

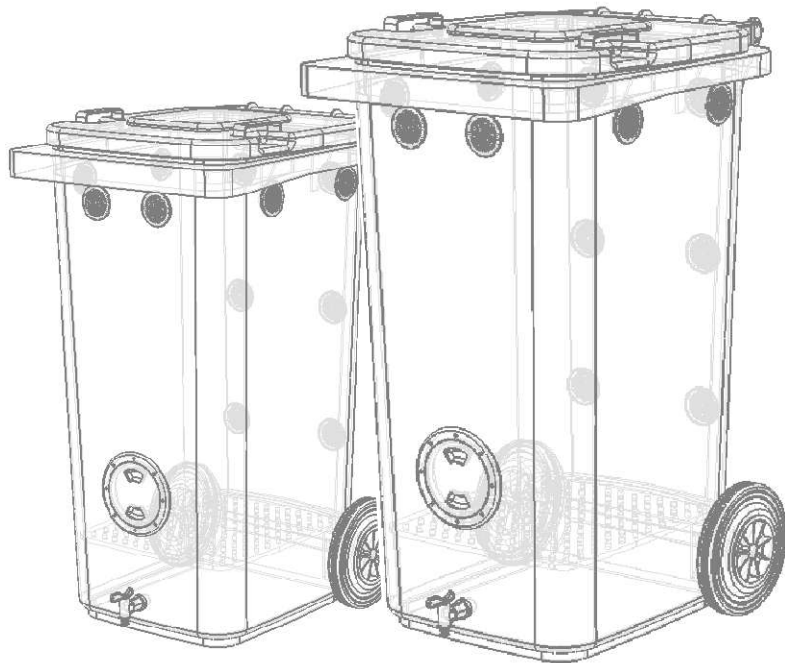
**Worms**  
Downunder

[www.wormsdownunder.com.au](http://www.wormsdownunder.com.au)

Change the world...

# Worm Habitat

Making a commitment to organic waste recycling













**Kit comes complete with  
bedding block and  
Instruction booklet**

**The Worm Habitat is Design  
Registered (No. 326995)**

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## Composting for the Future

There is no question that the world's environment is in crisis. People are changing their daily behaviour and beginning to recycle, ride bikes, demand less packaging, switch off lights, install water saving devices, buy local, organic food and chemical free products, and in general reduce their negative environmental impact.

**Methane holds 21% more heat than carbon dioxide, so reducing methane emissions has a positive effect on global warming. Using worms to compost food and garden waste stops the release of methane, and using the nutrient rich castings and liquid on the soil can help lock-in carbon and aid in establishing a fertile, ecologically balanced earth.**

Organisations are also experiencing a quiet revolution, with the introduction of green star building ratings and environmental choice labeling. Workers realise the need to use recycled paper, switch off computers, and use public transport. The effect of increasing greenhouse gas emissions on the planet however adds urgency to the changes required. Rotting landfill waste is a major contributor to greenhouse gas emissions. Sending food scraps, garden waste and paper to the tip contributes directly to global warming. In addition, transportation of waste to landfill creates even more problems.

Allowing compost worms to do what they do best, compost waste, provides a positive contribution to the environment. Waste can be dealt with sustainably on-site by worms who turn this waste into nutrient rich, fertiliser which enriches the soil.



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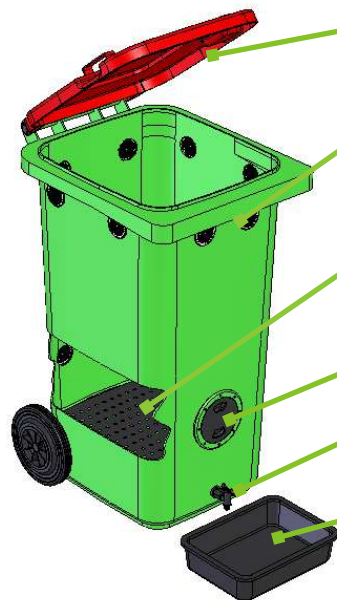
# The Worm Habitat

In response to a need to deal with larger amounts of organic waste on a sustainable scale, WormsDownUnder has developed the Worm Habitat. Retro-fitting a wheelie bin provides a low cost effective and easy to use system with the following benefits:

- ~ Readily available and locally made;
- ~ Strong, sturdy, safe and recyclable;
- ~ Recognized widely as waste receptacles;
- ~ Constructed with the potential for having standard colours for different waste types;
- ~ Of large capacity without being bulky;
- ~ Easily moveable;
- ~ Good height to employ a 'never-fill' system, providing the worms with depth and the ability turn compost into castings before harvesting.



## Design Features



- ~ Coloured lids - easy to lift, identifiable, with corporate colours & logos available.
- ~ Vents - worms require an oxygen rich environment and the specially designed vents allow for air movement while keeping pests out.
- ~ Perforated internal base - suspended base allows liquid to pass from the compost, keeping the castings oxygenated & allowing worms to breath.
- ~ Porthole - screw-out port hole allows easy access to castings.
- ~ Tap - with hose fitting is positioned to allow ease of drainage of liquid.
- ~ Collection tray - a liquid collection tray is optional and allows the tap to be kept open so liquid can drain freely and air circulate up into the system.

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## The Worms



**Using worms to compost your food scraps is not an innovation: worms have been composting organic matter for over 650 million years!**

Worms are living creatures and need to be treated with care and respect. Contrary to popular belief, if you cut a worm in half, you do not get two worms, but one dead worm. Like all animals worms have some basic requirements: habitat, food and water.

The worms supplied with the Worm Habitat Grande are the main types of compost worms found in Australia. They are Tiger worms, Indian Blue worms and Red worms. These worms love rich, moist and rotting material and will compete with each other to dispose of waste. In ideal conditions they can eat up to their body weight in food a day. Therefore a ton of worms can turn up to a ton of waste into nutrient rich fertiliser every day.

*'Worms have no eyes or ears but, in compensation, an extremely sensitive nervous system. They are able to notice a bird walking above them or sunlight on their tender skin. Either of these sensations will send them diving for cover.'* David Murphy (2005) Organic growing with worms

Worms are photophobic which means that they do not like light. If exposed to light for more than 2 hours they will die. Their normal life span however varies with the average being 2 years, up to 20 years for a very healthy worm.

Worms are hermaphrodites and when mating each of the partners produces a capsule (worm egg). On average a capsule contains 4 young, but can contain up to 22! In ideal conditions, a pair of mature worms can produce 1500 young each per year.



Worms have a digestive system, circulatory system (with up to five hearts) and a respiratory system (breathing oxygen through their skin).

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## Setting up



The Worm Habitat comes to you fully assembled, but requires some preparation for the worms, which need a moist bedding material to live in while the compost process is being established. The worms will gradually fill the worm farm with castings in which they will happily live. The bedding supplied with the Worm Habitat is natural cocopeat which requires rehydration. The following steps need to be undertaken to establish your worms in their new habitat:

- 🪚 Fill a wheelbarrow or large container with water and submerge the bedding block and break it up until 'fluffy' with a fine mulch consistency (approximately 15 mins).
- 🪚 Spread newspaper over the false floor in the Habitat and place the bedding evenly over the newspaper.
- 🪚 Introduce the worms to their new home by gently emptying them from the bag onto the surface of the bedding. The worms will burrow down relatively quickly.
- 🪚 Moisten a cover, such as the Worm Habitat felt cover or similar, and place on top of the worms.
- 🪚 Close the lid and allow the worms a day to settle in and explore before feeding. They won't starve; the bedding supplied contains enough food for this period. You will probably find worms up the sides and in the lid in the first weeks as they explore their new home. When it rains they also try and get to higher ground.



1kg of worms should easily eat 1/2kg of food a day. This is equivalent to about a quarter of a Worm Habitat Container, or 1/2 an ice-cream container full of food. Within 2-3 months the worms should be able to deal with 1-2 kg of food a day and after 6 months this will probably double again.

The Worm Habitat will generally need to be placed in a location where it will be fully shaded in summer to avoid overheating. Worms live comfortably in bedding temperatures of between 10 and 30deg Celsius. Maintaining a relatively thick layer of castings will allow the temperature of the worm farm to be more stable and will allow the worms to burrow down in particularly warm or cool weather. In the winter the Worm Habitat can be wheeled into a position where it receives some winter sun.

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## Continuing on



Maintaining a healthy, vibrant, odourless and effective worm farm is relatively straight forward. Worms need enough food, a reasonable temperature range, plenty of oxygen, and adequate moisture. As you become more familiar with your worm farm you will be able to quickly judge when these basic requirements are being met.

The Worm Habitat has sufficient vents to allow oxygen to move freely through the system. However, your worm farm will benefit tremendously from aeration by hand, garden fork or compost-mate (do not touch the false floor). Aerate before feeding to prevent food from being buried below the surface of the bedding.



### Collecting Juice.

Worm juice (leachate) will naturally collect in the base of the farm and drip out of the tap into a container if the tap is open. The Worm Habitat will also benefit from running the leachate back through the system as it is full of bacteria which will help to break down the food more rapidly. The resulting leachate will be even more potent as it picks up additional nutrients as it passes through for a second or third time.

### Harvesting Castings

It is beneficial to keep the worm farm relatively full of castings for the worms to live in, however when the level is just below the top vents, the castings can be harvested from the porthole. Unscrew the porthole for access and use a trowel to scrape out the castings - be careful not to damage the mesh covering on the false floor. Once finished hose-out the porthole thread and replace the porthole cover.







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# Worms and Food



Worms will eat almost anything organic - that is anything that was once living. They thrive on a variety of food and a good diet includes everything in moderation. The following worm food list is by no means comprehensive.

-  **Kitchen scraps** including raw/ cooked fruit and vegetables, tea-bags and coffee grounds, dairy products including cheese, eggs, egg shells, etc.
-  **Cardboard and paper** - worms love it shredded well, dampened and mixed with other materials
-  **Manures** from animals which haven't recently been treated for worms, as worming formulas can kill compost worms.
-  **Grass clippings** and garden waste such as weeds and dead plants

The following waste is recommended in small quantities only:

-  Meat raw or cooked meat including red meat, pork, poultry, fish and shellfish.
-  Wheat based products such as bread and cakes
-  Citrus fruits, onions and garlic sparingly.

Over feeding will mean the worms will not be able to efficiently process all the food in a timely manner, and may become sour. Therefore,

## **DO NOT OVER FEED.**

Feeding on the top surface will allow oxygen to reach the food and prevent odours which occur in anaerobic conditions. The food can be covered with a Worm Habitat Cover to keep the worms feeding on the surface.

Cutting, chopping, or processing food will allow worms to consume it more quickly and promote bacterial action, as smaller sized food particles offer greater surface area.

A sprinkling of fine sand or dolomite (which also provides other essential minerals) every few weeks will also aid digestion. Worms rely on grit to help break up food particles.

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**Prior to feeding to worms chop with a spade or mulch to size reduce particles.**



**Mix with shredded paper or moistened cardboard which provides a good carbon source.**



**Feed on the surface to allow oxygen to reach food and prevent odours.**



## Worms and Water

Water is a critical element in the Worm Habitat. Moist conditions in a worm farm are ideal for worms, but too much or not enough water can be lethal. If the compost becomes saturated with water the worms will suffocate with no oxygen to breathe. If the bedding is too dry, the worms will dehydrate.

**Worms breathe through their skins and need a moist aerated environment to facilitate the diffusion of oxygen.**



Ideally moisture levels should be 60-70%. A simple and effective test is to squeeze a handful of bedding. Only a few drops of liquid should run out between your fingers.

Recycling the leachate back over the farm is very beneficial as it puts good bacteria straight back into the systems aiding the breaking down of food particles.



Decomposing fruit releases a lot of moisture into the worm bed, so adjust your watering accordingly. If conditions are too wet, aeration (using a Compost Mate for example) and the use of dry paper buried in the bedding can remedy this.

Soil that contains little or no organic matter will not hold water, with soil granules becoming wet on the surface only, leading to evaporation. In prolonged rainfall, vital trace elements are washed away in runoff. Soil containing even just 5% organic matter can hold water at a rate of 2:1 (water: organic matter).



Therefore, a hectare of soil with 5% organic matter to a depth of 25cm has the capacity to hold more than 2500 tonnes of 'life-giving, crop-raising' water. In our home gardens, the more organic matter in the soil, the less watering will be required.

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## Worm Liquid and Castings

Worms literally eat their way through organic waste, leaving nutrient and bacteria rich castings in their wake. Their digestive system is comparatively simple: firstly, food is ground to a fine consistency in their gizzard; calcium carbonate is then secreted onto it, neutralizing the acidity; it is then passed to the actual digestive tract for processing; and finally, the food is excreted as castings (vermicast) along with the enzymes and bacteria produced.

The worms convert insoluble minerals into plant soluble form and in addition, the bacteria they excrete along with the castings, continues to convert minerals and further break down cellulose into rich humus. The resultant vermicast is ideal for plants and soil improvement as it is natural, nutrient and bacteria rich, with a neutral pH level of 7.

**Worm castings improve the soil, not only by providing nutrient rich organic matter, but also by locking in carbon which has great water storage capacity. Locking in carbon has immediate environmental benefits... and you won't need to water as often!**

### Uses of castings

-  Plant fertiliser  
Layer worm castings around plants and water
-  Lawn top-dressing  
Three parts cocopeat/ one part castings
-  Seed raising Mixture  
Three parts cocopeat/ one part castings
-  Potting Mixture  
Two parts cocopeat/ one part castings
-  Tree fertiliser  
Layer around base regularly and water in

Worm liquid, or leachate, which collects in the bottom compartment of the Worm Habitat picks up nutrients and bacteria as it passes through the compost and worm castings. This can be collected, diluted with water (anywhere from 1:2 to 1:10) and used on plants as a liquid fertiliser.



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Worms Downunder was started by Paul Harrey (PhD, Bsc Hons) and Pene Mitchell (PhD B Arch) because of their concern for the environment. The concept for Worms Downunder is to become a hub for sustainable organic waste management, including:

- 🌱 Provision of worms and worm farm systems across Australia;
- 🌱 Support for individuals and organisations in dealing with organic waste;
- 🌱 Undertaking of research & development to determine appropriate solutions to waste management problems which address environmental concerns;
- 🌱 Dissemination of information about the environmental benefits of recycling organic waste using worms.

Worms Downunder has successfully supplied hundreds of worm farm systems and worms across Australia. In response to a need for larger, low-cost, easy to use worm farm systems, Worms Downunder has developed the Worm Habitat range, which includes the Worm Habitat (suitable for domestic use, offices, schools, cafes, etc.) and the larger Worm Habitat Grande (suitable for horse agistment properties, universities, sporting clubs, etc.).

Paul and Pene bring to Worms Downunder a background in sustainability as environmental scientists, researchers and developers, consultants to large organisations, such as CSIRO, private companies, universities and industry. They consult in industrial design, architecture and life cycle assessment, determining environmental solutions for products, buildings and industry, and their ability to analyse problems and find sustainable resolution has been applied to waste management. If you would like to know how you can take responsibility for your organic waste on any scale using worms, please do not hesitate to contact us.

***Established in 2005, the overall aim of Worms Downunder is to provide cost-effective sustainable waste-management solutions using vermiculture.***

**Worms Downunder is passionate about ensuring a clean, safe and sustainable future for the earth.**

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Australian Owned and Manufactured in Montville, Qld.

## Details



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Visitors welcome, please phone  
to arrange a visit.

### DIMENSIONS AND CAPACITY

**Worm Habitat** (240 litres)  
73cm X 59cm x 105cm high  
Mass 14kg (empty)



**Habitat Junior** (140 litres)  
61cm X 52cm x 95cm high  
Mass 12kg (empty)



### TURNING WASTE INTO PLANT FOOD

Disposing of organic waste has never been easier! Using a Worm Habitat allows you to turn kitchen, garden and animal waste into a beneficial natural fertiliser which will do wonders for your garden. The Worm Habitat is a cost effective solution to our growing waste problem.



# Worms

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