

Composting with Worms

A worm bin is an easy way to turn food waste into fertilizer and amendments for your garden. Redworms are voracious recyclers that transform apple peels, zucchini stems, and other kitchen wastes in just a few months. Supply them with a home furnished with bedding and food, and they will go to work.

Type & Number of Worms

There are thousands of earthworm species in the world, all of which feed on some form of organic matter. Redworms, *Eisenia foetida*, are well suited for a worm bin because they prefer fruit and vegetable scraps, are voracious feeders, and reproduce well in captivity. They are smaller than earthworms. You can buy these worms by the pound through garden catalogs or suppliers that sell beneficial critters.

Worms can eat half their weight in food in 24 hours. Estimate the weight of your household's food waste per day to determine the weight of worms you need. Two pounds of worms are needed for each pound of kitchen waste added per day. One pound of worms equals 1,000 to 2,000 worms!

Worm Bin Basics

- Worm bins can be homemade or purchased. You can begin with a plastic bin, punching aeration holes in the sides and top, or you can buy a suitably-sized worm bin.
- The size depends on how much waste you generate per week. A bin measuring 1 by 2 by 3 feet can handle 6 pounds of kitchen waste per week (average for a family of four to six).
- Place bedding in the container. Loose, organic matter such as wood shavings (not cedar), shredded newspaper, and coconut fiber works well as bedding material. Add a little sand or plain garden dirt — worms like a little grit. Fill the bin about 80 percent full with bedding material.
- Add water to the bedding until it is dripping wet. Check the bedding's moisture content by squeezing some in your palm. If a few drops of water come out, it is sufficiently moist. In order to survive, worms require 75 to 90 percent moisture content in both their bodies and their bedding.
- Air circulation is a must in and around the worm bin. Worms need a constant supply of oxygen, so there should be air holes somewhere on the container — either on the lid or sides. If you use a plastic bin, be sure to add both drainage *and* aeration holes.
- Scatter your worms on the prepared bedding. Leave the lid open until the worms work their way down. Worms avoid light, so the container should be dark inside and have a good lid.
- Keep them in a place where the temperature remains 50° to 85°F.
- Choose a location that is convenient for maintaining the bin.
- Never use a container that has been used for storing toxic chemicals.

Worm Food

Although worms can break down just about any organic waste, it's best to treat them as vegetarians.

- *Do feed:* Vegetable scraps, coffee grounds & filters, tea bags, stale bread (no butter or mayonnaise), fruit peels or pulps, crushed eggshells, animal hair, shredded paper.
- *Don't feed:* Meat, fish, dairy products, greasy or oily foods, onion, citrus peels, garden debris (leaves, stalks, and grass clippings), and pet waste.

To start, add very little food. This forces the worms to go deep into the beddings and settle in. When adding food waste to the bin, pull aside some of the bedding and bury the food. Bury successive loads in different locations. Before adding new food, check to see if old items were used. As uneaten foods accumulate, they

may give off an offensive smell. If that happens, stop feeding and stir the wastes with a trowel or garden fork. Add fresh bedding. Observe carefully, adding new food in a few days. During the colder temperatures of winter, worm activity may slow down a bit. Monitor how much they are eating so that you do not give them too much food.

Although worms multiply fast, they will regulate their population to the confines of the available space and the amount of food you give them. So there is no worry about an overpopulation of worms.

Harvest & Use of Worm Castings

After several months of feeding, much of the bin's bedding will turn into dark, crumbly worm castings and will be found at the bottom of the bin. It's now time to remove this finished compost and add new bedding material. Also, collected liquid fertilizer can be used as a liquid fertilizer. Worm castings can be added to your garden soil or potting mix. Spread a layer of about ½ inch worm castings around your favorite plants, and water in. For seedling mix, use 3 parts aged compost to 1 part castings. Worm castings are generally neutral in pH and contain phosphorous, nitrogen, and other nutrients and minerals.

Red worms require moist conditions all year-round because they don't tunnel deep for moisture as do earthworms. If you wish to release them into your garden, give them a thick surface layer of mulch to maintain moisture and insulate them from heat and cold. If that's not possible, don't release them.

Potential Problems and Solutions

- *Odor*: You can control odors by not overloading the box with food waste, by keeping out items listed under "Don't feed" in the "**Worm Food**" section, and by providing adequate fresh bedding.
- *Pests*: Sometimes the very small vinegar fly (often mistaken for the fruit fly) gets in, but these do no harm. However, very large numbers of the vinegar fly may indicate that you are feeding the worms too much. To eradicate the vinegar flies, slow your rate of feeding to how much the worms will consume in one day and cover freshly-added wastes with a moist burlap bag or newspaper.

Ants will enter your outdoor worm bin if you have a lot of them, particularly if you have let the bedding become too dry or acidic. Add water to raise the moisture level, and add a liberal quantity of garden lime where the ants are gathering. This should discourage them. If they persist, physically remove them and smear some Vaseline around the entry points.

Rodents can be a problem outdoors. The easiest way to keep them from entering a worm bin is to keep the lid shut and meat wastes out. If there are signs of animals near the bin, raise it 12 to 18 inches off the ground or secure a sheet of wire mesh to the inside bottom of the bin. Keep the bin's lid latched or well-secured if possums or raccoons are a problem.

OSU Extension Service Resources & Other Books

Visit your OSU Extension Service office at 200 Warner-Milne Road, Oregon City, for these publications, or get them online at <http://extension.oregonstate.edu/catalog>

Sustainable Gardening – The Oregon-Washington Master Gardener Handbook.

Worms Eat My Garbage, Mary Appelhof, Second Edition

Welcome to the Can-O-Worms, N. Natrass.

Master Gardener™ Advice

- Call the Home Horticulture Helpline: 503-655-8631 (Clackamas County), 503-821-1150 (Washington County), 503-445-4608 (Multnomah County).
- For 10-Minute University™ handouts and class schedule, visit www.cmastergardeners.org or www.metromastergardeners.org.
- Look for Master Gardeners at area Farmers' Markets.