



Easy Gardening

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If we composted many of the things we throw away, such as kitchen scraps, grass clippings, leaves, and other landscape debris, we could divert 20 to 30 percent of the trash currently going into landfills. By composting these materials, we can reduce the amount of waste we generate and produce organic matter and nutrients for our garden, landscape and yard.

Composting is simply the process of organic material decomposition. The resulting substance is called compost. Every garden benefits from the addition of compost because it supplies many of the nutrients plants need and also

- Improves the soil's physical characteristics
- Increases the soil capacity to hold water and nutrients
- Increases soil aeration

Materials for Composting

Many materials can be put in compost piles, including:

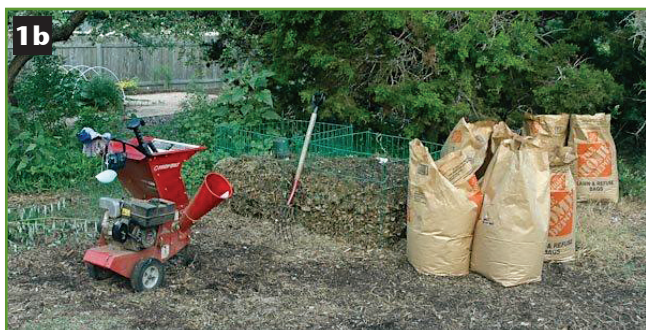
- *Kitchen scraps.* Fruit and vegetable trimmings, coffee grounds and filters, and eggshells are great items for the compost pile. Do not use animal products such as grease, fat or meat trimmings, or dairy products because they break down very slowly, attract rodents and other pests, and have an unpleasant odor when they decompose.
- *Grass clippings.* Grass clippings (Fig. 1a) have relatively high nitrogen content and make good compost. Mix green, fresh clippings with soil or dry plant material such as leaves to keep the grass from compacting as it settles. Compaction prevents air from entering the pile and slows or prevents the composting process.
- *Dry leaves.* These are plentiful in the fall, and rather than putting them out by the curb, put them in your compost pile. Most leaves decompose faster and more thoroughly when shredded before they are added to the pile. If

you do not have a shredder, place the leaves in a row on your yard and cut them up with a rotary lawn mower. Rake up the chopped leaves and add them to the compost pile. (Figs. 1a and 1b.)

- *Manure.* Chicken, cow and horse manures are great nitrogen sources for compost piles. Cat and dog feces should never be put in a compost pile because they can carry disease organisms.
- *Sawdust.* Sawdust is plentiful at sawmills in many areas, especially in East Texas. Always compost sawdust before adding it to your garden because it can tie up nitrogen in the soil as it decomposes. Add extra nitrogen to sawdust to speed its breakdown.
- *Other materials.* Sod removed from the lawn, hay, non-noxious weeds, shred-



Figure 1. Grass clippings and leaves (a) make good compost. Leaves compost faster if they are shredded before being added to the pile(b).



ded newspaper, and hedge clippings can all be composted. Large twigs break down slowly so do not use them.

Building a Compost Pile

You can buy many types of composting bins, but you can also make one easily with wire fencing, cement blocks, bricks, or even scrap lumber.

Less room is required if the pile is enclosed, but if you have adequate room you can also leave it free standing. With an enclosed pile, leave an opening on one side so the compost can be turned with a fork to allow air to enter the pile. The compost pile should be located:

- In a secluded area
- Preferably near the garden
- In a partially shaded area to prevent the pile from drying out too fast
- In a spot with good drainage so it does not become waterlogged

Ideally, a compost pile should be made up in layers (Fig. 2.) The first layer should be coarse plant material, such as branches

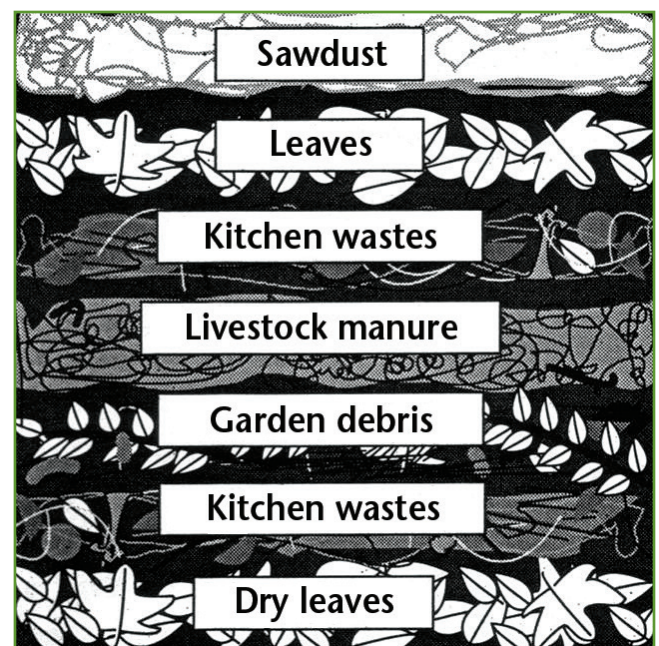


Figure 2. Layering of a compost pile.

and twigs, to allow oxygen to circulate up through the pile. The second layer should be 6 to 10 inches of finer plant material such as leaves, grass clippings, and kitchen scraps.

The third layer should be a 1 inch layer of soil or manure, which provides microorganisms and nitrogen. The microorganisms are what actually break down the plant material. To do this they need food in the form of nitrogen.

If you use soil for this layer, add $\frac{1}{3}$ cup nitrogen for every 25 square feet of compost pile surface area. The nitrogen can be in the form of ammonium nitrate, blood meal, or bone meal.

Repeat the second and third layers until the pile is 5 feet tall after settling. A compost pile needs to be of adequate size, usually 4 square feet, to provide a stable environment for the microorganisms. If a compost pile is much smaller than 3 feet in diameter, it will decompose much more slowly.

Required Elements for Composting

For decomposition to occur, these elements and conditions are essential:

- Organic material
- Microorganisms
- Air
- Water
- Nitrogen

Organic material comprises all the items previously listed: kitchen scraps, leaves, grass clippings, etc. The size of the material in the compost pile greatly influences the amount of time it takes for it to break down. The smaller the item, the faster microorganisms can break it down.

Microorganisms need a favorable environment, which includes air, water, and nitrogen.

Air is the only part that cannot be added in excess. Turning the pile often will provide an ample amount of air and speed the composting process. If there is too little air in a compost pile because of compaction, anaerobic decomposition occurs, producing an odor like that of rotting eggs.

A compost pile can have too much water, so the pile location should have good drainage. During the summer, you may need to add water so that the compost pile does not dry out. A compost pile should be moist but not soggy. If you squeeze a handful of the material it should be damp, but water should not drip out.

Organic materials have varying ratios of carbon (C) to nitrogen (N), and this ratio influences how fast microorganisms break them down. If the C:N ratio is too high, decomposition will be slow; if the C:N ratio is too low, the pile will lose some nitrogen to the air in the form of ammonia. The ideal C:N ratio for a compost pile is 30:1.

One way of estimating the C:N ratio is by the amount of green and brown materials in the compost pile. Cut grass, kitchen scraps, and manure are considered green materials and have low C:N ratios. Sawdust, tree leaves, and straw are brown materials and have high C:N ratios. An equal amount (by weight) of green and brown materials will give you the right C:N ratio.

Table 1. Carbon:nitrogen ratio of common organic materials.

Organic material	C:N ratio	Organic material	C:N ratio
Alfalfa hay	12:1	Cornstalks	60:1
Food waste	15:1	Leaves	60:1
Grass clippings	19:1	Straw	80:1
Rotted manure	20:1	Sawdust	500:1
Fruit waste	35:1	Wood	700:1

From Composting and Mulching: A Guide to Managing Organic Landscape Refuse by Wayne J. McLaurin (retired) and Gary L. Wade, Extension Horticulturists, The University of Georgia Cooperative Extension Service.

As microorganisms begin to break down the organic material, heat is generated. Within a few days the compost pile should reach an internal temperature of 90 to 160 degrees F. This process will destroy most weed seeds, insect eggs, and disease organisms, producing rich, soft humus or compost (Fig. 3.)



Figure 3. Humus ready for use in the garden.

Turn the pile weekly during the summer and monthly during the winter to increase the rate of decomposition. About 90 to 120 days are required to prepare good compost using the layer method. If you have room, make three piles so you will have one ready to use, one being tilled, and one being filled up (Fig. 4.)



Figure 4. Compost bins.

In-Ground Composting

Composting can also be done directly in the ground, preferably where a garden row is to be planted the following season once the raw material has completely composted.

To do in-ground composting:

1. Dig up the area—a long row or a raised bed—and remove the soil.
2. Fill the hole with the organic materials, such as shredded newspapers and dry leaves (Fig. 5).



Figure 5. After digging a hole or trench, fill it with newspapers and dry leaves.



Figure 6. Cover the composting material with the original soil from the hole or trench.

3. Cover it up with the original soil (Fig. 6).
4. Let this area rest, or compost, for a few months.
5. Turn the soil and use it as a new planting bed (Fig. 7.)



Figure 7. After the compost area has rested for a few months, turn the soil. It is ready to be used for planting.

Table 2. Troubleshooting guide to composting problems.

Symptoms	Problem	Solution
The compost has a bad odor.	Not enough air	Turn it. Add dry material if the pile is too wet.
The compost is not breaking down, and the center of the pile is dry.	Not enough water	Moisten and turn the pile.
The compost is damp and sweet-smelling but will not heat up.	Not enough nitrogen	Mix in a nitrogen source such as fresh grass clippings, fresh manure, or blood meal.
The compost is damp and warm only in the middle.	Too few materials and too small area	Collect more material and mix the old ingredients into a new, larger pile.

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