

Constructing a Worm Compost Bin

Worm composting is a suitable alternative for many people who do not have the space or volume of waste to support a larger composting system. Worm bins may be used in apartments, offices, and homes; and can be placed either indoors or outdoors. Worm composting may be done in a classroom setting; this introduces students to waste decomposition. The worms stay in the bin and eat household scraps, and the bin gives off little odor. For those of you interested in composting only food scraps, this is the ideal method. Following are instructions for constructing a wooden worm bin, as well as basic instructions for adding the worms and compost materials. Also included are basic instructions for making a worm composter using a plastic container.

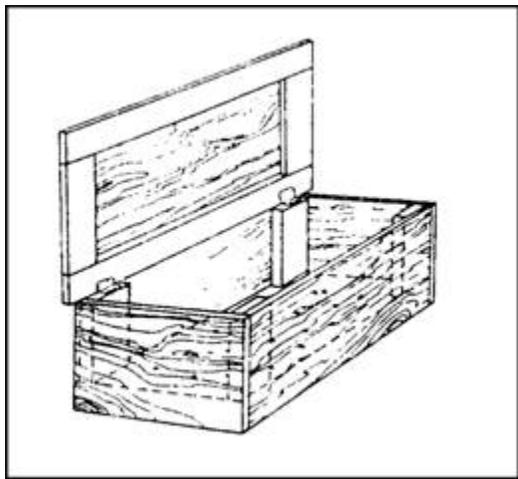


Figure 1 – Worm Composter

Materials

- One 4-x-8 foot sheet of 1/2-inch exterior plywood*
- One 12-foot length of 2x4 lumber*
- One 16-foot length of 2x4 lumber*
- 16d galvanized nails (1/2 pound)
- 6d galvanized nails (2 pounds)
- Two galvanized door hinges
- Plastic sheets for placing under and over the bin(optional)
- One pound of red worms for every 1/2 pound of food wastes produced per day
- Bedding for worms: peat moss; brown leaves; moistened, shredded newspaper; or moistened, shredded cardboard

Tools

- Tape measure
- Hammer
- Sawhorse
- Screwdriver
- Skill saw or hand saw
- Long straight-edge or chalk snap line
- Drill with 1/2-inch bit
- Eye and ear protection
- Work gloves

Building a Wooden Worm Composter

1. Measure and cut the plywood, so that you have one 24-x-42 inch top, one 24-x-42 inch base, two 16-x-24 inch ends, and two 16-x-42 inch sides.
2. Cut the 12-foot length of 2x4 lumber into five pieces: two 39-inch pieces, two 23-inch pieces, and one 20-inch piece.
3. Lay the five pieces on edge on a flat surface to form a rectangle, with the long pieces on the inside and the 20-inch length centered parallel to the ends. Nail the pieces together with two 16d nails at each joint.
4. Nail the 24-x-42 inch piece of plywood onto the frame with 6d nails every 3 inches.
5. Cut four 1-foot lengths from the 16-foot length of 2x4 lumber. (Save the remaining 12-foot piece.) Take the two 16-x-42 inch pieces of plywood and place a 1-foot length flat against each short end and flush with the top and side edges. Nail the 2x4's in place using 6d nails.
6. Set the plywood sides up against the base frame so that the bottom edges of the 2x4's rest on top of the base frame and the bottom edges of the plywood sides overlap the base frame. Nail the plywood sides to the base frame using 6d nails.
7. To complete the bin, nail the 16-x-24 inch pieces of plywood onto the base and sides at each end.
8. To reinforce the bin, stagger nails at least every 3 inches wherever plywood and 2x4's meet.
9. Drill twelve 1/2-inch holes through the plywood bottom of the bin for drainage.
10. To build lid frame, cut 12-foot piece (left from 16-foot length) of 2x4 lumber into two 45-inch pieces and two 20-inch pieces. Lay the pieces flat, forming a rectangle with the short pieces inside.
11. Lay the 24-x-42 inch piece of plywood on top of the lid frame so that the plywood is 1 1/2 inches inside all the edges of the frame. Nail the plywood onto the frame with 6d nails.
12. Attach the hinges to the inside of the back of the bin at each end (on the 2x4), and the corresponding underside of the back edge, of the lid frame, so that the lid stands upright when opened.
13. The unfinished bin should last for at least five years. Using pressure-treated lumber* could further extend the life of the bin. However, the use of chemically treated wood for gardening and composting is controversial. Please see note at end of publication.
14. Your bin is now ready to add worms, bedding, and food scraps.

Making a Plastic Worm Composter

A worm composter can be easily and inexpensively made using a plastic container. Surface area is important for good decomposition of your food scraps. Therefore, a wide and shallow container is better than a tall, narrow container. Your container should not be greater than 12-16 inches in depth, but should be at least 6 inches deep. Lids can be anything from a simple sheet of light-weight plastic to a hinged or snap-on top. If you do not have a suitable container, these types of bins are readily available in retail outlets.

To set up your composter:

1. Wash your container thoroughly with warm, soapy water.
2. Drill ventilation holes in the sides and bottom of the container. The holes should not be more than 1/2 inch in diameter. If you are using a snap-on or hinged lid, you may drill holes in the lid to provide extra ventilation and cut down on odors.
3. Add your bedding, worms and food scraps.

Guidelines for Setting-Up and Maintaining Your Worm Composter

Once you have completed either your wooden or plastic composter, you are now ready to begin the composting process. Following are some guidelines and tips for successful worm composting.

Placing Your Bin

The bin can be placed anywhere where the temperature remains between 50°F and 80°F. Garages, basements and kitchens are all possibilities. The bin may be placed outdoors in warm weather, but not hot weather. Select a location that will be convenient for you to add your wastes. To aid in ventilation, the bin can be slightly elevated. Placing the bin on bricks or blocks would accomplish this task. Placing a plastic sheet under the bin is wise, especially if used indoors.

Preparing Your Bedding

Various types of materials are suitable as bedding. These include peat moss, shredded

newspaper, shredded cardboard, brown leaves and machine shredded computer paper. To prepare your bedding, first weigh your dry material. Multiply the dry weight by three to determine the weight of water needed to achieve 75% moisture. Moisten your bedding by placing one-half of the material in a large bucket and then adding one-half of the water. Approximately two cups of garden soil can be added. The soil assists the worms in digesting materials. Add the remaining bedding material, and follow with remaining water. Mix well. Be sure that all bedding is dampened. Add bedding to a depth between 4 and 8 inches, depending upon the size of your container.

Adding Your Worms

Red worms are the appropriate type to use in composting. (Sources of worms are included at the end of this publication.) One pound of red worms can eat 3 1/2 pounds of food waste per week. Before purchasing worms, estimate the amount of food scraps you plan to compost. Keep in mind that baked goods, meat waste and bones are not suitable for composting. Fruit and vegetable scraps, egg shells, coffee grounds (with filters), and tea bags are suitable for your worm bin. Red worms are better suited for indoor composting and should be purchased through a horticultural or garden supply company. To add your worms, place on top of the bedding. Leave the lid off the bin for a short time, so that the worms will work their way down through the bedding.

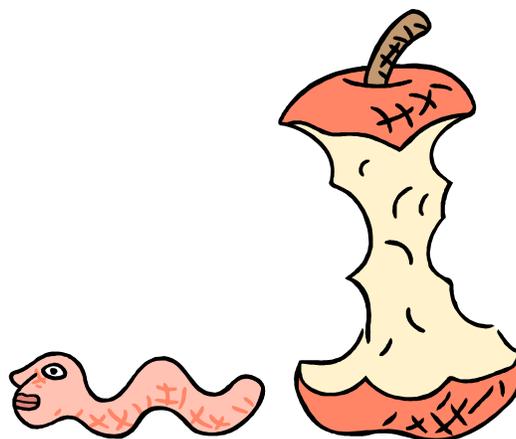
Adding Your Waste

To add waste, dig a small hole in the bedding and add scraps. Cover the hole with bedding. Waste may also be placed in a shallow trench or sprinkled across the top. Waste does not have to be added on a daily basis, but should be added at least every 2 to 3 days. If fruit flies become a problem, you

may add fresh bedding to the top. If odor becomes a problem, check for adequate ventilation. In addition, odor and/or fruit flies may be an indication that too much waste has been added to the system. To solve this problem, remove a portion of the bedding and waste, and replace with fresh bedding. Allow 1 to 2 days before adding waste again. Do not add any inorganic or potentially hazardous materials, such as chemicals, glass, metal or plastic.

Maintaining Your Worm Bin

Adequate moisture is important to keep the worms active, healthy, and contained. Check the moisture level regularly. Bedding should be damp, but not soggy. If bedding is too wet, add additional dry bedding. If bedding is dry, sprinkle with water. Every 3 to 6 months, move the compost to one side of the bin, and add new bedding to the empty half. Begin adding wastes to the new bedding only. The worms will move to the new bedding within one month. The "old" bedding (now finished compost) can be harvested for use. New bedding should be added in its place.



Sources of worms:

- ❖ Flowerfield Enterprises at www.wormwoman.com
- ❖ Worm's Way at www.wormsway.com

*Regarding use of wood products in gardening and composting projects: The University of Minnesota conducted a study on a raised bed garden made from Chromated Copper Arsenate (CCA) *pressure-treated* wood. Results showed that the vegetables grown can accumulate arsenic from the CCA pressure-treated wood, however, based on U.S. Public Health Standards, these vegetables would be safe for human consumption. Alternative building materials are currently available. This information is provided so that consumers are aware of the potential issues related to treated wood. If using scrap lumber or other used materials make sure you know if the lumber/materials are treated and what they have been used for in the past. Consumers should use their own judgment when constructing garden or compost units. For more information on wood products contact the University of Kentucky Forestry Department at 859-257-7597 or forestry.extension@uky.edu.

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