Bin Ecology

There are many critters in your bin, besides just worms, and that’s fine! The bin is a functioning ecosystem with prey and predators, primary and secondary consumers. The only unwanted creatures are those that harm the worms or are unpleasant to humans (e.g. ants or fruit flies). But most bugs you find, like springtails and sow bugs, are no problem.

Troubleshooting

Sometimes if you leave your bin for a while, your worms get unhappy. Don’t be discouraged, though! Just give them a little attention.

- Flies: Either your food scraps have larvae from your storage container (store in fridge) or you don’t have enough top bedding to cover the food (add more bedding, cover with cardboard)
- Smell: Probably feeding too much, so it’s rotting anaerobically. Cut back on food until the worm population grows. Also try increasing bedding and ventilation to get air flowing through.
- Ants: Raise the bin above a “moat” of water so they can’t climb into it. Ants sometimes also mean the bedding is too dry.
- Worm escape: If worms are crawling out drainage holes or climbing up the sides of the bin, there may not be enough food, or it may be too hot, humid, or toxic from lots of worm casting in the bin for the worms! If the environment is comfortable, they won’t leave.
- Earthworm mites: Typically because too moist in bin, so add dry bedding. Can bait the mites by putting a piece of bread or melon and remove the mite-infested food when mites congregate on it.

For more information:

Worms Eat My Garbage by Mary Applehof, 2000
www.mastercomposter.com/worm
http://www.calrecycle.ca.gov/vermi
http://www.wormwoman.com

Need help? Need worms?
Contact us at cce@asucd.ucdavis.edu

PROJECT COMPOST’S GUIDE TO

WORM COMPOSTING

VERMICOMPOSTING
A redworm eats its weight every day!

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**Vermicomposting**

Vermicomposting is the use of worms to digest organic matter. They eat food scraps and excrete worm casting a dark crumbly substance we call black gold! Vermicompost contains many of the macro and micro nutrients needed by plants and is a more concentrated and rich fertilizer than ordinary compost. By creating vermicompost systems, we can easily turn food scraps into valuable resources that improves the health of the soil rather than adding to the landfill.

**Worms**

Red worms, also called "red wigglers," are best suited for the job. This is because they eat large quantities of organic material and can digest up to their body weight every day. Unlike "night crawlers" and other common earthworms, they are surface feeders so thrive in the confined space and environment of a worm bin. The species Eisenia fetida and Lumbricus rubellus are most commonly used.

Worms have no eyes and they move through the soil with the help of a feeling pad or "prostomial.“ Worms don’t have teeth either, so a little dirt or finely ground eggshells in the gizzard helps grind up their food.

Worms are hermaphroditic (having both ovaries and testes) and can reproduce at about 6 weeks of age. They join together via mucus secretions and both deposit sperm onto the other worm. A cocoon (they look like small brown beads) then forms over the clitellum, collecting both eggs and sperm as it slides off the worm’s body. After two to three weeks, baby worms hatch from the cocoon.

**Harvesting**

Over a few months, the bedding volume will decrease. That’s because worms are eating and turning it into castings! This makes the environment less and less healthy for them because there is less air flow and because castings are toxic to the worms at high levels. If you wait until everything is entirely converted to castings, the worm population will be small and unhealthy. But if you harvest the castings sooner, you can give the worms a fresh start with new bedding and start over with a large, robust population. Two basics methods for harvesting out the vermicompost:

**ONE TIME:**

Empty your worm bin onto a plastic tarp. Make piles 3-5 inches in diameter. When the piles are exposed to light, the worms will migrate to the bottom of each pile, allowing you to remove the compost on the top of the pile. At the bottom of each pile will be a cluster of worms. These can be placed back in the refurbished worm bin.

**CONTINUOUS:**

Let the worms sort for you. Just feed your worms on one side of the bin for a month. The worms will migrate to the side with the food, and the worm castings can then easily be removed! Requires a bin large enough to split.

**Compost Use**

Worm compost is a great source of nutrients for plants, and it also improves the structure and water-holding capacity of the soil. You can sprinkle the compost onto garden beds, in seed flats, or even potted plants indoors. The leachate can also be diluted to make compost tea that can be applied on leaves to help protect against fungus or diseases.
If you keep your bin outdoors, it should be located on the north side of the house (away from direct sunlight), or in a shed or garage. Proper ventilation is important to avoid odor and moisture. Insulate as possible during the winter.

**Location**

- Surface area
- Vents
- Drainage

Provide a vent for natural air circulation and a drainage outlet for excess rainwater. There should be at least one of these. Ideally, a vent should be located on the north or east side of the building.

**Bliss**

There are many options for a sustainable garbage bin. Check out this list for some ideas:

- Compostable bags
- Biodegradable bags
- Paper bags
- Canvas bags
- Reusable cloth bags

**Environment**

- Compostable bins are a great option for reducing waste. They can be used indoors or outdoors, depending on your needs. Check with local regulations to ensure proper placement.
- Avoid using disposable plastic bags as they contribute to pollution.

**Food**

- Avoid food waste by properly storing leftovers.
- Composting kitchen scraps is an effective way to reduce waste and create nutrient-rich soil for your garden.

**Bedding**

- Use natural materials like straw, hay, or shredded paper for bedding. These materials are biodegradable and provide a comfortable environment for your animals.
- Avoid using synthetic materials like plastic or Styrofoam, which can harm animals and the environment.
Setting Up a Worm Bin

How to set up a worm bin from a plastic Rubbermaid storage bin

1. Choose a bin—remember you want surface area, not depth
2. Drill holes for ventilation at the top of the bin; drainage holes if desired
3. Tear newspaper into 1 inch wide strips for bedding
4. Fill bottom of bin (6 inches) with moistened bedding—like a wrung-out sponge
5. Acquire worms. Half to one pound of worms, depending on the size of the bin
6. Spread worms around the top of the bedding
7. Add food scraps. (no meat, dairy, etc.), and cover with more bedding (3-6 inches)
8. Cover bin with lid and store indoors or insulated location outdoors

Home sweet home!