

# Composting with Earthworms

## Definitions

**Vermicompost** is a term for the rich, crumbly, black compost that is created when earthworms eat their way through a pile of organic matter.

**Castings** is just a fancy word for earthworm excretions.

Earthworms are often grouped according to their function in the soil:

**Anecic** worms are usually larger worms that build permanent burrows in the soil and come to the surface to pull bits of leaves or other organic matter into their burrows.

**Epigeic** worms live in decaying organic matter, not in the soil.

**Endogeic** worms rarely come to the surface. Some endogeic worms inhabit the rhizosphere, the area immediately around plant roots, where they feed on soil that has been enriched by decaying roots, bacteria, and fungi.

*Lumbricus terrestris*, the night-crawler, is a large anecic worm with a flattened tail that is great for your soil, but will not survive in a closed compost bin.

*Eisenia fetida*, the red wiggler or redworm, is a small epigeic worm, three inches long or less, that thrives in compost bins. Some of these worms have yellow bands between their segments, others do not.

*Aporrectodea caliginosa*, often called a grey worm or a southern worm, is one of the most widespread endogeic species. It's often found in the roots of plants. As its common name indicates, it is a grey or slightly pink worm about two or three inches long.

## Worms prefer a healthy, vegan diet!

When you set up your worm bin, start feeding slowly. One pound of worms (about 1,000 worms) can eat up to half a pound of food per day. However, this depends greatly on conditions in the worm bins and how appetizing the food is (worms love melon and banana skins!). Also, finely chopped food is easier for worms to eat than, for instance, a head of lettuce thrown in whole.

Putting in more food than the worms can eat might lead to infestations of other pests in the bin. It can also increase the acidity and make the bin smell unpleasant. Over time, you will get to know how much food your worms can take at once.

What to feed worms	What NOT to feed worms
Vegetable scraps	Meat or bones
Shredded newspaper or office paper	Fats such as olive oil or salad dressing
Coffee grounds	Dairy
Eggshells	Animal feces
Dryer lint	Very spicy foods
Plain pasta or rice	Glossy magazine paper
Plain bread	Citrus, hot peppers, onion or garlic (small amounts are OK)

## Types of worm bins

- Can-O-Worms
- Wriggly Wrench
- The Worm Factory
- Homemade bin—plastic tub
- Large-scale bins are also available for schools, restaurants, and institutions.

## Conditions in the worm bin

- Find a cool, sheltered spot (on a porch or in a garage or basement)
- Protect worms from extreme temperatures (their ideal temperature range is 60-70 degrees.)
- Keep damp but not soggy (never pour water through your bin!)
- Start with a layer of peat moss or coir (coconut fiber) bedding
- Keep a layer of shredded newspaper or office paper on top
- Add crushed eggshells or a pinch of powdered limestone or rock dust to reduce acidity.
- Add a small amount of garden soil to provide grit

## Other critters in the worm bin

Even an indoor bin could attract a few other critters. Most other bugs are harmless and may, in fact, help to break down the compost so the worms can better digest it. Keeping a tight-fitting lid on your bin and putting your kitchen scraps directly in the bin (as opposed to, for instance, dropping them in a bucket outside and adding them later) will help keep bugs out of your bin.

Here are some examples of other bugs you might find in your worm bin:

**Fruit flies:** These tiny creatures are annoying but harmless. Reducing the acidity of your bin and keeping food buried under a layer of newspaper will help discourage them.

**Ants:** Ants are great decomposers. However, if you don't want them around, try sprinkling borax around the base of the composter or using store-bought bait. Just be sure the bait is not accessible to worms (and pets and children!).

**Sow bugs:** Also called pill bugs. These are the little hard-shelled bugs that roll up into a ball. They are harmless, but you can pick them out of your bin (a garden spade works great for this) if you don't want them.

**Potworms:** These are tiny white worms that you might mistake for baby redworms. They are great decomposers and there is no reason to discourage them.

**Slugs and snails:** Yuck! Pick them out with a garden spade and toss them into the street! (or crush them under your foot, or drown them in a bowl of stale beer!)

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## Life as an Earthworm

- Most worms live just a few years.
- Worms are hermaphroditic: they have both sets of sexual organs and line up head-to-tail to mate.
- You will find worm cocoons in your bin from time to time. They are tiny brownish sacs, from which two or three baby worms will emerge
- Baby worms are translucent with a red vein running through them.
- Some people say a healthy earthworm population will double

## Harvesting and Using Vermicompost

### Draining the liquid

Most composters have some way of draining off liquid from the bottom of the composter. Some bin manufacturers claim that this liquid is a very healthy "compost tea" that makes a great plant fertilizer. Other worm experts think this liquid is too acidic and too full of anaerobic bacteria to be of benefit to most plants. I pour mine into my flower beds and I've never seen any problems; but you be the judge.

### Harvesting castings in a stacking bin system

Most worms will have left the bottom tray that you plan to harvest. If some worms remain, you can put the tray of castings on top of the stack and leave the lid off. The exposure to light may send them diving for cover.

### Harvesting castings in a single-layer system

Once your bin starts to get full of castings, start feeding only in one corner of the bin. That will attract worms to that corner and encourage them to leave the other end of the bin, where you want to harvest your castings. If, after a few weeks, you still see a lot of worms in the side of the bin without food, you can also place a melon rind or apple core in that area. The worms will be drawn to it and can easily be scooped out and relocated. I keep a garbage can full of finished, aged compost around, so if I add worm castings to that can, I figure a few extra worms can't do any harms. If you add the worms to your garden, they will only survive if they have a very rich, damp pile of mulch or compost to investigate.

### Using vermicompost

New studies are starting to show that vermicompost can not only nourish plants, it can also help prevent plant diseases. Add a teaspoon (or small shovelful) to potted plants or transplanted seedlings. Work it into the soil when you're planting vegetable beds. Add a little to water and use within 24 hours as compost tea.



Vic Stewart

**Amy Stewart** lives in northern California with her husband, two cats, and several thousand worms. She is the author of *From the Ground Up: The Story of a First Garden*, and the garden columnist and book critic for the *North Coast Journal*. Her articles appear in a number of magazines and newspapers, including *Organic Gardening*, *Bird Watcher's Digest*, the *San Francisco Chronicle*, and the *San Diego Union-Tribune*.

### WORMS OF ENDEARMENT:

Visit what may be the first-ever worm blog. Amy keeps an online diary about her book tour and her life with worms at <http://wormsofendearment.blogspot.com/>

- every sixty days. This is a *very* optimistic figure! However, in the very best conditions, an initial quantity of 1,000 worms (one pound) will expand to fill a bin within a few years.
- There is no such thing as too many worms in a worm bin. The worm population is somewhat self-regulating—it will expand to meet the available food source. However, if you've got a bin full of worms, there's nothing wrong with scooping some out to share with a friend!

## WORM RESOURCES

### If you're just getting started, read:

Appelhof, Mary. *Worms Eat My Garbage* (Flower Press, 1997).

Nancarrow, Loren and Taylor, Janet Hogan. *The Worm Book* (Ten Speed Press, 1998)

### For information about large-scale worm projects, read:

Payne, Binet. *The Worm Cafe: Mid-Scale Vermicomposting of Lunchroom Wastes* (Flower Press, 1999).

Wilson, Eric. *Worm Farm Management: Practices, Principles, Procedures* (Kangaroo, 1999).

### And the all-time best book about earthworms is:

*The Formation of Vegetable Mould, Through the Actions of Earthworms, With Observations on their Habits*, by Charles Darwin. The book was published in 1881. You can find many charming old copies, as well as some more affordable reprints, at [www.abe.com](http://www.abe.com), or ask your favorite used bookstore to help you find one.

### Magazine

**Worm Digest**  
PO Box 544,  
Eugene, OR 97440  
A quarterly magazine published by a non-profit in Eugene, OR. Their website features a lively worm discussion forum. Includes links to other websites of interest. Publishes *The Art of Small-Scale Vermicomposting*,

a handy reference guide for home composters.

### Websites and Worm Forums

[www.wormdigest.org](http://www.wormdigest.org)  
Very active discussion forum.

[www.WormWoman.com](http://www.WormWoman.com)  
The website of Mary Applehof, leading worm educator and enthusiast.

[www.vermico.com](http://www.vermico.com)  
Hosts seminars and sells worms, books, videos, and more.

[www.happydranch.com](http://www.happydranch.com)  
Hosts an online discussion forum for Can-O-Worms users. Also sells worms, bins, books, and other items.

[www.gardeners.com](http://www.gardeners.com)  
The website for Gardeners Supply Company. They sell worm bins and other great garden supplies.

### And of course:



In her witty and offbeat style, Amy Stewart shows just how much depends on the humble worm. *Kirkus Reviews* calls the book "A nifty piece of natural history. Earthworms of the world can stand a little taller." Available wherever books are sold, or by visiting [www.amystewart.com](http://www.amystewart.com)