

# Instruction Manual



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Worm Factory

Can-O-Worms

Worm Café

## Introduction

Congratulations on the purchase of your new TUMBLEWEED Worm Farm.

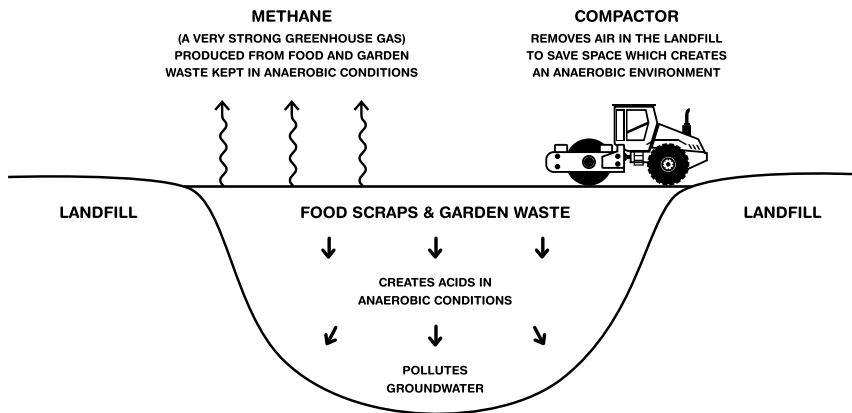
This exciting and revolutionary composting system is the result of years of research and ongoing development. The first domestic worm farms were introduced to the Australian market in 1993 as The Worm Factory® and Can-O-Worms®. We have continued this commitment by introducing the Worm Café® and worm farm accessories which will ensure you find the right worm farm and accessories for you.

Worms are Mother Nature's unique natural recyclers. By putting worms to work in your very own, easy-care farm, you will be converting your food waste into nutrient rich, 100% organic fertiliser that your potted plants, garden and vegetables will love. Whether you have purchased the Worm Factory® (single working tray), the Can-O-Worms® (two working trays), or the Worm Café® (three working trays). These generic instructions will allow you to harvest the power of composting worms. You can personally become a part of the revolution to reduce landfill and Greenhouse Gases by recycling your food scraps.

TUMBLEWEED Worm Farms are user-friendly and can be left on a balcony or in a laundry for apartment dwellers, in a shed or in a shaded location for those with a yard. It is important that you place them somewhere that avoids afternoon sun. Put yours somewhere convenient so that it makes it easy for you to use.



## What Happens To Food & Garden Scraps In Landfill?



## Which Worms Are For You?

There are thousands of species of earthworms worldwide, all of which feed on some form of organic matter but their preferences and habitats differ. Worms can be divided into two broad categories depending on those preferences:

**Composters:** There are less species of these, mainly 'Tigers', 'Reds' and 'Dendras'. These earthworms live and breed happily in an organic rich environment like a TUMBLEWEED Worm Farm or in a heavily mulched garden where moisture and food is maintained. Use these in your TUMBLEWEED Worm Farm to ensure successful composting.



**Earthworkers:** These are the many other earthworms which prefer to live in a less controlled environment. They will not thrive on food scraps but prefer soil and humus as their basic diet. They are usually much larger than composters.

## Setting Up Your Worm Farm

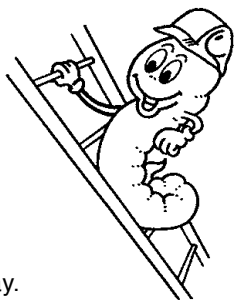
1. Assemble your worm farm as per your unit's instructions found on the reverse of your packaging. You only need 1 Working Tray to start with, keep any others aside for later use.
2. Locate in a cool position in afternoon shade. Morning sun is OK.
3. Setting up Working Tray 1. Fill a bucket with about 7 litres of water and place your TUMBLEWEED Worm Farm Bedding Block in it. As the bedding block expands, begin to break it up into an even mix. It should take about 15 minutes. Use the paper wrapper too. All the paper and cardboard packaging has been designed to be worm friendly.



4. Fold and place your cardboard packaging into the base of Working Tray 1. Then spread the expanded worm bedding block on top of this. The worms will eventually eat all the bedding and cardboard.

5. Spread your worms (minimum of 1000 composting worms) on top of the bedding, and cover with a TUMBLEWEED Worm Blanket. Now fit the lid and let the worms settle in for one or two days. This is the worms 'home' tray. Feed your worms in this tray first (refer to "Feeding Your Worm Farm" below).
6. It will take 3 - 6 months for this 1st working tray to become full. When the compost level in the 'home' tray is high enough to touch the base of the tray added above it, you may add Working Tray 2. Once again when Working Tray 2 is full you can add Working Tray 3. If ever a gap appears between the trays you must top up the lower Working Tray with some extra organic compost, bedding or coir. This allows the worms access to move up into the tray above.

**Note:** If you have a worm farm with only one working tray, when it is full, you will need to move the top 50-60mm of the surface material from one side, across to the other side, and then remove some of the rich black worm castings from lower down in the tray. Then level out the materials still left in the working tray, (should be only about half full now as you have removed some of the bottom worm castings). Now continue feeding the top of the tray. Alternatively, you may just feed one side of the Working Tray. This will allow you to harvest the worm castings from the side you are not feeding at any given time.



**Or:** You could purchase extra working trays to stack on top to make it a bit easier to manage.

## Feeding Your Worm Farm

1. Feed your worms only as much as they can eat. Maintain no more than 2cm of food over half the surface of the Working Tray. If your worm farm goes smelly you are most likely overfeeding your worms. If smelly, stop feeding for a few days, and scratch and gently aerate the top 50 - 60 mm of materials with a small pointed tool or piece of wood.
2. Chop up food scraps as small as possible before feeding to worms.

3. Place food under the TUMBLEWEED Worm Blanket. Never cover the entire feeding surface of your worm farm at one time.
4. Feed your worms with your normal kitchen vegetable scraps. Avoid large quantities of meat, citrus, onion, and dairy foods.
5. Sprinkle a handful of garden soil (or organic potting mix) on top of the food scraps every time you feed your worms.
6. Once a week sprinkle a teaspoon of TUMBLEWEED Worm Farm and Compost Conditioner when feeding your worms.
7. Each week flush your worm farm with water – worms like a very moist environment. Flush your worm farm by tipping a ½ - ¾ filled bucket of water (5 litres or more) under your TUMBLEWEED Worm Blanket in your top Working Tray. Ensure your tap is fully opened with a bucket underneath. Keep your tap turned on until the water stops dripping. Some people prefer to keep their tap open all the time, make sure you keep a bucket underneath to collect the worm tea. It is best to regularly drain water out of the worm farm, because water stored in the bottom tray will become stale and could begin to smell.
8. Drain your Collector Tray at least weekly. The worm tea can be further watered down (10:1) so that it looks like weak tea and used as a fertiliser on your pot plants and garden.



## My Worm Farm Is Full

1. Lift off the top Working Trays.

**Note:** If you have a worm farm with only one working tray, when it is full, you will need to move the top 50-60mm of the surface material from one side, across to the other side, and then remove some of the rich black worm castings from lower down in the tray.

Then level out the materials still left in the working tray, (should be only about half full now as you have removed some of the bottom worm castings). Now continue feeding the top of the tray. Alternatively, you may just feed one side of the Working Tray. This will allow you to harvest the worm castings from the side you are not feeding at any given time.

**Or:** You could purchase extra working trays to stack on top to make it a bit easier to manage.

**2.** If your system has two or more working trays, lift the lowest Working Tray off the Collector Tray. Empty worm castings out of the lowest Working Tray, and use on your potted plants or in your herb and veggie garden. Now clean the empty Working Tray.

**3.** Put the now emptied Working Tray on top of the other Working Trays. This commences the cycle of rotating the trays. Make sure there are no gaps between the trays. The lowest Working Tray just emptied, becomes the new top Working Tray where you feed your worms.

**Note:** It is also a good idea to clean out the Collector Tray at this time. There can be a considerable amount of worm castings deposited down here over time, by the worms.

**4.** Worm castings are one of nature's best fertilisers. Used on your garden or potted plants, you will see exceptional results.

## Worm Farming Questions & Answers

Following are some of the most commonly asked questions we get asked from people using a TUMBLEWEED Worm Farm. Peter Rutherford, renowned Ecologist and Worm Farm Expert has provided the answers below:

### Q.1 Where can I obtain compost worms?

**A.** Composting worms are now available from most hardware and garden outlets. You may also find suppliers via the internet, visit [www.tumbleweed.com.au](http://www.tumbleweed.com.au) for a list

of worm retailers or have a look through ads in magazines or the Yellow Pages. Also your local council may promote worm composting and be able to direct you to a local supplier. We recommend that you purchase a minimum of 1000 compost worms.

### Q.2 How much will my worms eat?

**A.** This depends on how many worms you have. Worms can eat up to half their own body weight every day and can double their population every few months.



If you start your TUMBLEWEED Worm Farm with 1 pound/450 grams of mature worms (identify mature worms by a distinct ring shaped swelling around their body) they will consume up to half a pound /225 grams of food waste per day. After a few months you should have doubled your worm population and you can feed them more.

The baby worms, however, won't eat much and will take about 3 months to mature. As you become familiar with them you will learn their rate of food consumption.

If you are feeding too much, the excess food will go anaerobic and begin to smell. If the top working tray becomes smelly, stop feeding for a few days or even a week, sprinkle with a teaspoon full of TUMBLEWEED Worm Farm & Compost Conditioner, and mix it in with a small fork or spike.

### Q.3 How can I help the worms to eat more?

**A.** Worms will feed at a faster rate once they have adapted to any new food source. Worms will also eat more if food scraps are mashed, blended or cut up more. Controlling temperature to around 24C° (70F°) will improve the overall performance of your TUMBLEWEED Worm Farm. Worms will leave very acidic food such as onions and orange peels until after they have eaten their preferred foods. A handful of crushed oyster shells or ashes from a fire will help to balance the effect of acidic foods or sprinkle with a teaspoon of TUMBLEWEED Worm Farm & Compost Conditioner once a week. The regular addition of Worm Fattener (recipe page 12) will encourage stronger, fatter worms. Since they consume up to half their own body weight each day, the fatter the worms the more food scraps they will eat.

#### Q.4 What shouldn't I feed my worms?

- A.** Be careful what you feed your worms particularly if you are unaware of its source. Manure from horses, cattle or dogs often carry vermicides intended to kill parasitic worms in the animal. These vermicides can kill all your worms in one day.

#### Q.5 Can I feed my worms garden refuse?

- A.** Not usually. TUMBLEWEED Worm Farms are designed to break down soft organic food scraps. Slow composting organic wastes such as garden refuse are best dealt with by conventional aerobic composting methods. Use a TUMBLEWEED 220L or 400L Compost Bin or Compost Tumbler designed to compost garden waste.

#### Q.6 I've had my TUMBLEWEED Worm Farm for a month now, but the worms don't seem to be eating any of my food scraps?

- A.** The worms may be still be eating your Worm Farm Bedding material. If you have used kitchen scraps in addition to your Worm Farm Bedding Block the worms will eat through this before eating any introduced food.

#### Q.7 Should I add water to the TUMBLEWEED Worm Farm?

- A.** Watering of your TUMBLEWEED Worm Farm will enhance the production of liquid fertiliser. Food wastes usually contain about 80% water. This is released as the worms break the food down. This will tend to stay in the bedding for a long time before eventually draining out. Any dry material such as newspaper or cardboard should be presoaked before being added. It is important to keep a TUMBLEWEED Worm Blanket over the freshly added food to encourage the worms to move up to the surface to feed. This will provide a dark damp shelter for them.

Once every week, pour about 5 litres of fresh water into the Top Working Tray, which will flood down through the lower trays and ensure that the entire worm farm is very moist. Worms love an environment with a moisture content of 70% or more, as long as the excess water can drain off and does not become 'stale' (ie anaerobic).



This practice is especially important in the hotter months of the year. Place an empty bucket under the open tap, you will have a constant supply of liquid fertiliser. The sudden 'flood' will not harm the worms.

#### Q.8 Will I get too many worms?

- A.** No, you will never have too many worms. They will regulate their population to the confines of available space and the amount of food you give them. Your worm population should reach about 5,000 to 10,000 worms after about one year. Some TUMBLEWEED Worm Farms have been known to house up to 20,000 worms under ideal conditions and diligent management.



#### Q.9 Can I put compost worms in the garden?

- A.** Yes as long as you have a thick surface layer of mulch on your garden. Compost worms require moist conditions all year round because they don't tend to tunnel deep like Earthworker worms to find moisture.

#### Q.10 Why aren't the worms moving up from the lower levels into the top working tray?

- A.** This situation can arise for two reasons. First, you may be adding new food too soon before the worms can eat the previous food. This will result in a lot of uneaten food scraps being distributed throughout the system and a general reluctance by the worms to migrate upwards while they can still access material lower in the system.

Before adding new trays, stop feeding the worms for at least a week to ensure that all existing food in the lower tray has been eaten.

Worms will then move up to eat from the surface as this is their natural behaviour pattern.

Secondly, you may not have waited for the level of worm castings in your Top Working Tray to get full enough in the tray before adding the next tray. This will create a gap between the trays preventing the worms from reaching the top tray.

If there is a gap between any two working trays, simply lift off the top tray and add some organic soil or organic potting mix to the tray beneath, put the top tray back on and continue operation.

### Q.11 What about severe temperatures?

- A.** Worms will tolerate a wide temperature range from about 10°-30° C (50°-90° F). If it gets much hotter than this, make sure your TUMBLEWEED Worm Farm is in a shady cool position. Take the lid off and hose the whole unit down keeping the bottom drainage tap open to release the excess water. If it gets much colder and freezes, put your TUMBLEWEED Worm Farm in the warmest possible position. An example being your basement, laundry or shed. If it is on a balcony or out in the yard, cover the unit with a couple of old carpet pads or old blankets to keep some warmth in.



### Q.12 It's raining and the worms seem to be gathering in the lid. What do I do?

- A.** What you are noticing is the worms sensitivity to air pressure changes in the weather. They will often go up into the lid even before it rains. In nature this takes them out of the soil to stop them flooding and drowning.

### Q.13 Are the little white worms in my TUMBLEWEED Worm Farm baby earthworms?

- A.** No, baby earthworms are not white, but clear to opaque, before developing a reddish color. They are just visible at this stage. The 'white worm' you are noticing is a type of worm called entrachyadids. They will not hurt compost worms, but they do indicate acidic conditions, which can be overcome by the weekly addition of a teaspoon full of TUMBLEWEED Worm Farm & Compost Conditioner. By placing a piece of moist bread in the top working tray of your TUMBLEWEED Worm Farm you can lure the white worms to a small area for easy removal. It is important to note that many organisms may appear in your TUMBLEWEED Worm Farm (such as large populations of minute red mites and large soldier fly larvae). These are beneficial to the break down of organic material, so there is no need to remove them.

### Q.14 How do I keep ants out of my TUMBLEWEED Worm Farm?

- A.** Ants will enter your TUMBLEWEED Worm Farm if you have a lot of them in your backyard and particularly if you have let the bedding become too dry or acidic.

The Worm Café model has ant caps on the foot of the legs to deter ants. If you do get ants in your worm farm simply add water to raise the moisture level, add a liberal quantity of TUMBLEWEED Worm Farm & Compost Conditioner to where the ants are gathering and dig and disturb the area where the ants are. This should discourage them. If they persist remove them physically and smear some Vaseline around the legs or place each leg in a container of water to isolate the system. Never use insecticides near a worm farm.



### Q.15 Will the TUMBLEWEED Worm Farm attract flies?

- A.** If managed correctly your TUMBLEWEED Worm Farm will not attract flies. All TUMBLEWEED Worm Farms are fly-proof against household flies. Sometimes the very small Vinegar Fly (often mistaken for the fruit fly) gets in, but these do no harm. However, very large numbers of the vinegar fly may indicate that you are feeding your TUMBLEWEED Worm Farm too much and may be a prelude to problems such as offensive odours. To eradicate Vinegar Flies, slow your rate of feeding to what the worms will eat on a daily basis and ensure that freshly added wastes are sprinkled with soil, and then covered by a moist TUMBLEWEED Worm Blanket.



### Q.16 What about maggots?

- A.** Should you experience any influx of maggots, it will most likely be the Soldier Fly larvae. The Soldier Fly larvae grow up to about one inch/2cm long. They start out white but soon turn dark grey with distinct ribbing bands. Fishermen say they make great bait. Don't be too alarmed if they appear. They are actually beneficial to the waste breakdown. If you want to remove them though, do so by liberally applying TUMBLEWEED Worm Farm & Compost Conditioner, or placing bread soaked in milk on the surface of the compost.





Larvae love bread and should infest it. Remove the bread (& maggots) after 2-3 days and bury them in a hole in the soil somewhere.

### Q.17 Will my TUMBLEWEED Worm Farm smell?

**A.** The only smell associated with a well maintained TUMBLEWEED Worm Farm is a pleasant rainforest odour. If your TUMBLEWEED Worm Farm has an offensive smell, it is an indication that anaerobic bacteria have built up in the system in uneaten food scraps. Stop feeding the worms and stir the food scraps in the top tray lightly with a garden fork adding TUMBLEWEED Worm Farm & Compost Conditioner as well. This aerates the organic material and allows worms to move through it more easily. Repeat this aeration procedure regularly to prevent recurrence. Start feeding again when all smells are gone.



### Q.18 What about holidays?

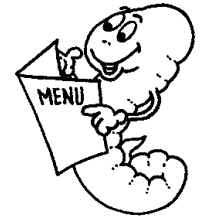
**A.** Leaving an established TUMBLEWEED Worm Farm for 3-4 weeks without constantly adding food is not a problem. Just feed the worms some extra food before you leave. A good 'slow release' food for holiday worms is Lucerne/alfalfa chaff, or pea straw hay. Just add a 50mm layer of wet chaff or pea straw. Flush the worm farm with at least 5 litres of water. Make sure that you leave the unit in a cool place under cover and leave the tap open with a container under it. Putting a soaked newspaper on top of your TUMBLEWEED Worm Blanket will give added protection against their bedding drying out.



## Worm Menu

As a guide worms will eat anything that was once living. This includes:

- Left over vegetable scraps, fruit and vegetable peelings
- Tea leaves/bags and coffee grounds
- Vacuum cleaner dust or hair clippings (also animal)
- Torn up newspapers, egg and milk or soaked pizza cartons
- Crushed egg shells (These will help with the pH balance)



The greater the variety of material you use, the better the castings will be. Sprinkle a handful of soil on top of the food scraps every time you feed your worms.

Sprinkle a teaspoon full of TUMBLEWEED Worm Farm & Compost Conditioner on a weekly basis.

### Worm Fattener

You can purchase a commercial Worm Fattener or Worm Treats or make up the following recipe to fatten and grow your worms;

Chicken Layer Pellets 50%

Wheat or Corn Flour 10%

Powdered Whole Milk/Skim Milk 10%

Bran or Wheat Meal 20%

Agricultural lime or dolomite 10%

Mix the ingredients and sprinkle lightly on the food scraps about once a week.

After several months you will have fat, tough worms in ready supply who will eat more food, converting to compost quicker.



## Worm Castings and Worm Tea

Worm castings and their accompanying liquid fertiliser (Worm Tea) are wonderful additives to any garden. You will see exceptional results in the color, quality and quantity of all your fruit, vegetables, flowers and ornamental plants. Castings are interesting in that they can be used pure as organic fertiliser or as an additive for your own favorite potting mix. You cannot harm any of your plants by using worm castings regularly in small amounts. The pH is mostly neutral (7) and therefore suitable for most types of plants from azaleas to orchids. Castings are extremely popular with vegetable gardens.

### Worm Castings

Once your Worm Farm is established – Worm castings can be harvested from the 1st working tray– the Worm Castings are the black bits you see in the soil. They help your soil breathe and hold water, while encouraging more worms and microbes. The best times to add 'worm castings' to your soil is outlined below.

#### Spring

This is the main time for using worm castings.

**Veggie Gardens** - Add 2 – 5 litres of worm castings to each sq m of your veggie garden. Dig it in with a few handfuls of cow manure. Get Planting! Cover the bare soil with a high protein mulch such as lucerne, or pea straw. Sugar cane mulch is also ok for veggie gardens.

**Trees & Shrubs** - Add 2-5 litres of worm castings (dilute with water if easier to apply, or make some 'worm tea'), around the drip line of any fruit trees or rainforest trees. Always cover the worm castings around trees, with a woody mulch.

#### Summer

Add a handful or two of fresh Worm Casting into the holes or furrows each time you plant a new lot of veggies.

#### Autumn

Use small amounts of worm castings in the veggie garden if plants are growing well. Any winter flowering plants could use a little extra worm casting.

### Winter

This is a time of slower activity in the soil. Use this time to build up your supply of worm castings ready for spring. Worm activity slows down in the colder weather.

Add some worm casting with any winter veggies and herbs you are planting.

### Worm Tea

Worm Tea is a nutritious tonic at any time and its really helpful when your veggies and plants are flowering or fruit is ripening. Rich worm tea also supports diseased and stressed plants, protects them against insects and even helps establish young plants (over two weeks old).

Worm Tea should be drained from your collector tray at least weekly, it can then be diluted 10:1 and used in your garden or for best results aerate your tea using a 25-litre bucket, two airstones and an aquarium pump with two air outlets. Visit [www.tumbleweed.com.au](http://www.tumbleweed.com.au) for instructions on how to set up your aerated brewer.

You can also collect Worm Tea when flushing your worm farm with water. This method is called leachate and can be used directly on mature plants.

It is best to use your Worm Tea 'fresh'. As old or stored Worm Tea can become anaerobic.

#### When to use Worm Teas?

- At onset of flowering or fruit set
- For any stress or disease in plants
- Booster for young plants over two weeks old
- Regularly as a general 'tonic' for all plants

Worm Castings and Worm Tea are great ways to incorporate the beneficial effects that earthworms can bring to your garden in a convenient, cheap and easy manner.



**For more information visit [www.tumbleweed.com.au](http://www.tumbleweed.com.au)**