

Wonderful Working Worms

Compost your kitchen scraps at home with the help of redworms



Composting with worms—or vermicomposting—is a process that converts food scraps into useful, nutrient-rich soil via redworms and other organisms that breakdown food scraps. Composting at home is one of the easiest things that individuals and families can do to significantly reduce the amount of waste they produce. Composting with worms is also great for small spaces and requires relatively little maintenance.

COMPOST

Make dirt, not waste.

What are you doing with your food scraps?

Most people think of compost when they are working in the yard, but a lot of compostable discards are also generated in kitchens! In fact, if you look into the garbage can of the typical Minnesota household, about one quarter of our household trash is made up of material that can be composted—things that came from plants and animals, like food scraps and paper we cannot recycle such as paper plates and paper towels.

When food scraps are thrown into the garbage, they have to be picked up, transported, and buried or burned at significant financial and environmental costs, and this valuable resource is destroyed. When food scraps decompose in the anaerobic (without oxygen) conditions of a landfill, they create methane, a greenhouse gas that has heat trapping capabilities 23-71 times greater than carbon dioxide. Landfills are the single largest direct human source of methane. In addition, as the food scraps decompose and ooze through the surrounding trash, they pick up other toxins and create highly toxic sludge—called leachate—that leaks into the ground water. Incinerators emit carbon dioxide and nitrous oxide – a greenhouse gas that is 310 times more powerful in atmospheric warming than carbon dioxide. Burning food waste is not efficient and on average, incinerators in the U.S. emit more carbon dioxide per megawatt-hour than coal-fired, natural-gas fired, or oil-fired power plants. Most importantly, in both scenarios, the nutrients found in your food scraps are wasted instead of recycled back into a valuable and much needed product – compost!



Note: Sometimes people use their garbage disposals thinking this material goes away to biodegrade, but it actually ends up in the same place as your trash – it just takes a longer process to get there. Waste from your garbage disposal actually has a larger environmental impact than throwing it directly in the garbage.

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What kind of worms are best?

Eisenia foetida, the scientific name for what are commonly called “redworms” or “red wigglers” are the best worms to process kitchen waste into compost. They will be very happy living in a covered box that has air holes on all sides, located in a room with a temperature between 55 and 77 degrees Fahrenheit. Redworms require moist bedding and will eat a variety of kitchen wastes. Regular earthworms or nightcrawlers do not breakdown food as quickly and are not as adaptable to live in a contained space. Redworms are living creatures just like us, so they need the same three things we need: air, water and food. Keeping these things in balance will maintain optimum conditions for your redworms.

What do redworms eat?

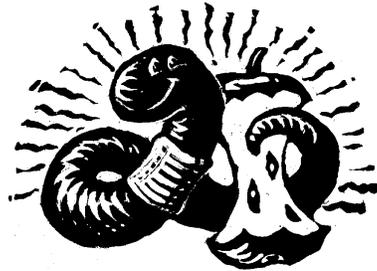
Worms are not too fussy, although they may eat some foods faster than others. Very small amounts of animal products will not hurt your worms, but they can smell bad and attract anaerobic bacteria, so it is best to keep them on a vegetarian diet. Redworms can eat up to the equivalent of their own weight each day! One pound of redworms living in good conditions will eat 4-8 pounds of kitchen waste in a week.

Worms will eat:

- ◆ apples/peels, banana peels
- ◆ beans/legumes
- ◆ biscuits/stale bread
- ◆ cabbage/celery
- ◆ cereal
- ◆ coffee grounds/filters
- ◆ egg shells (rinsed and crushed)
- ◆ onion peels
- ◆ potatoes
- ◆ tea leaves/bags
- ◆ tomatoes
- ◆ many other fruits, vegetables, and grains

Do NOT feed your worms:

- ◆ meat scraps or bones
- ◆ dairy
- ◆ pet feces
- ◆ fatty or oily foods
- ◆ very salty foods (salted nuts, etc)
- ◆ non-organics (plastic, metal etc)



Can worms be left alone?

Worm bins are very easy to maintain. The redworms are happiest when they are fed, kept moist, and not disturbed while they are working (which is all of the time!). They do fine when left alone for a couple of weeks. When you go on vacation, you do not need a “worm sitter” because the worms will eat their bedding when there is a shortage of fresh kitchen waste. The bedding is intended to be a food supplement and eventually becomes part of the compost.

What about odors and bugs?

When properly constructed and maintained, worm bins should not give off an offensive odor. Your bin should smell earthy and be as moist as a damp sponge. Making sure there is enough air, and not overfeeding the worms, as well as avoiding meat scraps and dairy, will prevent unwanted odors. The bin should also have air holes on the sides and bottom or the contents should be gently turned every week or two. You should find other organisms in your bin besides the worms, which is great! They are a healthy part of the composting system. Brown mites, springtails and pill bugs help the worms breakdown the food scraps. The only bugs you do not want to find are ants and centipedes – they are predatory insects – and fruit flies – they are nuisance. Burying or covering food scraps completely will help prevent fruit flies. If you are worried about bringing extra critters into the system, use shredded paper for bedding rather than leaves.

Setting up your system

- 1) Get or make a bin – approximately 4 cubic feet or 20 gallons. The size of a recycling bin is a great size for a worm bin, but make sure the bin is no deeper than 18" to prevent anaerobic conditions. Plastic or wood bins are usually the most readily available, but they can be made out of almost any material as long as there are holes for air and drainage. When in doubt, you will want to maximize surface area.
- 2) Soak the shredded paper or bedding material in bucket of water until all surfaces of the bedding are wet, but not dripping wet. Put bedding in your bin and toss in a handful of soil or coffee grounds for grit.
- 3) Place the worms in the bin as well as a few food scraps to start them off. Cover the worms and scraps with some of the bedding. Make sure to place the bin in a location that is no cooler than 55°.
- 4) Check on your bin often in the first few days to make sure the bin is moist like a damp sponge. The worms will begin to eat the scraps in a few days.

Harvesting your compost

Like all living creatures, worms don't like to be surrounded by their waste for very long. You can try any of these harvesting methods.

- **Dump and hand sort:** Dump all worms, compost, and bedding out onto a tarp and sort out the compost from the worms. This is fairly time consuming, but you can retain the most number of worms. Do this 1-3 times a year depending on your number of worms.
- **Divide and dump:** Take out half the compost and worms and put it in your garden. Add some new bedding, and the other half of the worms will repopulate the bin. You lose some worms but this method takes very little time.
- **Let the worms do the sorting/harvest as you go:** Add food scraps to only one quarter of the bin for a couple of weeks, then stop adding food to the first quarter and only add food to the second quarter and so on. Before you get back to the original placement, harvest the compost in the first quarter. The worms will have moved to where the food is and you would lose a minimal number of worms.
- **Let it all go to compost:** Stop feeding the worms. After 6 weeks to 2 months, the worms will have eaten all their food and bedding, and eventually become part of the compost. You lose all your worms and you would have to find a new way to take care of your food scraps.

Recipe for a happy worm bin:

- ✓ A worm bin – a bin that works for you that has plenty of holes for air and drainage.
- ✓ Location (kitchen or other room, garage, or basement) with a temperature between 55° and 77° F. But, worms work faster when it is warmer.
- ✓ Plenty of bedding to keep the worms and food scraps covered by about 4-6 inches.
- ✓ Approximately 1 pound of redworms will eat the food scraps of a family.
- ✓ Your food scraps, which become a valuable resource!

What's next?

Your food scraps are valuable, and recycling programs across the nation are now looking at these materials as the next frontier in waste reduction. In some communities, all food scraps and non-recyclable paper (beyond what can go in a worm or backyard bin) are separated by residents for collection, just like recycling. In these programs, the materials are delivered to a commercial compost facility that can manage the material at high temperatures for a sustained period of time. Eureka Recycling and the City of Saint Paul are currently working on plans for a citywide composting program; however there are significant barriers to address before you'll see composting collected at your curb. But the good news is that you don't have to wait for collection to come to your neighborhood – you can compost at home right now! In fact, composting right at home is the most efficient and environmentally friendly way to make dirt, not waste. If you would like to learn more, please contact Eureka Recycling or visit our composting website at www.MakeDirtNotWaste.org.

Did you know that you can compost when you go out to eat as well? Some restaurants, co-ops, farmers markets, and grocers in Minneapolis are partnering with Eureka Recycling to compost their food scraps. Support local businesses that are making dirt, not waste! Visit www.MakeDirtNotWaste.org for an updated list and more information about the environmental benefits of composting. We're adding new partners all the time!

What if I have questions? Where can I find worms?

Eureka Recycling offers worm workshops periodically throughout the year, as well as a recycling hotline that can help answer many of your composting questions. Please feel free to give us a call at (651) 222-7678 or check out our website www.MakeDirtNotWaste.org. There are lots of books and websites out there as well. Some other resources you might want to check out:

- **Flowerfield Enterprises** sells bins and other supplies for vermicomposting. They also sell the ultimate resource on worm composting, the book *Worms Eat My Garbage* by Mary Appelhof. (You may find this book at local bookstores and libraries.) (269) 327-0108, www.wormwoman.com
- **Kazarie Worm Farm** sells worms and bins year round. Their website can also be a good resource (888) 566-WORM (9676), www.kazarie.com

Worm Composting Troubleshooting

Worm composting can be easy; however, you may encounter a few obstacles along the way. Let this sheet help you recognize if you really do have a problem.



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Symptoms	Possible Causes	Solutions
Unpleasant odor from bin.	Too many food scraps.	Be sure you're not over feeding your worms.
	Excess moisture.	Check the moisture in the bin. Add more bedding if too wet.
	Exposed food scraps.	Be sure to bury the food under the bedding.
Worms are Escaping!	Too much moisture.	Add some more dry bedding or dryer food scraps. Try draining the excess water from the bin.
	Takes a few nights for the worms to adjust to their new home.	Keep the lid or cover with a t-shirt to keep them in. Or you can shine a light on the bin over night. This may keep the worms from escaping by driving them down to the dark places of the bin.
	Too hot or too cold.	Place the bin in a cool, dark place. Ideal temperature is between 55° and 77° F.
Fruit Flies and other critters	Food scraps towards the top of the bin are more likely to attract flies.	Be sure to put the food below bedding and keep your bin moist with several inches of bedding over your food scraps. Make sure not to overfeed them.

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