



# A guide to composting

**Natures Recycling System**



## What is compost?

Compost is a mixture of decomposed organic material and is used as a rich soil fertiliser.

Composting is a process which mimics nature by recycling organic material. It needs the right combination of ingredients and sufficient time for everything to break down completely before the compost is ready. Generally, the ingredients used to make compost come from our gardens and kitchens (food scraps), although organic material is anything that was once living.

Your household produces an enormous amount of waste each year that could be composted. Having a compost bin, worm farm or a bokashi in your backyard is a great way to reduce the amount of organic waste you send to the landfill each week, as well as returning valuable nutrients back into the soil.

Three main types of composting are shown in the table below.

Compost type	Input materials	How materials compost
Conventional composting	Most food and garden waste	Moisture+ air + heat + microbes
Worm farming	Most food waste	Tiger worms + air + moisture
Bokashi	All food waste	Effective organisms + no air + moisture

**Every year Kiwis throw away more than three million tonnes of rubbish and 45% of it is food waste which is compostable!**

## Why Compost

- Compost is a natural fertiliser and soil conditioner. It returns organic matter to the soil, improves soil fertility, aeration, texture and reduces the need for chemicals
- Composting reduces the amount of organic material entering landfills each year
- Composting saves rubbish collection costs – saving money
- Composting is easy, there are a variety of systems to choose from depending upon your lifestyle
- Compost helps maintain water retention in the soil, reducing the amount of watering needed during summer and dry periods

## Conventional compost getting started

- Conventional compost is a process of decomposition
- You can either buy a ready made compost bin or make one yourself. If you are making one, remember to leave room between the slats for air circulation. A 1x1 metre compost bin is a good size to start with
- Compost bins should be bottomless and placed on bare flat ground in a sunny situation. They work best in a warm, moist location. You can attach chicken wire to the bottom to keep out rodents!
- Begin with a bottom layer of coarse plant material such as twigs, followed by alternate layers of garden waste and food scraps sometimes known as '**greens and browns**'

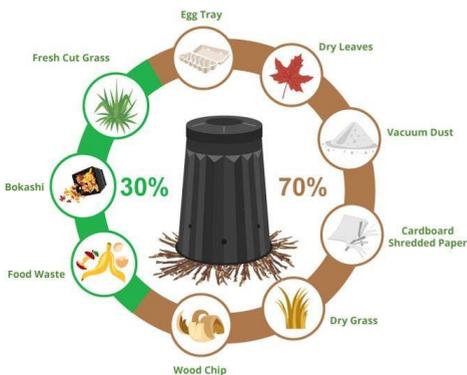


Adding a thin layer of soil occasionally will encourage microbes, earthworms and other helpful organisms which will speed up the decomposition process

## What to include in your compost bin

You will need a variety of materials which can be found naturally in your garden or come from the kitchen. These are the **'Greens and Browns,'** also referred to as the **Carbon/Nitrogen ratio**.

- **Greens** – are nitrogen rich waste products such as food scraps, fruit peels, coffee grounds, tea bags, grass clippings, horse manure, weeds, blood and bone, seaweed, fish scraps and aged chicken manure
- **Browns** - are high in carbon and help aerate the compost. They include dried leaves, sawdust, wood shavings, hay, peat, shredded paper, eggshells, pine needles and wood ash (untreated)



Browns
Greens
Browns
Greens: Veg Scraps, Manure, Grass Clippings, Worm Casings, Hay, Compost, Coffee Grounds
Browns: Straw, Fall Leaves, Shredded Paper, Pine Needles, Wood Chips
Wet Sheets of Cardboard or Newspaper
Soil Amendments: Gypsum, Peat Moss, Bone Meal, Blood Meal, Coconut Coir, Rock Dust, etc.

### **What are greens and browns?**

*Greens are organic materials that were recently alive and they tend to decay quickly Browns are organic materials that have been dead for a while. They are stable and break down slowly.*

## What to avoid putting in your compost bin

- Meat, grease, fat, dairy products and large bones (These will attract rodents and dogs)
- Food packaging, plastics, and other non-biodegradable items
- Weed seeds and pest plants such as kikuyu grass stems
- Cat and dog faeces (they may contain parasites you would not want to put into your garden)
- Large amounts of citrus and onion peel
- Glossy or coated paper
- Coal ash
- Sawdust from treated wood (contains toxic compounds)
- Pesticides and synthetic fertilisers

## Speeding up the process

- The smaller the pieces of food and garden waste are the faster they will decompose
- Ensure you have a lid or cover on your compost bin
- Keep the bin moist. Not too dry and not too wet (like a wrung-out sponge is ideal)
- Turn your heap every few months to mix up ingredients and keep it aerated.
- Heat speeds up the decomposition process and destroys most weeds and seeds, so if at first it doesn't heat up, try adding more green material, manure or a bit of blood and bone
- Composting slows down in winter as temperatures drop – try insulating with a layer of plastic to keep it warm and active

## The finished product

Ideally the finished product should look like potting mix – a sweet smelling dark crumbly material without any sign of the original ingredients.

## Trouble shooting

Problem	Cause	Solution
<b>Smelly, slimy heap</b>	Not enough air Too wet	Turn the heap Add ' <b>browns</b> '
<b>Materials are not decomposing</b>	Compost heap may be too small	Increase the size of the heap
	Not enough heat due to lack of green materials or water	Add <b>greens</b>
	Materials in the heap are too large	Break material down into smaller pieces
<b>Pests are attracted to the compost heap</b>	The wrong food has been added	Don't use meat/bones/fish
		Bury food scraps in the centre of the heap
	Bin is not rodent proof	Rodent proof your bin
<b>Fruit flies</b>	Heap is too acidic	Sprinkle lime on heap
<b>Ants</b>	Heap is too dry	Add water and lime

## Composting invasive weeds

Many much loved plants are invasive weeds (wandering Jew, ladder fern, agapanthus, Mexican daisy) and it is important to control them. It is possible to compost invasive weeds but it is essential that they first go through a '*pre-compost*' process to ensure that they die.

You could try:

- Putting the weeds onto a large black plastic bag with a handful of soil and water. Leave it in a sunny spot for at least two months until there are no green shoots or other signs of life
- Put them into a closed bin and cover them with water. Leave them for 2-3 months by which time the water will turn a green/brown colour

## Worm farming

Compost can be made by using a worm farm. Vermicomposting, vermiculture, worm bins, or a wormery are all forms of worm farming. It is a self-contained composting system that doesn't generate heat and retains most of the nutrients for reuse. This system is not able to take invasive weeds or their seeds. However, it is a compact and moveable system and



ideal for households with limited space. Properly maintained it is odourless and the worm castings and worm tea make excellent compost and liquid fertiliser.

Usually tiger worms are used in New Zealand. They are not the same as earthworms found in the garden soil. Tiger worms will not survive in a garden situation as they are shallow dwelling creatures living under a small layer of nutrient rich decomposing material.

## Benefits of worm farming - *it's simple, natural and fun!*

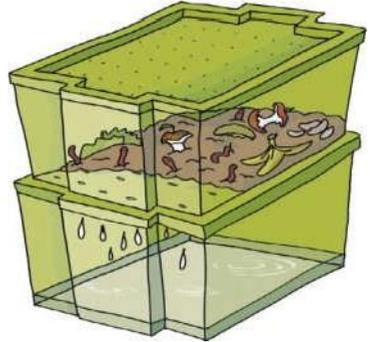
- Worms eat your kitchen food scraps and process them into castings (or compost). This reduces the rubbish you put out each week and makes an excellent soil fertiliser
- Worm tea is the liquid waste the worms produce which is also a great liquid fertiliser
- It is a great system for people with limited space
- It's an easy and fun way for people of all ages to recycle kitchen waste



## Getting started

Anyone can start a worm farm. All you need is a suitable location, container, bedding material, food scraps and worms.

- Choose a cool shady site, sheltered from the sun, wind and rain. Carports or sheltered porches are ideal
- Place moist bedding (shredded paper, coconut fibre or similar), a few hand fills of top soil and/or sand. Add tiger worms (250 grams or 1000 worms)
- Bury kitchen scraps just below the surface of the bedding
- Worms can eat their own weight each day but don't overfeed them at the start
- Tiger worms need air and moisture but not light



## Keeping your worm farm going

Worms need a moist environment, check regularly and add water if needed. Add dry leaves or torn paper if it is too wet. The working area should be like a wrung-out sponge.

Add food scraps regularly. Smaller pieces (less than 2cm) will be eaten more quickly and help prevent odours.

Worms cannot tolerate very hot or very cold conditions. Optimum temperature range is 10-30 degrees Celsius.

Small flies or white worms indicate the worm farm has become too acidic and you need to add a sprinkling of lime or crushed egg shells to neutralise the pH.

## What to feed your worms

Worms are omnivores and will eat almost anything, but some things are best avoided (see below).

Likes	Dislikes
Most fruit and vegetable scraps Fruit and vege pulp	Citrus, acidic fruit skin Spicy foods, onion, garlic, leeks, chilli
Cooked food Tea leaves, tea bags, coffee grounds	Plastic, tinfoil and shiny paper
Crushed eggshells	Meat and dairy products (these will smell and attract rodents and maggots)
Hair, vacuum cleaner dust, soiled paper, tissues, handy towels, shredded egg cartons, toilet roll inners, paper lunch wrap	Too much bread, pasta, grains and processed wheat products (they will just attract rodents)
Shredded cardboard and paper Lawn clippings (small amounts are best so they do not heat up and kill worms)	Fats and oils Pineapple (it contains an enzyme that can kill worms)
Garden pruning's, dirt and leaves Untreated sawdust and wood ash	Toxic house plants Salted or pickled food
Horse, cow or sheep manure	Cat and dog droppings

***If worms are overfed, uneaten food will rot***

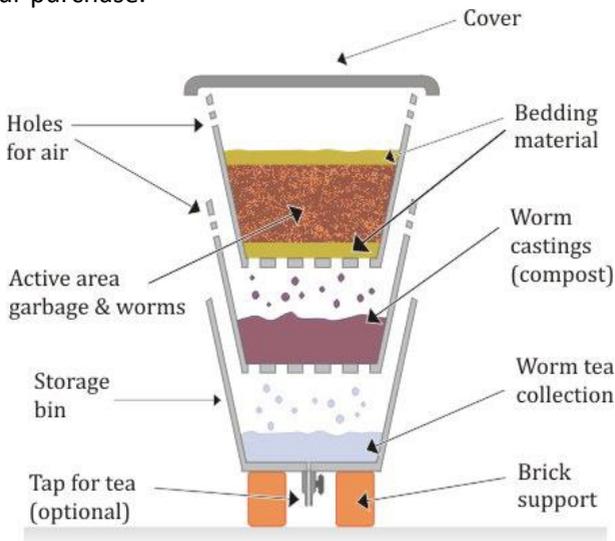
## Where to source your worms and worm farms

Readymade worm farms are available from **EcoSolutions**, The Warehouse, Payless Plastics, Mitre 10 and on line. Alternatively, you can make your own out of old tires, bathtubs or a variety of other used materials.

There are different types of worm bins but most generally have two or three layers. Some bins can have extra layers added to increase capacity. It is easier to harvest worm compost from bins with shallow layers.

Worms and food scraps are added to the top working tray which generally has a vented lid.

Size, price and functionality vary a lot, so ask questions and research before you make your purchase.



Tiger worms are available from EcoSolutions. Alternatively ask someone with an established worm farm if they have any they can spare any. Tiger worms can also be sourced by ordering via the internet.

## Harvesting worm compost

After three to four months your worm castings or compost will be ready to harvest and feed to your plants.

The worm castings (compost) are ready when it is dark and looks like fine compost and there are very few worms to be seen.

Depending on your style of farm remove the top 150mm layer and set it aside for starting the next bin. The remaining contents can then be removed for either immediate use or stored until required.



Put the top layer back into the bin with some fresh bedding to start the process again.

You may prefer to move the finished compost over to one side of the bin (easier to do in a larger bin such as an old bath tub), place fresh bedding into the space created and add food waste to the new bedding only.

The worms will gradually migrate over to the new bedding and food source.

Top up the bin with fresh bedding to replace the removed compost. The worms require bedding in which to live and lay their eggs.

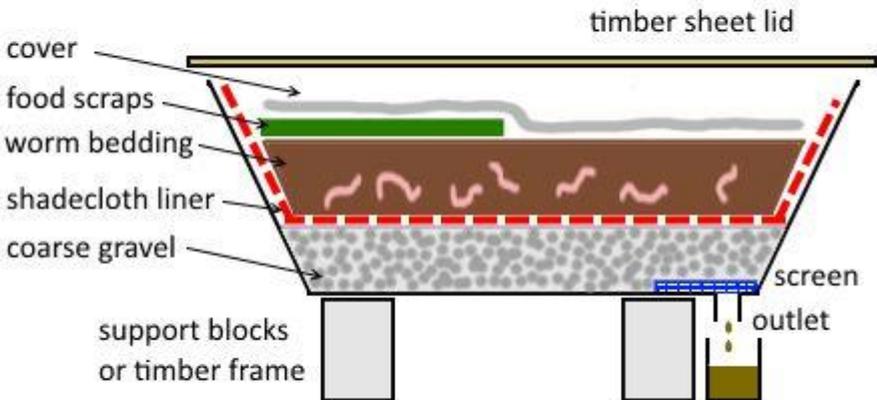


## Make your own worm farm

You can easily make a worm farm out of large buckets, fish bins, polystyrene trays or an old bath. What you choose will depend on your circumstances, how much food waste you generate, how much time you have and how much you love gardening.

If you use an old bath be sure to remove the plug. If you want to you could build a frame to allow the bath to sit securely at waist height. Bricks, posts or blocks may be used for elevation drainage and stability. A height of about 100-150 mm allows room for the liquid collection container to be placed beneath the plug outlet. A fall of 5-10cm will ensure correct drainage.

Bath Tub Worm Farm



## Bokashi

What is Bokashi?

Bokashi was developed in Japan and literally means '*fermented organic matter*.' A fermented wheat-bran mixture called *Compost-Zing* is used in a bucket system where food is pickled. The final product has a slightly sweet/sour smell.

### The system

The bokashi bucket system consists of a few simple elements. A two-bucket system with one nested on top of the other. The top bucket has a tight-fitting lid and holes in its base to drain to the lower bucket. The '*Compost-Zing*' which is made from wheat bran, untreated sawdust soaked in molasses, water and effective microorganisms, is sprinkled over each layer of food scraps. You can make your own Bokashi system but be sure it is air tight. Clean old paint buckets with holes drilled in the base of the top bucket work well.



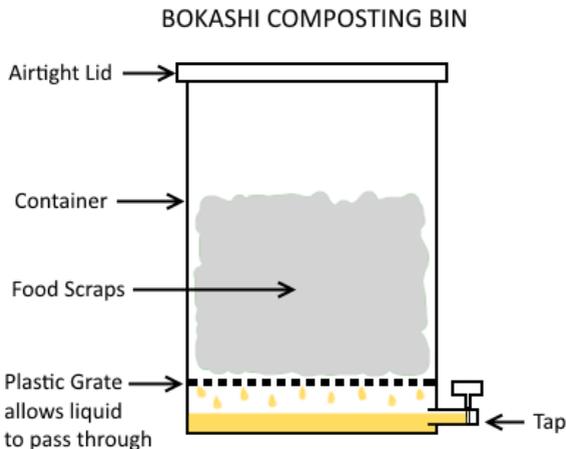
### Benefits of Bokashi

- You can add products such as meat and fish, which are discouraged in the usual compost due to vermin and odours
- Once dug into the soil or added to your compost it helps your food waste break down rapidly releasing the nutrients within 2-4 weeks
- Buckets can be kept indoors as the smell is inoffensive and the buckets are air-tight
- It keeps food waste out of the landfill and improves helpful microbial activity in the soil
- The bokashi method of composting is suitable for apartment dwellers, people with limited outdoor space, offices, schools, restaurants and anyone who wants to reuse their food scraps

## Getting started

Sprinkle a layer of Compost-zing in the base of the bucket (1 tablespoon)  
Add a layer of food scraps (approx. 2 litre ice cream container full) and then sprinkle another layer of Zing. Press firmly to exclude air and compress.

- The system is working well if there is a sweet pickle smell and the food isn't decomposing
- Start the second bin while the first full one is set aside to process for 10-14 days
- Only use food waste that is reasonably dry and don't use liquids
- The microorganisms will extract liquid from the food and this drains into the lower chamber through the holes
- The liquid is full of nutrients and can be diluted 1/100 to use as a liquid fertiliser



## What to put in your Bokashi compost system

yes	No
Fresh fruit and vegetables	Bones and seafood shells
Prepared foods	Paper
Cooked and uncooked meat and fish	Plastics and tin foil
Cheese and eggs	Grass clippings
Coffee grinds and tea bags	liquids

## Important points to remember

- Use only fresh food waste, don't allow it to decompose first
- Remove the bokashi juice from the lower container every 2-3 days
- You can plant over the processed bokashi after a week, or add it to a compost heap
- Nutritional value of the food waste is retained as there is no heating in the bins and methane is produced
- A bag of Compost Zing lasts about 8-10 weeks



# Start Composting Today!



**TIP:**  
A container in your kitchen saves running outside too frequently.

Up to 30% of an average household's waste is organic and can be turned into compost.

**The Right Mix**  
Ideally mix 1 part grass to 2 parts brown matter (dead leaves, twigs, cardboard)



Ideally...

...position your compost bin...

...in a sunny position on bare soil.

You'll have a supply of compost within a year from bin.

## FACT:

A rich dark colour means the compost is ready to use



## Good

### From the house:

- Old flowers - Teabags

- Cardboard - old toilet roll tubes, egg boxes, cereal boxes

- Vegetables peelings, scraps of fruit and salad leaves

### From the garden:

- Grass cuttings

- Leaves

- Comfrey leaves these help speed up the composting process

- Twigs limit the size of these as large twigs will slow down the composting process

- Old plants and any leaves or stems you may have removed - eg. Rhubarb leaves



## Avoid

- Citrus fruit peelings

- Leftover meat and fish

- Diseased plants and Perennial weeds

- Corn on the cob and broccoli stems

- Dairy products

- Dog muck and cat litter

- Egg shells - these attract vermin



141a Cameron St

Whangarei

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