

How-To Vermicompost

By Chelsea Lam



“worm composting” by Oregon State University licensed under [CC by 2.0](#)

Composting Overview

One of the simplest and most impactful ways to build soil and boost plant health is to use compost!

Compost is simply decomposed organic matter (previously living stuff!). It is made up of “brown” materials that are high in carbon (straw, dry leaves, twigs, paper) and “green” materials that contain a lot of nitrogen (food scraps, grass clippings, road kill). When you combine those green and brown materials with water and air, all of the seen and unseen microbes and creatures start to digest and break them down into what eventually becomes “finished compost.” The finished product is called “humus” - a smooth, dark, nutrient-rich, microbially-rich soil and organic fertilizer for your lawn and plants. This is the process that takes place within the natural world as plants and creatures die and cover the ground before decomposing and becoming reincorporated into the soil.

When we “compost” our food scraps, newspapers, lawn clippings or raked leaves, and then add that finished compost back to the soil, we are facilitating the decomposition process and completing the soil cycle by returning those essential nutrients and microbial organisms back into the earth to be cycled through again and again. This will help care for and conserve the soil of our place, all while significantly reducing the waste that we add to landfills!

How Vermicomposting Works



[“New worm bins \(2 of 7\)”](#) by Timothy Musson is licensed by [CC by 2.0](#)

There are a variety of ways to compost. From using a huge compost pile in your yard, to vermicomposting under your apartment sink, there are lots of methods and levels of engagement to choose from. Vermicomposting is a method of composting that uses worms to break down “green” kitchen scraps. Yes, worms. And lots of them!

In this system, containers of various sizes are filled with brown matter like coconut fiber and shredded paper and then filled with worms. Green kitchen scraps are added to the container and the worms and unseen microbes will work together to compost it into extremely nutrient rich worm castings or poop also called “black gold!” The finished compost can be sifted from the worms, removed from your container and added to your lawn or garden. Excess water from this system can also be added to plants as “compost tea,” which has a similar beneficial effect to compost.

Below are some best practices that will help get you started with your own DIY vermicomposting bin! This is a double-bin system with one 10-gallon plastic storage container for your compost that sits in a second container for drainage.

Materials

- 2 opaque 10 gallon storage bins
- 1 10 gallon Rubbermaid bin lid
- 2 milk cartons cut in half to use as blocks
- 5 cups of shredded paper or newspaper (noncolor print)
- 2-3 sheets of newspaper
- 1 coconut fiber block (see below for more information)
- 1 large bowl

- Water for rehydrating coconut fiber
- 1/2 cup soil (*optional* from outside or potting soil)
- 1lb red wiggler worms (see below for more information)
- 11" X 17" sheet of paper
- Marker
- Tape
- Electric Drill
- 1/8th inch drill bit (for drainage holes on bottom)
- 1/4th inch drill bit (for air holes on lid and sides of top bin)
- Plastic spray bottle (for maintenance)

Material Notes

Worms - Red Wiggler (*Eisenia fetida*) worms for construction of vermicomposting bins may be purchased at a organic garden supply or hydroponic store. You can also order the worms online. Uncle Jim's Worm Farm is a reliable online source (unclejimswormfarm.com). Note that they must be red wiggler worms in order to work for vermicomposting. We recommend starting with 1lb of worms, but more can be added based on the amount of kitchen scraps that you produce. The worms should be delivered or purchased the day before or the day of bin construction if possible, as the worms cannot survive in their packaging without oxygen or food.

Bedding materials - coconut fiber and shredded paper or newspaper are the suggested bedding materials for constructing the vermicomposting bins. Coconut fiber comes in dehydrated bricks and can likely be purchased where you purchase your worms, an organic garden supply or hydroponic store or online.

Set-up Instructions

Step 1: Hydrate Coconut Fiber for Bedding

Using your large bowls, water and coconut fiber, hydrate coconut fiber by following the instructions on each package. This will be used as part of the "bedding" or the material that the worms live in and process into compost. Coconut fiber makes excellent vermicompost bedding because it is pH neutral and holds moisture well.

Step 2: Drill Drainage Holes

While the coconut fiber is absorbing your water, drill 15-20 1/8th inch holes in the bottom of one of their 10 gallon plastic bins. These holes are for drainage of excess liquid from your compost. They are small to prevent worms or bedding from falling into your liquid. This excess liquid is called "compost tea" and is excellent to add to your plants, yard, or garden.

Step 3: Drill Air Holes

Switch to the 1/4th inch drill bit and drill holes along the upper edge of the first plastic bin- the same one as the previous step. 10 holes on the long sides and 5 on the short sides will give sufficient air circulation to your bin. Your plastic bin is opaque to keep your compost system nice and dark for the worms who do not like the light.

Step 4: Insert Top Bin Into Bottom Bin with Blocks

Place two blocks, halved cardboard milk cartons, into the bottom of the undrilled bin. These blocks can be anything that is stable enough to support the top bin while leaving some room for excess liquid to drip into the bottom bin. Place the top bin into the bottom bin.

Step 5: Add Bedding

Several different materials work well as worm bedding: shredded paper, newspaper, cardboard or leaves; wood shavings, peat moss, coconut fiber, or a mixture of those items! You should not use grass clippings, soil, or paper with color or colored print.

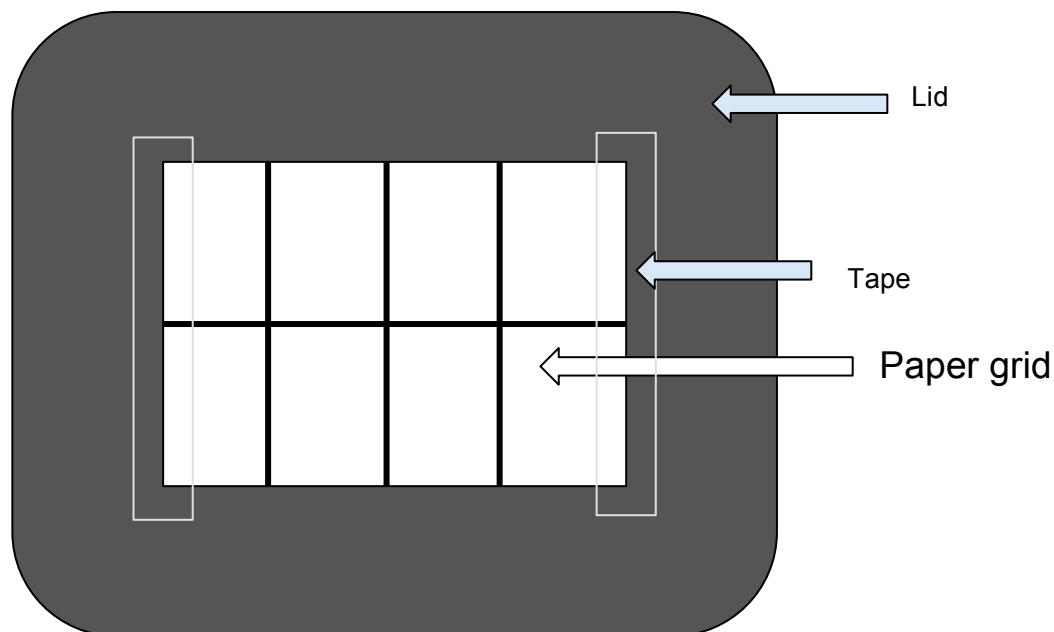
To make your bedding, wring out the coconut fiber so that it is damp, but not dripping, and add it to your top bin. Keep wringing and adding handfuls of coconut fiber until the whole block has been added. Put the remaining bowl of water aside.

Next, mix your coconut fiber with the shredded paper or newspaper and a cup or two of soil or potting soil. The soil adds some additional microbes and grit to help the worms digest food. The result should be 4-6 inches of fluffy, slightly damp bedding (like a wrung out sponge). Lay a few layers of dry newspaper on the top of your bedding. This will help absorb excess moisture and keep out pests and flies later.

Step 6: Add Worms

Now the exciting part! It is time to add your worms to their new home. The worms used in vermicomposting are not the large earthworms that you would find in your garden. Composting worms are called red wigglers. They are small, thin, they break food down quickly, they thrive in captivity, and they don't dig down as deep, which is perfect for composting systems. We are starting with 1 lb. of worms. Sprinkle them on top of your bedding and then put the lid on your bin.

Step 7: Make Lid Grid



Using the tape, large sheets of paper and sharpies, draw a grid onto your sheet of paper and tape the paper to the top of your compost bin lid. You can reference the visual on the slide.

This grid is for you to keep track of where you last added food to your bin. The first time you add food to your bin, add it into the upper left hand corner and mark the date on your lid. Then go clockwise around the bin. The worms will hang out in that spot and eat your kitchen scraps. As you add food to different sections, the worms will follow the food. By the time you make it back to the starting section of the grid, your food from before should be unrecognizable. This lets you know that your worms are ready for more grub! If so, you can add food to that spot and start your grid over again. If not, save your scraps for later by putting them in the refrigerator or freezer and let your worms keep eating until that food is broken down.

The construction of your bin is now complete! We will not add food to your bin right now in order to give your worms time to adjust to their new environment.

Step 8: Add food

You can add your first batch of kitchen scraps after giving your worms a day or so to habituate to their bedding!

To add food, simply remove your lid and pull aside your newspaper over the section that you want to add food to. Using a garden trowel, your hands, or a large kitchen spoon, drag aside about 2 inches of bedding in the first grid section of your bin. You don't want to use a sharp metal shovel that might cut your worms!

Don't dig down so deep that you reach the bottom of the bin, but dig down deep enough so that your scraps will be covered with 1-2 inches of bedding once they are buried. Once you have a trough, add your chopped up kitchen scraps or coffee grounds and completely recover them with your bedding. Recover your bedding with your newspaper sheets and place the lid back on top of your bin.

Vermicompost Maintenance

Let's talk about how to maintain your new vermicomposting system starting with how to feed them!

Feeding Your Worms

So how much will these worms eat? These worms can eat half of their weight in food everyday. If you add 1 lb. of worms, your system will be able to process about 3.5 lbs. of food scraps per week. Once your worms begin to reproduce, you will be able to add more scraps to your system, but it is best to start slow while your worms are habituating to their environment. To find out how many worms you need, estimate or weigh your food scraps for a week and multiply that by 2. If 1 lb. of worms isn't enough for you or your family, additional worms can be purchased at garden supply or hydroponic stores, online, or at bait shops. Just be sure that the worms are red wigglers (*Eisenia fetida*).

What exactly do worms eat? Your worms can eat fruit and vegetable scraps, coffee grounds, tea bags (staple removed) and grains. Certain foods should not be added to your worm compost bin to avoid odors or harm to your worms. Bones, meat and dairy products take so long to break down that they can start to smell or attract flies. Citrus, oils and salty foods can coat the skin of your worms making it hard for them to get adequate oxygen. Grass clippings in your worm bin will begin to “cook” or create heat as they break down. That heat can kill your worms who prefer more moderate temperatures of 50-80 degrees. And obviously, plastic or other inorganic products should not be added to your bin.

Also, it helps if you chop up your food scraps into smaller pieces to increase the surface area for the worms and microbes to digest it. Don't blend up your scraps in the blender because it will make your compost too wet.

Now you know what your worms should and should not eat, you know approximately how much they eat, and you have a handy system on your lid for keeping track of where you have added food to your bin.

How exactly do you add food to your bin? To add food, simply remove your lid and pull aside your newspaper over the section that you want to add food to. Using a garden trowel, your hands, or a large kitchen spoon, drag aside about 2 inches of bedding in the first grid section of your bin. You don't want to use a sharp metal shovel that might cut your worms!

Don't dig down so deep that you reach the bottom of the bin, but dig down deep enough so that your scraps will be covered with 1-2 inches of bedding once they are buried. Once you have a trough, add your chopped up kitchen scraps or coffee grounds and completely recover them with your bedding. Recover your bedding with your newspaper sheets and place the lid back on top of your bin.

Maintain Proper Moisture Levels

Every time you add food to your compost bin, feel your bedding to make sure that it has the moisture level of a wrung out sponge. If your bedding feels too dry, lightly spray the top of your bedding with water from a spray bottle. If your bedding is too wet, mix in some additional dry bedding like shredded paper or newspaper. A plastic spray bottle is included in your worm bin materials for you to take home and use.

Excess moisture will drain into the bottom bin in the form of compost tea. Compost tea is an excellent, microbially rich additive to your plants, lawn or garden. Once some liquid collects in the tray, you can remove the top bin from the bottom, dump the liquid, and reinsert the top bin.

Harvesting Compost

After a few months you will notice that your bedding has been broken down and now looks like smooth, dark worm castings. “Worm castings” means worm poop. It is now time to harvest your compost and add fresh bedding to your bin! There are several ways to do this.

One way is to pull all of your existing bedding to one side of your compost bin. Add the new bedding on one side along with new kitchen scraps. Over the next week, your worms will migrate over to

the fresh side, allowing you to harvest the finished compost by gently scooping it out and removing any lingering worms that need to go back into the bin.

Another simple way to harvest your worm castings is to sift the finished compost with a large metal strainer or plastic colander. Scoop out the finished compost and shake the strainer over an extra container. The sifted compost can be added to your garden or yard and the worms can be added back into your worm bin with fresh bedding and food.

For more ideas check out the additional resources on your hand out or do some researching online! There are several harvesting methods to choose from.

Vermicomposting Issues and Concerns

Below are some issues and concerns that might come up as your begin your vermicomposting adventure and how to troubleshoot them if they occur.

Odors

A common concern with vermicomposting is a fear of unwanted odors. Your worm bed should smell earthy, but never stinky. If your compost bin stinks, something is wrong. Your compost may be too wet (thus, don't add water for a week and let it dry out). You may have added meat, dairy, bones, or oil (remember, these take too long to break down in your worm bin and should be avoided). You may have added too much food and the worms aren't breaking it down fast enough (don't add food for several weeks to give the worms time to catch up. When the previously added food is unrecognizable, you can add more. In the meantime, freeze food scraps.)

Flies and Pests

Flies and fruit flies love decomposing kitchen scraps just as much as worms do. To avoid flies from laying eggs in your bin, always bury the food beneath a layer of bedding and cover your bedding with a layer of newspaper. Because flies cannot burrow, they are only able to lay eggs on food that is exposed. Keeping food covered keeps flies from smelling it or laying eggs in your bin.

You may see mold or very little bugs in your compost system. This is perfectly normal and means that you have a thriving soil food web in your bin!

Worms escaping

Maybe you are worried that your wormy friends will make a break for it! This is a very legitimate concern as worms can escape from the air holes in your bin. The good news is, happy worms stay put. If your wormies are trying to get out of your box, that means that their environment is not hospitable for them. A common reason for worms escaping is the bedding being too wet or dry (think damp sponge, not dripping). Your PH may be off from adding too much acidic shredded paper. Avoid colored print and try adding more PH neutral coconut fiber and letting the worms get used to it for a few days before adding more food. Do they have enough food? Remember worms eat about half their weight in food every day. If the food in your bin is unrecognizable, it's time to add more scraps and make a note on your grid.

For more resources and information on vermicomposting, check out the [Going Further Resources](#) document or explore [Conservation@ forums at arocha.us/conservation@](#). Happy vermicomposting!