

WELCOME TO THE CAN-O-WORMS™



Instruction Manual

The Can-O-Worms™ is made in Australia
from 100% Recycled plastic

INT. PAT. APP. No. PCT/AU94/00016

The **Can-O-Worms™** worm farm is the
subject of various patent and design rights, including

- Int. Pat. App. No. PCT/AU94/00016
- U.S. Design Patent App. No. 29/023712

The **Can-O-Worms™** is the Trade Mark of N. Natrass
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INTRODUCTION

Congratulations on the purchase of your new **Can-O-Worms™** worm farm! This exciting new composting system is the result of years of research and development, to utilize the benefits of worms which are nature's own recyclers. By putting worms to work in this innovative system you will be converting your food waste into nutrient rich, 100% organic fertilizer that your potted plants, garden and vegetables will love.

The **Can-O-Worms™** worm farm is user friendly, easy to operate and fun for all ages. It is so versatile that it can be left on a balcony or in a laundry for apartment dwellers, in a shed or in a shaded outdoor location for those with a yard.

Most important of all, you will contribute to the reduction of garbage at your local municipal land fill, by reducing the amount of waste you now throw away. In line with this issue, as the manufacturer we consider environmentally friendly packaging as important. Your colorful cardboard display cover has been designed to be re-used in the system along with your Bedding Block wrapping. This leaves a minimum of packaging that won't be re-used in the system.

The **Can-O-Worms™** worm farm is made in Australia from 100% post consumer recycled plastic.

Do your bit for the environment.

"Reduce, Re-Use, Recycle" - it's easy. We just have to make the commitment.



Printed on recycled paper

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 only a few species of these, mainly 'Tigers' and 'Reds' and 'Dendras'. They live and breed happily in an organic rich environment like a **Can-O-Worms™** worm farm, or a Reln Compost Bin or even a heavily mulched garden where moisture and food is maintained.

Earthworkers - These are the many others which prefer to live in a less controlled environment. They will not thrive in food wastes but prefer soil and humus as their basic diet. They often appear much larger than the composters but this is usually because they are older. Composters also get bigger with age, particularly if worm fattener is fed (see page 15).

It is important to make sure you use only composters in your **Can-O-Worms™** since earthworkers will not do well. Conversely you shouldn't add composters to your soil as they are not likely to survive when the soil dries. The exception to this is a heavily mulched garden as described above.

The compost worms in your **Can-O-Worms™** will produce worm manure called castings which can be used in your garden as a soil improver. Page 16 discusses its many uses ranging from seed raising and potting mix additives to a top dress fertilizer.

WELCOME TO THE CAN-O-WORMS™

The **Can-O-Worms™** worm farm consists of four trays. The bottom tray is a Collector Tray which has a solid base and tap. Liquid drains through the upper trays into the Collector Tray where it can be tapped and used as a liquid fertilizer. The worms are started off in the first Working Tray by means of the Bedding Block provided with your kit. They then simply 'eat their way up', wriggling into the Working Tray above where they can detect the food scraps which you have placed there. By the time the top Working Tray is full most worms have left the original Working Tray where they began which had the bedding block. You can now take out this tray, remove the castings and then return it to the top again.

Thus the cycle is never ending, and you will always have a convenient, natural and efficient way to dispose of your food waste, while at the same time ensuring a constant supply of your very own top quality fertilizer.

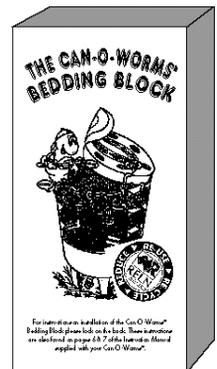
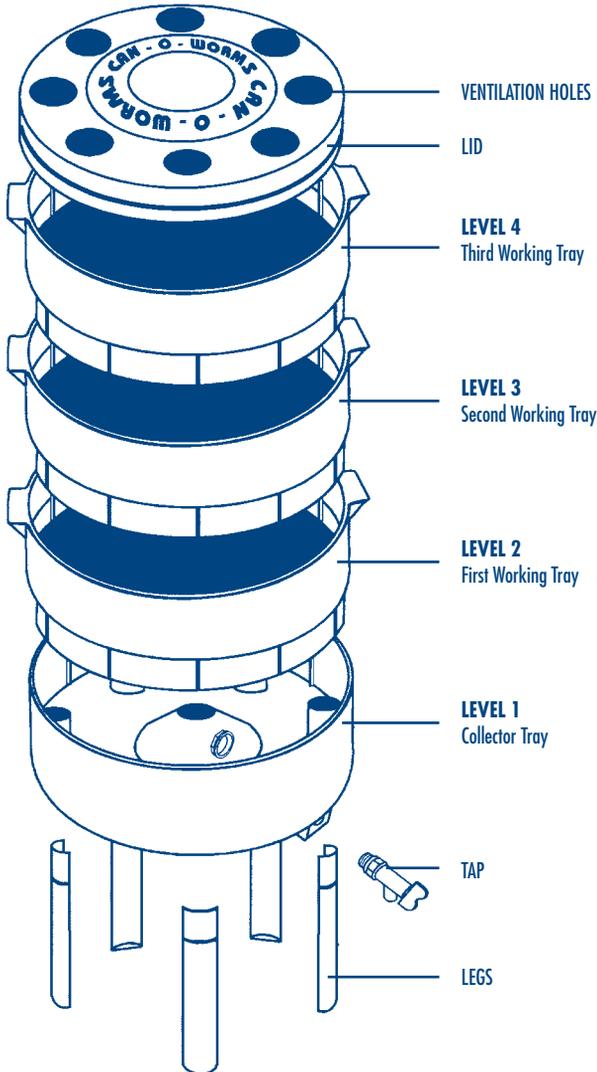
The **Can-O-Worms™** worm farm consists of the following parts:

- * A 'Collector Tray' - the one with the leg spaces, centre mound & tap hole underneath.
- * Three 'Working Trays' - these are the ones with the mesh bases and are interchangeable.
- * One lid.
- * One plastic tap and a nut.
- * Five legs which clip in to the Collector Tray as a stand for the system.
- * One **worm bedding block**
- * Comprehensive Instruction Manual.
- * Cardboard display (this will be used again later)



ASSEMBLY INSTRUCTIONS

1. Fix the tap to the Collector Tray with the nut on the inside. (turn the tap not the nut)
2. Attach the five legs making sure they slide firmly into place.
3. Place one Working Tray on the Collector Tray. (Put aside the other Working Trays in a convenient place until you need them).



A FULLY OPERATIONAL CAN-O-WORMS™



LEVEL 4
Third
Working Tray

LEVEL 3
Second
Working Tray

LEVEL 2
First
Working Tray

LEVEL 1
Collector Tray

WORKING INSTRUCTIONS FOR THE FIRST CYCLE



Select a cool shaded, protected and level location to site your **Can-O-Worms™** worm farm.

Level 1 - Collector Tray

This tray catches liquid fertilizer that drains from the upper levels of the system. Do not put worms, compost or scraps here! You can drain the liquid fertilizer out from the tap and use it as it comes or dilute with water. It has been designed with a 'mound' in the centre so any worms that fall into this tray are able to climb back up.

Level 2 - First Working Tray

The worms are started off in this tray using bedding material. We have made this easy for you by providing a **Can-O-Worms™ Bedding Block** which will make the perfect bedding material for your worms made from coconut fibre called coir. Just follow these five simple steps. (Also found on the back of the block.)

Step 1. 3/4 fill a standard pail/bucket with water. Deposit your **Can-O-Worms™ Bedding Block** with the wrapping still attached in the water (your worms will love the paper wrapping!)

Step 2. As the block soaks the water up and expands, begin to break it up into an even mix. It should take about 15 minutes. (Coir is a natural and clean product that will not soil your hands)

Step 3. Place the cardboard display that came with your **Can-O-Worms™** in your first Working Tray to stop your coir bedding falling through.

Step 4. Evenly distribute the coir bedding on top of the cardboard display. It should nearly come up to the top of the plastic ribs on the inside of the Working Tray.

Step 5. Spread your worms on top. Worms do not like direct light so to enhance the 'settling in' process, leave the lid off for a while till no worms are visible. You may now cover your worms with either a moisture mat which is full of nutrients which will add to your compost, or even a hessian sack or wet newspaper. This will help keep the surface dark and the moisture in.

Most worm farmers will provide their worms in worm castings (refer to inside back cover for your worm supplier), manure or some other bedding material. If this is the case you can simply empty the whole container on top of your prepared coir bedding. If this causes your total bedding to go above the top of the ribs then you already have a head start and can progress to the next working tray as described below, in Level 3 -The Second Working Tray.

Note: When purchasing your worms, be sure that you get a minimum of 1000 worms. Less than this will cause very slow operation of the system. Additional worms will increase its initial effectiveness. You can expect that in a few years your initial population would breed up to about 15,000 to 20,000! Beyond this they will slow their breeding down. You can then start your friends off with their own **Can-O-Worms™** worm farm!

Level 3 - Second Working Tray

Place the Second Working Tray on top of the First Working Tray and make sure the base is touching the bedding material. **Refer to Q10 Page 12** (You will need to lift out your damp cover (burlap, hessian, etc.) to do this.

Now put a couple of handfuls of food waste from your kitchen into this Second Working Tray and replace the damp cover over the food. **This may take a few months to reach Level 3.**

Continue to regulate feeding to keep just ahead of the worms rate of food consumption. More food will be consumed as the worm population increases. Do not feed the worms too much. As a guide, maintain no more than one inch/2cm of food over half the surface area of the Working Tray. **Don't overfeed.**



When your worms have filled the Second Working Tray (Level 3) to at least one inch/2 cm above the plastic ribs on the inside of the tray with their castings (a dark black soil appearance), take out the cover and place the Third Working Tray (Level 4) on top of the Second Working Tray (Level 3), then replace your damp cover in the now empty Level 4 ready to cover food scraps. (This may take several months to reach Level 4).



Level 4 - Third Working Tray

Repeat the procedure as for the Second Working Tray (Level 3) until the Third Working Tray (Level 4) is filled to above the plastic ribs with worm castings. When you have reached this stage, most of the worms will either be in Level 4 or Level 3. You can then take out the first Working Tray (Level 2), (which should have hardly any worms in it at all) and use the rich worm castings in your garden. Once you have emptied this First Working Tray (Level 2) it goes to the top becoming the new Third Working Tray (Level 4) and you start adding scraps to begin the process all over again.

When using the upper Working Trays (Levels 3 and 4), it is not necessary for you to make further beddings - as you did in Level 2. The reason for this is that the worms will make their own bedding as they progress upwards through the system. When Level 4 is added into the system, the worms will be eating food from their preferred living environment in Level 3. As Level 4 fills up with worm castings, the worms will migrate into this tray. If for some reason a lot of worms have remained in Level 2, place it on top of Level 4 without emptying it and with no cover. Begin to rake the castings to one end a bit at a time and scoop them into a bucket. As you progress downwards the remaining worms will move away from the light into the tray below. When emptied you can recommence your feeding in the bottom of this top tray as this will now become Level 4.

It may take a minimum of 12 months for a full system to reach maturity.



Questions & Answers about the Can-O-Worms™



Following are the most commonly asked questions about the **Can-O-Worms™** worm farm. Experts from the field of vermiculture (study of worms) have been consulted to provide answers and hints that will ensure the most efficient use of your **Can-O-Worms™**.

Q.1 Where can I obtain compost worms?

A. There are a number of worm farmers in most states. These can be found through ads in magazines or the Yellow Pages. Some local nurseries may sell them or advise you or even your local municipal offices 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 **Can-O-Worms™** 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 double 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.



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 waste is mashed, blended or processed. Controlling temperature to around 24°C (70°F) will improve the overall performance of your system. Worms will leave very acidic food such as onions and orange peels until after they have eaten their preferred foods. A handful of lime mix (or crushed oyster shells or ashes from a fire) every few weeks will help to balance the effect of acidic foods. The regular addition of worm treats or worm fattener (see page 15) will encourage stronger, fatter worms. Since they consume up to half their own body weight each day, the fatter they are the more wastes 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. Manures, for example, from horses, cattle or dogs often has vermicides still active in it that were designed to kill parasitic worms in the animal. They can kill all your worms in one day. If you use animal manures make sure you know when worming is conducted and avoid using the manure for a few weeks.



Q.5 Can I feed my worms garden refuse?

A. Not usually. The **Can-O-Worms™** is designed to break down soft organic waste. Slow composting organic wastes such as garden refuse are best dealt with by conventional aerobic composting methods.



Q.6 I've had my Can-O-Worms™ for a month now, but the worms don't seem to be eating?

A. The worms may be eating your bedding material if you have used manure or compost in addition to your **Can-O-Worms™ Bedding Block**. If that is the case the worms will eat through this before eating any introduced food. If just the bedding block is used the worms should readily eat introduced food waste even though they do also like to eat the coir fibre.

Q.7 Should I add water to the Can-O-Worms™?

A. Watering of the **Can-O-Worms™** worm farm will enhance the production of liquid fertilizer. Food wastes are about 80% water which is released as the worms break them down. This will tend to stay in the bedding for a long time before eventually draining out. Any dry material such as old manure, newspaper or cardboard should be presoaked before being added. It is important to keep a moisture mat or similar 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. If you pour a maximum of 2 litres (1/2 gallon) of water over the scraps each week or two and then place the empty bucket under the open tap, you will have a constant supply of liquid fertilizer. The sudden 'flood' will not harm the worms.



Q.8 Will I get too many worms ?

A. No, you can never have too many worms. They will regulate their population to the confines of available space and the amount of food you give them. Worm concentration should reach capacity (about 15,000 to 20,000 worms) after 2 - 5 years.

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

A. Only if you have a thick surface layer of mulch in your garden. Compost worms require moist conditions all year round because they don't tunnel deep like earthworkers to find moisture. If you cannot provide this environment in your garden, don't introduce compost worms into it.



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



A. This situation can arise in two ways. 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 wastes 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 to pass the support ribs on the inside of the tray before adding the next tray. This will create a gap preventing the worms from reaching the top trays.

Q.11 What about severe temperatures?



A. Worms will tolerate a wide temperature range from about 50° - 90° F/10° - 30° C. If it gets much hotter than this, make sure the **Can-O-Worms™** worm farm is in the shady cool position. Take the lid off and hose the whole unit down keeping the bottom drainage tap turned on so it doesn't flood. If it gets much colder and freezes, put your **Can-O-Worms™** 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. Feed them a lot more food wastes which will create some warmth as they decompose.

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 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. Move the **Can-O-Worms™** out of the rain. Take the worms out of the lid and replace them in the bedding.

Q.13 Are the little white worms in my Can-O-Worms™ 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 handful of lime. By placing a piece of moist bread on your **Can-O-Worms™** you can lure the white worms to a small area for easy removal. It is important to note that many organisms that may appear in your **Can-O-Worms™** (such as large populations of minute red mites and large soldier fly larvae) 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 Can-O-Worms™?

A. Ants will enter your **Can-O-Worms™** if you have a lot of them in your backyard and particularly if you have let the bedding become too dry or acidic. Add water to raise the moisture level and add a liberal quantity of garden lime to where the ants are gathering. 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.



Q.15 Will the Can-O-Worms™ attract flies?

A. No the **Can-O-Worms™** is 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 the Can-O-Worms™ too much** and may be a prelude to problems such as offensive odors. 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 covered by a moist burlap/hessian bag or newspaper.

Q.16 What about maggots?



A. Should you experience any influx of maggots, it will most likely be the soldier fly or vinegar fly larvae. The soldier fly larvae grow up to an inch/2cm big starting out white but soon turning dark grey with distinct ribbing bands. Fishermen say they make great bait. The vinegar fly larvae are small, usually 1/4 inch/6mm or less. 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 lime, or placing bread soaked in milk on the surface of the compost. Larvae love bread and should infest it. Remove the bread after 2-3 days and dispose of it.

Q.17 Will the Can-O-Worms™ smell?



A. The only smell associated with a well maintained **Can-O-Worms™** worm farm is a pleasant rainforest odor. If your **Can-O-Worms™** has an offensive smell, it is an indication that anaerobic bacteria have built up in the system in uneaten food wastes. Stop feeding the worms and stir the wastes in the top tray lightly with a garden fork adding garden lime 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?

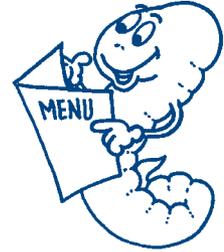


A. Leaving an established **Can-O-Worms™** for 3-4 weeks without constantly adding food is not a problem. Just feed the worms a good quantity of food waste (1/3 of a tray full) before you leave. Make sure that you leave the unit in a cool place under cover and leave the tap open with a container under it. Putting a soaked newspaper on top of your burlap will give added protection against their bedding drying out.

APPENDIX 1 - Worm Menu

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

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



The greater the variety of material you use, the better the castings will be...

APPENDIX 2 - Worm Fattener

Make up the following recipe to fatten and toughen up your worms;

Chicken Layers 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 wastes about once a week.
After several months you will have fat, tough worms in ready supply for fishing.

APPENDIX 3 - Using Castings and Liquid Fertilizer

Worm Castings are a useful additive 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 fertilizer or as an additive for your own favorite potting mix.

You cannot harm any of your plants by using worm castings. The pH is neutral (7) and therefore suitable for most types of plants from azaleas to orchids.

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

The following methods are typical of the many different ways to use worm castings:

Top Dressing - Simply spread a layer (about 1/2 inch/12mm deep) of worm castings around your favorite plants. Mulch and water in.

Seed Raising Mixture -

3 parts aged compost or coir fibre to 1 part castings.

Potting Mix -

2 parts aged compost, 1 part castings, 1/2 part Vermiculite.

Native trees, fruit trees - Apply around base and water in well. Re-apply when necessary. Collected liquid fertilizer may be added to your plants directly from your **Can-O-Worms™** or diluted to 50% without loss of nutrients.



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