



Vermicomposting – Composting With Worms

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<http://osufacts.okstate.edu>

What is Vermicomposting?

Vermicomposting is composting with worms (*vermes* is Latin for worms). Worms speed up the composting process of organic materials, such as food scraps and garden waste.

Why Compost with Worms?

Landfills are expensive to build, operate, monitor, and close. The average household waste stream contains 32 percent paper and paperboard, 9 percent food waste, and 14 percent yard waste. These items can all be composted. Worms will eat the majority of paper and food waste. By removing these items from the waste stream with home composting, residents can reduce the cost of municipal solid waste collection and disposal, prolong the life of landfills, add valuable nutrients to their gardens and soil, reduce the amount of commercial fertilizer in their yards and gardens, and save money.

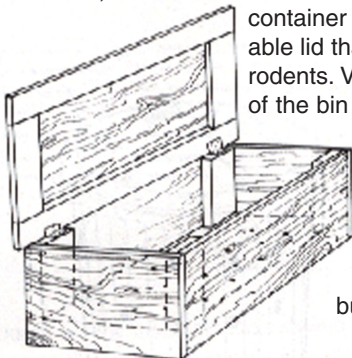
What Kind of Worms are Needed?

Worms naturally aid the composting process, but Red Wigglers (*Lumbricus rubellus* or *Eisenia foetida*) are best. They reproduce quickly, adapt well to life in a bin, and compost food rapidly as they consume their weight in food daily. They are 3 to 5 inches in length, dark red in color, and will tolerate temperatures from 50 to 80 degrees Fahrenheit. They prefer to live in the dark. One pound of Red Wigglers is needed to start a colony. They make excellent fish bait. Red Wigglers are found at some bait stores or local worm farms.

What Kind of Bin is Needed?

There are several types of commercial bins available, or homeowners can make their own from a variety of materials such as plastic, wood, Styrofoam, metal containers, washtubs, crates, or boxes. Since the worms prefer to live in the dark, the container will need a secure and removable lid that will keep out flies, cats, and rodents. Ventilation holes around the top of the bin and in the lid should be small to keep out flies. Holes (1/2 inch) in the bottom will relieve excess moisture. A tray placed under the bin can collect any excess moisture.

The size of the bin may vary, but it should be large enough



to accommodate the amount of food waste the household produces. The sides should be 8 to 12 inches deep. For two people, a container 2 feet by 2 feet should do.

Where do you Put the Bin?

Keep in mind the temperature restrictions of the worms (50 to 80 degrees F) when positioning the worm bins. Most basements or cellars and heated garages are ideal. Inside the house, many people use a small bin under the kitchen sink or in the laundry room. During temperate weather, outside in the shade or along the wall of the house are good spots.

What is Bedding?

The worms need a substrate that will hold moisture yet allow air circulation, cover the food scraps, and is fluffy so they can burrow into it. Bedding for the worms should also be lightweight, biodegradable, retain moisture, and not be toxic to the worms. Some good candidates are shredded paper bags or newspaper (not shiny), old leaves, peat moss, or composted manure. The bedding materials should be moist – wet it, then wring out the excess water and fluff it up. A handful or two of garden soil should be added to start and when the compost is harvested and the bedding is changed. Crushed eggshells will add roughage and valuable minerals for the worms. Spread the bedding evenly in the bin.

How are the Worms Fed?

Small scraps of food waste are buried in the bedding for the worms to eat. The smaller the pieces, the faster they decompose into compost.

What do the Worms Eat?

Worms will eat an amazing variety of food, most non-greasy, non-dairy, or non-meat organic materials. Coffee grounds and filters, tea leaves and bags, vegetable and fruit scraps, and breads and grains are all good worm food. Worms will also eat the bedding. Keep the food and bedding moist. Bury the food in the bedding. Do not feed the worms pet waste, meat or fish scraps, greasy foods, rubber or plastic items, dairy products, bones, tobacco, or twigs. One pound of worms will eat about a half-pound of food scraps per day.

PROBLEM	CAUSE	SOLUTION
Rotten Odor	Bedding too wet Food exposed to air Greasy or meaty food Not enough air Too much food	Drain moisture, fluff up bedding Cover food with bedding Remove offending food Drain moisture, fluff up bedding Add more bedding, stop adding food for a while
Attracts flies and insects	Same as above Air holes too big	Same as above Cover holes with netting
Worms dying	Starving Too wet Too dry Bedding gone, eaten Temperatures too high or low Toxicity Acid build up	Add more food Add more bedding or dry it out Spray water on to moisten Harvest compost, add more bedding Move to a more moderate climate Check for food and bedding for offending items Too many citrus scraps, remove them
Mold forming	Acid build up	Too many citrus scraps, remove them
Water running out bottom	Too much moisture	Drain, add dry bedding and fluff, use less food with high moisture content; leave lid off for a day
Worms escaping	Unhealthy conditions	Check problems listed above

What Can Go Wrong? How is the Problem Fixed?

Once established, a vermiculture requires little attention. However, some problems may arise. The following table can help diagnose and cure the problem(s).

How to Harvest the Compost and Worms

Worms turn the food and bedding into rich, dark, compost soil, and castings in two to five months. Harvest the compost two to three times per year in several different ways. Be sure and add one or two handfuls of garden soil to the new bedding.

1. Under bright light or sunlight, dump the bin onto a plastic sheet. Build cone-shaped piles on the sheet. The worms will retreat to the dark center. At 10 to 30 minute intervals, remove the outer soil from the cones several times until all the worms are in a small center area. Return the worms to the bin with new bedding and food, or harvest them for compost bait.
2. Remove one-third to one-half of the bin contents and use on the garden. Combine the remaining compost and worms with new bedding and food.
3. Move the compost to one end of the bin. Add new bedding and food to the other end. The worms will move to the new area and harvest the mature compost and castings.
4. Return any yellow colored eggs to the bin.

How is the Compost Used?

The compost and worm castings can be used immediately or stored for use later. It is very rich.

Soil Amendment - it may be mixed with other soil or potting mix as an amendment to increase nutrients and organic matter, retain moisture, and loosen soils such as clay.

Mulch - 1 to 2 inches thick around trees and other plants. Do not put next to plant stems.

Fertilizer – top dressing for houseplants or mix into planting beds.

Tea – seep compost in water to solubilize nutrients for watering houseplants.

For additional information, please contact the local County Extension staff.

Additional Resources

Waste Management Web Site – www.rd.okstate.edu/waste
Fact Sheet F-6037, “Backyard Composting In Oklahoma”
Brochure L-252, Recycling Yard Waste, “Don’t Bag It” – Leaf Composting

The Rodale Book of Composting by D.L. Martin and G. Gers-huny, Eds., Rodale Press, Emmaus, Pennsylvania

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