

Want to Know More about Composting?

Check out these books:

Backyard Composting: Your complete guide to recycling yard clippings. Ojai, Calif.: Harmonious Press, 1992.

Let it Rot! The gardener's guide to composting. Campbell, Stu. Pownal, VT: Storey Communications, 1998

Worms Eat My Garbage. Applehof, Mary. Kalamazoo, MI: Flower Press, 1982.

Or, contact:

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Log onto our Web site for links to Internet composting resources: www.cvswwmd.com

This publication adapted with permission from *The Dirt on Composting* written by Julie Berbiglia, Composting and Master Gardener, Scarritt-Bennett, with Sharon Smith, Recycling Coordinator and Master Composter, Metro Public Works, Division of Waste Management, Nashville, Tennessee. Edited by Cathy Donohue, Central Vermont Solid Waste Management District.

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the dirt on composting



What is compost? The gardener's best friend!

Compost is simply organic materials that have rotted to the point where plants can use the nutrients. Consider the forest floor. Leaves, logs, and dead animals pile up, rot and make fertile soil. Home composting is a way to manage this process so that it is faster and more convenient. About 21 percent of the waste that Vermont residents create each year (by weight) is food waste* that could be composted!

Compost improves the structure and fertility of garden soil. It makes clay soil drain better, and it makes sandy soil hold more water. Compost adds nutrients to the soil and provides a source of good bacteria. This home-grown additive will bring your soil to a neutral pH and prevent plant diseases. Compost is the answer to most gardening problems.

Getting Started

Compost is simple to make, requiring just two things: a “container” of some sort to hold the ingredients and the ingredients themselves. The container can take many forms, from a hole in the ground to a purchased bin. And, as you’ll see, there are also a wide range of ingredients that can go into your compost mix.

* DSM Environmental Services, prepared for Vermont Department of Environmental Conservation Solid Waste Program, *Vermont Waste Composition Study: Final Report*, June 2002, pp. iv, v.

Ten Types of Compost Containers

There are many ways to compost. Mainly it depends upon how much work you want to put into it and what you want the site to look like. Here are some ideas, listed in order from simplest to slightly more complicated. If you

make a bin, always use untreated wood. Treated wood will leach harmful chemicals into the soil and your compost.

The Pit	The Trench	The Site	The Pile	The Bag
Dig a hole, throw your stuff into it, cover with dirt and you are finished. You can plant on top of the compost pit immediately.	Just like the pit, except you start with a trench. Plant a row of seeds or transplants on either side of the filled trench.	Lay your kitchen and plant waste directly on top of a garden bed. Cover with leaves and a little bit of dirt and let it rot. Wait a month and then begin planting.	Easy and just like it sounds – pile everything up and it will make compost.	Throw everything into a black trash bag. Throw in a shovel of garden soil. Poke a few holes for air circulation. Loosely tie the open end.
Loading Pallet Bin	The Tomato Ring	The Can	The Pretty Bin	Store-Bought Composter
Get three loading pallets (usually available for free) from a local warehouse or grocery store. Wire them together at the corners, leaving one side open.	Drive four poles into the ground. Surround the poles with chicken wire to make a cage. Plant tomatoes on the outside and dump your stuff into the cage.	Cut the bottom off of an old plastic trash can. Drill holes in the middle of the sides for air circulation.	Use plain, untreated lumber to make a three-sided bin. Add a gate to make it really attractive.	There are many styles of plastic bins. You can choose one that works with your house and fits in with your neighborhood rules.

Compost Ingredients

Vegetable peels, leaves, yard clippings, egg shells, small sticks...the list of compostable items is long. Compost ingredients can be separated into two categories—greens and browns. “Green” ingredients provide nitrogen. “Brown” ingredients provide carbon. Mixed together they make heat, which makes compost rot faster.

Greens include grass clippings, fresh plant parts, and kitchen scraps. Browns include dry leaves, sticks, and newspaper. (Newspaper is OK in small amounts, preferably shredded and printed using soy ink.)

Refer to the following lists as you get started.

What Goes In?

(N) means the ingredient contributes Nitrogen, and (C) means it contributes Carbon.

- Fruit and vegetable scraps (N)
- Coffee grounds and filters (N)
- Tea bags and loose tea (N)
- Grass and shrubbery clippings (N)
- Old or dead plants and clippings (C and N)
- Most weeds (C and N)
- Leaves, wet (N) or dry (C)
- Small sticks less than 1 inch in diameter (C)
- Newspaper and other paper (C)
- Straw and hay (C)
- Wood chips (C)

Carbon to Nitrogen Ratio: Why it matters

The ideal carbon to nitrogen ratio is 30:1. Is this important for a backyard composting pile? Yes and no. If you add anything to your compost pile which might contain weed seeds or disease pathogens, you'll want to make sure your compost pile gets hot enough to kill them. Most disease pathogens will die after 15 minutes or so at temperatures around 130°F. To ensure that nothing “bad” survives the composting process, increase your carbon to nitrogen ratio to 20:1; this will make the pile get hotter.

What Stays Out?

Although compostable, these items attract rodents:

- Meat, bones, or fish scraps
- Fat, in solid or liquid form

These yard items will contaminate your compost:

- Plants that seem to be diseased—when in doubt, leave it out!
- Anything treated with pesticides.
- Weeds that are persistent problems in your garden, including grasses. (Grass clippings without seeds are fine to include.)
- Weeds and seeds (unless the pile heats to at least 131°F).
- Pet feces or bedding. These items can carry diseases.

Managing Your Compost Pile

Compost can be managed as a “hot compost” or a “cold compost,” depending on the amount of work you want to put into it and how quickly you want the finished product.

Hot Composting

If you are really interested in managing your compost, invest in a compost thermometer with a long probe so you can check the temperature from time to time. You will notice that the compost temperature tends to spike at around 150°F and then starts to drop. When the temperature starts to drop to around 100°F, it's a good time to turn the compost. When the temperature no longer fluctuates, the compost is ready.

If you are in a hurry to produce compost to add to your garden, you might want to turn the pile before the temperature reaches 131°F. This will require turning your pile more often but, since the pile will be sustaining optimum temperatures longer, you will produce compost much faster.

Cold Composting

So-called “cold compost” is also good compost. Don't worry if you don't want to be bothered with taking the temperature of your pile, or if your pile doesn't reach the optimum temperature. Your compost will still rot, just more slowly. Many homes won't produce enough yard and kitchen waste to make a pile that is large enough to heat up very much. It is also unlikely that

you will have the materials to create the exact carbon to nitrogen ratio that makes for the perfect hot pile.

Never fear the cold compost pile! It's easier to just let it be and let it rot without worrying about it. Keep in mind, however, that this method is slower than a hot compost pile. It may take six months or so to get your first load of finished compost. Remember that seeds and pathogens will not die in the cold compost, so it's important to keep weed seeds and diseased plants out of the mixture.

Is it compost yet?

Once you've started a compost pile, you'll be anxious to start reaping the rewards! Keep in mind that the more involved you are, the sooner you will have the end product. By turning the pile after the temperature spikes, and making sure you have good levels of greens and browns, you can produce rich compost in as little as three weeks.

For less managed compost piles, expect it to take several months for the process to complete during the summer. To speed things up, add a layer of sticks between every six inches of food and yard waste to create air pockets. This takes the place of turning the pile. Remember: Composting is a natural process that will occur, regardless of how involved you are.

Composting Myths & Facts

Compost piles are hard work and must be turned over very often. Fact: Turning a compost pile adds air to it so it rots faster. If you throw in some sticks every now and then, air pockets will form and you won't have to turn the pile.

I have to water the compost pile often or it won't work. Fact: Sure, wet stuff rots faster than dry stuff. But concentrate on adding moisture in the form of fruit and vegetable peelings, coffee grounds and tea leaves, or gray water (collect the water you use to wash out recyclable cans and bottles and pour it onto the compost pile) instead of using fresh water.

Lots of bugs are in the compost pile and they will hurt my plants. Fact: The animals you see in compost – worms, roly-poly bugs, centipedes – are working for you by decomposing the organic matter and making the nutrients available to plants in the form of compost.

It is necessary to purchase and add "compost starter." Fact: A shovel of regular garden soil should be added to the compost pile when you start a brand-new pile. After that it works fine by itself. You can add some out-of-date yeast, old yogurt, or the water from washing out a milk bottle to speed up the process.

Compost smells bad. Fact: Only when there is too much wet material. Poke a smelly compost pile to get some air into it, and the smell will become more like clean soil.

Lime, alfalfa pellets and other amendments must be added to make it rich in nutrients. Fact: There is no need to buy anything to add to a compost pile. The nutrients from the decomposed organic matter are rich enough.

Compost piles must get very hot inside or they aren't working. Fact: A cold compost pile will rot just fine, but perhaps a bit more slowly than one that gets hot.

Simple Solutions to Common Compost Problems

Compost is alive! There are all kinds of bacteria and microorganisms in your compost pile too small to see with the naked eye. Then there are the myriad animals that you can see. Roly-poly or pill bugs, millipedes, ants, beetles, and all kinds of worms should populate your compost. Each of these is working hard for you, breaking down your yard and kitchen waste into nutrients that your plants can use. You won't get any compost without these decomposers.

If you can't find any life in your compost pile, then it may be so dry that the soft-bodied insects have tunneled into the earth for moisture. They will come back the next time you throw in some moist food waste. It is also possible that you accidentally poisoned the decomposers with pesticide- or herbicide-contaminated plants. Try adding some garden soil to the pile to introduce new life.

Given time, everything rots. With composting, it's how things rot that seems to confuse people. Here are the most common composting problems and some very simple solutions.

What if . . . ?

... my compost is not heating up

Making hot compost requires volume and some work. The pile needs to be at least 3 feet x 3 feet x 3 feet. Make 6-inch layers, alternating green and brown materials. When the pile gets very hot, turn it all over and let it heat up again.

... my compost is dry

Dig a hole in the pile and add wet kitchen scraps. There is no need to water it down with the garden hose. In the future keep it covered during dry spells to keep moisture in.

... my compost stinks

Poke it with a shovel to let some air circulate through it. In the future throw some sticks on top of each layer of wet stuff to provide air circulation.

... my compost is not making compost

Look under the pile. You should find some decomposed mulch-type materials and possibly even some new soil. Both qualify as compost.

... my compost is made only of browns

Add some greens, or just let it be. A pile of leaves will make fine compost all by itself. It might even heat up.

... my compost is made only of greens

Green ingredients all by themselves will rot, but they may stink. Add some newspaper; no more than one quarter of the total material should be paper. Add sticks throughout the pile to permit air circulation.

... my compost is attracting flies

Cover kitchen scraps with leaves, or bury them deep in the pile.

... my compost is attracting animals

Try using a closed container.

Compost: Putting it All Together, Step by Step

Follow these easy directions to great fertilizer with very little work!

A Decide on the kind of compost container you want to try.

Ideally, your compost bin will have an open bottom so that worms and other organisms can crawl out of the earth and into your pile where they will go to work for you. If you use a completely enclosed compost bin, make sure you throw in some dirt from your garden every spring and add a few earthworms.

B **Add your ingredients.** Review the Compost Ingredients section. In brief, the following things can be added to the compost bin: grass clippings (only those without any fertilizer or herbicides); plant clippings; sticks of all sizes (they won't rot quickly, but they make important air spaces in the pile); brown and green tree leaves; vegetable and fruit peelings from the kitchen; coffee grounds and paper filters; tea leaves and bags; weeds and dead (but not diseased or bug-filled) plants. Some weeds will grow in the pile—once you learn which ones do, avoid them in the future. Avoid meats, bones and fats since they can attract rodents.

C **Be patient and let nature take its course.** The pile will gradually sink down as the stuff rots. Continually add new materials, covering food stuffs with leaves or plant clippings to keep flies and critters out of the pile.

D Harvest the compost from the bottom of the pile.

You don't need to wait until the entire pile has turned to dirt; simply take the finished compost from the bottom as you need it. Compost is ready when it looks like either mulch or soil. Spread it around your plants and mix it into the soil.

E Be very proud of your efforts!

Tools of the Trade

The beauty of composting is that it's a natural process that will happen with very little help from you. You won't need many tools, but the following may come in handy:

- 🔧 **Compost or gardening fork** to turn the pile.
- 🔧 **Wheelbarrow** to haul compost ingredients to and from the pile and finished compost to your garden.
- 🔧 **Pruners or loppers** to trim branches to put on the pile.
- 🔧 **Compost thermometer** to check the temperature of the pile if you're managing a hot compost pile.
- 🔧 **Aerator** to get more air into the pile.

Using Compost

Now that I've got it, how do I use it?

Use compost in all the ways that you would think of using fertilizer. The most common uses include:

- when starting a garden bed, mix compost into the soil.
- when transplanting, place some compost into the bottom of the planting hole.
- when mulching, put compost around the plants before you add mulch.
- when watering, add compost to the watering bucket and stir it up.
- when plants don't look so good, surround them with compost.
- when container gardening, top off potted plants with a layer of compost.



Making Compost Tea

No one ever has enough compost! What can you do if you don't have enough compost to fulfill all your gardening needs? You can stretch the compost you do have by making compost tea. Here is a simple recipe.

1. Place a handful of compost into the foot of an old pair of pantyhose or a sock. Tie shut and cut off the excess. This is your tea bag.
2. Put the tea bag into a bucket and add water. You can use the resulting tea immediately to water your seeds. This is especially good to use on new seedlings and transplants. Compost tea also makes an excellent foliar spray for houseplants.
3. Leave the tea bag in the bucket and use it over and over again.

Composting with Worms!

More formally called vermiculture, worm composting is lots of fun and easy to do indoors when you don't have space or permission for an outside compost bin.

The basic idea is that you are keeping worms as your personal garbage disposal. Special worm bins can be expensive, but the worms will be just as happy in a bin you make yourself.



Homemade worm composting bin materials

- A plastic bin with a top—minimum of two square feet in size. The bigger the bin, the more worms; the more worms, the more food waste will be composted.
- A pan that fits underneath the worm bin.
- Window screen or other fine mesh metal or plastic screen.
- Shredded newspaper.
- Tools: scissors and drill.
- Food scraps.
- Red worms, aka red wigglers. These can be purchased from a fishing bait store. (Regular earthworms won't work well in this environment.)

Making your worm composting bin

1. Drill holes in the bottom of the bin to allow for drainage. Drill more holes around the sides of the bin for air circulation.
2. Cut a piece of window screen or fine mesh to cover the inside of the bottom of the bin. This keeps the worms from falling out or attempting an escape!
3. Shred enough newspaper to provide about two inches of bedding at the bottom of the bin.
4. Moisten the newspaper so that it is about as wet as a wrung-out sponge. Worms need to keep their skin moist in order to breathe, but you don't want to drown them.

5. Add worms. How many worms depends on how quickly you want the garbage to disappear. But you don't need to start with a large number of worms. Besides eating, they will be reproducing! If you get too many worms, consider passing them on to your friends, neighbors, or local schools. You can also throw the extra worms outside for the birds to eat. Don't feel guilty; the red worms can't live in the soil.
6. Now the fun begins! Feed your living garbage disposal by burying food scraps in the newspaper bedding. Start with a small amount of food, about equal to the amount of worms you have. Add more food as needed. The amount of food can be increased as the amount of worms in the bin increases. Keep the bin covered to prevent flies from laying eggs on the food.

The payoff comes when you harvest the worm castings—the poop. This is really easy and quite a bit of fun. Simply remove the lid, and the worms will burrow down to escape the light. Shine a light directly on the pile of food, castings, bedding and worms to make the worms move more quickly. Carefully scoop out the castings, which look like dirt. Use the castings in the same ways you would use compost.

Tips for Keeping Your Worms Working

- Don't let the worms drown! Worm tea will leak out of the bin into the pan underneath. Empty the pan so the liquid doesn't build up in the bin and kill the worms. Use the tea as a liquid fertilizer.
- Don't let the worms fry or freeze! A good rule of thumb is to keep the worms at room temperature. Apartment dwellers have been known to keep worm bins under the kitchen sink or in the laundry room. For best use, keep it near the place where you produce food waste.
- Don't let other creatures take over the worm bin! If flies have laid eggs in the worm bin or other insects are taking over, dispose of everything and start over. Try using a more tightly fitting lid on the bin and use screening to cover all of the holes in the bin to prevent intruders.
- Don't give up on your worms! You may lose a few helpings of worms before you get the hang of it.

Remember "The Rule of One"

One pound of worms will eat one pound of food waste in a one-square-foot bin in one day.