

Vermicomposting

Vermicomposting, or worm composting is an easy process that requires only a few simple components: some red wiggler worms, a ventilated bin, bedding for the worms to live in, food for the worms, and some time to harvest their nutrient rich castings. Once you have all the components in place, worm composting is easy! Vermicomposting is perfect for apartment and condo dwellers who do not have a backyard area for composting.

Effort Scale:

Easy	1	2	3	4	5	Hard
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Vermicomposting is easy, with most effort coming around harvest time. Great for all ages!

The Worms and Other Worm Bin Organisms

Red Wigglers

Vermicomposting requires a special type of worm called a red wiggler (*Eisenia foetida*). The red wiggler is a deep red colour, unlike the common earthworm (*Lumbricus terrestris*) which is more of a pink colour and is found in your garden soil. Unlike typical garden worms, which like to travel through the soil, red wigglers prefer to live in smaller, more enclosed spaces with a concentrated food source -- like worm bins! Worms are the predominant decomposing organism in your worm bin.

You will also notice other organisms that make their way into your worm bin - do not panic! These are all apart of the vermicomposting process and will not harm the worms or escape into your home. A multitude of organisms is indicative of a healthy worm bin. Some organisms you may find are whiteworms, sowbugs, springtails, centipedes and millipedes. For more information on compost organisms see Fact Sheet #8: Compost Ecology.

The Worm Bin

There are many different ways to make a worm bin, but all worm bins should meet certain criteria in order to ensure the bin can process food scraps and keep your worms comfortable:

- To handle food scraps from two people, the bin should be at least 3 feet³ (0.08m³) in size. The dimensions of this size bin might be 2' (60cm) long, 1.5' (45cm) wide and 1' (30cm) deep. You can make your bin as large as you



Worm bin with stand

want, but keep in mind that a bin full of worm castings is heavy.

- The bin must have a lid. The lid keeps moisture (and the worms) in and flies and light out. It does not need to be tight fitting.
- The bin must have drainage. A few holes in the bottom of the bin will suffice. A tray beneath the bin can catch the drippings, which make a wonderful fertilizer. As well, you will need a stand to hold the bin up above the drip tray (see photo).
- The bin will need a source of air. Holes drilled in the side and fitted with soffit vents will provide the necessary aeration.

Locating Your Worm Bin

It is important to place your worm bin in a good location. Consider the following factors:

- **Temperature**

Worms prefer a temperature of about 17C-22C (70-80F). Thus, it should be kept indoors in the winter and can be put outdoors in the summer if it is in the shade.

Do not place the bin too close to a heating device like a radiator or heater, which can quickly warm the bin and kill the worms.

- **Accessibility**

It is a good idea to place your bin where it can easily be accessed and monitored. Some common places for worm bins are:

On a patio or balcony
Under the sink
Under a shaded tree

In the kitchen
In the garage
Under a table

The Bedding

Worms need a comfortable material in which to live - what we call 'bedding'. This bedding should resemble a light, moist, fluffy soil that is easy for the worms to move around in. Here are a few items and tips that can help you achieve this environment:

- Shredded leaves make wonderful bedding for worms. They can be used on their own, or mixed 50/50 with shredded newspaper. Leaves, however, are only available at certain times of the year, so stockpile them when you get the chance!
- Shredded newspaper (about 1/2"-1"/1-3cm wide) is a great bedding product because it is abundant and free. However, it cannot really be used on its own; it mixes well (50/50) with leaves or coir.
- Coir (coconut husk fibre) is a by-product of the coconut industry and has a texture much like peat moss. It can be mixed 50/50 with newspaper for bedding.
- The bedding should be moist but not soaked. We recommend that it be as wet as a wrung out sponge or slightly wetter.
- It is a good idea to mix or turn your bedding every few weeks to help aerate the bin. This prevents the bottom and corners from getting too wet and becoming anaerobic -- creating an unpleasant smell.

Food and Feeding

Food

Worms can eat a wide variety of food scraps such as:

- Raw fruit and vegetable scraps
- Coffee grounds (a particular worm favourite!)
- Tea bags
- Egg shells

Do not add meat, dairy, or oily food to your worm bin. These items risk attracting fruit flies and houseflies and can rot if not ingested quickly. Also, be sure to feed your worms a wide variety of materials. Limiting their diet to one or two items can slow their population growth and disrupt the pH of your bin. It is best to limit the amount of citrus, garlic and onion added to the worm bin: they are all naturally antibacterial and do not seem to appeal to worms. In addition, foods that are very acidic (e.g. lemons, tomatoes) can also alter the pH of the bin and attract fruit flies.

Feeding

Red wigglers are voracious eaters with the ability to eat half their weight in food each day, so they are ideal for worm composting. For a standard sized worm bin, we recommend adding two 750g yogurt containers of food each week.

We recommend feeding once or twice per week so you don't disturb the worms too often and can



= each week

keep track of how much you are feeding them. When you feed your worms, dig a hole in the bedding, place the food scraps in the hole, then re-cover them with the bedding. Keeping food scraps covered at all times prevents them from smelling and attracting flies and other pests. Be sure to feed your worms in a different place in the bedding each time, ideally moving in a consistent direction. This ensures that you do not dig up your other food scraps when burying new ones, and that the worms are moving throughout the whole bin, consuming the bedding along with the food scraps.

You can also chop or cut larger food scraps up to help the worms eat them more quickly. This is not essential but will help produce a more even-textured finished product.

Harvesting Your Castings

Harvesting the worm castings is the most labour intensive part of the vermicomposting process, but it only needs to be done **every 4-6 months**. There are many ways that you can harvest your worm castings, but here are just a few:

1. Migration Method

The migration method is an easy but lengthy process. You will want to begin your migration method when you see the worm bin is about 90% finished. This is easy to determine if you have used some newspaper in your bedding. When the newspaper is almost all gone and most of the bedding has turned to moist, black worm castings, it is time to migrate your worms. The timing of your migration is important because the castings are toxic to worms and they will eventually die if left in their own waste for too long.

Feed your worms on one short side of the bin, and the worms will migrate to that side to feed. After 2-4 weeks you can harvest the castings on the opposite side of the bin and replace them with new bedding. You can then start placing the food in the new bedding and the worms will migrate to it.



Windrow piles on a tarp

2. Tarp Method

The tarp method is a more labour intensive process of harvesting your castings, but it can be done much more quickly than the migration method.

- 1) Simply dump the contents of your finished worm bin onto a big tarp. This is best done outside.

- 2) Separate the castings into small piles or make a long windrow pile (a long tall mound).
- 3) Shine a light on the top of the pile (or use the sun outside) and the worms will move to the bottom of the pile to escape the light.
- 4) Scoop the castings off the top of the piles and then re-pile them several times until all you have left is a bit of castings and a bunch of worms.
- 5) Add more bedding to your bin, return the worms to their home and add their food for the week.

The tarp method can also be used right inside the bin. Simply take off the lid and place the bin outside on a sunny day or under a bright light inside. Mix up the bedding thoroughly but gently and let it sit for about an hour. The worms will have worked their way downward, out of the light, and you can skim the compost from the top of the bin. Repeat this process several times until you have a thin layer of worms and castings at the bottom of your bin. You can then add new bedding directly to the bin and continue with feeding.

Worm Bin Timeline

Daily:

- Put food scraps into compost pail (not into the worm bin)

Weekly:

- Bury approximately 2 yogurt containers worth of food scraps
- Check/empty drainage tray.

Monthly:

- Fluff bedding, making sure that newspaper is not clogging the drainage holes

Every 4-6 Months:

- Harvest worm bin

Troubleshooting Your Worm Bin

Symptoms	Possible Cause	Solutions
Smelly bin	Food overload	Gently mix bedding in with the food; stop adding food for a couple of weeks, or add less food.
	Not enough air circulation; too wet	Mix in fresh newspaper; make sure bedding isn't matted over the drainage holes; gently fluff bedding.
	Unsuitable materials	Remove any meat or dairy or large amounts of bread or citrus
Worms leaving	Not enough air	Mix in fresh newspaper (not the glossy kind, and not the flyers); make sure bedding isn't matted over the drainage holes; gently fluff bedding.
	Bedding ready to be changed	Harvest castings
	Too many citrus peels	Remove some of the citrus peels
Worms dying	Not enough food	Bury more food in the bin
	Not enough air	Mix in fresh newspaper; make sure bedding isn't matted over the drainage holes; gently fluff bedding.
	Too dry	Mix in water until the bedding is damp like a wrung out sponge
	Too wet	Mix in some shredded newspaper (not the glossy kind and not the flyers) or shredded brown paper towels (after they've been used).
	Too cold	Move worm bin inside
	Too hot	Move out of direct sunlight
Fruit flies	Not burying food or overloading bin	Make sure food scraps are well buried under the bedding; Make sure compost collection pail has a secure lid (it can also be kept in the fridge); Place a 1-inch thick layer of damp newspaper over top of the bedding until fruit flies subside;

Troubleshooting tips adapted from The Composting Council of Canada's *Composting Goes to School Teacher's Guide*



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