

The Worm Factory

Composting Worm Bin System



Year Round
Production

Warm Weather — Outside
Cool, dry space

Cold Weather — Inside
Odor-free operation

The Composting Worm Bin System:

- An incredibly efficient method for recycling
- Converts kitchen waste into nutrient-rich compost
- An easy-to-manage, compact design with odorless operation
- Features a unique, self-sorting upward migration worm bin system



Why Compost with Worms?

Your worm composter is an incredibly efficient way to quickly convert your kitchen waste, cardboard, newspaper, junk mail, dried leaves and other organic matter into nutrient-rich compost for your plants, planters, flower beds and garden.

In nature, the recycling process breaks down and converts any once living material into the nutrients plants use. This is an ongoing process in nature's food chain. For example, your yard waste, grass clippings and leaves, if left alone, can take up to two years to complete the composting process. Your worm composter speeds up this process and takes as little as three months. The composting worms as well as the microbes (millions of bacteria, fungi, nematodes and protozoa) living inside your worms are the work horses that process your household waste.

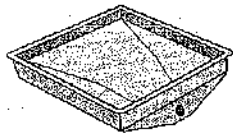
In full operation, your worm composter, which we will call a vermicomposter, will house 10,000 to 12,000 worms, helping the microorganisms process up to five pounds of food waste and junk mail a week.

This instruction book will give you the basic information and protocol necessary to manage your vermicomposter in order to produce organic, nutrient-rich fertilizer for your plants and garden.

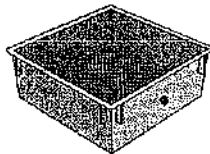
Table of Contents

Assembly.....	2	Oxygen.....	12
Parts List.....	2	Temperature.....	13
Assembling your Vermicomposter....	3	Cooling Bedding in Hot Weather.....	13
Getting Started.....	4	Moisture.....	13
Adding Bedding.....	4	Troubleshooting.....	14
Adding Food.....	4	Dealing with Pests.....	14
Adding Worms.....	5	Finding Things Growing in Trays.....	15
Managing Your Vermicomposter.....	5	Going on Vacation.....	15
Managing the Working Tray.....	6	Unpleasant Odors.....	15
Managing Vermicompost.....	6	Just for Avid Gardeners.....	15
Vermicomposting Goals.....	8	Basic Bin Management.....	16
Worms.....	8	Moisture Control.....	16
Weekly Worm Review.....	10	Optimum Temperature.....	16
Raising Worms for Fishing.....	10	Feeding Guidelines.....	16
Bedding.....	11	Fiber Sources.....	18
Food.....	11		

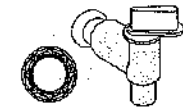
Your vermicomposter kit contains the following parts:



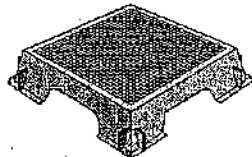
1 Collection Tray



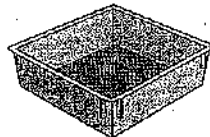
1 Holding Tray



1 Lever Tap Spigot
and White Spigot Nut



1 Base



3 to 5 Stacking Trays
(Depending on your order)



1 Quick Tips Lid



1 Knob and 1 Nut

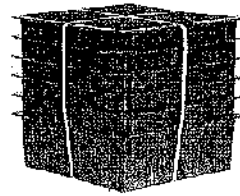


2 Steel Bolts
2 Steel Nuts

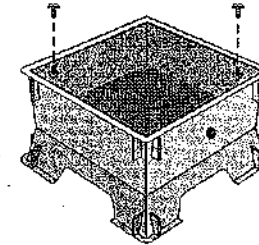


1 Coir Brick and
Shredded Paper

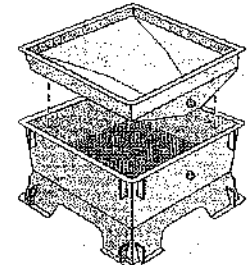
Assembling Your Vermicomposter



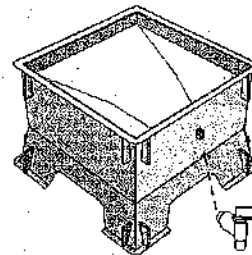
1. Separate the stacking trays from the other parts. You may have 3 to 5 trays depending on which system you purchased.



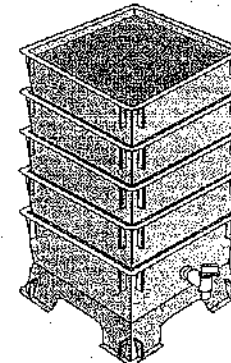
2. Place the holding tray over the base tray and align the grids. Locate the stainless steel bolts. Place the bolts in opposite corners a few squares from the edge. Twist bolts by hand through aligned grids until secure.



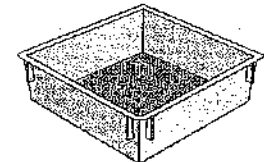
3. Place the collection tray into the holding tray and align the spigot holes.



4. Locate the spigot and the large white plastic nut. Insert the spigot through the holding tray and collection tray. Thread the plastic nut on the spigot inside the collection tray. Firmly tighten by hand to secure the collection tray. Make sure threads align properly before tightening.



5. To assemble the lid, place the knob through the hole in the center of the lid. Screw the nut on the bottom of the lid to secure.



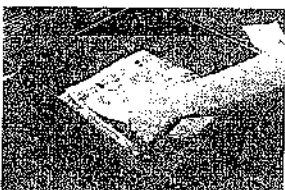
6. As you begin to use your vermicomposter, the remaining trays will be added one by one.

NOTE: After assembly, place some water in the bottom of the collection tray. If water leaks around the tap, check the proper placement of the plastic nut and make sure it is firmly tightened. Remove any water from the collection tray before you set up the bedding.

Getting Started

Once you have completed the assembly of your vermicomposter you are ready to prepare the worm bedding. The following instructions (1-5) are for the first working tray only.

Adding Bedding



1. Place an empty working tray on top of the collection tray. Line the bottom of the working tray with 3 or 4 sheets of dry newspaper. Only add dry newspaper to the bottom of your first working tray.
2. To make your tray bedding, soak the block of coir in a container with 3 quarts until it breaks apart and is moist. Wring out excess water and mix the loose coir with a cup of active compost (rich dark dirt, crushed egg shells and/or sand). You can use compost from your garden bin; however, if that is not available, use decayed leaf litter from beneath your shrubs. If you live in an apartment, be creative and find decayed leaf litter under shrubs in your neighborhood. Then, mix the coir with the shredded paper included with your vermicomposter.
3. Spread freshly mixed bedding on top of the newspaper in the working tray.



It is important to have your vermicomposter and the bedding ready to receive worms as soon as they arrive.

Adding Food



Place food in the corner.

4. Place 2 handfuls of food scraps in one corner of the working tray on top of the bedding. (See page 11 for food types.) Cover food and fill the tray with 2-3 inches of dry shredded newspaper. Then, cover the shredded paper with 3 or 4 full sheets of moist newspaper. Place the lid over the material in the working tray. Set aside the remaining trays for future use. Your vermicomposter is now ready for your worms to arrive.

Adding Worms



*Purchasing worms locally is best. Check out FindWorms.com to find the nearest grower.

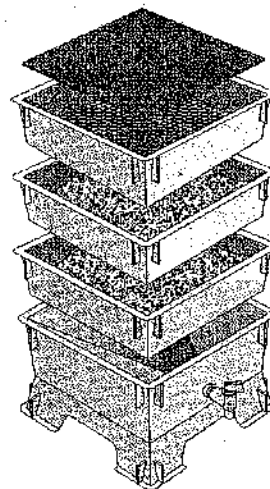
5. In most cases, worms are not included when you purchase your vermicomposter. When purchasing worms separately, make sure you buy the proper variety and enough quantity for a healthy population in your vermicomposter. **Make sure you purchase the red wiggler, also known as *Eisenia fetida*.** You can start with as few as a half pound of worms (approximately 500), however, a full pound of worms will work even better if you really want to jump start your vermicomposter.

To add the worms, remove the worms and special bedding material from the package they arrived in. Next, remove the lid and lift the top layer of moist newspaper in the working tray. Gently place the worms on the prepared bedding in the working tray.

Worms can become stressed during shipment. They may take a week or so to adapt to their new environment. Leave a light on at night to encourage them to burrow into their new home. A common mistake is to overfeed your worms when you start using your vermicomposter. **Be patient.** Once the worms are in place, re-lay the newspaper and replace the lid.

NOTE: Purchasing worms locally is the best option. To locate your nearest worm farm or grower be sure to check out FindWorms.com.

Managing your Vermicomposter



After three days remove the lid from the working tray. Lift the layer of moist newspaper and look to see that the worms are actively involved in the food waste. If they are crawling in and around the food in the working tray, add more handfuls of food waste to the original food in the working tray. Cover the new food with the layer of moist newspaper. It may take up to 1-2 months to eventually fill the working tray to a depth of 3 1/2 - 4 inches. Once the first working tray is full, you will be ready to add a new working tray to your vermicomposter.

It's important to note that as you begin to add trays to your vermicomposter the tray names will change. Always add trays to the top of your vermicomposter.

When you add a second tray to the top of your vermicomposter, the top tray is now the working tray and the bottom tray becomes a processing tray. When you add a third tray to the top of your vermicomposter, the two trays below are called processing trays and the top tray is named the working tray.

Managing the Working Tray

When you are ready to add a new working tray to your vermicomposter, the material in the tray should be configured from the top down as follows: (Note: In layers 1 and 2, you do not need to add everything that is listed. If you only have a few of the items, the working tray will still function properly.)

Lid - The plastic lid keeps the light out of the working tray, but more importantly allows heat and gases generated in the composting process to escape from around the perimeter.

Layer 1 - A top layer of three or four sheets of moist newspaper.

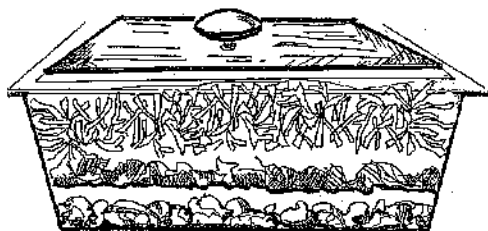
Layer 2 - A layer consisting of *one or more* of the following:

- Moist shredded cardboard
- Moist shredded newspaper
- Moist shredded junk mail (glossy junk mail is okay but do not use plastic coated paper)

Layer 3 - A layer consisting of *one or more* of the following:

- Old leaves (not green)
- Pre-composted grass clippings
- Other composted plant materials

Layer 4 - A bottom layer of food waste.



Worms need space to move around and the mid layer is where they like to hang out when not working in the food scrap layer. Always place the food waste under moist paper and other composted materials.



Always add food to the top of your working tray. Never add food to a processing tray. Worms have very small brains; however, they are smart enough to crawl up, through the grid, into the upper trays looking for food once food in lower trays are exhausted.

Place the tray on top of your vermicomposter and continue adding trays in this manner until you run out of trays to stack.

NOTE: Do not overfeed your worms. Place only a few handfuls of food in the working tray at a time. Only add more food when the worms are actively working in the food you added most recently.

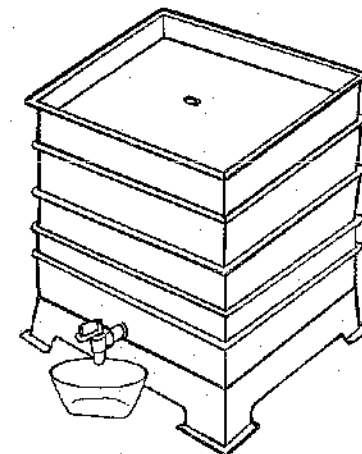
NOTE: When worms are removed from their natural habitat and placed in your composter, special care must be taken to protect them. Always shelter your composters in a covered, shady, well-ventilated area when placed outdoors. Never expose your worms to direct sun, rain or freezing temperatures.

Managing Your Vermicompost

As the compost processes, you will notice changes. The compost will shrink, the texture will become more evenly granulated, and will turn a dark coffee color. As your worms work into the upper working tray, the bottom processing trays will contain worms, worm castings, broken-down organic matter, bedding, and other organisms called vermicompost. Vermicompost can be used in your garden or house plants to enrich the physical condition of the soil and increase the organic content.

Worm Tea - During the composting process, gravity pulls moisture through the trays dragging nutrient-rich particles with it. This nutrient-rich liquid is called leachate, which eventually lands in the collection tray. The leachate can be drained at any time during the composting process. Note: It will take some time before your compost produces enough liquid in the collection tray to be drained from the spigot.

To collect the leachate, place a small plastic container under the spigot and turn the valve to drain. Before applying leachate directly to your plants, it is a good idea to pour it from one bucket to another to add oxygen. You can use it at full strength on your outside plants. For houseplants, dilute it using one part water to one part leachate. You can also recycle the leachate back through your vermicomposter if the contents of the vermicomposter are running a little dry.



To make fresh compost tea, mix 1 cup of well processed castings in a gallon of water; steep overnight, shake, mix or aerate with an aquarium pump if desired; then use the solution within 12 hours to water or spray plants.

Bottom Processing Tray - After all of the trays are full, you can begin to check the contents of the bottom processing tray. When you see that the material is nearly black and the chunks of matter are small, tip the material out and wash the tray over an area you want to apply compost, such as a lawn or flower bed. There is no exact point in time when the bottom tray is ready to be emptied. The longer you wait, the more times the worms will eat through the same material and the better quality your vermicompost will be. As long as the material is dark and small, your plants and garden will love it. Once you have emptied the bottom tray of completed compost, set it aside until you are ready to start a new working tray. (Refer to the instructions on the previous page on how to set up a new working tray.)

Collection Tray - Before you re-stack the trays, it is a good idea to check the collection tray. Occasionally, you will find very fine, dark material in the collection tray. Scoop it out, add it to a small container of water and it will dissolve creating leachate. You can also add it back to your vermicomposter to recycle it through. You can place it in any tray, but it is recommended that you place it in the bottom processing tray.

Worms - Worms sometimes land in the collection tray. The collection tray is designed with an incline to allow them to return back to the processing tray. If you find worms in the collection tray, gather them up and put them in the working tray. Remember, the red wiggler lives in nature in the top 10 inches of the litter layer consisting of leaves with hummus. The red wigglers will not survive in your garden of clay soil. Red wigglers are most comfortable under trees, shrubs or a layer of compost.

When you are ready to re-stack the trays, processing tray 2 becomes processing tray 3, working tray 1 becomes processing tray 2 and the newly filled tray is now the working tray.

Vermicomposting Goals

As you begin working with your vermicomposter, "experience will be the best teacher", but following the instructions in this book will ensure that you achieve a successful vermicomposter. After time, you should reach the following goals:

Goal #1: After about three months, the majority of the contents of the lower processing tray should be converted into small, dark chunks ready for the garden. The majority of the worms will have moved upwards into the trays above.

Goal #2: To have several processing trays in different stages which work together to produce a finished processing tray. Each month the bottom processing tray will be ready to export into your garden or house plants. It is important to remember these are goals. **It may take more time** depending on many variables which will be covered later in these instructions.

Worms

Earthworms have been around for a long time and have survived in the most extreme conditions. Many earthworm varieties originated in Europe and spread across the country with the westward migration of settlers. They are found in all parts of the world with the exception of harsh deserts and arctic regions. There are over 7,000 varieties of earthworms found in good garden soil. Worms come in all sizes, from smaller than an inch to several feet long. They can live for up to 15 years and their young can reproduce when they are a few months old.

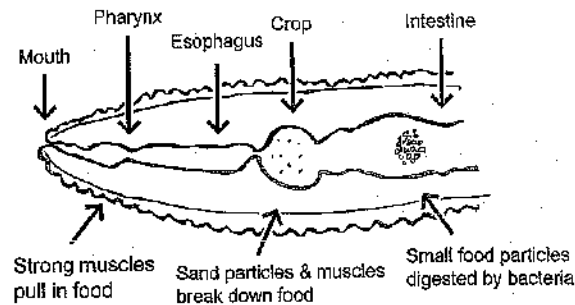
There are a few species that are suitable for your vermicomposter, but the red wiggler, also known as *Eisenia Fetida*, has proven itself worthy of any vermicomposter. It processes vast amounts of food, has a rapid reproduction cycle and is the worm that is recommended for your vermicomposter.

Make sure you order your worms from a grower who has the right variety and not from the local bait shop. To ensure that you buy the proper worms, visit FindWorms.com

In nature, many earthworms live in permanent burrows in solitude. They are excellent soil aerators in the garden, but we want a worm that is communal and burrows randomly through the litter layer of top soil. The red wiggler does exactly this.

We also want a worm that stays in your vermicomposter and the most important characteristic of the red wiggler is that they love darkness and hate light. Some other varieties are accustomed to light and will exit the working tray without any warning or notice. We received an e-mail from a gentleman who had carefully collected worms, a few at a time, in his backyard. He ended up with a bin of free earthworms that refused to stay in his vermicomposter because the habitat and the food were not what they wanted or needed to survive.

The red wigglers have what can be described as a rudimentary digestive system. Because they have no teeth and very few digestive fluids, they depend on bacteria, fungi, molds, and other organisms to predigest their food. In other words, worms can survive on any organic matter, including cellulose, wood fibers, and starches, but they need microorganisms, bacteria, fungi, nematodes and protozoa to break down the fibers. The diagram at right shows how your kitchen scraps and junk mail are processed through the worm.



Worms don't eat garbage directly. Garbage must be broken down so they can digest it. Usable worm food is created when plant growth

has stopped and the cells become separated by either bacterial action and/or oxidation (exposure to air and water). When the food is small enough, the worms suck the food through their mouth. Sand particles and strong muscles continue to grind and break down food before it is actually digested. The intestines of the worm house the tiny microbes mentioned above. The microbes are what actually digest the food and turn it into nutrient-rich worm castings that will ultimately be used on your plants and garden.

Each species of worm has a favorite food and habitat. Although earthworms are found in manure, we do not recommend you use animal manure in your vermicomposter. Commercial worm growers often use animal manure and paper waste as primary feed stocks. It's important to note commercial growers raise a variety of species for many uses and the methods they use may not be the best for your small scale vermicomposter.

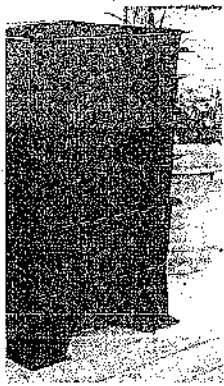
Every 3 months, red wigglers in your vermicomposter can be expected to double in population. The worms lay eggs and are incubated in cocoons. Each tray of your vermicomposter can hold about three pounds of worms, or about 3,000 worms. Overpopulation is not a concern as worms can migrate freely between trays and some worms will wind up in your garden when you dump the bottom processing tray.

Worms in nature control most of their environment. Because the worms are taken out of the ground and placed into bins, you must play an important role in the management of your vermicomposter's environment to insure their health and survival.

Bedding

To reach the vermicomposting goals that were discussed earlier in the Instruction manual, managing the bedding, food, oxygen, temperature, and moisture will ensure a successful vermicomposting system.

Your vermicomposter comes with basic bedding materials: coir brick and shredded paper. You want to create a bed that will allow excessive moisture to drain, while at the same time, holds the right amount of moisture. Bedding can't be too coarse because it requires space for air to move through. A good bedding mix is always a mixture of several materials including coir, shredded paper and powdered rock or crushed egg shells.



Coir is ground coconut fiber. It is the most desirable bedding material because it retains moisture and improves the quality of the worm castings that go into your garden. Coir is available at many garden centers and nurseries.

Shredded paper is inexpensive. Just recycle the Sunday paper, computer paper and junk mail. Some junk mail may be glossy which is not harmful to your worms, but be sure to avoid plastic coated papers. **Be careful:** too much paper will mat in clumps. Mix shredded paper with leaves or shredded corrugated cardboard. When possible, set aside a couple of bags of leaves each fall. Paper egg cartons, shredded and soaked in water also make good bedding material.

You will also need something to help keep your bedding loose and allow air to pass through. Powdered rock or crushed egg shell can accomplish this and both will benefit your garden. Add a small amount of soil or active compost to your initial working tray when you first set up your vermicomposter to introduce the healthy microbes worms rely on. The grit in soil, finely ground eggshells or sand is also used in the worm gizzard to allow the worms to grind up and digest what they eat.

Collecting Leaves

By far the best and least expensive way to make your worms work at top speed is to give them leaves from trees gathered in the fall. Place dry leaves on the top of the working tray to help manage fruit flies. Add them to your bedding, mixing it with shredded paper. Use them wet or dry to help manage your bedding moisture. **Never** use leaves from plants such as bay, eucalyptus or magnolia trees, and never use needles from pine, fir and cedar trees. These types of leaves will kill your worms.

Food

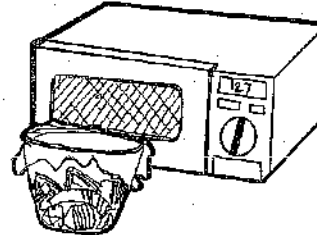
The plastic tips lid on your vermicomposter has an easy, accessible list of foods that can be added to your compost including vegetables, fruits, starches, egg shells, coffee grounds, paper and cardboard which will all come from your own resources. Avoid salty foods, citrus peels, oils (like those found in salad dressings), meat, and dairy products because they can be harmful to your worms. If you run out of food, one thing you can do is to ask your local coffee shop for a bag of their old coffee grounds.



You can buy books used by commercial growers with complicated feed formulas using manure, sewer sludge and grains of all kinds. It's a lot of work and your vermicomposter may prove too small to warrant such extreme feeding tactics. Sticking to the foods recommended on the tips lid will ensure happy, healthy worms.

Smaller is better when it comes to adding food to your vermicomposter. Some folks even puree food scraps, and others first freeze them to help break down the material. You want to achieve a soft food which will break down more quickly.

An easy and effective alternative is to place your food scraps into a plastic container with a little water. Cover and microwave for 5 to 6 minutes. After cooling, the "cooked" food is broken down and ready for the worm composting process.



Your vermicomposter is what could be called a "cool compostor," operating between 60° and 80° Fahrenheit (15° to 26° Celsius).

In contrast, a "hot" outdoor compost bin with fresh grass cuttings can range from 150° to 160° Fahrenheit (65° to 71° Celsius). Remember, never use fresh cut grass clipping in your vermicomposter. Doing so can cause your worms bedding to get too hot. You can use composted garden and grass clippings for food and bedding after they are first broken down in a hot compostor.

Feeding your worms

Organic bedding is necessary to operate your vermicomposter. As a result, everything in the bedding is food for your worms. Remember, the smaller and softer the bedding, the better the environment for the bacteria, fungi, molds, and protozoa to prepare the food for the worms.

You can add new food to the uppermost working tray at any time. Worms will eat 3 times their weight in a week or more, so one pound of worms will consume three pounds of waste and organic fiber per week. Be careful not to overfeed the worms. Watch to make sure the food that is in your vermicomposter is already being consumed.



Oxygen

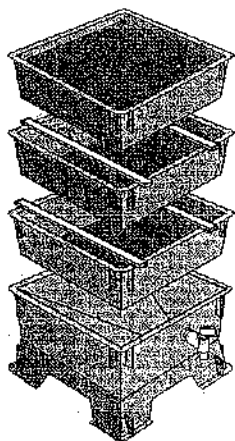
The movement of oxygen through the bedding is essential. Unlike some composting worm bins that are sealed, your vermicomposter allows air to freely pass between working trays. Some folks even drill small holes in the side of the plastic working tray to increase airflow. It is very important to keep your vermicomposter in an area or room with good ventilation.

Temperature

Red wigglers normally live and feed within a few inches of the ground surface. The ground maintains a consistent temperature. In extreme heat or cold, red wigglers will go as deep as two feet under the surface to maintain their temperature. When we put red wigglers in plastic bins above ground, we must consider their natural behavior as a factor when managing your vermicomposter.

Worms thrive in temperatures between 60° and 80° Fahrenheit (15° to 26° Celsius). They will slow down in cold or hot conditions. When in temperatures of 90° to 100° Fahrenheit (32° to 38° Celsius), they will move to the lower trays. In hot conditions your vermicomposter must be kept moist. Never place your vermicomposter in direct sunlight. Find a cool shady spot with plenty of air movement.

In northern climates, your vermicomposter must be kept indoors during the winter. A well-managed vermicomposter will not create any offensive odors. Red wigglers will not survive freezing conditions.



Cooling Bedding Material in Hot Weather

From time to time you may notice that the bedding in your Worm Factory occasionally becomes hot to the touch. This is often the result of using certain types of foods or exposure to extremely hot weather.

To solve this problem, find some pieces of wood no more than 1/4" thick. Lath, dowel, or paint stirring sticks from a local hardware store work well. Separate your trays by adding strips of the wood between them to allow additional air circulation. You will get the best results by doing this at night and removing the strips of wood during the day. Two recommendations: first make sure that the openings are too small for rodents, and secondly add a fan if more air circulation is needed.

Moisture

Red wigglers require moisture to breathe because they take in oxygen through their skin and will die if they dry out. Too much moisture and your bin will start to produce unpleasant odors and your worms could drown. The moisture in bedding should range from 60% to 80%. Without an expensive meter, how can you determine the moisture? Here is where experience comes into play.

Too Dry?

Observe. You should never see dry scraps, especially paper, in a working tray.

Your vermicomposter runs a little dry in contrast to sealed vermiculture systems because it is so well aerated. If it is too dry, you have several options. You can add wet shredded paper, or spray water on the tray. In very dry conditions, small amounts of water can be poured and let it work its way down. It is possible to drown worms with too much water, but potentially the biggest problem is the fact that excessive water compacts the bedding creating thick globs. To avoid these problems, be sure to add very small amounts of water at a time.

Too moist?

The squeeze test. Hold a small amount of bedding between two fingers and squeeze. You want to see a drop or two of water. The bedding should be as moist as a wrung-out sponge. You want the bedding to be damp, not dripping wet.

Remember, the fruits and vegetables you add contain large amounts of water which may cause excess moisture. If you find your bedding too wet or with a bad odor, add dry shredded paper. It's not a bad idea to always keep the valve in the collection tray open with a plastic tub under it. This will allow more air to flow through your vermicomposter and will help monitor the moisture in your bin.

After a while, you'll be able to judge the condition of the bedding by just looking at it.

Troubleshooting

Dealing with pests

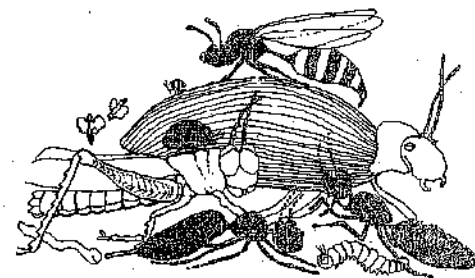
Most commercial growers raise their worms in windows on the ground. As a result, ants attack, slugs raid, and sow bugs ravage their worms. You should not have the same experience with your vermicomposter. You may, however, notice other critters in your vermicomposter from time to time, some of which are a part of the composting process, such as spring tails, mites, white pot worms, and molds. It is very unlikely that you will ever find house fly larva in your vermicomposter. A complete list of invertebrates and other things found in vermiculture can be found online at:

www.FindWorms.com/invertebrates.html

The fruit fly is by far the biggest problem, especially if you keep your worms inside during the winter. These guys arrive on the skins of fruits and vegetables. You can make fly traps, use chrysanthemum bug spray or make it difficult for them to exit.

Place an empty working tray on top, full of dry shredded paper or dry leaves through which the flies must pass to get out of the bin. They become discouraged very quickly. Beneficial nematodes, available at many garden centers, are also an excellent biological control for fruit flies and spring tails.

Ants invading your vermicomposter is very rare, but if you do encounter this problem it is because your vermicomposter is too dry. Ants shy away from moist environments and properly controlling the amount of moisture in your vermicomposter will keep them away. You can try building a water moat around your bin or place the legs of the base in containers of water until your vermicomposter is moist enough to get rid of the ants.



Finding things growing in the working trays

Sometimes, seeds from food scraps sprout. Microwaving your food scraps will help fix this problem. Other things such as molds may also grow. Have no fear! Mold is a part of the natural composting process and should be no problem. If too much mold remains, it may be an indication that you are feeding too much.

Going on Vacation

Worms can function just fine for up to a month without any care. The biggest concern is not enough moisture, and that is only a problem in extremely dry conditions with low humidity. Add moist shredded paper or cardboard to the bin before leaving on vacation. This will feed your worms while you are away. Extra food waste can cause your bin to heat up and the worms will do fine feeding on just the paper.

Unpleasant Odors

If your vermicomposter is operating correctly there is no odor unless you actually open it up. If it does start to make a big stink with the odor of a sewer or rotten eggs, it is not being managed correctly. Excess water and/or overfeeding are the likely problems. Most foods contain a high percentage of water, especially pureed fruit. If the bedding becomes compressed and water-logged, it will restrict the flow of oxygen needed for the compost process to work.

To correct the problem, first stop feeding. Next, add dry bedding materials: shredded paper, dry coir, dry leaves or broken up corrugated cardboard will work. Mix the contents to immediately aerate the bin. Another possibility could be the food you are adding. Meat scraps, dairy products and oily foods could be the problem.

If you continue to have an unpleasant odor, gently stir up the entire bin periodically to create more air spaces. You are trying to add oxygen and the air pockets will allow this to happen. Be careful, worms can become stressed which will cause them to group up in a ball or even crawl out of the bin.

Just for avid gardeners

While a sensitive touch and experience work for most folks, some gardeners have meters to read both moisture and the pH levels. Either way, try to keep the moisture in your vermicomposter between 60% and 80% indoors and somewhat dryer outdoors. If your bin is too dry, ants may enter your bin and cause problems.

Without going into detail, the composting process can create an excessive acid problem. You can test pH with a simple kit from most garden centers. Worms enjoy a pH of between 7 and 8. A safe way to deal with acid is to add crushed eggshells, rock dust, crushed limestone, crushed oyster shells or calcium carbonate in small amounts. **Never** use quicklime, slacked lime, plaster lime or any sort of salt or soda products.

Weekly Worm Review

At first it may sound strange, but you will actually get to know your worms. Worms don't appreciate you digging around too much, however, you do need to check up on them. In addition to regular feeding, a weekly review of the working tray is a good idea. Remove the lid and examine the tray contents. Are the worms moving up? Is there an "earthy odor" like the soil in your garden? Do the worms have a moist layer of slime on their bodies? Do the worms quickly bury themselves when exposed to light? Do you see small "young" worms? If you see evidence of dry conditions, add moisture. A sour odor may indicate overfeeding or too much moisture. Take steps to correct these conditions immediately. Refer to the troubleshooting section on **page 13** for solutions to possible problems.

Raising Worms for Fishing

Most fishermen have a bias for the large earthworms called the night crawler. Even for commercial growers, night crawlers are very difficult to raise because they burrow deep in the ground. A little known fact is that red wigglers have an advantage for fishermen over night crawlers. Red wigglers will stay alive for several days in water and continue to wiggle on the hook, whereas night crawlers die almost immediately.



The Ideal Worm Fattener Recipe

- 5 parts chicken layer mash
- 2 parts wheat or rice bran
- 1 part agricultural lime
- 1 part wheat flour
- 1 part powder milk

Red wigglers are usually 2 ½ to 3 inches long and make great fish bait. You can even fatten them up by feeding them chicken mash or cornmeal! Ask for chicken mash at your local feed store. Sometimes the only mash available consists of little chunks of corn. You can run this through a blender to break it into finer pieces. Add a handful of moist mash (or cornmeal) to the top of the working tray every day, or mix a handful with the food waste when you feed your worms. It will take several days to fatten your worms and you should add mash with every feeding. For fatter worms, just follow the ideal worm fattener recipe above.

Basic Bin Management

Moisture Control

Worms require moisture so be sure to check your bedding regularly. Use the squeeze test (see page 14) to see if adequate moisture is present. To increase moisture, recycle the liquid from the collection tray or add wet fiber: shredded newspaper, cardboard, etc. To reduce moisture, add dry fiber including shredded paper, cardboard, peat moss, etc.

Optimum Temperature

Your vermicomposter ranges between 60° and 80° Fahrenheit (15° to 26° Celsius). Keep your vermicomposter in a dry, cool covered area. Never allow the vermicomposter to sit in the rain or direct sunlight. Never allow your vermicomposter to freeze.

Feeding Guidelines

Add more food only if the worms are actively involved in the food waste already present. Avoid overfeeding. Feed your worms a balanced diet of 50% kitchen scraps and 50% fiber. Always place new food under the layer of moist newspaper beneath the plastic lid.

Food Sources

Paper Products	Magazines, cardboard, dryer lint, paper egg cartons, vacuum dust, Kleenex, napkins, paper towels, coffee filters with grounds, tea bags, paper bags and junk mail.
Fruit	Melon, banana, pineapple, apple, grapes, peaches, plums, berries, and baker's yeast.
Grain-based foods	Breads, oatmeal, muffins, cereal, pasta, rice, pizza crust (without any toppings). NOTE: Use grain-based food sparingly. Excessive use can cause your Worm Box to overheat.
Garden Trimmings	Dead flowers, dead disease-free plants, dried leaves gathered in the fall.
Vegetables	Corn, broccoli, cabbage, onions, beans, tomatoes, squash, carrots, peas, cooked potatoes, green salad (without dressing).

A special thank you to the Washington State University Extension Service for providing this list of recommended foods for your worms.

Expand Your Worm Composter

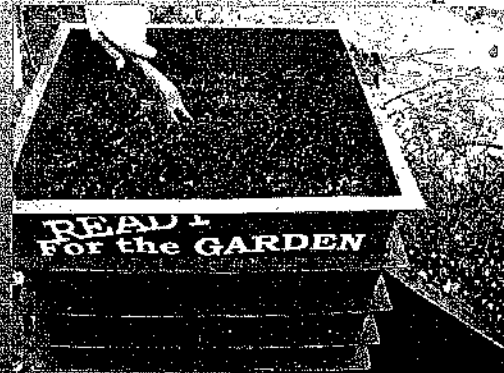
Add Additional Trays



Save your Worms

When your bottom tray is "Ready for the GARDEN" place the tray on the top and remove the lid. Stir the compost several times a day.

The remaining worms, which do not appreciate light will move down into the tray below.



Bottom Tray

When the bottom tray is "Ready for the GARDEN" place the tray on the top and remove the lid. Stir the compost several times a day. The remaining worms, which do not appreciate light will move down into the tray below.

