VermiTek

iTower Worm Bin

USER'S MANUAL

Air-vented Lid
Perfect For Outdoor

Stackable & Expendable

- Easy To Use
- Odorless
- 100 % Organic Fertillizer
- Educational
- 30% Household Waste Reduction

Dimensions:
16"(L)x16"(W)x18"(H), 40 liters

Includes:
Air-vented lid, three, four, or five working trays, iTower base, coconut coir, spigot, worm saver sheet, worm juice cup, coconut mat, claw, tong, sillcon scraper, temperatur gauge, colour manual booket & DVD manual.

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Recycle the carton and let it become organic fertiliser

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Introduction

The VermiTek iTower transforms the organic waste from your kitchen into organic fertilizer for your garden. It's easy to use! We can benefit from worm composting in three areas: produce organic fertilizer for your garden, raise worms, and help the environment by reducing the organic waste going to landfill or incinerator.

In nature, the recycling process breaks down and converts decomposing materials into the nutrients which plants use. However, this natural compost process is slow. Sometimes, it may take one to two years to complete the process. Worm composting or vermi-composting is much faster and more efficient than the natural composting thanks to the worms and the microbes living inside the worms and composters.

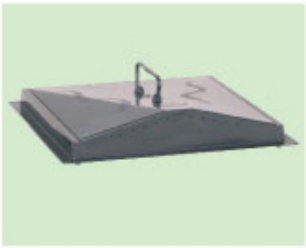
The VermiTek iTower has an unique design that keeps food scraps automatically separated from the finished compost. Start by adding bedding, food scraps and worms to the bottom tray. As the worms finish digesting at the bottom tray, they will migrate upward into the food scraps in the trays above, leaving rich castings behind. At the same time, liquid drains through the trays to the liquid collection tray below, and can then be used as a nutrient rich compost liquid for your plants. The VermiTek iTower has very little odor since the compost worms eliminate odor in the process of the food scraps digesting or composting.

In ideal operation, 2lbs or 1kg worms can consume 1lb or 0.5 kg of food scraps per day on average. A 5-tray worm bin can house 10 lbs or 5 kgs of worms. Therefore, it can help to reduce 5lbs or 2.5 kgs food scraps per day. The VermiTek iTower provides the perfect capacity for household waste management.

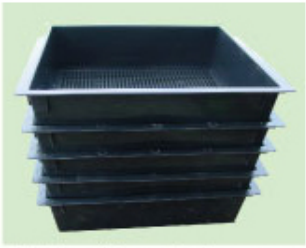
The iTower includes:

* Air-vented lid
* Three, four, or five working trays
* iTower base
* Worm saver
* Coconut coir
* Spigot
* Colour manual booklet & DVD manual
* Claw
* Tong
* Silicon scraper
* Temperature gauge
* Liquid collection cup
* Coconut fibre mat

Part List

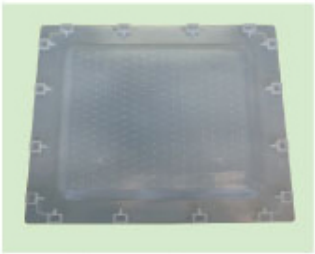


Air-vented Lid



Working Trays

iTower Base

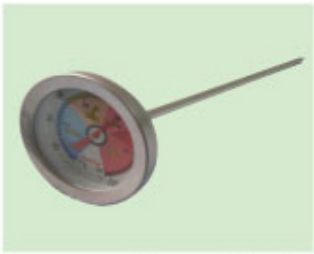


Worm Saver

Tap

Coconut Coir

Tong



Temperature Meter

Cup

Scraper

Claw

Coconut Mat

Assemble

1. Remove all parts from the carton box;

2. Four legs are provided. Insert the legs into the sockets at the corners of the iTower Base. Push the legs all the way in until they click (see picture 1).

Picture 1

3. Install the spigot on the base. Insert one piece of the clear plastic washer through the thread of the spigot, and then insert the thread part of the tap through the hole (see picture 2).

Picture 2

4. Next, insert the other piece of washer through the thread of the tap, and then, screw the plastic nut on the thread, and hand-tighten the nut (see picture 3).

Picture 3

Start Up

Worm Bed Material

Worm bed is the place where worms live and work. Worms need to have a comfortable living environment so that they can efficiently work on composting. The choice of material is essential in creating a healthy bed for your worms. Followings are the recommended materials for the worm bedding: Damp coconut fiber, worm castings, soil (not clay), shredded newspaper, shredded paper, crushed egg shells, decayed backyard leaves or grasses (avoid using green leaves or grasses because they will generate heat during composting and increase the temperature inside the worm bin).

Worm Bed Set-up

1. Find a bucket from your home (over one gallon size), and fill it with one gallon of water. Soak the coconut coir in the water until it breaks apart and is moist.
2. After the coconut coir is soaked and moist, locate one of the working trays, and scoop the soaked coconut coir from the bucket to the working tray. Mix the soaked coconut coir with a few handfuls of soil (not clay), shredded paper or other garden compost. The garden compost can be from your garden compost bin or decayed leaves from your shrubs. Please make sure that the mixture be moist, not too wet or too dry. To test the moisture level of the mixture, simply place a small handful of the mixture on your hand. If water drips out from the mixture without squeezing, it indicates the mixture is too wet. If no water drips when you squeeze the mixture, it tells the mixture is too dry. If it is too wet, mix it with some shredded paper to dry it up; if it is too dry, sprinkle some water on the mixture. When the moisture level of the mixture is right, the mixture can be used as bedding material.
3. Next, take another empty working tray and cover the bottom of the working tray with 2 or 3 sheets of dry newspaper.
4. Spread the bedding mixture on top of the newspaper. Place the Worm Saver on the top of the base, then, place the tray (this is the first working tray) on top of the Worm Saver and cover it with the lid. Now, you have a perfect wrom farm waiting for the arrival of your worms. Clean the working tray used for mixing the bedding, and set aside the empty working trays for future use.

   Note: the Worm Saver is designed for three purposes: 1).Provide a strong platform for the working tray; 2). Filter out debris dropping out of the working tray and prevent the spigot from clogging; 3). Prevent worms dropping to the base tray.

Worm Foods

The following can be served as worm foods: vegetable scraps, fruit peels (of low acidity), egg shells, shredded paper, cardboard, coffee ground and filters, grains, starches, decayed garden leaves and grasses, manure of horse and cow, wood sawdust, and hair.

Please note: animal waste can be used as worm food. However, remember that all animals get wormed and this could kill your compost worms. Therefore, be careful for using animal waste as worm food. It is advised starting with a small amount and see if the animal waste is proper for your worm bin.

The following food wastes should be excluded from your worm diet: All citrus fruits (due to high acidity), plant seeds, cooking oil, meat, fish, poultry, dairy products, and salad dressings. For more information on worm foods preparation, please refer to the Section of System Optimization.

Worm Arrival

When your worms arrive, place them on the surface of the worm bed and cover the bedding with a sheet of damp newspaper. Worms will quickly disappear under the worm bed. Note: The worms may become stressed during shipping.
In general, worms may take a week or so to adapt to their new home. They may try to escape from the worm bin (even when you harvest or move worms to a new tray, they may try to escape). In the first a couple of days after the worms arrive, we would advise leaving a light on at night near them so that they are encouraged to burrow into their new home.

Worm Food Additions

We suggest adding worm foods after the worms arrive. Place one handful of food scraps at the corners of the worm bed, mix and cover them with the beddings, leaving most of the tray area open to allow air flow.
Cutting the foods into small pieces is strongly suggested for more efficient composting.
The food scraps should be less than 1" deep.
Then, cover the worm bed with a sheet of damp newspaper, and the coconut mat. For more information on worm food addition, please refer to the Section of System Operation.

A common mistake for beginner is to over-feed the worms. You have to be patient and allow a few days for the worms to become acclimatized to the worm bin and for the micro-organisms, which is also a vital part of worm composting, to populate the bin. Do not expect to see the foods disappear before your eyes.

2 to 3 weeks after the worms arrive to the bin, the worms start consuming the foods. When you see approximately half of the foods in the bin disappear, you can add new foods. The common mistake is over-feeding the worms. When worms are over-fed, part of the foods may become rotten and generate unpleasant odor. It also produces acidic substances, lowering the pH. Worms become very inactive in low pH and could die. Therefore, avoid over-feeding the worms. The rule of thumb for feeding the worms is to add foods when half of the last feed is gone.

In optimum conditions, 1 lb of red worms can consume 3lb foods per week. The factors that impact the rate of composting are climate, temperature, humidity, pH oxygen levels, level of micro-organism inside the bin, and the type and amount of foods

Optimal Conditions can be achieved through efforts of trial and error. Please refer the section of System Optimization for the tips of optimizing the system.

Upper Tray Addition

When the first working tray is 2/3 full, it is time to add an upper working tray (2nd working tray) to your bin. We suggest the procedure below for adding an upper tray:

1. Spread a handful of foods on the bottom of the working tray to be added.
2. Cover the foods with some compost from the last tray, decayed leaves, and/or grasses. If you can't access the decayed leaves or grasses, you can purchase coconut coir and mix the soaked coconut coir with soil as described in the Section of Start-up. It is suggested covering the foods with 1/2" mixture of compost, decayed leaves and/or grasses.
3. Add 1/2" shredded moist paper (suggested materials include: newspaper, books, card board or junk mail without plastic coating) on top of the bedding materials described in above.
4. Cover it with a couple sheets of moist newspaper on the new tray.
5. Then, take the coconut mat from the last working tray and place it on top of the moist newspaper on the new tray.
6. Place the tray on top of the last working tray and cover with the lid.
7. One week later, add a handful of foods under the moist shredded newspaper. Mix the foods with bedding.
8. Add foods to the bin in the reasonable amounts as described in Worm Food Addition.

Here are a few tips for adding the upper working tray:

- Make sure that the top of the bedding in the first working tray comes in complete

contact with the bottom of the 2nd working tray you have just added. The coconut mat from the last tray must be moved to the upper tray, so that worms can migrate through the meshes of the tray.

■ When the 2nd working tray is 2/3 full, it is time to add the 3rd working tray. The way to add the 3rd working tray is the same as adding the 2nd working tray. It is the same way for the 4th and 5th working trays.

Notes on worm behavior:

■ Worms would migrate upward into the upper working tray to search for food.

■ Worms would re-eat their food sources several times. This means worms will migrate up and down the working trays.

Worm-castings Harvest

Keep feeding foods to the top working tray. Most of the worms will migrate to the upper trays for foods. The bottom working tray will contain only the worm castings or worm compost with only a few worms.

When the material in the bottom tray is nearly black, and resembles to soil with only a few small chunks of mostly composted bedding matter, it is time to harvest out of the bin.

If the bottom tray is ready to harvest but there are still some worms in it, which you would like to keep in the bin, it is very easy to separate them from the tray: simply remove the tray to be harvested out of the bin and place it on the top of the upper most working tray with the lid off. Plow the compost in the tray several times in the day time. The remaining worms will move down into the trays below because the worms do not like light. Once the tray is free from worms, it is ready to harvest.

Empty the tray that is ready to harvest onto a piece of plastic sheeting. The compost is now ready to be used. Rinse the tray with water; the rinsed water also contains rich nutrition that can be used to water your plants. The cleaned tray is now a new working tray for the continuous rotating cycle.

You can also harvest the worm compost liquid from the food leach. Simply put a cup provided under the tap and open the tap to drain the liquid. The amount of liquid depends on the type of foods fed into the system. If they are juicy foods, much liquid is expected. You can collect the worm liquid once a week. The liquid contains rich nutrient that can be used for plants. However, since it is a concentrated liquid fertilizer, it should be diluted with water in a 1:2 volume ratio.

Air,Moisture,Temperature,and pH

■ Air. Just like any living animal, worms need oxygen. Oxygen is also essential for aerobic bacteria, which helps to compost organic materials. The iTower worm bin has a

in an air-stagnant environment such as enclosed cabinet, it is difficult to have fresh air through the system. Therefore, a worm bin should be placed in a good ventilation area.

- Moisture. The moisture in the worm bed is important to worms since worms take in oxygen through moisture on their surface. Please refer to the Section of Start-up for how to check the moisture level of the worm bed. Ideally, the worm bed should be slightly damp. If the worm bed has too much moisture, worms may crawl out of the bin. However, if the bed is too dry, worms could die. To prevent dehydration, use a spray bottle to sprinkle water into the bin.
- Temperature. The ideal temperature for the worms to compost is between 15 and 25 ° C (55 -77 ° F). In the instances of hot weather, it is recommended putting the worm bin in a sheltered place with good ventilation. Never place the worm bin in direct sunlight. The plastic bin will absorb heat and cause the temperature inside to be higher than the environment temperature. In the extremely cold weather (< 32° F or 0° C), we would advise moving it inside the house. The worm bin has very minimal odor.
- pH. The pH value in the worm bed is important to the worms. When pH is above 7, it is alkaline; pH below 7, it is acidic. A pH between six to eight is acceptable to worms.

Acidic bedding is commonly caused by adding too much food into the bin that the worms can't digest fast enough, leaving behind rotten foods that generate acidic juices. In this case, we recommend removing the excess of foods. Please also avoid adding acidic fruits into the compost bin.

If it is detected the bedding is acidic, it is recommended adding a handful of purmice, which can be purchased at garden center. Oyster shell powder can also be used to mitigate acidic bedding problems.

System Optimizations

Theoretically, 1kg (or 2 lbs) of red worms can compost 0.5kg (or 1 lb) of foods each day under ideal conditions. However, in reality, most worm bins can't reach the ideal conditions. There are many factors impacting the recycling process. Based on the collective experience from many worm farmers, we summarize the following practices and tips for the vermi-system optimizations.

Foods

Worms take in foods by slurping the food juice or bacteria generated by composted organic materials. Therefore, in order to speed up the worm composting process, it is important to prepare the foods in a way that can be easily composted. Below are several suggestions:

i. Chop the foods into small pieces. When the food size is smaller, a larger surface area is exposed to open air, allowing for optimal growth of bacteria.

ii. Freeze the foods. When the foods are frozen, it is easier for them to break down and become soft and juicy.

iii. Microwave the foods. When the foods are cooked, they break down and become soft and juicy.

Moisture

Studies have shown that worms breathe by taking in the dissolved oxygen in water through their skin. Therefore, the worm bed environment has to be moisturized. The worm bed moisture level needs to be between 60% to 80%. Moisture meters can be used to detect the moisture level. You can check your worm bed moisture level, chart the worm activities, and find the optimum moisture level for your worms. When the moisture level is too low, use a spray bottle to sprinkle water to your worm bin; when the moisture is too high, you can remove the lid to allow evaporation of the moisture or add shredded paper to absorb the excessive moisture.

Temperature

Worms work best between 15 and 25 ° C (or 55 -77 ° F). They will slow down composting beyond the ranges. Temperature gauge can be used for temperature measurement. When the worm bed temperature is above 29°C (or 85° F), you should cool it down. Here are a few ways to cool down the worm bed:

i. Spray some cool water onto the worm bed, and lift the lid off. The vapor will carry the heat out of the bin.

ii. Separate each working tray to allow more air flow through the system. Find a few pieces of sticks or stripes and put them between each working trays. The more air flows through the system, the more heat can be carried out of the unit.

iii. Add ice cubes to the top of your worm bin. The ice will melt into the bedding to cool down the bin.

System Troubleshooting

Mites

Occasionally, you may notice some little white insects in the system. These are mites. They are not harmful to your worms. Their presence indicates your worm system is too acidic and/or possibly dehydrated. In this case, you should spray some water, add a handful of purmice, oyster shell powder, or crushed egg shells on top of the working trays.

Fruit Flies

A wet and acidic environment encourages fruit flies. If the system is over-fed with foods, some foods may be rotten and encourage fruit fly activity. When you see fruit flies in your system, you can do the followings to get rid of them:

i. Remove the rotten food and the excess of foods
ii. Add some dry shredded paper to reduce the moisture level
iii. Add some oyster shell powder, purmice, or crushed egg shells
iv. Place dry shredded paper or dry leaves/grasses on the last working tray
v. Always keep the food covered with beddings.

Unpleasant Odor

If the system is managed properly, it should only have very minimal odor, and only when the lid is lifted, it may have a little smell. If it starts to smell, it indicates the system is not operating correctly. There are a few reasons for the odor problems in the worm bin.

i. Over-feeding the system. When foods stay in the farm for too long, and are not digested quickly enough by your worms, the foods will become rotten, causing odor. In this case, use the tong provided to remove the rotten foods and the excess of foods, especially the large pieces of foods.

ii. There are protein types of foods such as meats, bones, dairy products and greasy foods inside the worm farm. Worms can't compost these types of foods. When they are exposed to the air, they will naturally de-compose and smell. Avoid adding these food scraps into the worm bin. They can cause odor, lower the pH and even kill the worms.

iii. Too much moisture. Excessive moisture in the farm can also cause odor. In this case, you can add some dry shredded paper to the worm bed to absorb the excessive moisture.

iv. Insufficient Oxygen. Anaerobic bacteria, which grow in the environment with lack of oxygen, carry about an unpleasant odor by nature. Use the claw provided to loosen the bedding to allow more air flow through.