Be part of the Compost Revolution

your guide to home composting & wormfarming

Randwick City Council
a sense of community

Waverley Council

NSW Environmental TRUST

Welcome to the Compost Revolution.

Composting and wormfarming prevent the wasteful transport of food scraps to landfill where they produce harmful greenhouse gases and best of all, it's easy to do either at home.

With a compost bin or wormfarm, you could halve your waste and return vital nutrients to the soil to grow your veggies in.

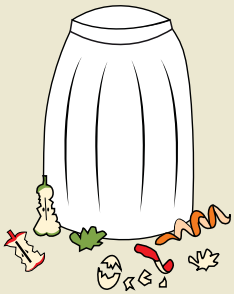
The Compost Revolution is a community-focused initiative in Sydney's eastern suburbs, run by Waverley, Woollahra and Randwick councils with funding from the NSW Environmental Trust. It promotes home composting, growing food locally and connecting neighbours.

This guide will give you a basic understanding of how to compost or wormfarm effectively.

For more information about the Compost Revolution visit www.compostrevolution.com.au

Compost bin or wormfarm?

Composting and wormfarming are different ways of breaking down and recycling your food scraps into healthy soil. One method will suit you best, depending on your home and garden situation.



Compost bin

Compost works by aerobic decomposition – air-breathing microorganisms break it down and create heat. It needs garden materials as well as food scraps.

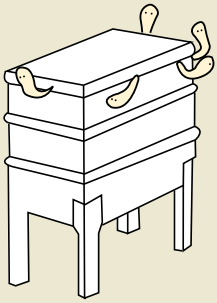
COMPOSTING SUITS IF YOU:

- have garden waste
- have space on bare earth for the bin
- are in a household of two or more.

BENEFITS OF COMPOSTING:

- some food scraps that can't be used in wormfarms can be composted, such as garlic, onion and citrus
- garden waste can be composted
- larger volumes of material can be composted.

For composting tutorial see page 4



Wormfarming

In wormfarming, worms and the microorganisms inside them break down your food scraps – garden materials aren't needed.

WORMFARMING SUITS IF YOU:

- don't have any garden waste
- don't have access to bare earth for a compost bin
- have a small household or don't produce a lot of food scraps.

BENEFITS OF WORMFARMING:

- you can collect liquid and solid fertilisers
- you can keep your wormfarm in a courtyard, on a balcony or even indoors
- you don't need garden materials
- you don't have to dig, turn or aerate your wormfarm.

For wormfarming tutorial see page 14

Composting

The principles of composting

Four important principles of composting are Aliveness, Diversity, Air and Moisture (ADAM). Remember these principles for healthy, effective compost.

ALIVENESS

Compost is a living system, full of good bacteria, microbes, fungi, worms and other creatures. Healthy soil depends on all of them.

DIVERSITY

Diversity is an important feature of all natural systems, including compost. A range of materials achieves a good balance of nutrients.

AIR

Air is needed for compost to break down properly – the good bacteria in the compost breathe air. Airflow will also prevent smelly compost.

MOISTURE

All living things need water. Your compost should be kept moist.

Ingredients

Compost needs a balance of nitrogen-rich and carbon-rich materials – put simply, a balance of food scraps and garden materials. For every bucket of food scraps, you need to add two buckets of garden materials.

IN BACKYARD COMPOSTING:

- **'nitrogen-rich'** (providing the nutrients) is anything colourful and moist such as food scraps or freshly cut grass.
- **'carbon rich'** (providing the carbon and fibre and assisting with airflow) is anything brown and dry like old garden clippings or cardboard. These make for healthy, stable compost but can slow your compost down.

While anything organic (once living) can technically be composted, it's best to follow the above guidelines for composting in a small backyard bin.

DID YOU KNOW?

Fresh weeds can be a source of nitrogen-rich materials but you probably don't want their seeds to grow into new weeds when you use the compost. Kill the seeds by putting weeds in a black plastic bag in the sun for a few weeks. Then you can use them as a carbon-rich source.

TIPS

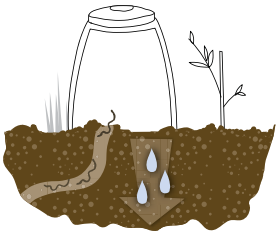
- **Diversity is the key. Too much of one thing can cause an imbalance.**
- **The smaller the pieces the faster they break down. Chop food and garden scraps into golf ball sizes or smaller.**

The perfect spot

Your bin needs to be somewhere you can access easily, with good drainage and contact with the earth.

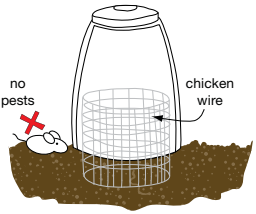
STEP 1

Keep your bin close to your house so it is convenient to empty your scraps, away from windows and neighbours.



STEP 2

Worms and other creatures need to move between the compost and soil – make sure your bin has contact with soil. Good drainage is important – layers of sticks on the bottom can help with this.



STEP 3 (OPTIONAL)

Effective composting should mean no rats, but you can rat-proof your bin by lining it with chicken wire that goes at least 10cm into the soil.

Alternatively, place the open base of your bin on top of a piece of chicken wire, bend it up to encase the bottom of the bin and tie in place with rope.

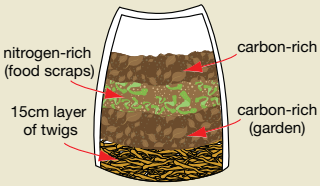
TIPS

Got a friend with a compost bin? Grab a handful of their ready-made compost to give it a kick start!

Compost prefers a stable temperature. Pick a sheltered spot where temperature fluctuations aren't too extreme.

Setting up your bin

Gather some sticks and a mix of carbon-rich and nitrogen-rich materials to start your compost.



STEP 1

Put a 15cm layer of twigs or mulch in the base of the bin. Add a 15cm layer of carbon-rich garden materials. Add a 15cm layer of nitrogen-rich materials. Add another layer of carbon-rich materials.

STEP 2

Pour some water over the compost.

STEP 3

Cover with some damp newspaper and a hessian sack.

DID YOU KNOW?

Worms will find their way into the bin and help break down the food scraps. They improve the soil around the compost bin by aerating it and breaking down the soil nutrients to be absorbed more directly by plants.

The layering method helps achieve a good carbon/nitrogen balance. Once set up you don't need to stick to the 15cm layering – you can add food scraps as you create them, and find other nitrogen-rich and carbon-rich materials to balance and provide diversity.

Life with your bin

Once set up, you can add nitrogen-rich food scraps as you create them, always placing a layer of carbon-rich garden materials and a hessian sack on top. If the carbon/nitrogen balance is maintained, it's kept moist and is stirred, your compost will get hot and create healthy soil.

1. Aerating the compost

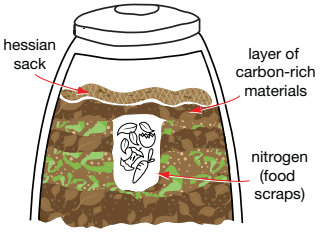
Once a week, remove the lid and hessian sack and stir to mix and aerate. Use the 'compost mate' screw provided with your bin to make it easy.

2. Create space for food scraps

When you place your food scraps in the bin, first create an indent in the middle of the compost with a shovel.

3. Add food scraps

Throw your food scraps into the space you made in the middle of the compost.



4. Cover the food scraps

Add a layer of carbon-rich garden materials over the food scraps. Digging a space for food scraps and covering with a carbon-rich layer and hessian sack is important to prevent pests.

Compost should always be moist but not soggy. Add water if it's too dry, more carbon-rich materials if it's too wet.

TIPS

Collect garden clippings and leaves for your carbon layer when you have time and store them next to your compost so they are available when you add food scraps.

To save water, rinse out your food scraps container in the garden and use the water to pour over the compost.

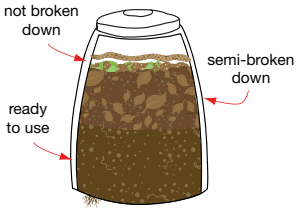
DID YOU KNOW?

The method described on the previous page is called 'slow' or 'cold' composting. The compost does generate heat but as materials are added gradually the volume isn't big enough to get really hot. It will take three to six months for the compost to be ready. 'Hot' composting is when you fill the bin all at once and leave it to 'cook', stirring and adding water occasionally. This will create soil in six weeks to three months but is not so useful for recycling your food scraps regularly.

Gardeners often use both methods. They may have a 'hot' compost they fill all at once and leave 'cooking', and also a 'cold' compost to add scraps to regularly.

Harvest time

Your compost is ready if it looks like rich, dark soil and smells earthy. This normally takes three to six months. Compost is very rich and must be mixed with other soil and covered with mulch when used in the garden.



Ready-to-use compost at the bottom

The top layers will not be broken down so harvest from the bottom of your bin. Throw sticks and other materials that haven't broken down back in the bin.

To get the compost out...

If you have a trap door, open it and scrape the compost out with a shovel. No door? Tilt the bin and scrape it out with a shovel.

To empty all compost at once...

Lift the whole bin off the pile. Take the top layers of the first compost and put them back in the empty bin to start a new compost and use the rest on the garden.

The speed at which compost breaks down depends on the volume of materials, how healthy it is and how hot it gets. It will slow down in winter.

Mix compost with soil to create a new garden bed or potting mix, or spread it in around existing plants. Always keep any soil and/or compost covered with mulch to keep it alive and healthy.

TIPS

If the compost is not ready but you want to start another one, lift the bin off the compost pile. Cover the pile with an old blanket or sheet (something that lets it breathe and get wet) and leave it for another few weeks. Then add more soil and plants straight into it.

Compost is too rich for most native plants, use it on your vegetables and exotics.

Egg shells take a long time to break down but are a good source of calcium, don't worry if they are not completely broken down. Egg shells can also be crushed and scattered around plants to deter snails.

DID YOU KNOW?

Your backyard compost is unlikely to get hot enough to kill seeds. When plants such as tomatoes and pumpkins sprout where you don't want them to, pull them out and throw them back into the compost, or replant them in a veggie garden.

Avoiding problems

Problems can generally be avoided or fixed by following the four compost principles: Aliveness, Diversity, Air and Moisture, but you may find the following tips helpful if you do come across problems with your compost.

BAD OR AMMONIA-LIKE SMELLS

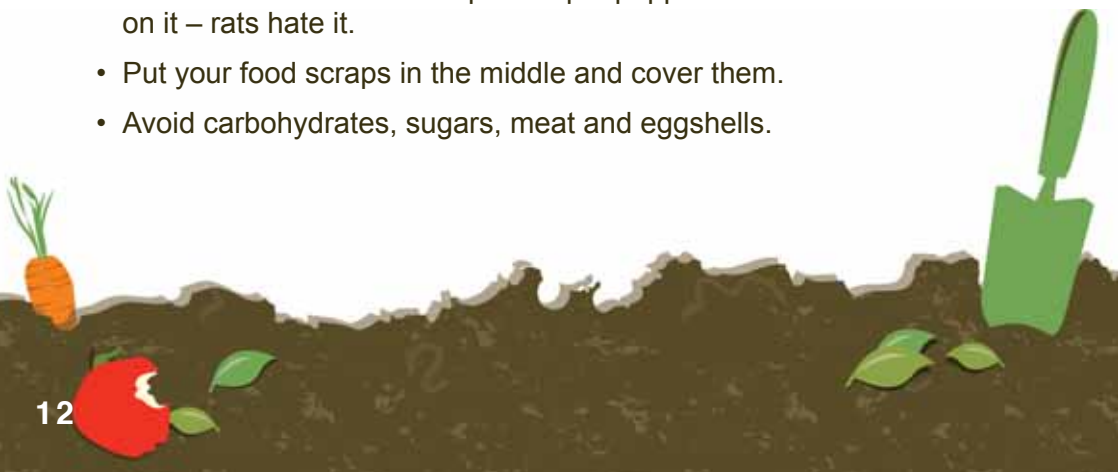
If your compost smells bad it's probably too wet, needs more air or is too acidic.

- Add more carbon-rich, dry garden materials.
- Give it a good stir for aeration and to mix.
- If smells persist, add ash, garden lime or dolomite to balance the pH (available at nurseries).

RODENTS

If they are common in your area they could be attracted to your bin.

- Check the lid is secure and there are no gaps.
- Rat-proof your bin by lining it with chicken wire that extends into the earth. Alternatively, place the open base of your bin on top of a piece of chicken wire, bend it up to encase the bottom of the bin and tie in place with rope.
- Grow mint around the compost or put peppermint oil on it – rats hate it.
- Put your food scraps in the middle and cover them.
- Avoid carbohydrates, sugars, meat and eggshells.



COCKROACHES

Cockroaches like to hide in warm, dry and undisturbed places.

- Soak your compost with a hose.
- Mix your compost, thoroughly poking around in crevices.
- Avoid forming any dry, sheltered pockets over time.
- Follow the four compost principles for healthy compost.

NO REAL PROBLEMS BUT IT DOESN'T SEEM TO BE BREAKING DOWN

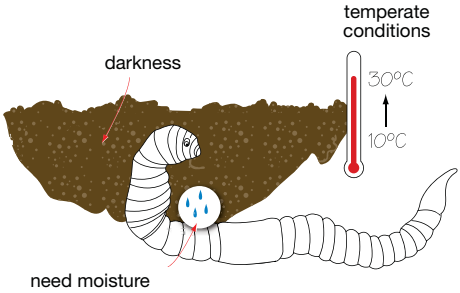
- Be patient. If you're only adding small amounts it takes time.
- Add some cow manure, fresh green grass clippings or other nitrogen-rich materials to accelerate the process.
- If it's dry, wet it and stir.

SOLDIER FLY LARVAE

These can be confused with maggots but are bigger, more segmented and browner in colour and don't create a smell. They are common in summer and are not a problem for your compost but they could indicate that it's slightly acidic. There is no easy way to remove them, just leave them and they will die off in a few weeks.

Wormfarming

Introducing the worms



Worms eat your food scraps and turn them into rich fertilisers. You'll find them easy to look after if you remember worms have sensitive skin, need moisture, darkness and conditions that are not too hot or too cold.

- Wormfarm worms are a mix of breeds called 'compost worms' and are different to native earthworms.
- They self-regulate their population and create worm capsules or eggs every six weeks under good conditions.

With small amounts of food the population will remain small; give them more and they will breed until there is no more room and stop breeding.

TIPS

- **If you ever need more worms you can grab a few handfuls from a friend's wormfarm. Both populations will breed and recover.**
- **Unlike compost, wormfarms only need nitrogen-rich food scraps, not carbon-rich garden materials. Fresh fruit and vegetable peelings are the best thing to give them. Leftover cooked meals are fine in very small amounts.**
- **Keep a brick on the lid of the wormfarm to stop it from blowing off, or animals getting into it.**

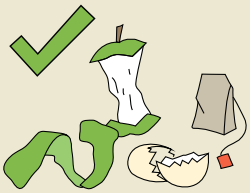
DID YOU KNOW?

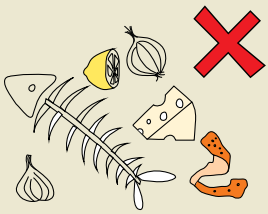
Wormfarm worms eat their body weight in food each day – although they are not actually eating the food but rather the bacteria on the surface of the food.

If you go away your worms will be fine without food for a month or longer if you leave them with plenty of damp newspaper. Make sure they are somewhere shady or even in the bathroom if you are away in summer. Remember to leave the wormfarm tap open so that if it rains, water can drain away and the worms won't drown.

What worms like to eat

You should mainly feed your worms fruit and vegetables. Small amounts of carbohydrates and dairy products are ok but best to avoid until you know you're wormfarming well. Remember worm skin is sensitive – they won't eat citrus, onions or chilli.





WORMS LIKE TO EAT

Fruit and veggie scraps, egg shells, tea bags and coffee grounds. Small amounts of carbohydrates, small amounts of cardboard and hair.

WORMS DON'T LIKE TO EAT

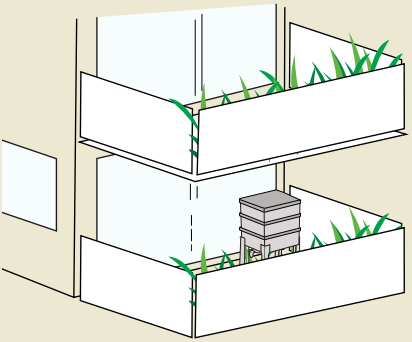
Citrus fruit, onion, garlic, chilli, (tiny bits in leftover food is ok), dairy products, meat (and bones), fish and tofu.

The perfect spot

Wormfarms can be kept inside or outside. The best place is somewhere with convenient access outside, but under cover to avoid getting too wet or too much sun.

Avoid direct sun in summer – the worms will die if they get too hot. You may need to pour water over the worms occasionally, especially in summer to make sure they are not too hot or drying out.

If you don't have shelter you can still keep a wormfarm, you will just need to be mindful it doesn't fill up with water or get too hot.



Setting up your wormfarm

There are different ways to wormfarm – whatever works for you is right. Here is one way to set up your wormfarm and manage the trays.

THE WORMFARM

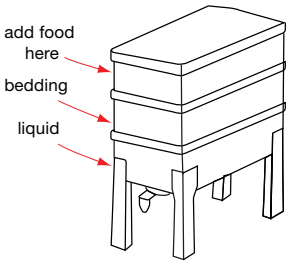
Consists of two to three layers. Liquid collects in the bottom layer, the middle layer is for bedding and the worms start here. The top layer is added later and the worms are fed here.

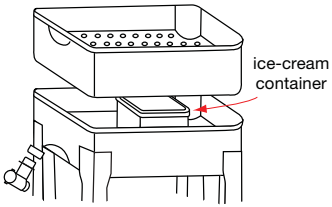
ATTACH THE LEGS, ADD THE TAP AND A CONTAINER

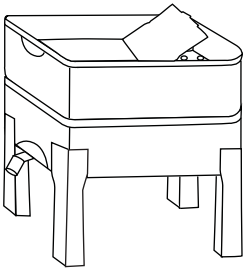
Take the bottom layer and clip on the legs. Screw in the tap with the washer on the inside. Place a container in the bottom layer that touches the next layer so the worms can climb up it.

LINE THE MIDDLE TRAY

The tray with holes in it sits on top of the bottom layer. Line it with newspaper or the cardboard packaging your wormfarm came with.







ADD PRE-SOAKED COCONUT HUSK

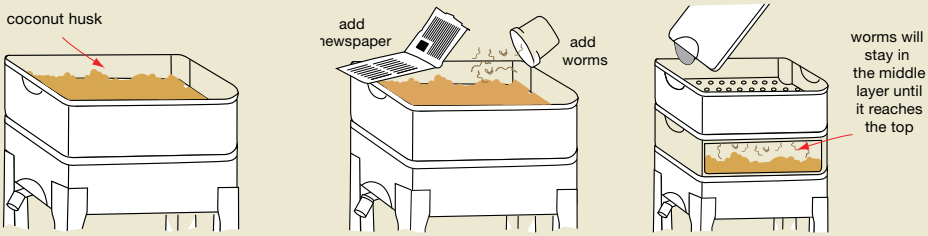
Your wormfarm comes with a coconut husk brick. Soak it in a bucket of water for 30 minutes before you set up. When ready, pour the soaked husk over the cardboard in the middle layer and let it settle.

ADD THE WORMS

Add your worms to the middle layer, cover them with damp newspaper and/or a hessian sack. To feed them later, peel back the newspaper and hessian sack, place the food down and replace the covers.

THE EXTRA LAYER AND LID

The extra layer is not needed until the middle layer fills up. Put it aside or take it on and off each time you feed the worms in the middle layer. Insert the tabs into the slots on the lid before you put it on and place a brick on top.



The worms will be happy settling in for a week or so before you start feeding them small amounts of food.

Worms move between the layers through the holes but they can't jump, so you need to make sure the middle layer touches the top layer before you put food there. When it touches, move your hessian sack or newspaper up to the top layer and continue placing food under it. The worms will start to move up and live in this layer

DID YOU KNOW?

A good way to ensure the worms start breeding quickly is to make sure there is plenty of space for them to live in. You can do this by creating more bedding by adding aged compost or more coconut husk

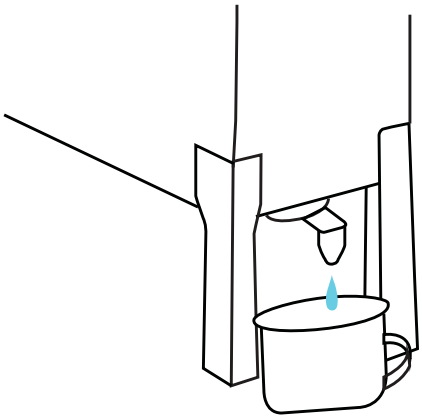
TIPS

Covering the worms with damp newspaper and a hessian sack keeps them moist and helps prevent small flies. You can use an old t-shirt or anything made from natural fibres.

Using the worm produce

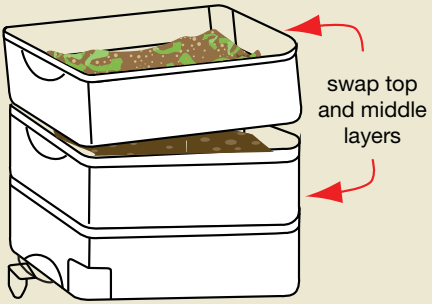
Collecting the liquid

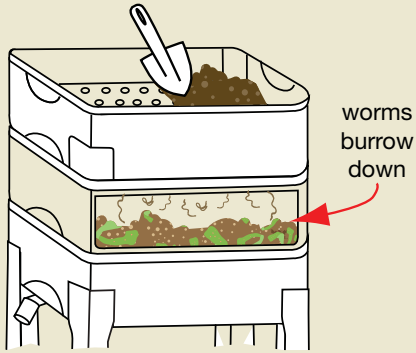
Collect as needed from the tap at the bottom. Use one part liquid ‘worm wee’ to seven parts water, or dilute it until it looks like weak tea. If your wormfarm is not under shelter it’s a good idea to leave the tap open so the bottom tray doesn’t get too full, causing the liquid to rise up and drown the worms.



Diluted liquid can be poured around the roots of your plants or sprayed on to the leaves of plants to encourage plant health.

The worm castings or ‘worm poo’ will build up in the wormfarm in the middle and top layers. This happens slowly and you don’t need to worry about emptying it very often, every six months or so is fine. Otherwise you can harvest it when you want to use it in the garden.





Collecting the solids, step 1

Swap the middle and top layers and leave the lid and covers off for 20 minutes in the sun. The worms will burrow down to avoid the light.

Collecting the solids, step 2

To avoid taking too many worms, slowly scrape off the castings (worm poo) allowing them to burrow deeper. Mix castings with equal amount of soil. Use as potting mix or dig it in around plants, always covering with mulch – castings dry out and become very hard if left out in the sun.

TIPS

You can store worm wee in bottles – remember to label it! When you use it, aerate it by shaking the bottle and mixing with water. Worm castings need to be used once harvested or they will dry out.

Wormfarm problems

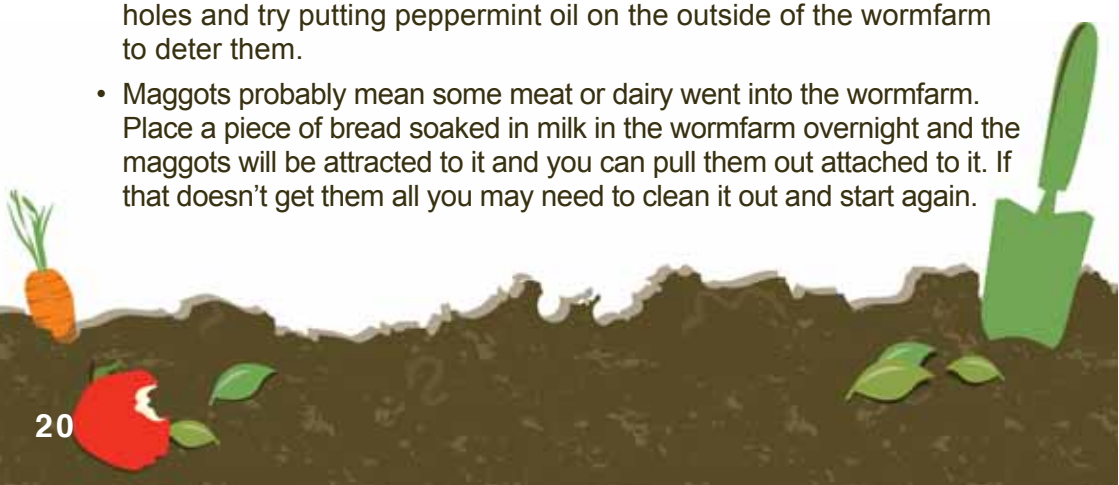
Common wormfarm problems

Wormfarms are easy to look after and shouldn't smell bad or attract pests. If you do have a problem you can try a few things and most likely it will be healthy again within a week.

OTHER CREATURES

Wormfarms aren't just home to worms. You will see lots of other tiny creatures – all part of the system. Spring tails, earwigs, mites and microorganisms (especially bacteria) are some examples. The creatures you don't want in there are rats and mice, cockroaches and maggots.

- Ants or cockroaches probably mean your wormfarm is too dry. Gently pour water over it, then find ways of keeping moisture levels up in the long run eg. use a spray bottle each time you visit, add water or drink scraps to the food scrap bucket before emptying, or move the wormfarm to a cooler, wind-protected place.
- Put the legs of the wormfarm in jars of water to prevent ants and cockroaches crawling in. A drop of oil in each jar will prevent mosquitoes breeding.
- Mixing the food in the wormfarm and lifting the trays up and down to disturb it regularly can also reduce cockroaches.
- A brick or heavy object on the lid should prevent rats and mice getting in. If you do have a problem, stop feeding the worms for a week and just put damp newspaper in. Check there are no gaps or holes and try putting peppermint oil on the outside of the wormfarm to deter them.
- Maggots probably mean some meat or dairy went into the wormfarm. Place a piece of bread soaked in milk in the wormfarm overnight and the maggots will be attracted to it and you can pull them out attached to it. If that doesn't get them all you may need to clean it out and start again.



FRUIT FLIES

These tiny little flies are common near fruit in summer and are actually vinegar flies. While not particularly harmful, they are annoying. It's hard to stop them in summer especially if they are already in your house. There are a few things to try:

- Keep your fruit in the fridge.
- Keep all surfaces in the kitchen clean, especially your bin where you put your food scraps. Also, keep the outside of your wormfarm clean.
- Make sure you have plenty of newspaper and a hessian sack covering the food in the wormfarm.
- Dig the food scraps into the worm farm so they are not on the surface and the worms will eat them faster.
- Make a fruit fly trap. With a skewer, poke some holes through the lid of a bottle. Put some old wine in the bottle and replace lid. Place next to your wormfarm and repeat the process when the wine is full of dead flies.

SMELLS

If your wormfarm smells bad it is not functioning well. You could have maggots or the worms may not be getting through the food. It could also be that it is too wet or acidic.

- Check that there are still lots of worms living, if not, add more.
- If the wormfarm appears soggy, add shredded newspaper and spread it through. Check the bottom drainage layer isn't blocked and the tap is on.
- Stop feeding them for a week or so to give them a chance to eat what's there.

NO OBVIOUS PROBLEMS BUT THE WORMS AREN'T EATING MUCH

- Be patient, worms breed every six weeks and need time to build up the population. Only increase their food intake very gradually.
- Cut food scraps smaller, and read the section on reducing food waste on the next page.
- Worms won't eat mouldy food. Pull it out and throw it away.
- Try adding more worms and another layer to your wormfarm. If they still aren't getting through all your scraps after more than three months, you probably need a second wormfarm or compost bin as well.

Avoiding food waste?

Impacts of food waste

One-fifth of all food bought in Australia is thrown away – an enormous waste of money, energy, water and resources needed to produce the food.

The average garbage bin in Sydney's eastern suburbs is 40% food waste.

Food waste can be thought of as avoidable and unavoidable.

Unavoidable food waste such as peelings and inedible parts of fruit and veg, meat scraps etc can usually be composted.

Avoidable waste is food that's been thrown away because it's spoilt, rotten or just not wanted. Visit **www.lovefoodhatewaste.nsw.gov.au** for tips on cutting down avoidable food waste.

By cutting out avoidable food waste you're significantly lessening your environmental impact.

By composting or wormfarming what you can of your unavoidable food waste, you're keeping it in the food cycle, avoiding the serious environmental impacts of food waste going to landfill.

IMPACTS OF THROWING OUT FOOD

Garbage has to be collected by trucks to take to landfill, with the transport causing its own environmental impact.

- Landfill is anaerobic (no air) and the food waste breaks down anaerobically creating methane, a greenhouse gas which contributes to climate change.
- The food waste mixes with other waste to create acid leachate which can poison groundwater.
- The food waste is lost as a source of nutrients to put back into the food cycle.

For more information
email **info@reduceyourfootprint.com.au**
or call **9369 8112**

To find out more about the Compost Revolution project or to have your sustainability questions answered, visit **www.reduceyourfootprint.com.au**

You can also do an online tutorial and quiz at **www.compostrevolution.com.au**

The Compost Revolution is a collaboration between Waverley, Randwick and Woollahra councils, with funding from the NSW Environmental Trust.

Woollahra Municipal Council

Randwick City Council
a sense of community

Waverley Council

NSW Environmental TRUST