

Vermicomposting – “Worm Composting”

Vermicomposting is the process of using worms and microorganisms to produce rich compost from kitchen wastes. One pound of worms will turn 65 pounds of garbage into garden compost in 110 days. Here's how you can do it:

Find A Suitable Place.

Temperatures of about 60 to 80 degrees F are ideal, but the worms will tolerate temperatures from 40 to 90 degrees F. You'll want the location close to your kitchen to make disposal quick and easy. Even though a properly maintained bin is odorless, most would rather not have a box of worms inside their house. Most people prefer a porch or garage location.

Purchase or Build a Container.

The worms aren't too picky about housing, so mainly consider what suits you. The box size will depend on the amount of kitchen waste generated. A rule of thumb is one square foot of surface for each pound of waste per week.

2 person family = 3-4 lbs of garbage per week = 2 ft x 2 ft box

4 person family = 6-7 lbs of garbage per week = 2 ft x 3 ft box.

You can build a worm box (see enclosed instructions), but plastic storage containers of similar dimensions are readily available and inexpensive. These stand up to many years of use, are easy to carry and easy to make. Just drill several ½ inch holes in the top and bottom for drainage and aeration. Then use screening and duct tape to cover the bottom holes inside to cut down on debris falling through and to prevent the earthworms from escaping.

Prepare the Bedding. Bedding is usually some form of light and fluffy cellulose, non-toxic material such as shredded newspaper cardboard or computer printout paper or leaf mold or manures from grazing animals.

With newspaper, use only black and white sections, not the color or glossy

sections, as dyes may be toxic to worms. Tear the paper along the center fold, then keep tearing in parallel strips about 1 ½ inches in width. You'll need 4-6 lbs for a 2 x 2 box, 9-14 lbs for a 2 x 3 box.

Put the shredded newspaper in the bin. Moisten the bedding with water – about 1 pint of water for each pound of bedding. Slowly pour in the water, fluffing the bedding occasionally. Add a handful or two of soil as you fluff the bedding to provide grit which the earthworms use to digest waste. The bedding material should be moist, but not soggy.

Get the worms. Just any worms like those from your back yard won't do. The worms you need are English red worms also called “red wigglers,” “manure worms,” “red hybrid,” “dung worms” “brandings,” and “striped worms.” These do a suitable job of composting thrive in the environment you've created, and are excellent fish bait, especially for bream. These worms are commonly raised for fish bait and can readily be purchased locally for stocking. You'll need approximately 2 pounds of worms for each pound of garbage your household produces daily. For example, a family of four produces about 1 pound of waste per day and will need 2 pounds of worms.

Spread the worms gently over the top of the prepared bedding. The worms will wiggle their way down into the bedding. After about two hours, pick off any worms still on the top and cover the box/bin with the lid or a sheet of black plastic or dampened newspaper.

Feeding and care of the worms. Worms feed on plant derived products such as potato peels, lettuce leaves, moldy bread, spaghetti, citrus peels, tea or coffee grounds coffee filters, and tea bags, crushed egg shells and garden waste like corn shucks or pea shells. Plate scrapings are suitable although large amounts of meat or bones can cause odors and attract dogs or rodents and should be avoided.

To feed your worm bed, push back the bedding, place the food, and cover it so that it's an inch or so beneath the surface. There's no need to chip or grind the food; let the microorganisms and worms do that for you.

You can feed the worms every day, twice a week or only once a week. Let your schedule, not the worms be your guide. If you're going to be away from home for more than a month, you may wish to have someone feed the worms for you.

If you place the garbage in sequence at different locations in the bin over the course of several days you won't come back to the same place twice and thus avoid disagreeable encounter with freshly decomposing garbage.

Harvesting the compost and/or worms. Once the food disappears and the contents of the bin have darkened into the moist compost material (about 2-6 months) it's time to harvest the compost and larger worms. There are two ways to do this.

*Push the contents of the bin over to one side. Place new bedding and waste on the vacant side. The worms will move over to the new bedding in search of food. After a few weeks, harvest the old finished compost and add fresh bedding to the bin until it is completely filled.

*Dump the box/bin onto a large piece of plastic or plywood. Arrange the compost into several cone shaped mounds. In a few minutes, the worms will move into the mounds to escape the light and exposure. At this point you can gently remove the top few inches of the pile, wait a few minutes, and repeat. Eventually you will be left with a pile of mostly worms. You can harvest the large ones for fish bait and return the small ones and the egg cases to a freshly prepared bin with new bedding.

How to use the compost. Use the old composted garbage and bedding as a nutrient rich soil amendment around plants

and in your garden. A good potting mix can be made with ¼ part worm castings, ¼ part peat moss, ¼ part perlite, and ¼ builders sand or garden soil.

Some Commonly Asked Questions: Can the worms see? No, earthworms don't have eyes. However, they have some kind of sensor for discovering light and are very sensitive to bright light. They will try to hide away as soon as are exposed to light. Earthworms seem less sensitive to red light. Placing red cellophane between the light source and the earthworm bin will make it easier to observe their behavior.

Where is the worm's mouth? The earthworm's mouth is in the first anterior (front) segment. There is a small protruding lip just over the mouth called a prostomium, which is used to sense food.

How does the worm eat? Earthworms have no teeth for chewing their food. They grind their food in their gizzard by muscle action. Earthworms take only small particles into their mouth and mix it with some grinding material such as sand, topsoil, or limestone which is also ingested. The contractions form the muscles of the gizzard compress those particles against each other, mix it with fluid and grind it into smaller pieces.

Be sure to add a little garden soil, sand, or topsoil in the earthworm bedding.

Do the worms die in the box? Some worms die in the box. They decompose rapidly since their bodies are 75 to 90% water. If you find a lot of dead worms, you should try to find out the cause. Is it too hot in the box – over 84 degrees F is usually fatal to worms. Perhaps too much salt or acidic food was added. Partially or completely replacing the bedding will usually solve the problem.

How do worms breathe? Worms need oxygen to survive; oxygen moves into their bodies through their moist skin and carbon dioxide moves out.

If a worm is cut in two parts, will both parts grow back? If a worm is injured or cut towards the tail end, it will sometimes grow a new tail. However the cut off end will not grow a new head.

References for Additional Information: "Worms Eat My Garden" by Mary Appelhof is available for \$10.50 from Flower Press, 10332 Shaver Road, Kalamazoo, Michigan 49002.

This brochure was produced using the following references:

"Worms Eat My Garbage", Mary Appelhof.

"1-2-3 Worm Composting Bin", King County, Washington State.

"Worm Bin Composting: A Guide for Teachers and Households", Chester

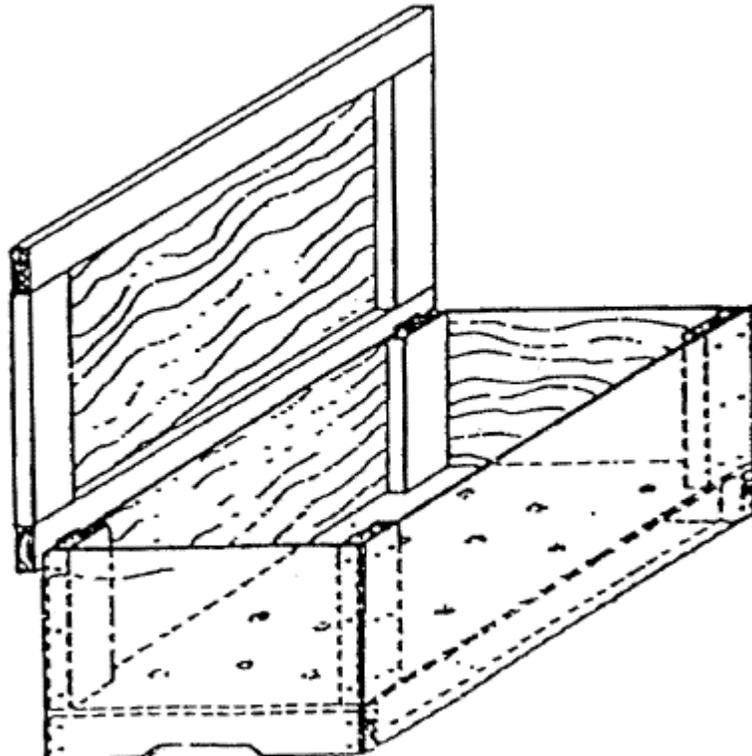
County Health Department Division of Solid Waste Management, Chester County, Pennsylvania.

"Master Composter Training Manual", John Van Miert, Whatcom County Cooperative Extension Service, Washington.

"Vermicomposting", Loretta Hernday, Master Gardener, Milwaukee County Cooperative Extension Service, Wisconsin.

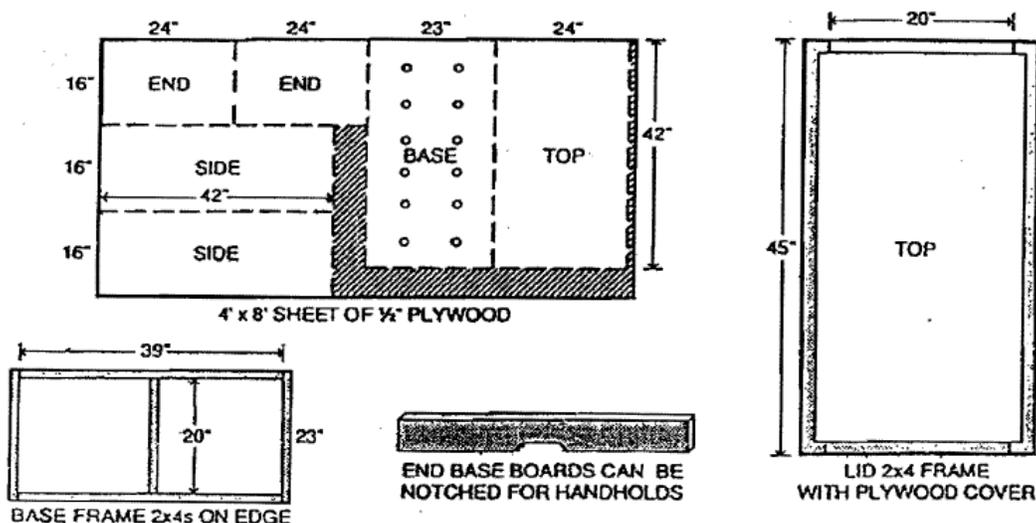
"Worms Eat Her Garbage, And They Can Eat Yours, Too", Alabama Cooperative Extension Service Auburn University, Alabama.

"Vermicomposting in the Classroom", Tom Crowley, Marinette County, University of Wisconsin Cooperative Extension Service.



How to Build a Worm Bin

If you decide to build your own box, use exterior grade plywood and construction grade lumber. Don't use pressure treated wood for those parts on the inside surface, as the chemicals may be toxic to the worms. You can paint or stain the exterior of the box, but leave the inner surface unpainted. Be sure to drill at least twelve ½ inch holes in the bottom for drainage. Plans are included at the end of this section.



Construction Details

Measure and cut plywood as indicated in the illustration. Cut the 12-foot 2 x 4 into five pieces: two 39", two 23", and one 20" long. Nail the 2 x 4s together on edge with two 16d nails at each joint as illustrated on the Base Frame diagram. Nail the plywood base piece onto the 2 x 4 frame.

Cut four 1-foot lengths out of the 16-foot 2 x 4. Nail a 1-foot 2 x 4 onto each end of the side panels flush with the top and side edges of the plywood. Nail the side pieces onto the base frame. To complete the box, nail the ends onto the base and sides. To reinforce the box, make sure there is a nail staggered at least every 3 inches wherever plywood and 2 x 4s meet. Drill twelve ½ inch drainage holes in the bottom of the box.

To build the lid, take the remaining 12-foot 2 x 4 and cut it onto two 45" pieces and two 20" pieces. Lay these pieces in a rectangle with the short pieces inside as indicated in the diagram above. The plywood top should be inset from the edges of the 2 x 4s by 1" all the way around. Nail the plywood onto the 2 x 4 securely. Place the hinges on the back side of the box at both ends on the 2 x 4s, and on the under side of the 2 x 4 lid frame so that the lid will stand upright when opened.

Materials

- 1 4'X8' sheet of ½ " plywood
- 1 12-foot 2x4
- 1 16-foot 2x4
- 2 lbs 6d galvanized nails
- ½ lb 16d galvanized nails
- 2 galvanized door hinges

Tools Required

Tape measure, skill saw, or rip hand saw, hammer, saw horses, long straightedge or chalk snap line, screwdriver, and drill with ½ " bit.
Remember to use eye and ear protection.

This information was provided courtesy of King County Washington State.