

How to set up a Worm Composting System
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Setting up and Maintaining a Worm Composting System

Pre Analyze the Class

Consider the following questions:

1. Who is the audience?
2. Where are they located?
3. What do they already know?
4. What are the skill levels?
5. What do they need to learn?
6. What resources are available?
7. What constraints exist?
8. How will learners demonstrate mastery?
9. Where and how will training be delivered?
10. By whom will training be developed and delivered?

Overview

1. What is our purpose?

Most of us know that worms are an important part of any ecosystem. However few people know all the benefits a home worm farm brings. Raising worms can be a fun hobby. Even with even a small worm farm no bigger than a “Rubber Made Container” the home worm farmer can:

Compost (called vermicomposting) to reduce home food waste

Produce organic fertilizer

Fertilize indoor plants safely

Worm Composting System

Enrich garden bed soil naturally

Worm-casting Production

Worm Tea (no not to drink)

Eliminate dangerous chemical fertilizers

Raise fishing worms

The objective will be to deliver concise information that you will need for raising composting worm in an environment that nurtures worms, in a clean and safe habitat.

You really need only four basic things to establish a successful and easy to maintain starter worm farm or vermicomposting bin.

What You Need to Start A Worm Bin

1. Worm Bin (a container) This is the home for your worms
2. Worm Bedding, The material your worms live in
3. Worm Food, Don't worry you probably have some at home right now
4. Composting Worms - We are not talking earth worms.

2. Design

Worm Bins

Types of Worm Bins

When we talk about a worm bin we mean a home for you worms; what type of system will physically contain your worms and bedding. The term "worm bin" is often used to describe one of many housing "systems" used to raise worms. In a little while we will explain these different systems or bins.

Determining what type of worm bin, or system, you prefer is best done before ordering worms. But in reality most beginning worm farmers come across something interesting online, or in a store and go with that. Quite often worms are included in the package deal. Nothing wrong with that, in fact that's how I started.

There are several styles of worm bins, so take the time to learn a bit more about them here. In selecting your worm home worm bin there are two very important considerations that need to be addressed.

Worm Composting System

First choose between a commercially manufactured worm bin or homemade worm composting bins.

Second, determine where you will keep your worms, in the house, or outside, or in a sheltered building with no heating and cooling.

Traditional Worm Bin

The traditional worm bin is one of the oldest, and probably most common bin methods used for raising worms. What to use as a "bin" ***is only limited by your imagination.*** The most common bins these days are plastic Rubbermaid storage containers. Other common containers are modified to serve as worm bins are plastic buckets, kitty litter containers, plastic restaurant tubs or just about any other plastic container that has about a ***2 gallon or more capacity.***

Bins, generally have a cover to prevent worms from escaping. Worm farmers often modify their bins with vents to allow for ventilation. Drainage holes and spigots are also frequently added to drain off moisture, which makes harvesting easier.

The plastic bin is not high tech, yet many commercial worm farming operations use the humble worm bin by the hundreds. Worm bins are inexpensive and easy to make however they do have drawbacks. They can get heavy, water logged, and are more difficult to harvest worms and worm castings from.

Large worm bins are often kept outdoors year round, however in both very cold and very hot climates temperature must be controlled.

Flow Through Worm Bin Systems

The flow through worm bin was designed to address some of the shortcomings and problems of traditional worm bins by taking advantage of the red worm's natural instincts to live near the surface of the earth. In this system food and worms are literally added to the top of the bin and worm casting, worm poop, (Not Vermicompost) is harvested from the bottom.

Typical flow through systems are constructed from a wooden box, plastic barrels, or metal drums. The bottom of the bin is left open. A network of pipes, wires, or dowels runs horizontally across the bottom of the bin, just above the opening. A layer of cardboard or paper is placed on top of the network preventing the bedding and worms from falling through. Food is added from the top and once converted to castings is harvested from the bottom.

Flow through systems are becoming more and more popular since they make worm farming much easier, particularly when harvesting castings. Flow through systems are commercially produced. However may be homemade and constructed from plans, or engineered and built by worm farmers themselves.

Stacked Bin Worm Bin Systems

Stacked worm bin systems were designed to save space by utilizing a series of worm bins, or trays, stacked upon one another vertically with the entire stack sitting securely on a base unit that doubles as a moisture collector. Stacked bin systems have numerous holes in the bottom of each bin that allow worms to "migrate" up to the next bin once the bedding and food in the first tray is converted to castings.

Most of the worms crawl up out of the bottom bins making harvesting of worm castings easier than in a traditional bin. Since the trays are nestled upon one another and are topped off with a tight fitting lid moisture retention is excellent. The base of the system usually has a drain or spigot allowing for easy drainage of liquid. (*This is not Worm Tea*)

There are many excellent commercially produced stacking worm bin systems on the market. However a nice system can cost anywhere from \$50.00 to \$100.00. For those handy with tools a homemade stacking system can be constructed from wood, plastic bins, or kitty litter buckets.

Worm Trays

Worm trays are very similar to worm bins; in fact you could almost classify worm trays as shallow bins. However worm trays are generally utilized a bit differently than the traditional bin. Worm trays are often used by commercial worm farmers, or people looking to breed serious numbers of worms. Commercial worm farmers may use hundreds of trays to breed worms.

The use of worm trays will produce worm castings; but typically the focus of using worm trays is using them for reproducing worms in a very controlled and well thought out system. In these systems worms are fed a very controlled diet, spend only enough time in the trays to produce cocoons, then are harvested and moved on to another set of bins to start the process over. Or they are sold. The bedding is then set aside for the cocoons to hatch; thus starting a new tray of worms.

Out Door Worm Bins

Maintaining an outdoor bin means different things to different worm farmers. Outdoor bins come in many styles. An above ground out door worm bin is typically a large bin or flow through system that is insulated or temperature controlled to maintain survivable conditions for worms year round. These types of systems depend on the insulation and heat naturally created during the composting process.

Worm Composting System

In ground systems include windrows, vermin-trenches, and buried bins. As the name "in ground" implies the entire system of worms, bedding, and food are all contained in the ground.

A buried bin is just that. A bin buried flush with the ground and functions as a contained system. As long as the proper conditions and food are maintained the worms will not escape.

Windrows, sometimes called vermin-trenches, are long straight trenches cut into the earth. The trenches are filled with a bedding and food material. Aged horse manure, shredded cardboard, and decomposing vegetables are layered into the trench. Once the worms are added more bedding is added on top of them. In the winter an insulating layer of leaves or straw is piled atop the trenches. Again, the insulating material and heat of decomposition maintains a temperature that allows the worms to survive.

Worm Bedding

Preparing good worm bedding is not hard at all; however it is important to use the proper materials. Properly prepared worm bedding serves two purposes in your worm farm. First it provides a properly balanced medium for your worms to live in. Composting worms live in their bedding, not in soil like earth worms. The second function of worm bedding is to provide supplemental food, that's right; your worms actually eat their bedding.

There are many good materials you can use for bedding; and fortunately some of the best bedding materials are free or very inexpensive. Here is our recommendation for worm bedding:

Worm Bedding Mixes

Shredded News Paper

Shredded Cardboard

Dried Leaves

Coffee Grounds in small amounts

Straw

Black peat moss (chemical free only)

Coconut coir (sparingly)

Now it's time to mix in some of the waste materials, the waste material is more worm food.

Worm Composting System

The last step in preparing the bedding is wetting it down. Worm bedding needs to be wet for a couple reasons. First; worms absorb oxygen through their skin, so that's how they breathe. They can only do this when kept moist. Second the bedding should be wet to help facilitate the breakdown of food particles and bedding material.

Worm bedding should be wet as a damp sponge, not soaking wet. Very slowly mix some water into your prepared bedding. The use of a hand held spray bottle is a great way to wet it. Every so often check the moisture by grabbing a handful of bedding and squeezing it tightly. The proper moisture level is reached when a couple drops of water drip out. If you add too much water simply let the material dry, or add more bedding until it passes the squeeze / drop test. (***Demonstrate***)

Unless you already have your worms on hand let your bin set for a week. This allows bedding and food to start breaking down; it also allows for the Ph levels and temperatures to stabilize before the worms dig in.

Worm Food (Organic Waste Material)

Worms do better when given food sources besides their bedding. However there are many worm farmers that feed their worms nothing but shredded cardboard. But most of us are very interested in composting with worms so they can process lots and lots of our food waste and in return give us "black gold" (worm castings).

Worms are fairly tolerant when it comes to food but they cannot be fed just any old table scraps. These foods are safe and healthy for your worms:

Feed Your Worms

- Vegetable waste,
- non-citrus fruit waste,
- used coffee grounds,
- tea bags,
- ground egg shells in small amounts,
- rotting leaves,
- shredded cardboard,
- aged animal manure (beginners should start with horse manure and experiment from there),

Commercially available worm food.

Worm Composting System

Do Not Feed Your Worms

- Meats
- Animal Fats
- Cooking oils or Grease
- Citrus Fruits
- Plastics
- Too many starchy materials like rice or potatoes
- Human Waste
- Weeds

Grass clippings with pesticides on them

Composting Worms

Now it's time for the fun part, getting your worms. When it comes to a worm farm or Vermicompost bin you just can't go into the back yard and dig up a bunch of earth worms. Not unless you want them to die. Earth worms are not at all suited for the worm bin.

What you need is composting worms. Composting worms do not live deep in the soil. They thrive in colonies within the nutrient rich layer of decaying matter found on top of, or within, the first few inches of topsoil

There are several types of composting worms available. The most common is the red worm. The red worm is so popular because they are easy to raise, relatively inexpensive, withstand a wide range of temperatures, breed quickly, and produce good worm castings quickly.

Here is a quick list of each breed:

1. Red Worms (red wigglers) - By far the most common composting worm. Easy to raise and breed.
2. European Night Crawlers - The most popular "big" composting worm. Easy to raise and breed.

Worm Composting System

3. African Night Crawlers - A good "big" composting worm, but needs TLC in cold climates.
4. Alabama Jumpers - Another popular compost worm, but they have some special considerations.

Evaluate

1. Gather participant reactions after each session.
2. Collect more in-depth feedback by emailing or phoning participants shortly after a session. If requested.
3. Following up, after weeks or months. What areas remain unclear?
4. Revise training where possible.
5. Track and report whether training has addressed the objectives needed.

Training Material Needed:

Rubbermaid Bin

Bedding

Food

Red Worms

Worm Composting System

References:

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