



Complete Guide

Composting With Worms ... Everything You
Need To Know

Please Note: Everything written here is original information developed over 25 years of worm farming experience by George and is not a me-too, copycat of other (often wrong) information on the web!!!

A brief history of me and my passion for worms

Hi, my name is **George Mingin** and I'll be taking you on a brief but fascinating journey of why compost worms can help save our planet and human civilisation as we know it today, no bull!!!

Firstly, just a quick word about myself and my background. Since I was a young kid, I learnt from my Dad that the best and most versatile fishing bait, was worms. Back in those days I used to dig through Dad's veggie patch to find the biggest worms for my fishing passion. Bigger worms, meant bigger fish, right? 😊

Then, as I grew older, I re-encountered the **wonderful world of worms** in the early 90's and discovered that worms were far more important than just catching that big fish. Really? I had no idea!!!

From the best farmers of the day, and for the past 28 years, I have learnt that worms are absolutely vital for the health of our soils and therefore our food. All good farmers will tell you that a good soil is soft and spongy underfoot, with heaps of worms in every shovel full of soil.

In fact, **worms are so vital for soils** that famous people like Charles Darwin made statements like "there is probably no more important creature on earth than the lowly earthworm for building our topsoil" and Aristotle noted that "the earthworms are like the intestines of the earth". And another famous quote "whole human civilisations have risen and collapsed on the back of the worm".

Wow!!! That's probably why Dad's veggie patch was always flourishing and providing our family with an abundance of fresh healthy food and why Dad never needed to use any fertilisers, pesticides or herbicides.

A brief history of worms

Did you know that worms have been around for at least 300 million years?

They are true dinosaurs from beneath the earth. Perhaps more accurately, they probably ate dinosaur poop and became the masters of recycling huge volumes of organic wastes way before the first human ever appeared. Just imagine how much dinosaur poop there must have been for **worms to eat and convert into topsoil** over the eons? So, earthworms and specifically compost worms have played a huge part in the evolution of our species and all terrestrial life on earth.

Earthworms make topsoil!!! By the process of **eating organic waste** (anything that was ever living) and pooping out the world's most fertile and natural topsoil.

Scientists tell us that there are now (2018) over **6 thousand known species** of earthworms. We are only concerned with a handful of these worms that can easily help us to harness the immense power of the worm to recycle our organic wastes and convert them into fertile, healthy topsoil.

Earthworms are categorised by scientists into **3 major groups**:

- 1/ Anecic, the **deep soil dwellers** that recycle the degrading rock minerals from deep below the soil and bring it up to the surface to re-mineralise depleted top soils.
- 2/ Endogeic, the **medium depth soil dwellers**. Their speciality appears to be mixing and gluing together the layers of topsoil, creating structured or aggregated topsoil and feeding on decaying wood and other ligneous materials.
- 3/ Epigeic, the **top layer dwellers** that live in mainly rich organic matter. These worms eat the organic matter that falls on the soil surface. Everything from animal poop, to fallen fruit to dead and decaying leaves and grasses. These are the fellas who make our topsoils.



Composting worms

It is this third group of worms that we are most interested in for **recycling our organic wastes**. These Epigeic worms are commonly called compost worms or manure worms. They are usually a shade of red in colour on their backs or anterior and can be stripy or plain and generally with a pale or yellowish coloured belly or posterior.

The **3 most common varieties** of compost worms are Eisenia Fetida or Tiger worms, Eisenia Andrei or Reds/Red worms and Perionyx Excavatus/Spenceralia or Indian Blues. These 3 species of compost worms make up over 90% of all worms sold and used for composting. Other good composting worms, but less common are, Eisenia Hortensis or European Nightcrawlers and Eudrilus Eugeniae – African Nightcrawlers.

These worms are **bigger and great for fishing**. We grow these fellas as well as the 3 composting varieties.



Working with worms

So, let's look more closely at the 3 most common composting worms, Tigers, Reds and Blues.

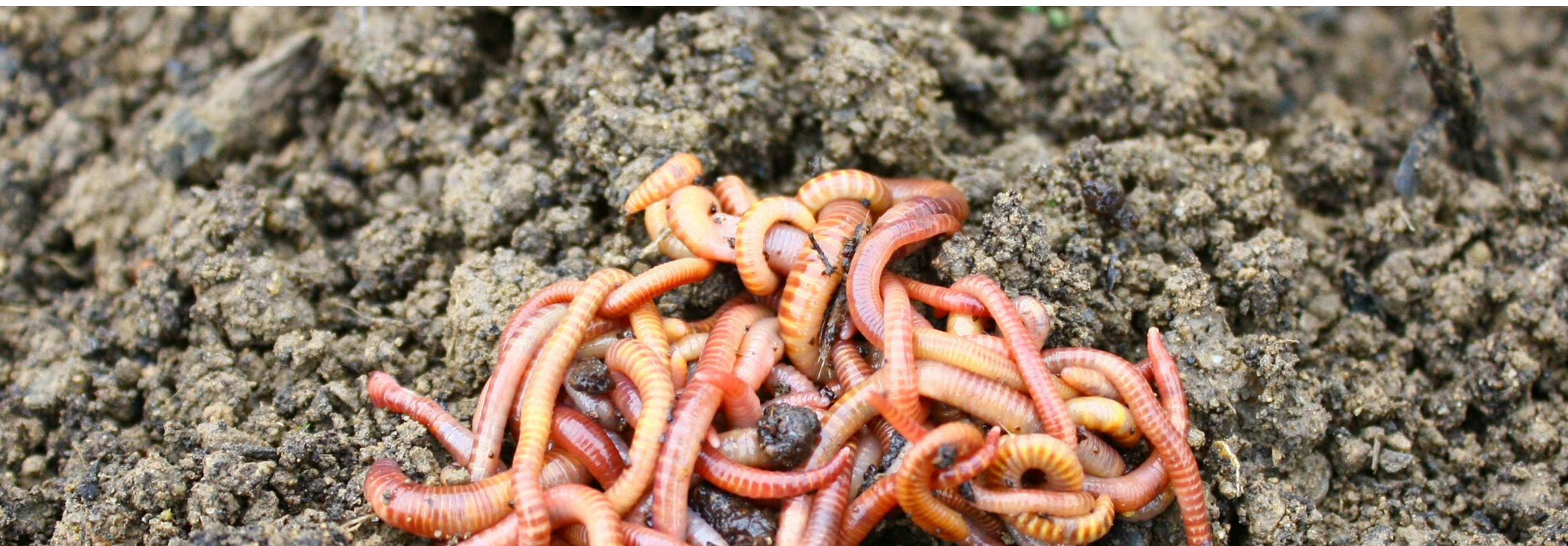
First thing to remember is that worms **DO NOT eat any living plant matter**. Therefore, they will NEVER harm a living plant. They **DO NOT eat plant roots nor plant seeds**. Just needed to highlight these points because of so much misinformation floating about on the web these days. One can't always believe the stuff on the web or social media these days!

Next thing to note, is that **worms are living creatures**. Like any living creature they need regular looking after and the provision of the basic necessities for life, namely bedding, shelter, food, and water.

Worm bedding

So, what makes a good worm bedding? Basically, any well aged and rotted down organic matter. Aged and rotted horse or cow manure, aged and stable good quality compost (beware of potting mixes or compost made from pine bark or shavings – **worms don't like pine**), wetted down and shredded cardboard or newspaper, peat moss and coconut coir are just a few good examples of worm bedding. Remember compost worms live in nature in the top layer of rich organic matter, they will live in soil but prefer to live in rich organic matter soils and are not normally found in heavy clay or light sandy soils.

The **worm bedding should be moist but not soaking wet**. Worms need air to breath and soaking wet soils have little to no air in them. Pick up a handful of worm bedding and you should be able to squeeze just a few drops of water out of it. If your worm bedding is too dry, water lightly until you get it just right.



Worm shelter

Worms are at the **bottom of the food table**. This means that just about every omnivorous or carnivorous creature, will eat your worms. To maximise the survival of your worms they need some sort of shelter from predators and, of course, the elements.

Good worm shelters can range from **fancy pre-fabricated worm farms** like the Worm Café, Can O Worms or Worm Swag, which you can buy from your local Bunnings Hardware, favourite nursery or online. Through to simple old discarded bathtubs, fridges or even buckets. All of these **worm shelters need good drainage**.

As a general rule, the worm bed or shelter should have a **greater surface area than depth**. Worm productivity depends on the surface area of the worm bed. Therefore, the larger the surface area of your worm bed, the more they will breed and the more they will eat.

A good worm bed will be **well drained and well aerated**. A bucket with a tight-fitting lid will very quickly suffocate all your worms. Therefore, heaps of ventilation is a must.

Worms work best if they have a **cover over them**. The best type of cover over your worm bed is a piece of hessian, cotton cloth or several sheets of newspaper. Plastic covers can suffocate your worms. Bunnings sell a “worm blanket” that is tailor made for the Worm Cafés and Can O Worms.

These blankets do a great job to **protect your worms from predators** like birds, keep the worm bed from drying out too quick and keep the worms working in a dark and moist environment feeding 24 hours a day. Worms don't like the light and will die from long exposure in the sun, so it's always a good idea to keep them lightly covered.

Worms prefer to live in a bedding temperature that is between **10 and 30 degrees C**. Note, I said worm bedding temperature - this is not necessarily the same as the air temperature. The more worm bedding in a worm farm, the better it will buffer the extremes of air temperature and the better the worms will fare.

With your standalone worm farms like the Worm Café, Can O Worms etc, it is always best to set them up in a permanently shady spot. Sun, even in winter, directly shining on a black plastic container will turn the inside into an oven in no time. Good for me, because I get to sell more worms 😊, but not good for you or your worms.

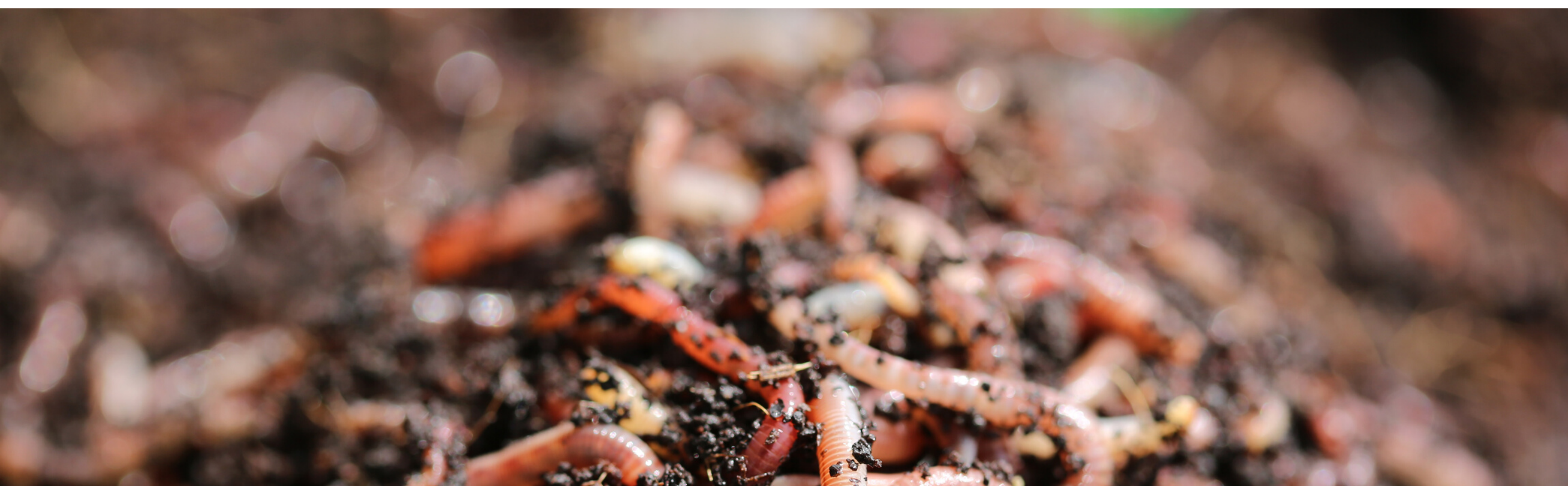
My favourite worm shelter or worm farm is my own designed **Little Rotter**. I may be a little biased here 😊, but I believe it is the best for some very good reasons, other than it was my original idea 😊.

The Little Rotter is truly the **worlds simplest worm farm**. It works on the principle of a feeding station for worms and a place to hang around in and gormandize on whatever treats the owner has left for them. It is a simple bucket with a firm closing lid and holes in the base. The Little Rotter sits directly on top of the ground allowing worms easy access through the holes in the base to the soil below.

All you have to do is open the lid, drop the food scraps inside and close the lid. The worms do all the work for you. They will come up through the holes and munch away at your organic waste, kitchen scraps, garden waste or dog and cat poo. They then leave the **comfort of the Little Rotter and travel through your garden** to do their poo and in the process, fertilise and aerate your soil for you. Bingo!!! The worms do the work and you just regularly feed and occasionally water them and you end up with natures best, fertile, healthy soil!!!

These Little Rotters also have a **surprisingly large capacity**. Even though the surface area inside the Little Rotter is small the actual surface area that your worms have access to, is the size of your garden. So, you can feed a huge population of worms with just one Little Rotter, meaning they have the ability to outperform much bigger worm farms. These Little Rotters are also a “never fill” bin. As long as they are sitting ON TOP of the soil, the worms will continue to empty them for you. They will NEVER FILL when used properly.

You don't even have to worry about killing your worms in the heat of summer or the frosts of winter. The worms just **dig deeper into the stable temperature soil underneath** the Little Rotter during the extremes of the exterior weather conditions. How simple and ingenious is that? Even if I have to say so myself 😊.



Worm food

Worms will eat anything that was ever living, but I need to add a caveat to that statement.

Worms don't have teeth and therefore cannot eat anything hard like branches, sticks or wood. They can't eat bones or hard shells like nuts.

Worms must **wait for the tougher foods** to break down through the process of rotting. Some foods are naturally soft and squishy, like bananas, watermelons and tomatoes which they can tuck into straight away. But other foods have tougher stalks or skins and can take some time to rot and allow for the worms to eat them.

Other good worm foods are **animal manures**. Ruminant animal manures are the best - cow, horse, sheep, goat etc. But worms are not too fussed as to whose manure it is, dogs, cats and even ours 😊. Just be careful with any bird manure, like chicken poo. It needs to be composted first to remove the excess nitrogen. **Excess nitrogen can cause heating of a worm bed** to the point of killing all the worms, as well as the release of ammonia gas which will also kill worms.

All worm food should be fed with plenty of **inert carbon rich material**. Some worm experts call this high carbon material – browns. Browns are a buffering agent from excessively rich or high protein/nitrogen foods and refers to materials such as shredded cardboard, aged stable compost or manure, brown leaves or brown dried grass etc. Same as the worm bedding, as described above.

Beware of fresh green grass, this is a high nitrogen feed and can lead to excess heat and ammonia generation. Feed worms green grass in moderation and with plenty of browns as a buffer.

Worms should be fed regularly and in small amounts. Don't feed any more than what your worms will eat in 2-3 days. Overfeeding is THE MOST COMMON cause of dead worms. As a general rule of thumb, 1000 worms will eat about half their body weight per day or half a cup of food per day.

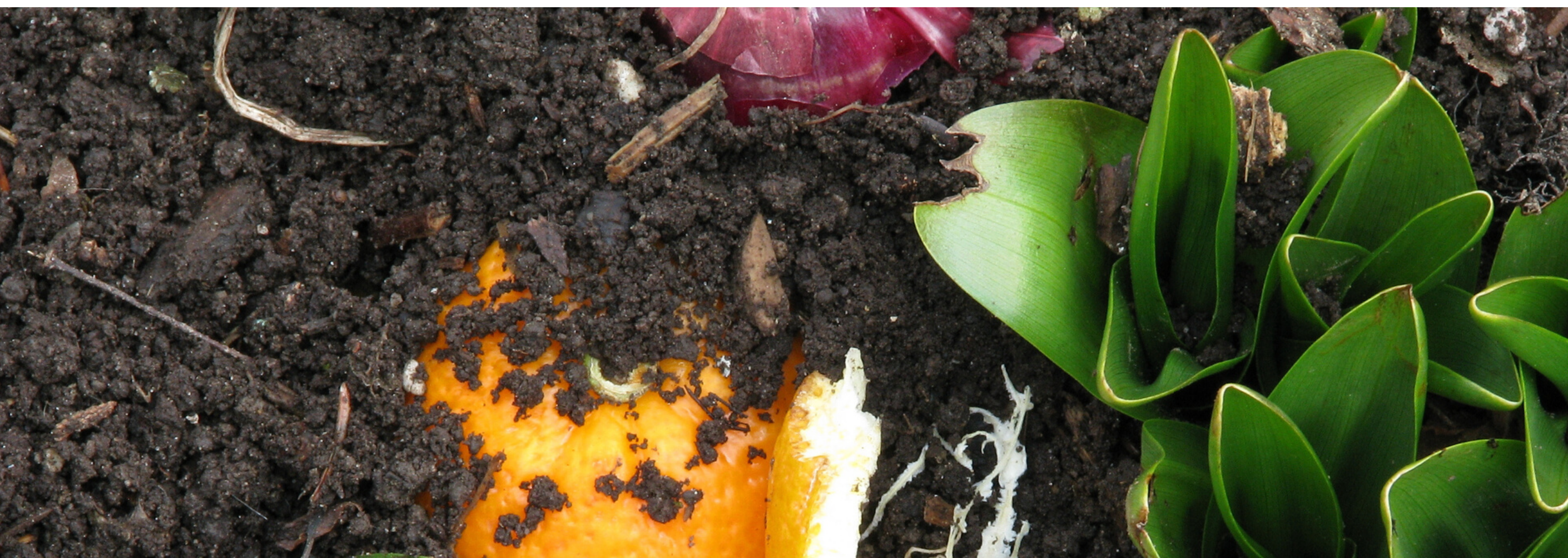
What about citrus, onions and garlic?

Again, there is a lot of **misinformation out there in the cyber world**. One of the most common bits of misinformation about worm food is that they don't eat citrus, onions or garlic. BS!!!

Worms love rotting citrus, onion and garlic. BUT note that I said **"rotting"**. These organic wastes must be rotting before the worms can get stuck into them.

The misinformation about citrus, onion and garlic has come about because these plants have **natural anti-bacterial agents** in them. This means it takes a while longer for the bacteria and other micro-organisms to break down the anti-bacterial compounds and start to soften and rot them. Once the rot starts, the worms are more than happy to devour them along with all the other food waste you might toss in their direction.

[As an interesting little side note. I once had to do a trial on a major small crop farm in Victoria who were large growers of onions. At one point in time the price of onions had dropped so low that it was not worth the farmers time or money to pack the onions into boxes, let alone ship them to the markets, so, the farmer just dumped them in a paddock. I was asked if worms could turn the onions into something useful, so we did a large-scale trial of about **50 tonnes of onions**. We pushed the onions into a windrow, inoculated them with heaps of compost worms and covered the windrow up from the weather. After a number of weeks, I noticed that the windrow had shrunk a bit, but on opening up the covers, the onions still looked quite whole and intact. I picked up one onion and almost dropped it in surprise when it moved in my hand. Peeling back the few hard outer-skin layers of the onion, I was most **pleasantly surprised** to find a ball of pure worms, worm cast and virtually no soft onion flesh left. The worms had done their job. So I say BS to all the claims that worms won't eat onions!!!]



When and how to feed your worms

Feeding worms is really very simple. Just like feeding any other pet; please don't overfeed them. Only feed enough food to last the worms 2-3 days at a time. You can easily tell when the worms have eaten their food, it looks like dark soil.

Again, as a general rule of thumb, **1000 worms will eat about half their body weight per day or half a cup of food per day.**

The worm's food should only be placed in **thin piles around a worm bed**. Never heap it up higher than a few centimetres, because it might become anaerobic – without air, and start to go off and get smelly.

Always **cover your food with a piece of hessian or cloth or worm blanket**. And never cover the whole surface of a worm bed with food. You need to leave some of the worm bed free for air to diffuse into the worm bed and somewhere for the worms to escape should a problem develop with the food.

An interesting method of feeding your worms has been developed and promoted by Brian Donaldson – www.thewormman.com.au - a worm farmer from Brisbane. Brian calls his system the "Pocket Feeding System". **This involves placing a week's worth of worm food in a corner of your worm bed and burying it lightly.** Next week, place a similar amount of worm food in the next corner of your worm bed and again bury it lightly. Continue on in a rotating fashion, feeding and lightly burying worm food in each corner of your worm bed. By the time you get back to the original corner, the worm food should all be eaten and you can start all over again. This **Pocket Feeding System** has a number of advantages, which include a disciplined approach to worm feeding, by burying the waste it will not smell and will not attract unwanted insects like the small vinegar flies, and it will keep the worms working the whole worm bed making it more aerated and producing a better-quality worm cast overall.

A properly fed worm bed should never smell. Many people keep a small worm bin in the kitchen of their house to make disposal of their kitchen scraps quick and easy.

Should you still be concerned about smells or flies from your worm bed, you could try this simple little trick. Another simple method of preventing smells and flies in your worm bed, is to **wrap the worm food up in a brown paper bag** or even a single sheet of newspaper. You then just drop this wrapped up parcel of food on top of the worm bed. The bottom of the wrapped food becomes wet and the worms quickly eat through the paper at the bottom and then get stuck into the food inside. Whilst the paper on the outside keeps the flies and smells away.

What about meats, dairy and bread? Many people say not to add these types of wastes to a worm bin. Again, the trick is in moderation. Worms will eat meat, dairy and breads, **but in moderation and well buffered with browns**. Meat may attract rodents and get smelly if not eaten quickly. If in doubt, leave it out 😊

Water

Water is an important ingredient in any worm bed.

Worms **breath through their skin** by the process of diffusion of oxygen from the air.

An overly wet worm bin **won't have any oxygen** and the worms will suffocate.

An overly dry worm bin won't have enough moisture to allow the diffusion of oxygen and again the worms will suffocate.

So, the aim is to have just enough **moisture in a worm bed** so that the worms can breathe freely and easily.

So, what's just enough moisture in a worm bed? Pick up a handful of worm bedding and give it a squeeze. **A few drops of water is perfect**. A stream of water is too wet, add heaps of dry browns to soak up the excess water. No drops of water and it's too dry, water lightly with a misting or spray bottle.

Note: Some worm food can have a large percentage of water within it i.e. watermelon, tomato, lettuce etc. With these foods, you need to **add plenty of dry browns** to soak up the excess water.

There you have it: A complete guide to keeping worms!!! Well nearly 😊

PS: However, if you have any questions that are not covered above, just post them to our **Frequently Asked Questions-FAQ page**, and I'll do my best to answer them as promptly as I can.