

'The Dirt' on Composting



**A Comprehensive
Guide to Backyard
Composting**

Catesgarden.com



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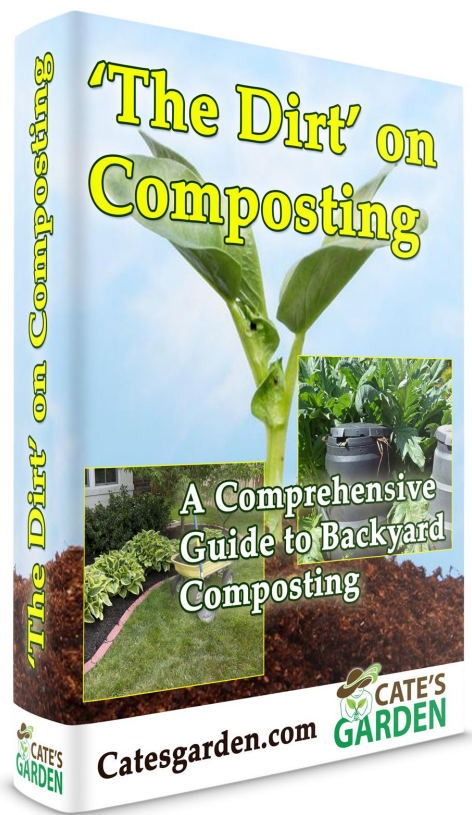


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You've heard of composting, and you're curious - and wondering if it may be for you. If so, you most likely have a number of questions. Is composting difficult? Does it take a long time? Doesn't it smell? Do I really have enough room for a compost heap in my yard (or urban deck or dwelling)?

You might be surprised to learn that composting is easy – and that it's nothing new. In fact, composting, which mirrors natural processes that take place in all areas of the globe, has been performed in a deliberate way by humans for thousands of years.

In recent decades, composting has gained recognition among garden and lawn aficionados. Composting is particularly popular around those looking to achieve a more natural lifestyle. But there's nothing “hippie-ish” or faddish about composting. Here's everything you need to know to add composting to your lifestyle.

What is Composting?

Composting is a method that mimics what the earth does naturally: recycling organic waste into nutrients that feed the soil.

In nature, materials such as fallen leaves, grass and waste from animals mix together and decompose naturally. This decomposition is caused by the elements, oxygen exposure, natural heat reactions, and insects and microorganisms feeding on the debris.

Over time, these processes break down the waste into a nutrient-dense, earth-friendly mixture called compost. The compost then nourishes the soil, causing plants and trees to grow more lushly and healthfully.

When it works correctly, this process is the perfect form of re-feeding the earth. In fact, composting is the oldest form of recycling in the world. Humans didn't invent composting; we observed and learned to mimic it in order to create more lush gardens and crops of our own.

Why Compost?

Of course, you may be wondering: if the earth already effects these changes by itself, why should *you* compost?

Unfortunately, with over-usage of forest and other resources, the earth is incapable of generating as much natural compost as it did in centuries past. We create more waste than ever before, but we don't return it to the soil. Instead, we bag it in plastic and create many thousands of tons of land fill.

However, humans can help reverse that trend by encouraging the decomposition process ourselves, using materials we'd otherwise simply be throwing away. And it can start in our own back yards.

Here are the main reasons people choose to compost:

1. **Composting saves time.** Although you may be envisioning endless hours churning your compost bin, composting can take as little as a few minutes per week. It's as quick and easy to add kitchen scraps to your compost pile as it is to toss them in the garbage can. And it's faster to rake grass clippings into the pile than to bag them, store them until garbage pick-up day, then drag the bags up to the curb.
2. **Composting saves money.** Compost turns naturally over time (and with the tricks we'll be revealing here) into an amazingly nutrient-rich fertilizer. Using compost is much cheaper than buying expensive fertilizers.
3. **The fertilizer composting creates is all-natural.** If you compost in order to create fertilizer (or as one of your key points), you know that your garden and lawn are receiving 100% natural materials. Many of the most popular fertilizers on the market include chemicals (or are created with them) and may contain particles that actually discourage some of the best soil recyclers, such as earthworms. With proper composting, you won't have these worries in your garden.
4. **Composting is good for the environment.** The composting process significantly reduces the volume of lawn and kitchen scraps in comparison to simply throwing them in the garbage. As your heap turns to compost, you will notice the materials "shrinking." That's because as they decompose and lose water, they compact. Even if you never plan to use your compost for fertilizer or other things, you will be doing the earth a big favor by recycling composted versus adding to landfills freshly discarded materials.
5. **Composting is a great activity for children.** Including your children or grandchildren in the composting process will teach them about nature's lifecycle, is fun for them to watch happening over time and is a great lesson in respecting the earth.

Composting is Not New

At least as far back as the Roman Empire, people took note of the natural processes of decomposition and began to mimic them in a systematic way to grow better crops and lush gardens.

Ancient scientists noted the overuse of natural resources and saw that soil that was used repeatedly for growing crops or gardens stopped yielding as well over time. In addition, as cities began to develop, waste often became a problem.

As far as written history can tell, this is when crop rotation, early waste management, and re-feeding, or “fertilizing,” of crops began. Scientists and farmers began to re-use natural waste, such as grass clippings, certain types of food (generally vegetables) and animal manure to revitalize the soil.

In various areas of the world, the preferred materials differed. For example, people in the Americas utilized such items as fish in their crops, allowing these to decompose in the soil before planting. (Please note: meat, fish and poultry scraps are NOT recommended for today’s home composting; we’ll get to that reason later in this book.)

Though we have greatly refined these techniques in recent times, the basics remain the same. Nature’s way is still best – we’ve simply hastened the process to produce great compost in shorter periods of time.

Now let’s move along to the mechanics of composting and how they can be a boon to both your garden and the environment.

The Composting Cycle

Your compost pile or bin will decompose almost by itself, but some pretty amazing things will be happening behind the scenes. Let’s take a closer look at exactly how the composting cycle works.

1. Organic materials such as grass clippings, leaves, fruits and vegetables, egg shells, coffee and even some paper materials, such as paper towel and toilet paper tubes, are combined in one compact area. They may either be raked together into a heap or placed into a bin.
2. Here’s where nature steps in. Certain insects, including the classic composter, the earthworm, as well as microbes (tiny microscopic organisms) are attracted to the waste and begin to eat it. They then leave their own waste, including, for some varieties of insects, their nutrient-rich “casings” (shed outer skins). The burrowing of these tiny helpers also creates pockets of air which are necessary to the decomposition process.

3. The activity of microbes and insects does something else, too: it produces heat, which hastens the rate of decomposition. In fact, heat is paramount to the success of your compost heap; we'll talk more about this later.
4. As decomposition continues, the materials compact down, making the total amount of waste much smaller.
5. Eventually, the material decomposes completely into a nutrient-rich, crumbly, soil-like and pleasant smelling material called compost. It is now ready to use.

How Compost Improves Soil Health

The addition of compost can improve nearly any type of soil, including sandy and clay-like soils. Compost helps in the following ways:

- It aerates – or adds oxygen to – the soil. Properly composted material contains air pockets. This helps to keep the soil from compacting too much, allowing for proper drainage.
- It attracts beneficial insects which “turn over” the soil on a continuous basis by making tunnels through it and leaving their waste and nutrients.
- It prevents water run-off, which can also happen when soil is too compacted. This means water stays in the soil for a longer period of time. If you're concerned about water conservation, this is an excellent point in favor of adding compost to your garden.
- By providing nutrients, it reduces or eliminates the need for added fertilizers. This saves money, as well as eliminating the possibility of chemicals in commercial fertilizer products.
- It creates a crumblier soil which allows roots to penetrate more deeply, creating more lush plants, vegetables, flowers, grass and trees.
- It helps control soil-borne pathogens that can create disease in the soil and harm plants.

What Can I Compost?

Composting uses two types of materials: brown and green. “Brown” refers to dry materials, while “green” means there is moisture present.

Why do you need both? Because in the correct ratio, brown and green materials will provide carbon and nitrogen, respectively. These are both necessary for the decomposition process and for creating a good, rich compost.

Brown Materials

Brown materials provide the larger carbon portion of your compost pile. Brown materials keep the pile from becoming overly moist, slimy and smelly. In addition, brown materials are essential for microbes' and insects' nutrition when snacking on your compost heap.

Commonly used brown materials include:

- Dry leaves, twigs and grass
- Straw
- Dryer lint
- Paper towel tubes and toilet paper tubes
- Shredded newspaper
- Saw dust

Green Materials

Green materials deliver a significant amount of nitrogen, an important protein in the diet of the microbes that feed on your compost pile. They are considered the “wet” portion as they contain moisture. Too little green materials, and your compost pile will decompose very slowly and will contain fewer beneficial microbes.

Commonly used green materials include:

- Fresh grass clippings
- Green leaves
- Weeds that have NOT yet seeded
- Vegetable kitchen scraps
- Coffee grinds
- Tea bags
- Composted (not fresh) farm animal manure
- Hair

The Balanced Ratio

As we mentioned above, too much or too little of one of these types of materials could lead to problems. Too much brown and too little green, and you're not providing adequate nutrition to beneficial microbes, potentially slowing the composting process. Too much green and too little brown, and you will experience, in effect, rotting, with the associated bad odors and slimy texture.

What you're looking for here is the correct ratio of carbon to nitrogen. All living (or once living) things contain both carbon and nitrogen. Where things get confusing is that composters are told they will need approximately 20 parts carbon to 1 part nitrogen in their compost pile.

This does not mean you should throw in a huge amount of brown materials, and a tiny amount of green materials. Instead, the ratio relies on the fact that both brown and green materials contain carbon and nitrogen – just in very different amounts.

Given that, the best ratio of total brown to total green materials is 4:1.

Remember, the chemical reaction of heat is necessary to proper, and timely, composting. If you find your compost pile is not heating up adequately (more on this later), you will want to add more green materials. If your pile is beginning to smell or feel slimy, more brown material should be added.

Things Not to Compost

It all sounds easy, doesn't it? Just add wet garbage to dry garbage in the right ratio, and you'll get compost. But not every organic material is suitable for your compost pile. Here are items never to compost:

- Meat, fats or bones. These can attract pests, particularly rodents, to your compost pile. They also encourage harmful bacteria as they break down.
- Weeds that have seeded. Seeds may survive the composting process. This means that if you decide to use your compost as fertilizer, you may be planting the seeds of weeds that will eventually become a big problem for your lawn or garden.
- Human or pet feces, which may contain disease.
- Pressure treated wood. Pressure treated wood can leach arsenic, a poison, into your compost pile.

- Particle board or plywood.
- Colored paper.
- Any inorganic materials, such as plastic or metals.
- Coal or charcoal ashes; these may contain toxic particles.
- Lime. The high pH of lime can halt the natural composting process.

Types of Composting Methods

Creating a compost area can be as simple as designating a spot in your yard and raking or placing materials in a pile. However, containers are often preferable in order to keep the pile from “drifting” and settling outward. Urban dwellers may also prefer a contained area because it looks neater, and materials will not drift out on the wind into others’ spaces.

You may wish to construct your own simple compost container, or go with the “big league” composters with a commercially crated bin. Here are your choices when it comes to compost container methods.

DIY Constructing

You don’t need to be particularly handy to create your own compost container. These are the three basic DIY methods, though variations abound:

Easy Garbage Can Compost Bin

You Will Need:

- an old outdoor garbage can or recycling garbage can
- long nails for poking holes in the bin
- a hammer
- large bricks or cinder blocks

To Create the Bin:

1. Oxygen is necessary to the decomposition and composting process, so you will begin by hammering holes into your garbage can. Lay the garbage can on its side.

- Position a nail near the bottom of the bin. Hammer the nail until a hole is created.
2. Move up about 6-8” and hammer another hole. Continue until you are near the top of the bin.
 3. Repeat this process from bottom to top, moving over about 12”. Continue until the entire garbage can is finished.
 4. Place the garbage can on top of the cinder blocks or bricks. Your bin is now ready to receive your composting materials.

Wooden Compost Bin

You Will Need:

- four pieces of 4X4 UNTREATED lumber cut to 3-4’ lengths, depending upon your preference
- up to 16 pieces of 2X6 UNTREATED lumber cut to the same lengths as your 4X4 pieces above (fewer pieces for larger gaps; more pieces for smaller gaps)
- galvanized nails

To Create the Bin:

1. Lay two 4X4 pieces on the ground three feet apart (be sure to measure carefully).
2. Nail one 2X6 piece across the bottom of the two 4X4 pieces, about 2” up from the bottom.
3. Continue to nail 2X6 pieces across the board at your chosen space interval. Up to two inches apart is the standard. Stop a few inches from the top.
4. Create another wall section exactly as per steps 1 – 3.
5. When you are finished with the two wall sections, stand them facing each other, 3’ apart. Nail a 2X2 across the bottom, about 2” up, matching the height of the boards in the two wall sections you’ve already created. You now have three sides to your bin.
6. Continue nailing 2X6 pieces, spacing them to match the other two wall pieces, until this third wall matches the first two.
7. Now complete steps 5-6 above for your fourth side. Your bin is finished.

Chicken Wire Lawn Scraps Bin

You Will Need:

- a large roll of chicken wire
- wire cutters
- four UNTREATED wood stakes, cut to the height you wish your scraps bin to be (about 3' high is standard)
- a staple gun

To Create the Bin:

1. Lay the roll of chicken wire on the ground.
2. Using the wire cutters, cut across (horizontally) the chicken wire to achieve a height that is about 4" shorter than your wooden stakes.
3. At the beginning of the cut chicken wire section, staple the wire to one of the wooden stakes at about 8" intervals. There should be about 4" of wooden stake above the height of the chicken wire.
4. Roll the chicken wire into a large cylinder (to your preferred bin circumference) and cut. Now staple this new cut end to the wooden stake. You will have a cylinder shape.
5. Staple the other three wooden stakes at regular intervals, so that your bin will hold its cylinder shape during use.
6. Turn the bin upside-down and push the stakes into the ground where you wish your bin to be. Your bin is now ready for use.

Commercially Available Compost Bins

If you don't feel comfortable making your own compost bin, there are plenty of choices commercially available.

First, check with your city, township or county. Some cities offer free or reduced-price compost bins in an effort to help clean up the environment.

If not, you still have a variety of options. The basics to look for are:

- **Size.** How large a bin do you want/need? If you're not sure, call the company and tell them approximately how many scraps, volume-wise, you plan to compost.

They can help you make a choice.

- **Insulating walls.** Whatever material the bin is made of, the walls should have good insulation in order to encourage heat, which is critical to the decomposition process.
- **Aeration.** Oxygen is another critical factor. Make sure the bin has ventilation holes.
- **Composting speed.** Some products advertise usable, reduced compost in as little as 60 days. If your requirements are for a faster process, look for a bin that will accommodate this.
- **Temperature gauge.** Not all commercially available compost bins include this, but it's a good idea to periodically just how hot your bin will get, so if your bin doesn't include one, consider purchasing a thermometer for this purpose. You are looking for a steady 90-140F.
- **Easy access to the finished compost.** Many bins offer a pull-out tray so that you can cleanly and easily remove the finished product.

Basic compost bins may run you as little as \$30, but can go up to hundreds. Do your homework before buying.

Rotating Tumbler

Rotating tumbler bins take a good part of the work away from the process – and often, they look cool, too!

The basic idea is that the tumbler will either rotate the entire bin periodically by itself, or will include a hand mechanism so that you can perform the action. This replaces the usual method of poking holes into and/or stirring and mixing the compost by hand with a shovel or pitchfork.

Rotating tumbler compost bins usually look somewhat like a barbecue grill. They stand up off the ground and are somewhat compact, making them ideal for smaller spaces or urban dwellings.

Generally, rotating tumbler bins start at around \$100 and go up from there depending upon what additional features you desire.

Trench Composting

Trench composting is an option that provides two benefits: it makes the composted items “invisible” as they are below and up to the surface of the soil around them, and it delivers fertile compost directly to the roots of plants.

Trench composting is simple and is exactly what it sounds like. You dig trenches where you want them, and deposit the compostable materials directly into them.

Here are three ways to trench compost:

- Trench between rows. Dig your trenches 12-24” deep in rows between plants in your garden. Place green and brown materials into the trenches in the correct ratio, as described earlier in this book.
- “Drag and drop” compost materials. Dig a 12” hole into the soil near plants that you wish to compost near. Place green and brown materials into this hole and allow them to compost.
- Dig a compost trench in one area of your yard. Be careful: if you have small children, you’ll need to keep them away from the area while playing so they don’t fall in. (Placing colorful stakes or a sign near the area is a good idea.) In this case you’ll be digging a 12-24” deep square, rectangle or circle as large as you wish the trench to be – usually about 5’X5. Your green and brown materials can then go inside.

Successful Composting Techniques

Size Matters: the Optimum Size for Your Pile

Up until now we’ve been giving hints on sizes for various composting containers and methods. But ultimately, which size is perfect for your needs?

First of all, no matter what size bin you decide on (or make yourself), you really don’t want to go smaller than a 3’ X 3’ cube. There needs to be room inside the bin for several layers of both green and brown materials in order to get the natural reactions going that will turn your scraps into compost. You also need enough room to use a shovel or stick to occasionally stir your materials.

If you have space considerations, you may want to consider a bin that is smaller in diameter but taller than it is wide. This way you are still getting in your minimum cubic feet, but with the bin rising up rather than spreading out, you will be saving space.

At the same time, you don't want your bin or heap to be so large that it's unmanageable. Trying to lift and turn heavy decaying materials from the bottom of a very deep bin can be difficult. Our recommendation is not to go wider than approximately 5' for a home/garden use compost bin. You can always put up more than one bin or pile and keep them composting simultaneously.

For a compost pile, which will "drift" outward somewhat, you can go somewhat wider provided you have the space to do so.

Passive Composting

For those with little time on their hands, passive composting can be a good option. Be aware that you will still need to check on your compost heap periodically.

Passive composting simply means placing your allowable scraps (see "What Not to Compost" above) into an aerated container. Passive composters don't worry about the carbon to nitrogen ratio or the exact temperature of the pile. Instead, a tarp or covering of hay is usually placed over the top of the heap to encourage warmth and keep out the elements. Then the compostable materials are allowed to "do their thing."

Passive composting does work, though it may take a longer period of time and/or require occasional tweaking the general amount of green or brown materials. The fact is that every living thing (or everything that was once living) will decompose. Therefore, given enough time, a compost heap that is not temperature gauged, turned, etc. will eventually turn into compost.

If you find your materials are beginning to smell, attract pests you don't want (such as rodents or roaches), or seem to not be decomposing fast enough, you may want to apply some of the techniques in this book to improve the situation.

Location, Location, Location

The best place to locate your compost bin is in a sunny area. This will encourage heat, an important part to the composting process.

If you have a back or side yard, these are obviously your best choices for a compost bin. However, a few people have their bins in the front yard. This doesn't have to be

unsightly. Many of the newest commercially available bins have a sleek look and take up less space. Look for a bin that will be unobtrusive in your yard if you must use your front yard space.

For an urban dwelling, your choices are obviously limited. Some lucky apartment or condo dwellers have a deck; we suggest you utilize this space. “Pretty” it up around the bin by placing potted flowers on either side (be sure to leave yourself plenty of room to move around so that you can stir, look over and check the temperature of your compost).

In some cases, urban dwellers may be able to use the roof of their building. Do NOT place your bin on the roof or otherwise use the roof without the WRITTEN permission of your landlord or the owner of the building. Compost bins get heavy as waste compacts down into them, and may present a hazard on a less than stable roof.

If you simply have no space for a compost bin, check with your city to see whether there is a communal garden or other space where compost bins might be allowed. More and more towns are encouraging environmental measures such as composting. Even school gardens often have one. Check out all your options.

Layering Your Materials

Now that you have some know-how behind you, it’s finally time for the fun part – building up the contents of your compost bin!

Before putting materials into your bin, make sure it is raised slightly off the ground, OR that it is placed directly on soil and not on asphalt, concrete or tarmac. Solid materials such as asphalt will not allow for proper aeration of your materials and may impede the composting process.

There are two ways to layer your materials:

- Over a period of time, collect green materials separately from brown materials. When you’re ready, layer them per the 4:1 brown to green ratio until your bin is filled (or partially filled – some people collect materials over a period of two weeks or so, then fill, and repeat). Please note that this method requires proper storage of the green materials until they’re ready to add to the bin, as they will otherwise rot where they are and could attract pests.
- Start a brown layer in the bottom of your bin. Be sure to include plenty of twigs and branches or other materials that have weight but irregularity in order to encourage more air underneath and through them. Then add a layer of green materials. Each day when you go to place items into your compost bin, make sure

your ratio of 4:1 brown to green is roughly achieved (you don't need this to be perfect).

Troubleshooting Your Layering Technique

As we said above, the 4:1 brown to green ratio is an approximation; decomposition will happen one way or another. However, you may begin to notice issues with your bin. Generally these will relate to having either too much/too little brown, or too much/too little green.

If your bin is beginning to emit an unpleasant odor, seems overly-wet rather than damp and/or is attracting rodents or other unwanted pests, you probably have too much green material as compared to brown. Poke holes with a stick or shovel into the compost and add more brown materials, then stir. The problem should rectify itself over the next week or so.

If your bin is decomposing much more slowly than you expected, there are two possibilities: either you have too little green material, or your bin is not heating enough.

- For too little green material, the answer is simple: poke holes in the existing materials in the bin and add more green material.
- If you determine that the temperature of your bin is too low (see below), try covering the bin if you have not already. This will allow your bin to retain more heat.
- Adding earthworms to your bin will generate more heat due to their movements and the composition of their leavings. You can purchase live earthworms at a bait store or online, where they will be shipped to you in a time-sensitive and temperature controlled manner.

Temperature of Your Pile

We've mentioned temperature several times already. That's because although decomposition will occur in all but the coldest temperatures, it will happen much more slowly if there is little or no heat in your pile.

The ideal internal temperature of your pile is 90-140F. That's a little under normal human body temperature to significantly above it. The outside of your pile might get cooler, particularly as fall approaches, but inside, it should stay at the ideal temperature in order for composting to take place within about six months.

Because it can be hard to determine this by feel – as well as the “ick” factor of sticking one’s hand into a pile of decomposing items – you may benefit from a reliable compost bin thermometer. This type of thermometer has a long probe so that you can accurately gauge the temperature deep within your pile. Compost bin thermometers aren’t hard to find and can be found at a reasonable cost online.

Turning Your Pile

In order to ensure there is plenty of oxygen for compost-friendly microorganisms, make sure to turn your compost periodically. A pitchfork is great for this as it both lifts and separates or “sifts” the materials. This provides oxygen bubbles throughout your bin. If you can, turn your pile completely every 15-30 days, or for a bin that has slats or large open spaces on the sides, poke a long stick into the pile in various places to bring space (and oxygen) in.

Don’t go crazy on your stirring and lifting. You do need to leave some clumps of heavy materials. These will provide for your anaerobic microorganisms so they too can flourish.

Anaerobic Versus Aerobic Composting

Though we’ve been stressing oxygen quite a bit in this book, in actuality, there are two microbes that feed on waste materials: aerobic (“in oxygen” or “with oxygen”) and anaerobic (“without oxygen”).

Simply put, aerobic microorganisms need oxygen to survive, and anaerobic microorganisms don’t. Think of the processes going on in swamps and bogs.

In this guide, we are mainly talking about aerobic composting. Anaerobic composting uses an entirely different method of decomposing bacteria and processes. Instead of the material breaking down into earthy-smelling soil, it breaks down through fermentation.

However, purely anaerobic composting is much easier to do and involves no maintenance. You add only green materials to an air-tight container. It should hold at least 35 gallons to function properly. Add lots of water (so at least 50% or more of the content will be water). Water also reduces the smell.

It is best to have two bins – one to decompose in an air-tight environment, and another to be filled. Do not open the bin more than once a week. If there's a strong, rotten-egg smell, and lots of bugs, it is working. Occasionally add a layer of fresh soil to help control fruit flies.

Anaerobic composting won't heat up much, and takes at least six months to a year to finish – it will look dark brown and be moist. Do not directly add it to the soil afterward, due to its high acid content. Instead, it has to “air out” and dry over a few weeks before being added – you can simply keep the lid open and turn the finished soil periodically.

Worm Composting (Vermicomposting)

We mentioned earlier that worms are one of nature’s best recyclers. It’s their waste that’s so useful: as worms digest a meal of scraps, the material breaks down in the perfect way to create compost. Believe it or not, worm waste is one of the best things you can add to your compost pile to give it the right mix of nutrients.

If possible, you’ll want to make sure there is a good supply of these wonderful little wigglers in your compost heap. Worms will be naturally attracted to the green and brown materials, but you can encourage the process by buying your own worms and adding them in.

You can either utilize your worm bin as a separate compost bin, or “grow” your worms in the bin and then later gently add them to your compost pile.

The Best Types of Worms

Red worms are the most commonly used type of worm for vermicomposting. The red wiggler (*Eisenia fetida* or *Lumbricus rubellus*) is a great little composter and is inexpensive to obtain (or can sometimes be found right in your own yard, if you do a little digging). Red wigglers will chow down on nearly anything, but have a preference for green materials.

Do not use night crawlers or other earthworms commonly found in your backyard. These worms burrow more deeply in the soil and need cooler temperatures. They will not survive the vermicomposting environment.

Equipment and Supplies

You can give your worms a good start by having a bin just for them, and allowing them to establish themselves there. Once you have a good supply of worms, you can introduce them into your compost heap.

Of course, you don't have to do this. You can place the worms directly into your compost area. However, they will probably do better and be healthier if you allow them to establish their own mini-ecosystem first.

- You can purchase a worm bin online if you'd like the easiest possible route. This will already be ventilated and will be a secure place for your worms.
- If you'd rather make your own worm bin, buy a galvanized tub. (Do NOT use treated wood, as this may poison your worms.) You will want about one cubic foot of space for every pound of worms. The bin should be a maximum of 24" deep. Punch holes all around the bin starting 4" from the bottom so that the water you will be placing in the bin will not drown your worms – they will tend to want to stay local to the ventilation.
- You will want a cover for your bin in order to keep out light and to retain moisture. A purchased worm bin should come with a cover. If you are making your own bin, you can cover with a piece of UNTREATED wood or with a section of tarp.

Preparing Your Worms' Home

Now it's time to create the worms' environment. You will be creating and encouraging a mini-ecosystem for them to thrive in.

1. Put down a layer of "bedding." This will consist of brown materials, such as straw, shredded cardboard, newspaper, dried grass and dried leaves.
2. Warning: do NOT use eucalyptus leaves. Eucalyptus is a natural insecticide and may kill your worms.
3. Sprinkle a layer of dirt or peat moss on top.
4. Moisten the bedding thoroughly.
5. Place the cover over your worm bin and put the bin in a cool, shady place, away from direct sunlight.
6. Allow at least ONE full day before adding worms.

Keeping Your Worms Happy

Worms – particularly red wigglers/earthworms – are very self-sufficient, hardy and can make their home in almost any dark, dry place. But they do much better and thrive more heartily with a little care.

TIP ONE: Feed your worms once a week. Worms love fruit and vegetable scraps, coffee grounds and egg shells – in other words, green materials suitable for a compost bin. Do NOT add any animal products, such as meat or fat scraps.

TIP TWO: Cut up the food before placing it in the bin. This makes it easier for your worms to chow down, though they will go through even large scraps eventually.

TIP THREE: Mix the scraps into the bedding layer. Worms like to burrow to find their food. Mixing the scraps into the bedding also cuts down on the possibility of fruit flies.

TIP FOUR: Start off with small amounts of food, then increase. Begin with just a cup or so of scraps. As the number of your worms increases, work your way up to a quart of food per square foot of space.

TIP FIVE: Keep the bin moist, but don't drown your worms! Yes, your worms will drown in a bin that contains too much water (that's why you see worms on pavement after heavy rains – they breathe oxygen). Sprinkle the dirt with enough water to create dampness. Try to keep the moisture level about that of a wrung-out sponge.

TIP SIX: Add brown materials about once a month.

Harvesting Vermicompost

Eventually, with proper maintenance, your worms will have created compost. This should take about 3-4 months.

There are many ways to harvest finished compost, but the easiest way is to push all the contents to one side, and add fresh bedding and kitchen scraps on the other. Over the next week or two, all the worms will migrate to the new source of food. Any new worms hatching will also crawl over to the new food sources.

Then, scoop out the wormless compost and gently spread the newer material all around the box.

Harvesting Your Compost

So it's finally time to harvest and use your compost. Or is it? Here's how to tell and what to do.

When is Your Compost Finished?

You can determine the “readiness” of your compost by three things: look, texture and smell.

- The compost should *look* dark brown. It should look like dirt/earth, not like materials that are still decomposing.
- The compost should *feel* crumbly in your hands, like fresh garden dirt.
- The compost should *smell* pleasantly earthy and should have no rotting odors.

How to Apply Compost in Your Garden

Gardening enthusiasts call compost “black gold” because of the many benefits it gives to one's garden. In addition to adding vital nutrients, compost also aerates the soil, improves drainage and discourages soil diseases.

Compost can be sprinkled on top of lawns to encourage grass growth, placed around trees and vegetables for nutrients or dug into the soil. Below are some specifics on how to apply compost to your lawn and garden.

Applying Compost to Clay or Sandy Soils

For clay or sandy soils, you will want to till the compost into the dirt rather than simply sprinkling on top. This is because clay soil is compacted and will not allow the compost to sift down, and sandy soils are in need of mixing with “live” (fertile) materials.

What you will be doing is a process called “amending” or “conditioning” the soil. Here's how you do it: dig up several inches of the existing soil. Mix well with compost. Return the mixed compost to the area you have dug up.

For clay soils, dig about 1” down. For sandy soils, dig 3” down.

Using Compost as Mulch

Mulch is any material placed on the surface of soil in order to increase fertility, add minerals and important nutrients, retain moisture and reduce weed growth. Mulch can also add to the beauty of the area. Compost makes the ideal mulch as it performs all of these activities perfectly.

As an added benefit, compost does not harbor plant-harmful fungi such as *Sphaerobolus stellatus*, which wood chips can sometimes do.

To use compost as mulch, begin spreading the compost around the base of the area you wish to cover (i.e. the trunk of a tree; the base of a plant or bush). Do NOT allow the compost to come into contact with the plant's trunk or base, as this can encourage disease or pest issues. The compost should be in a 2-4" thickness.

Gently spread the mulch outward to cover the canopy/roots area. That's it – you're done!

Using Compost as Soil Conditioner

Soil conditioner, also known as soil amendment, adds nutrients to soil that is lacking in them. One of the most sought-after benefits of compost is that it enriches the soil, allowing plants to grow more lushly and beautifully.

Here are the most common uses for compost as a soil conditioner:

- **As a top dressing for lawns.** Compost will get your lawn beautiful and green and will encourage “bare spots” to fill in. Spread compost about ¼” thick across the lawn. If you plan to re-seed areas of your lawn, do so immediately after spreading the compost down. After adding the seed, give your lawn a good watering to encourage the seeds to sprout.
- **For trees and shrubs.** Lush trees and shrubs add beauty to your lawn or garden, but they usually require a lot of nutrients. Putting compost down adds those nutrients back into the soil that the trees and shrubs have been depleting. Spread about 3” thick around the trunk or base of each tree or shrub, keeping the compost 4-6” away from the base and spreading outward.
- **For flowers and flowering plants.** You only need about 2” thickness of compost for these. Sprinkle around each plant.

Using Compost in a Container Potting Mix

Potted plants are a real space-saver and can add beauty to a smaller space, such as a deck. They also look wonderful on the front porch or around the sides of your house. In fact, container gardening, including the growing of vegetables, is increasing in popularity as it can be accomplished in small urban settings as well as smaller lawns or gardens.

One drawback to container gardening is that nutrients won't leach into the pot, the way they do when greenery is planted directly into the ground. Therefore, a base of very fertile earth, plus occasional fertilizer, are both important in container gardening.

Because compost tends to compact within the small space of a gardening pot, it should be mixed with sandy soil/loam. Three parts sandy soil to one part compost will impart plenty of nutrients while maintaining drainage (always be sure that your gardening pots have holes in the bottom to encourage drainage). Blend this mixture well and place in the pot, then plant your greenery.

Add a sprinkle of compost to the top of each pot at the beginning of each season in order to keep plants well fertilized.

Compost Tea

Looking to give your garden a boost? "Compost tea" is a liquid extraction of the nutrients in your compost materials. It acts as a vitamin shot to whatever you're planting. Composters swear by compost tea, which is simple to make, healthy for your plants and lawn and contains no pesticides or chemicals.

Benefits of Compost Tea

Because it extracts nutrients, compost tea is a super-dense fertilizer. It also helps keep fungus and plant-unfriendly organisms from gaining hold in your garden. What's more, it's all-natural, though you can purchase ready made compost teas at your local garden shop or online. But why spend when you can create your very own? Read on...

Basic Tea Recipe

Compost aficionados have their own favorite "recipes" for compost tea, including urging them toward either more beneficial bacteria or more fungi depending upon the plant to be fertilized, but here is a simple one that even a beginner can use. This will yield a nutrient-dense, all purpose tea.

Ingredients and materials needed:

- fresh, finished, aerated compost
- a bucket or small barrel
- water
- a mesh cover
- a stir stick

Instructions:

- Fill the bucket approximately 1/3 full with compost. (There should be NO “pieces” in your compost; it must be completely broken down into a crumbly, soil-like material.)
- Fill the rest of the bucket up to approximately 1” from the top with water. Unchlorinated is best. To do this, fill a different bucket with tap water, then let it sit for a few hours. The chlorine will naturally break down.
- Cover with a mesh to keep out water-loving insects, such as mosquitoes.
- Stir once daily with a stick.
- Allow to sit for about five days.
- Using cheesecloth or a piece of burlap, strain the solids out. The liquid that is left is your tea.

Harvesting and Applying Your Compost Tea

Harvesting the tea is easy. As we stated above, all you need to do is strain the remaining solids using a cheesecloth or piece of burlap. Reserve the liquid, and that’s your tea.

To use, try any of the following:

- For most applications, compost tea should be diluted. Dilute with water at 8 oz. of tea per gallon of water.
- Apply the tea 2-3 times per growing season.
- Pour into a sprayer. Spray directly on leaves/stalks of plants as a fungicide. (Caution: research your plants to make sure they can allow/withstand moisture for

- periods of time on their leaves.)
- For the lawn, pour into a lawn sprayer. Use approximately five gallons per acre of lawn. Spray the entire lawn thoroughly with the tea.
 - For small, local areas, such as potted plants, pour the tea into a mason jar or watering can. Thoroughly wet the area with the tea so that it is soaked through but not muddy or murky.

Compost Troubleshooting

Because all organic materials naturally break down over time, it seems like composting should be easy as 1-2-3. And in many ways, it is: find the right amount of brown materials, mix it with the green materials and then let nature “do its thing.”

However, even seasoned composters run into trouble on occasion. Here are the most common head-scratchers as concerns composting, and what to do about them.

My Material is Not Breaking Down!

Actually, it probably is – it’s just not doing so quickly enough for your needs and expectations.

You can speed up the decomposition process by doing the following:

- Make sure there are plenty of holes/slits in your compost bin. Plenty of aeration is needed in order to support the oxygen-loving insects and microorganisms that munch on your heap and help turn it quickly into compost.
- Check the temperature of your bin. The materials need to reach 90-140F and stay there steadily in order to encourage timely decomposition. (See below for what to do to warm up your bin.)
- Keep your materials damp, but not soaked. If they’re overly dry, add a little water. If too wet, keep the lid off and aerate, and add more brown materials.
- Make sure your green to brown ratio is correct; see the previous information in this book for tips.

The Temperature of My Materials is Too Low

If you feel the temperature inside your bin may be too low, use a thermometer to check. (Special long-probed compost thermometers can help you determine the exact internal temperature of your pile.)

You want to be as close to 140F as possible. Anywhere between 90-140F will cause breakdown of your compost materials, but the warmer they are, the faster decomposition will take place.

Try these techniques to warm up your compost bin:

- We do NOT recommend attempting to artificially warm your compost heap.
- Make sure your compost is well insulated. Compost itself is insulation, so adding a good solid layer on top of your decomposing materials will help retain heat. In addition, you may add a cover or tarp to help your bin retain heat.
- Position the compost bin so it isn't in a windy area.
- Position the compost bin so that it is in direct sunlight for at least four hours a day.

My Compost Pile Smells Bad

Correctly decomposing brown and green materials shouldn't smell bad. If they do, it's likely they are experiencing rotting at too fast a pace.

The best way to correct bad smells in one's compost pile is to add more dry brown materials, as fast rotting is usually due to too much moisture and greens. Dry materials will help correct this balance. Add a scoop of brown materials and mix. Wait two to three days and see whether the smell has reduced.

You can also check the dampness of your pile. Your compost pile should NEVER be soaking wet. Slightly damp is adequate for your composting needs.

Help – I Have Pests!

Unfortunately, any food materials left outdoors can attract pests such as rats, raccoons or even outdoor house pets. In order to discourage them, try these ideas:

- Place your compost bin well AWAY from garbage cans in your yard. Garbage cans are already a temptation for many foraging animals, and they'll quickly make the association between "yummy" garbage and your compost pile if the two are in close proximity.
- Buy or build a strong, well-fitting cover for your compost bin. One with locks is even better. Secure the top on at night.
- Cover any open areas with wire mesh. Make sure the holes are small enough that even small pests can't get in. Remember, mice and other tiny foragers can fit into any hole the size of their head.
- Keep odors down – see above for tips.
- If your pest problem becomes serious, cayenne pepper is a natural method many composters swear by. Most pests hate the scent of cayenne, and it burns the eyes and mucous membranes when it comes into contact with them. Sprinkle cayenne liberally all around your compost pile.

Composting in a Cool Climate

With heat such a crucial element to fast decomposition, composting in a cool climate can be a challenge. However, it's definitely doable! The following recommendations work during the winter, too.

- Keep "feeding" the microbes. Microbes slow down their feeding in colder situations. Encourage them to start eating again by making sure you're giving them plenty to munch on. Nitrogen-rich, "green" materials are best for this.
- Compost in layers. Rather than mixing brown with green materials, put a layer of each on the pile. Continue in this fashion as long as the cold snap lasts. Essentially, you are making a "blanket" for your compost pile.
- If your locale experiences any strong sun in the winter, place your compost pile there. Even on the coldest days, direct sunlight will help the "greenhouse effect" of a well layered compost heap.
- Let the snow stay. Believe it or not, a solid blanket of snow is insulating and will actually retain heat. As long as the snow isn't overly wet/slushy, allow a blanket of snow to remain on your compost pile until it's time to add more scraps. Then scrape off the snow with a shovel. You can replace snow on top of your pile in a

thick layer afterward if you wish.

- Cover your compost pile with a tarp to keep out winds and the worst of winter's chill.
- Cover the top of your compost pile with hay, which is insulating.

Composting Has a Message for Everyone

Now that you know the essentials of composting, spread the word! Or allow your results to speak for themselves. When friends come over, mention that you've been composting and show them the results.

Many people who are unfamiliar with the composting process will be surprised that finished compost doesn't "smell bad" or feel slimy – in fact, it has a pleasant, earthy fragrance and crumbles easily in the hand. You just may open up new worlds for your friends (and help the earth) by talking about and comparing composting methods.

You may also be able to get your town interested in composting. Call your city hall and ask whether there are any composting incentives available, such as free or low-cost bins. If not, find out whether there is an area where you and your neighbors can start a compost heap, such as a neighborhood growing collective.

Remember, even if you're the only person in miles to be invested in composting, you are still making a difference. You are reducing your "footprint" on the earth by minimizing and recycling waste, and the results of using compost for fertilizer on your lawn and plants will be obvious. So keep at it. Composting is so easy and the results are so superior, there's really no reason *not* to compost.

Happy composting!

The Staff at Cate's Garden

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