URBAN ECOLOGY CENTER

Worm Composting Directions

Worm composting can be as simple or as complicated as you wish to make it. Like any hobby, you can go online and purchase all sorts of paraphernalia … different types of farms, soil testers, etc. We at the Urban Ecology Center prefer to keep it simple. All you need is a container with small drainage holes filled with the basic ingredients:

1) **75% Roughage or carbon** (hay, straw, shredded paper, wood chips)
2) **25% Nutrients or nitrogen** (your vegetable based food scraps)
3) **A bit of Water** (After initial watering most comes from your food wastes)
4) **Oxygen** (infused with the weekly gentle turning of the compost)
5) **Worms** (for a local source call Growing Power at 414-527-1546)

Our system is designed to handle the food scraps generated by a family of four who like to cook with vegetables. We recommend a 30 to 35 gallon plastic bin that can be purchased from your local hardware store. This is the size we base these instructions around. However, once you know the basic principals of worm composting, a farm can be any size.

In our system, we have also added a collection system for the nutrient rich water that slowly drains through the holes in the bin. This water, called “worm tea”, collects in liter soda bottles for later use as a fertilizer for gardens or indoor potted plants.

Drilling the Bin

Before filling, be sure to drill ¼″or ⅜″ diameter holes in the bottom of the bin at least three inches in from the edge and approximately three inches apart. Smaller holes will not allow adequate drainage; larger ones will allow your worms to escape.

Filling the Bin

Roughage: What you fill the bin with has to do with what you have available to you. A good, active worm composting system should be about 75% carbon or roughage. This can be hay, straw, wood chips, coarse saw dust (like that from a sharp chain saw, not fine powder dust from sanding), shredded paper, ripped up paper towels, some kinds of leaf litter (maple leaves work well, oaks do not) or any combination of these. If you visit the Urban Ecology Center we can always provide you with excellent sawdust if you bring a bag or container. Fill the bin so there is about a three-inch layer of roughage.

Water: Sprinkle small amounts of water on the roughage and stir it in until it is moist to the touch, like a recently rung out sponge.

Dirt: This is optional, but we always stir a few large handfuls of dirt into the mix and place a small pile (a couple more handfuls) in a dug out pocket in the middle of the bin.

Food scraps or nutrients: Food scraps should always be of vegetable mater. Because of the pathogens that are present, **do not use any meat products, dairy products or animal waste from litter boxes**. Many people do not use bread products, onions, garlic or vegetable oil. We have used all of these with no affect on the success of the farm. Orange peels tend to take a long time to compost and corncobs never seem to break down. Broken up egg shells are great for the soil (adds calcium); you will want to crush them and sprinkle them on the farm. Melon rinds, apple cores, banana peels, waste veggies from making a salad, coffee grounds and coffee filters, tea bags, etc. are all good scraps. The worms love softer, smaller scraps that have been allowed to rot for a few days. We usually feed the worms once a week so some food is softer and some is fresher.

To start, place a pile of food scraps on the roughage or on the small pile of dirt if you used it. Now you are ready for worms.

Worms: The worms you want to use are called red wigglers. In Milwaukee the best place to get them is at Growing Power at 5500 W. Silver Spring Road. Call ahead (414-527-1546) to arrange a pickup of worms. A half pound is plenty to get started. Tell them what size bin you are using and they will know how much to give you. Your other options are to order worms online or ask us at the Urban Ecology Center (414-964-8505). We may have some or know of other farmers who can share. Once you have your worms, put them in the bin and you are ready to go!

Drainage system to harvest "worm tea"

A worm bin needs to be able to drain otherwise the water will fill at the bottom and drown the worms. The holes drilled into the bottom of the bin are sufficient for this.

But in our system we have also added a collection system for the nutrient rich water that slowly drains through the holes in the bin. This water, called “worm tea”, collects in liter soda bottles for later use as a fertilizer for gardens or indoor potted plants.

The drainage system consists of a sloped platform on rough 2 x 4 legs (see the end of this document for complete instructions). The legs are tall enough to accommodate a liter bottle standing up underneath. On this platform is a V-shaped rail that holds the bin up an inch or two above the platform so the bin is free to drain, while routing the liquid into a ¾” hole at the tip of the V. A flat 30-gallon plastic bag is draped over and stapled to these rails (do not staple in the drainage area, only on the top of the rails, as the staple holes may leak tea from the system). A hole is then poked through the plastic into the drain hole with a finger or pencil. This stretches the plastic bag just enough into the hole to cover any wood and funnels the tea into the soda bottle. We add a ¾” clear plastic tube (purchased at any hardware store) to the soda bottle to fit into this drain hole. However, you can also just let the tea drip into a watering can or container for future use (we mix worm tea with an equal amount of water before applying to plants).

We generally use scrap wood from other projects to build these bins. While we have added measurements to the worm farm materials list and construction drawing there is no magic about exact sizing for the wood, as long as the bin is held above a sloped platform so it can drain.

Because we use a plastic bag for the tea to drip down, no painting or finishing of the wood is necessary.

How much tea is generated varies a lot and depends on how much food enters the system, how moist that food is, and if and how much you water the worms. Our system will generally generate about a liter every month, though this can vary quite a bit.

Worm Care

Weekly Care: We generally feed our worms once a week. First, we gently turn the farm with a trowel (getting valuable oxygen into the system) trying to minimize disturbance and injury to worms (It is unavoidable, so don't be too worried). We then make a depression in the roughage, put the food in the depression and cover the top either with material from the farm or added woodchips or hay. This is necessary to prevent odors and fruit fly colonies. Do not be concerned if other small mites occupy the worm farm. This is normal to the ecosystem you are creating. Once your farm is active you will also see thousands of tiny white baby worms.

Each time you feed, you can also check the moisture level of the farm. We always keep the lid on the bin (enough oxygen can get through the seal). The bin is too moist if many worms are climbing the walls and near the seal of the bin. In this case, place the lid a little skewed on the bin so the corners are exposed to the air. This will dry out the bin. If, when you do your weekly check, the top of the farm is dry, either spray or sprinkle additional water or just seal the lid tighter again. Once the system is started, we don't water our worms very often and instead just adjust the lid … enough moisture gets into the system through the food scraps. More water, however, also means more tea. It's your choice.

If the bin is looking like mostly dirt, stir in more roughage. A healthy active bin looks more like mulch than dirt.

Yearly Care: We generally only keep the worms active during the winter months from November until April. During the warmer months we put all food scraps in the outdoor compost heap. We keep the worms in the bin but only feed them small amounts during the summer maybe every six weeks or so and don't add any more roughage. In this way, come fall, the bin has become almost pure worm casts or black gold. Worms can be kept through all seasons, but a second bin is necessary to allow the first bin time to clear out all food and roughage for harvesting black gold.

Removing the worms: Every fall we start a fresh second bin as described above using the worms from the previous year. If you choose, this is a good time to expand to more bins or share worms with friends. To remove most of the worms from the dirt, we take window screening (the thicker, pet resistant window screening purchased from any hardware store works best) in roughly a two-foot by two-foot square. Lay this on the dirt, place a good pile of food scraps on top of the screening and cover with a thin layer of dirt from the edge of the bin. Let this sit for three to five days. Most of the worms will crawl through the screening into the food. You then can lift up the screen/food/worms and place in a newly prepared bin or a couple bins if you choose. Have a trowel at the ready to scrape the pile of squirming worms that have not crawled through the screening yet but are still directly under the food pile that was just lifted out.

Black Gold Harvesting: You now have a bin with most of the worms removed and all of your winter's food scraps now turned into incredibly rich soil. Remove the lid from the bin and let it dry out considerably.

Make a soil sifter from half-inch hardware cloth (described in the worm bin construction drawing). When the soil is dry enough, sift all the black gold into buckets for future use or storage. We find that half inch sifting is sufficient for most planting; however some people like a second sifting with quarter inch hardware cloth (this makes very fine looking potting soil). While sifting soil, many worms will still be discovered in the soil. These can be tossed directly into the new bin as you sift.
Any material that is larger than ½ inch can either be added to your outdoor compost heap or to this year's new worm bin.

Good Luck!

Sample Bin instructions:

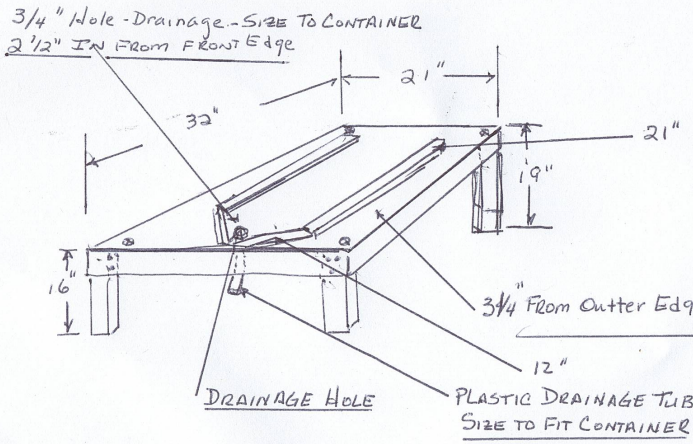
Part	Quantity	Size	Material
Stand			
Legs			
Front	2	16”	2x4 Construction Grade
Rear	2	19”	2x4 Construction Grade
Screws	12	2 ½”	Deck Screws
Rails			
Side	2	32”	2x4 Construction Grade
End	2	21”	2x4 Construction Grade
Screws	8	2 ½”	Deck Screws
Top	1	21 x 32”	½” Plywood
Screws	4	1 ½”	Deck Screws
Vent Hole	1	¾”	Size to Plastic Tube Opening
		6”	¾” OD Plastic Tube or Equiv.
Top Rails	2	21”	1x2 Furring Strip
	2	12”	1x2 Furring Strip
Top Cover	1		30 Gallon Plastic Garbage Bag
Summary		176”	2x4 (2 @ 8ft.)
Stand		1	2’ x 4’ x ½” Plywood
		20	2 ½” Deck Screws (Legs)
		4	1 ½” Deck Screws (Top)
Sifter			
Side	2	2x2x23”	2x2 Furring Strip
Side	2	2x2x16”	2x2 Furring Strip
Mesh		3 sq. ft.	½” Hardware Cloth or Equiv.
Worm Bin	2	35 gal.	Plastic Drum 32x20x20 W/Cover
			Drill 3/8” Holes in Bottom for Drainage
Misc.			
	1	5 gal.	Plastic Pail
	1	1 gal.	Plastic Pail
	1	3x2’	Plastic Mesh (Pet Screening or Equiv.)
			Sized to fit Plastic Container
	1	1 ltr.	Plastic Soda Bottle or Suitable Container
	1	Ea	Garden Trowel
	-	-	Staples (Plastic Cover & Hardware Cloth)

Worm Farm Stand & Sifter.

Cover With 30 gal Garbage Bag.
Do Not Staple In Drainage Area!
Cut Plastic over Drainage Hole

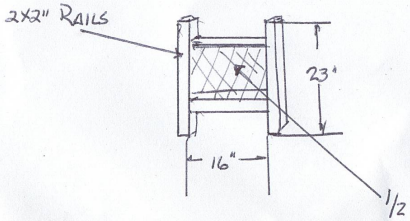
2x4 Legs & Rails.
1/2" Plywood Top.

Stand.



Provide enought slope
to allow drainage 1"/ft ±

Sifter.



Size to Fit Worm Container.