTS

Grass Clippings	25:1
Oak Leaves	50:1
Straw	80:1
Rotted Manure	20:1
Grass Clippings	25:1
Sawdust	400:1
Kitchen scraps	25:1

nitrogen (like freshly pulled weeds) are called "nitrogen". The ideal ratio for effective composting is approximately 25 parts carbon to 1 part nitrogen. (see inset for examples). If the carbon number is too high, your compost pile will take much longer to decompose. If it's too high in nitrogen, you'll have a soggy, smelly pile. Because it's difficult to determine the carbon to nitrogen ratio exactly, (grass clippings lose much of their nitrogen content if they're left sitting on the lawn for a day), we've included three successful recipes on the last page of this bulletin — one

from a customer and two from staff members. Remember that these recipes are just for reference. Composting is for creative cooks, and we'd love to know what works best for you!



### Microbes at Work!

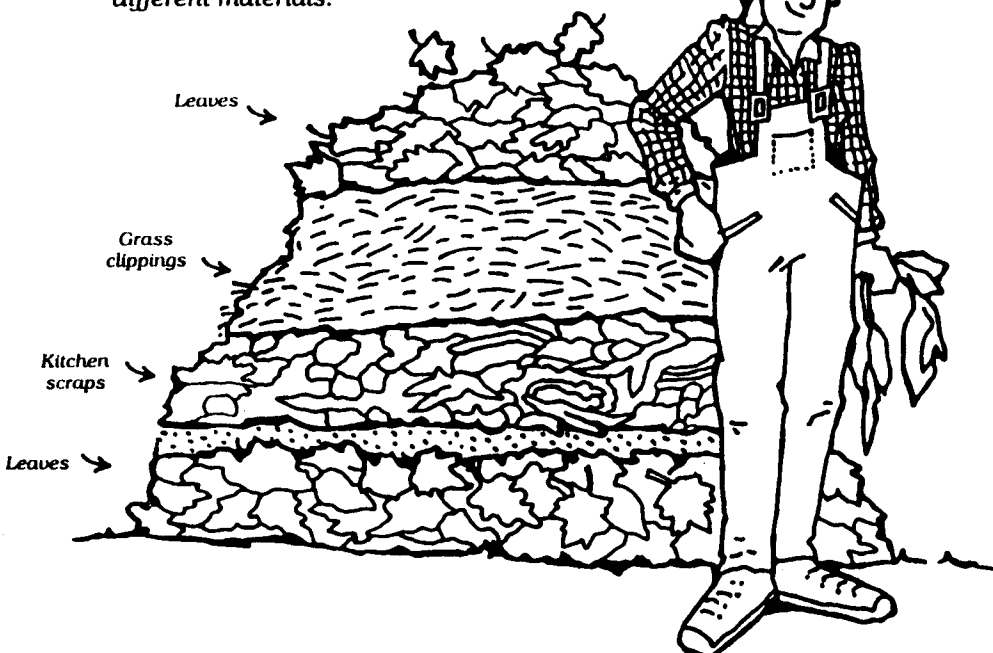
Once you've created your pile, or your bin is full, the

microorganisms will get right to work. There are three types of microorganisms that work to digest the materials in a compost pile. They each work best at a particular temperature range.

The psychrophiles like cool temperatures — even as low as 28° F, so they will be doing most of the work during the winter months. As they digest carbon in the organic matter, heat is given off. When the temperature rises to 60°-70°F, the mesophilic bacteria take over. They are responsible for the majority of the decomposition.

If the mesophiles have the right food, air, and water, they work so hard at digesting carbon that they raise the temperature above 100° F and at this point the thermophilic

For best results, alternate layers of different materials.



bacteria kick in. It is these bacteria that can raise the temperature high enough to kill disease-causing organisms and weed seeds. Three to five days of about 155° F is long

### DON'T PUT THESE IN THE PILE!

*These materials do not break down easily and will attract rodents and other four footed creatures.*

- Pet manure
- Meat and bones
- Dairy products
- Fat or grease
- Trash or plastic

enough for the thermophiles to do their best work. Then the temperature starts to drop, and when it reaches around 90-100° F, the compost is ready to use (or ready to be turned— see below).

You'll be amazed at how much your compost pile will shrink when the microorganisms are actively working. You may need to add more green materials after the first week or so to replenish the supply of nitrogen needed by the microorganisms so that they can complete their job.

Compost can be started any time of the year, but expect the bacterial activity in your pile to cease during sub-freezing temperatures. When the weather warms up, the pile will resume "cooking".

### Turning Your Pile

Turning your compost pile (or rotating it in a compost tumbler), mixes the carbon and nitrogen materials together and helps bring undecomposed material into contact with the microbes. In this way, turning improves the efficiency of the composting process. Turning also helps to aerate the pile. One way to tell how often to turn your pile is to monitor the temperature inside it with a composting thermometer. When the temperature dips below about 110° F, turn the pile with a pitchfork or compost aerator tool. Be sure to bring the undecomposed material on the outside edges of the

pile into the center, where the microbes can work on them. Each turning will raise the temperature as long as there is still undecomposed material to be broken down. Once the turning results in no increase in temperature, your compost is probably ready.

A fast-working pile may benefit from being turned every 3 days. While turning can speed the composting process, it also releases heat into the air. During cold weather, you should turn your pile less often and avoid turning it during chilly winds.

### There's a Compost Bin for Every Yard

You can choose from many different types of composters on the market, or you can make your own. Wire bins are inexpensive; wooden bins are more aesthetically appealing; closed bins are more efficient. A compost heap that has most of its surface area exposed to the elements will decompose more slowly than material in an enclosed composter such as the Soil Saver or Green Magic Tumbler. If you want to make compost year-round, or if you wish to make compost more quickly, try an enclosed composter. But don't get your hopes up for year-round outdoor composting if you live where there are prolonged sub-freezing temperatures during the winter. In that case, you may have to let the organic matter accumulate until spring.

### How to Get Super-Fast Compost

**Chip or shred the raw materials.** Small pieces of organic matter will decompose more quickly than large chunks. Chop the material up any way you can. The easiest way is with the help of a lawn mower (for grass and leaves) or a chipping/shredding machine. (Contact us for more information on our Bio-Cycler Chipper/ Shredder.)

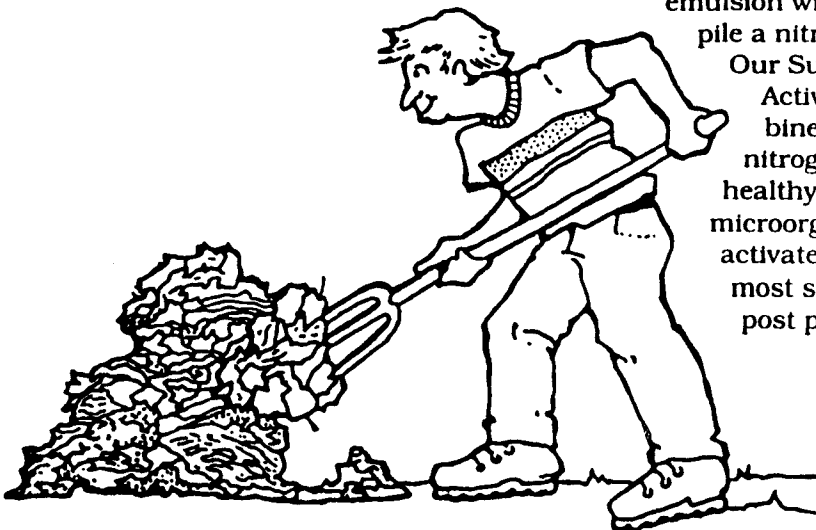
**Turn your pile every 3-5 days.** You can greatly reduce the composting time by turning your pile. Yes it's work (unless you have a barrel like the Green Magic Tumbler), but it's worth it if your goal is fast composting.

**Use an enclosed composter.** A compost bin that has sides and a top will retain heat and help speed up the composting process. In dry climates, an enclosed bin will also make it much easier for you to maintain an adequate moisture content.

**Try an activator.** Activators like BioActivator contain microorganisms that hasten the decomposition of materials. They are especially helpful if your compost pile is not in contact with the soil.

Another kind of activator is a high nitrogen/protein activator. This can be helpful if you are short on nitrogen materials in your pile. Blood meal, alfalfa meal, and fish emulsion will give your pile a nitrogen boost.

Our SuperHot Activator combines a boost of nitrogen with a healthy supply of microorganisms to activate even the most sluggish compost pile.



## What to Do When Your Compost Pile Won't Cook

Fresh compost materials will decompose quickly at first, but at some point the decomposition process will begin to slow down. Usually turning the pile will get it going again, but what do you do when the pile just sits there? Here's an easy troubleshooting checklist:

- Materials are too dry. Leaves and grass clippings can dry out quickly during the summer months. Try to keep your compost materials moist to the touch.
- Too many leaves or carbon materials. Fast-working microorganisms can quickly consume all the nitrogen and leave an imbalanced amount of carbon materials behind. Replenish nitrogen content of your pile with fresh green garden weeds, kitchen scraps, fertilizer, or SuperHot Activator.
- Smelly compost. If your pile smells like ammonia, it contains too much nitrogen. Add carbon materials like straw, leaves, or hay to correct the balance.
- Soggy Compost. Dense or waterlogged compost piles don't contain enough oxygen for the microorganisms to survive. Often these piles give off an unpleasant odor. The solution is to aerate the pile and add more dry materials.

### WHAT'S HUMUS?

*Humus (pronounced "Hew-mus") is well-rotted compost that is fine-textured, dark, rich, and crumbly. It is the ultimate compost and is often referred to as "garden gold". Don't confuse "humus" with "hummus" (pronounced hum-mus), which is a delicious middle eastern dish that's meant to be eaten, not spread around on your garden!*

## You're Ready to Begin

After giving you all this advice, the most important message to leave you with is that composting (just like gardening), is part science and part creative flair. Don't be disappointed if your first batch takes longer to decompose than you expected. You'll no doubt make some changes with every batch you make. That's part of the fun.

There's no such thing as a "bad" batch of compost. Nature is on your side! If you get stumped, give us a call at 800-950-4470. We're always happy to help.



## Compost Recipes

### Recipe 1

In a Soil Saver Composter sprinkle BioActivator between each of the following layers:

- A 3" layer of fresh cut grass
- A 3" layer of leaves
- A 3" layer of good soil

Repeat layers until the composter bin is full. I turn or aerate my pile each day for at least 15 minutes. This keeps the material loose and mixed up.

*from John Wadlington,  
Wheaton, IL*

### Recipe 2

In a Green Magic Tumbler layer

- Fresh grass clippings
- Green materials (weeds or 12" kitchen scraps)
- Shredded leaves

Make a 6" layer of each ingredient. Sprinkle each layer with water, and add a small shovelful of good garden soil, and some

Super Hot compost starter. Turn the tumbler every 3 days. For tough leaves like oak or camellias, you'll need to add more Super Hot between layers.

*from Mel Buss,  
GSC Research and  
Development Manager*

### Recipe 3

In a 4' x 4' x 4' open pile layer:

- 4" fresh grass clippings
- 4" straw or spoiled hay
- 1" of soil for each layer

Sprinkle each layer with water. The temperature of the pile will rise gradually. Once the temperature of the pile drops, turn the materials with a pitchfork and sprinkle with water if needed. You can incorporate new materials if you don't need the compost right away.

*from Matt O'Brien,  
GSC Telephone Sales Manager*

**GARDENER'S  
SUPPLY COMPANY**  
AMERICA'S GARDENING RESOURCE