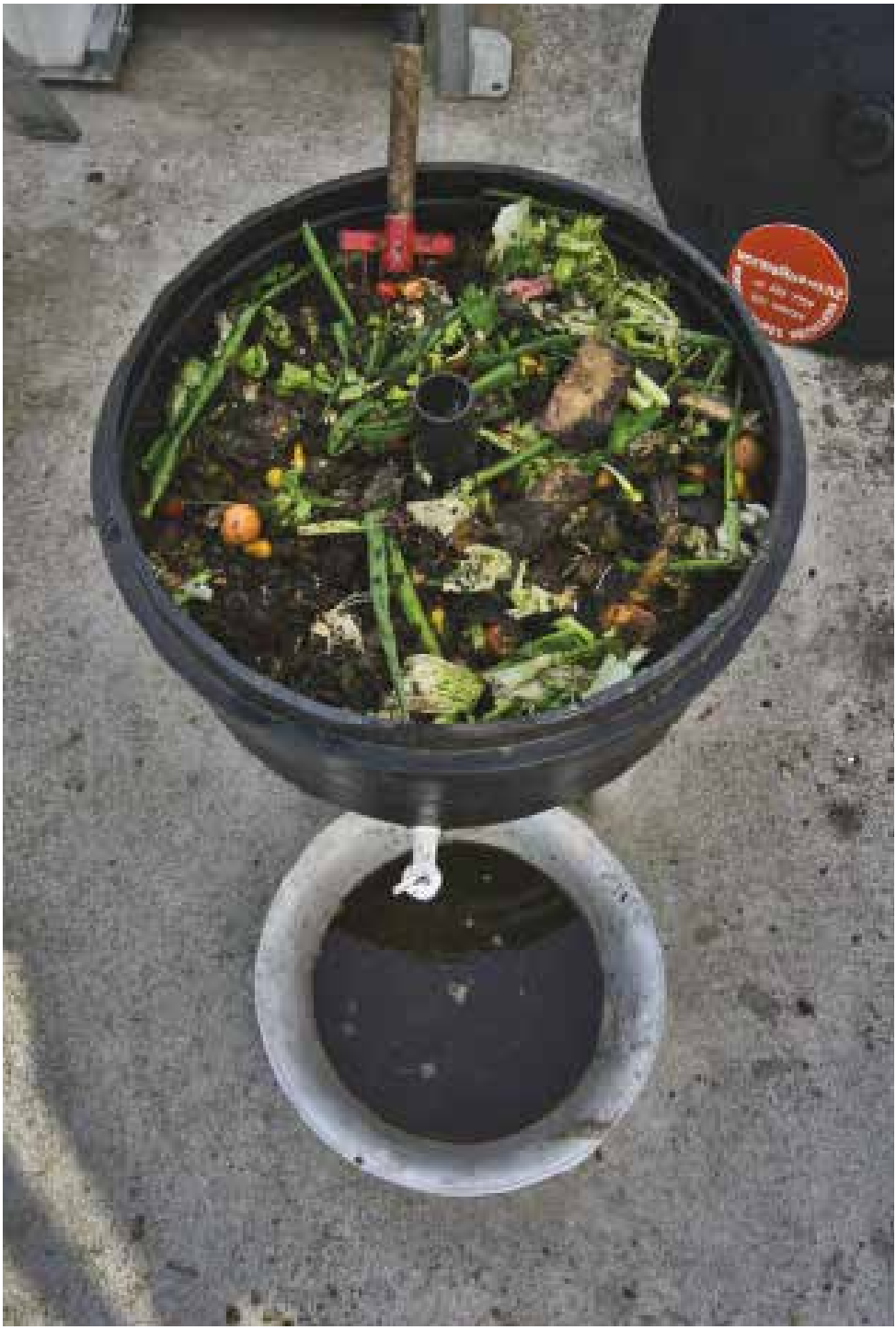
Composting - a ‘how to’ guide
Mahi wairākau - he aratohu

whakatane.govt.nz

WHAKATĀNE District Council
Kia Whakatāne au i ahau



Contents
Rārangi upoko

Introduction
Kupu arataki

What is compost?
He aha te wairākau?

Compost is a mixture of organic material and is used as fertiliser. Generally, the ingredients used to make compost come from our gardens and kitchens (food scraps), although organic material is anything that was once living.

Compost results from the eventual decomposition or break down of the ingredients. It can take anywhere between two and 18 months before compost is ready to use. The length of time is governed by the method employed, what gets put into the bin, the time of year and how often the material is turned.

What is composting?
He aha te mahi wairākau?

Composting is a process that mimics nature by recycling organic material.

Composting is like baking a cake. It needs the right combination of ingredients and sufficient time for everything to 'cook' i.e. break down completely – before the compost is ready. Materials that are only partly composted can harm plant life.

As the organic material breaks down, it changes and becomes what is known as humus. During the process, soil micro-organisms, worms and insects convert the organics into a soil-like material that can then be used in the garden.

There are several ways to compost; however, the focus here is on three methods that are most common and effective – using heaps and/or bins, worm farms and Bokashi.

The benefits
Ngā huanga

- Compost produces a valuable humus that returns organic matter to the soil.
- It reduces the harmful effects of organic waste in landfill (e.g. water pollution, emissions of the potent greenhouse gas methane and bad smells).
- It reduces the need for chemical fertilisers in your garden.
- It reduces rubbish collection costs.
- Producing your own compost saves money.
- It reduces the space needed for landfills.

Composting
Mahi wairākau

Getting started
Hei tīmatanga

- Choose a site with care. Ideally, it should be warm and sheltered.
- Consider neighbours by siting the heap or bin away from any areas that are too close and could cause offence.
- To work properly, your compost heap should be at least 1m high x 1m wide x 1m deep.
- Start with a layer of coarsely chopped twiggy woody material on bare soil or grass.
- Add alternate layers of green matter (nitrogen rich) and brown matter (carbon rich) preferably in layers no more than 5-10cm deep – see list on page 5.
- Limit all materials, including grass clippings, to thin layers.
- If you can't be bothered layering, just make sure there is a mixture of green and brown matter.
- Avoid cat/dog/human faeces, meat, fish, bones, oil and invasive weeds.
- Smaller pieces make quicker compost – for quick compost, fibrous materials should be no bigger than the thickness of your finger (2cm).
- The heap should have a cover, e.g. plastic lid, underfelt, tarpaulin.
- Be aware that it is difficult to manage rodents if a compost heap is used.
- Rodents can be kept out by cutting out a piece of chicken wire larger than the bin base. Place it underneath the bin on the soil and fold the edges 10cm up the sides of the bin.

When adding food scraps, it's especially useful to add an equal quantity of brown material (such as dry leaves) to reduce odours.

Keeping it going
He rite tonu te mahi

- Compost activators or accelerators can be added to the compost to hasten the natural break-down process.
- They usually contain a natural nitrogen or bacterial enzyme and can be bought at most garden centres.
- Sprinkling on lime and untreated wood wash can help balance pH and reduce smells.
- The heap should be as moist as a wrung out sponge. Add water if needed.
- Avoid excessive moisture by keeping the heap covered.
- To work properly, your compost heap needs to reach temperatures between 30 and 60°C. From time to time, check that it is heating up in the centre; it should feel warm.
- Compost needs air – turn and mix it up to aerate and speed up decomposition.

The final touches
Hei mahi whakamutunga

- Once an open heap is one metre in height, you should finish it by turning it with a pitchfork and mixing it up every week or two.
- Either use a new bin for the new heap, or use your original bin and just keep the old heap covered with underfelt, tarpaulin or something similar.
- Compost is ready when it becomes a sweet, dark, crumbly material and you cannot distinguish the original materials in it.
- If compost is well-maintained and turned often, it can be ready in as little as six to eight weeks. If it is never turned, it will be ready in 12-18 months.
- When it's ready, put it onto the soil or dig it into your garden. You can also use it for pot plants and for potting up seedlings.
- Don't forget to wash your hands when you've finished composting and gardening!

Green and brown matter
Ngā momo whaipara

Green - Nitrogen rich, wet	Brown - Carbon rich, dry
Food scraps	Torn newspaper/cardboard
Manure	Egg cartons
Fresh grass clippings	Tree prunings
Weeds without seeds	Dry leaves
Vegetable scraps	Bark, untreated sawdust
Seaweed	Wood ash
Tea leaves	Twigs and sticks
Coffee grounds	Crushed shells

What not to compost
Kaua e whakawairākau i ēnei mea

Although in theory anything organic can be composted, some things are best avoided when composting at home.

Material	Reason
Cat and dog faeces	Can cause disease
Meat, fish, oil, bones, fat	Can attract rats
Non-organics e.g. tin, glass, plastics	Won't break down
Invasive weeds, e.g. kikuyu, wandering willy, jasmine	Could spread in or beyond your garden – however they can be composted after treatment (see page 7)
Large amounts of pine needles or gum leaves	Allopathic - create environment hostile to compost creatures
Woody materials in pieces larger than the diameter of your finger	Too slow to break down
Diseased plants (e.g. with blight)	Disease may spread
Bamboo, flax and cabbage tree leaves	Not suitable for composting and not taken by composting companies (bury in the ground, or take to a resource recovery centre for landfilling)

Common composting problems
Ētahi raru wairākau

Problem	Cause	Solution
Smelly, slimy heap	Not enough air	Turn heap
	Too wet	Add brown material (e.g. dry leaves)
	Too much nitrogen	Add brown material
Materials are not decomposing	Heap too small	Increase size of heap
	Not enough heat due to lack of green materials or water	Add green materials (e.g. manure or blood and bone) and water
	Materials in heap are too large	Break materials down into small pieces
Pests attracted to heap e.g. flies, cockroaches, rats, mice	Wrong food added	Don't use meat/bones/fish Bury food scraps in centre of heap
	Bin not rodent proof	Rodent proof your bin
Fruit flies (vinegar flies)	Heap is too acidic	Sprinkle lime on heap
Ants	Heap is too dry	Add water and lime
Other 'mini-beasts' e.g. beetles, worms	This is not a problem – creatures are essential to the composting process	Appreciate the work they do!

Invasive weeds
Ngā otaota urutomo

It can be difficult for people to accept that well-loved plants like honeysuckle and Mexican daisy are deemed to be pests, but it is essential to control them. Plants like ginger, jasmine and privet can cause serious harm to our native environment and others can threaten the livelihoods of producers of commercial crops.

To find out more and to identify invasive weeds, visit:

- doc.govt.nz
- weedbusters.org.nz
- boprc.govt.nz/environment/pests/pest-plants/

Composting invasive weeds

It is possible to compost invasive weeds; however, it is essential that they first go through a 'pre-compost' process to ensure that they die.

- Put the weeds in a large plastic bag with a handful of soil and water.
- Tie the top and leave for at least two months, until there are no green shoots or other signs of life.
- Add them to your compost heap as a green.

If you leave them for long enough, they will turn into soil.

There is also another way to handle noxious weeds.

- Put them into a closed bin and cover them with water (or submerge them in a sack).
- Leave for two to three months by which time the water will turn a green/brown colour but it can be used as fertiliser for your plants.
- Empty the solids into your compost bin.

Types of compost bins
Ngā momo ipu wairākau

Before you choose a compost bin, you should consider what you will be putting in it. Larger, open bins are better for people with large amounts of garden waste. Smaller, enclosed bins are more suitable for households with large quantities of food waste as they provide a barrier to rodents. You may find you need both!

Choosing a bin

There are a number of points to consider before you buy a bin so that you get one appropriate for your needs. These are:

- the number of people in your home
- the size of your garden
- the capacity of the bin, taking the above into consideration
- your ability to turn compost with a garden fork
- the bin design (i.e. whether different parts need be lifted)
- materials used in the making of the bin (e.g. some are made of recycled plastic)
- whether the bin is made locally.

If it's hard on your back, your back needs to be up to it!

Buying a bin

There is a range of commercial compost bins that vary in size and complexity. With regard to size, a medium-sized compost bin (240 litres) should cope with all the kitchen waste and garden waste of two to four people.

Worm bins are especially suitable for households with limited outdoor space and are designed to process kitchen waste, not garden waste – see *Worm farming* on page 10.

Bins are usually available from hardware and garden stores, and range in price from $40 to $220. Generally speaking, bins that require less turning are more expensive.

While larger bins are obviously more suitable for larger households, bins may not vary significantly in performance. The most important thing is knowing how to manage your bin so that you make good compost.

TIP! Make sure you get all your questions answered by the retailer or manufacturer before purchase and check whether there is any further support available once you've bought the bin. Make sure the bin is manageable for you.

Make your own compost bin

If you are making your own bin, you can use a wide range of material, including chicken wire, wood, plywood, bricks, concrete blocks, etc. It must be on the soil and no smaller than 1m high x 1m wide x 1m deep and no larger than $5m^3$.

For large amounts of garden waste, units can be made from wood, bricks or concrete blocks. Ready access from the front is necessary.

Stacking bins have the advantage of being moveable and can be extended to cope with large amounts of waste. Black polythene or sacks may be used for lining, warmth and moisture control. Wrap netting frame around wooden stakes. Line these with newspaper or cardboard to retain heat.

There are plenty of designs online for building your own compost bins. You can also reuse old wooden or timber for this saving them going to landfill.

Worm farming
Pāmu noke

What is worm farming?
He aha te pāmu noke?

Compost can also be produced using worms. This is known as worm farming. It is also called 'vermiculture' or vermicomposting.

Usually tiger worms are used for worm farming in New Zealand, though red worms can also be used. Worm farming uses the same principles as composting, but it does not generate heat, making it cold composting. Value is added to the materials when they are eaten and excreted by the worms. This produces what is called vermicast and worm tea, which have high levels of nitrogen, phosphorous and potassium (NPK) compared to ordinary soil. This makes them valuable for your plants' leaf growth, root and stem strength and flower and fruit set.

The benefits *Ngā huanga*

- Casts and worm tea are fantastic for plants (always dilute the worm tea to the colour of weak tea – usually about 1:10).
- Kids enjoy them.
- If you have mostly kitchen waste and live in a home with little or no outdoor space, a worm farm is a good option.
- Same benefits as page 2.

Getting started
Hei tīmatanga

- Choose a site that is sheltered from sun, wind and rain. Carports or sheltered porches are ideal.
- Use a layer of bedding first – e.g. hay / coconut fibre / shredded cardboard/paper. Bedding should be damp and porous.
- Add worms – 1,000 (250g) is fine; 2,000 is even better.
- Food can then be added. You can cover food scraps with damp newspaper or cardboard to limit flies and odour.
- Worms can eat their own weight each day but don't overfeed at start (e.g. for 250g of worms give about 200g of food).
- Worms need air but not light (worms are photophobic).

Keeping it going
He rite tonu te mahi

- Worms need a moist environment.
- Check that their surroundings are damp, add water if needed.
- Add dry leaves or torn up paper products if it is too wet – the working area should be as damp as a wrung out sponge.
- Add food scraps regularly.
- Smaller pieces (no larger than 2cm) will be eaten more quickly and prevent odours.
- Worms cannot tolerate very hot or cold conditions (10-30°C is OK).
- Small flies or white worms/bugs indicate the worm farm has become too acidic and you should add a sprinkling of lime to neutralise pH.
- Worms are omnivores and will eat almost anything, but some things are best avoided (see below).
- If worms are overfed, uneaten food will rot.

The diet *Ngā whiringa kai*

What worms like	**What worms don't like**
Most fruit and vege scraps	Spicy food, chilli, onion, garlic
Coffee grounds and teabags	Meat and milk products
Aged horse manure	Flour products
Dirty paper	Large amounts of cooked food
Crushed eggshells	Garden waste
Vacuum cleaner dust	Shiny paper
Hair	Citrus / very acidic food

Harvesting your worm casts
Te hauhakenga o ngā wairākau noke

- After a few months or when a layer is full, you should harvest the casts.
- Remove the top layer and take off the bottom layer. This bottom layer contains the casts. It is ready when few worms can be seen.
- Remove worm tea from the bottom level. When using, dilute to the colour of weak tea, usually about 1:10.
- When one working layer is full, you can add another layer to your worm farm.
- Place the new layer on top of the old one and then add bedding (paper/ straw/ manure) and then add more food scraps.
- Add food only to the new layer. The worms will migrate slowly to the food layer.
- If you have large layers in your plastic bin and you want to harvest casts earlier, you could add a layer of chicken wire instead of a new plastic layer.

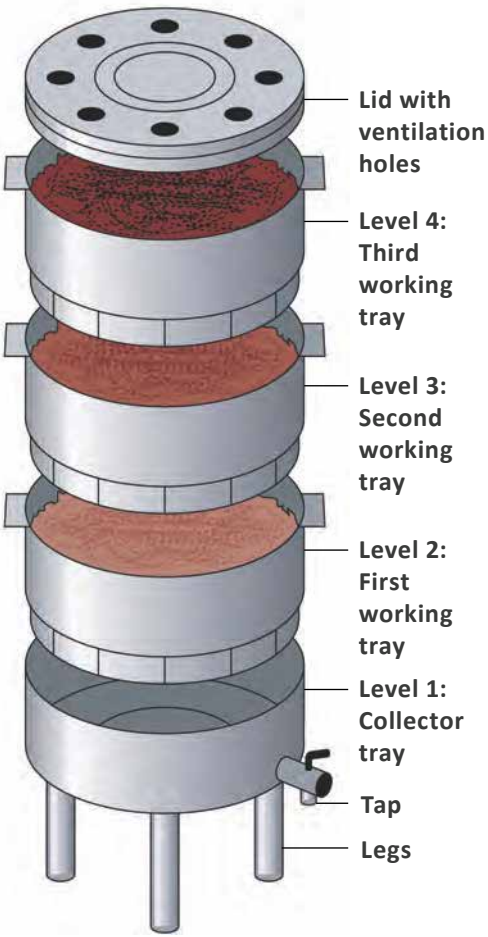
Common worm farming problems
Ētahi raru pāmu noke

Problems	**Cause**	**Solution**
Rotting food	Too much for population	Feed less
Fruit / vinegar flies around farm or small white bugs and worms	Too acidic	Add lime to increase pH
Worms climbing up sides Worms very fat and pale	Too wet	Add paper products and dry leaves, gently fork holes in the working layer
Ants	Too dry or acidic	Add water/lime If your worm farm is on legs, place each leg in a container of water to stop such pests from getting in
Food rotting and not eaten	Too much food / wrong food / pieces too big	Add less food, break into small pieces
No worm tea	Not enough water	Add water

Types of worm farms
Ngā momo pāmu noke

There are different types of worm bins but most have a number of layers. Note that it is easier to harvest worm casts from bins that have more shallow layers. Bins generally have two to three layers; some bins can have extra layers added to increase capacity. When buying a bin, ask the retailer whether there is any back-up if you need advice.

- A tray / layer / stacker system allows for easy removal of worm casts
- Bins with taps allow the worm tea to be extracted easily
- Some bins stand on legs, which can be easier to proof against pests (legs can stand in bowls of water if need be)
- Some bins are made from recycled plastic and made locally
- Sizes vary and costs vary between $20 and $200
- Worms and food scraps are added to the top working tray, which generally has a vented lid
- More levels can be added once the first working tray has filled with worm casts
- A three-tray system allows for easy removal of worm casts with minimal loss of worms
- Size, price and functionality vary a lot, so ask questions and think carefully before you buy!



Bokashi

Composting with Bokashi
Te mahi wairākau i te Bokashi

What is Bokashi?

Bokashi was developed in Japan and literally means ‘fermented organic matter’. Fermented wheat-bran mixture called Compost-Zing is used in a bucket system where food is literally pickled. The final product has a slight 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. In addition, there is a bag of Compost-Zing made from wheat-bran and untreated saw dust that has been mixed with molasses and water and effective micro-organisms. You can make your own system as long as it is air tight. Old paint buckets that have been cleaned out work. Drill holes in the base of the top bucket and sit inside the other one. A good seal is very important.

The benefits

- The benefit of this system is that you can add products such as meat and fish, which are discouraged in the usual compost due to vermin and odours.
- It produces a compost product within two to four weeks after being buried rather than three or more months in a compost pile.
- No space is required as fermentation takes place in the bucket, which makes it ideal for small houses, apartments and schools.
- Buckets can be kept indoors as the smell is inoffensive.
- It keeps food waste out of the landfill and it is good for your plants adding beneficial vitamins to the soil.

Getting started
Hei tīmatanga

- Sprinkle a layer of Compost-Zing in the base of your bucket (one tablespoon).
- Add a layer of food and remember to break it into small pieces. Once you have a layer of about 3cm, add another handful of Compost-Zing. More may be used in summer than winter.
- Push layer down gently to remove any air, as this is an anaerobic process (a potato masher is ideal).
- It is best to minimise opening the bucket to avoid excess air.
- Close the bucket lid tightly. This can be easily removed by pressing down on the centre of the lid.
- Drain any liquid that forms at the bottom of the bucket every three to four days. Dilute as required.
- When the bucket is full, close lid and keep in a warm place for about 10-14 days.
- When the food waste smells like pickles, it is ready to be buried in the garden.
- Plants can be put directly into the soil after 10 days.

Foods you can compost

All food waste that is well-drained, including:

- fresh fruit and vegetables
- prepared foods
- cooked and uncooked meat and fish
- cheese and eggs, coffee grinds, tea leaves
- wilted flowers

DO NOT USE:

- liquids such as milk, orange juice and oils
- paper and plastic wrap and meat bones
- shells from seafood

Stockists

Compost bins and worm farms are available from various outlets including your local garden centre and hardware store.

Worms can also be purchased from the following outlets:

- WormsRus - wormsrus.co.nz
- KoruKai Herb Farm - korukai.co.nz

Alternative options
Ētahi atu kōwhiringa

Garden bag and bin collections
Ngā kohinga pēke me ngā ipu māra

There are many garden bag and bin collection services available nationwide. Many accept invasive weeds as well as ordinary garden waste.

Check in the Yellow Pages under ‘garden bags and bins' to find services in your area.

Garden waste disposal
Te porowhiunga para māra

Resouce recovery centres provide another option for garden waste disposal. Visit the Whakatāne District Council website or call 07 306 0500 for your local resource recovery centre details.

Frequently asked questions
Ngā putuputu pātai

Composting
Mahi wairākau

How will compost help my garden?

Compost feeds the soil, helps with water retention and encourages earthworms into your garden.

What makes my compost smell?

A compost high in nitrogen with no air will become acidic. Add carbon and turn your compost.

How do I stop rodents getting into my compost bin?

Add grass clippings to increase heat and turn regularly. Place chicken wire underneath your bin.

What can and can't go into a compost bin?

Don't put in meat, bread, or heavy unshredded prunings (see 'What not to compost' on page 5).

How long do I have to wait until my compost is ready?

A well-maintained compost bin will produce compost in three to four months in summer and up to six months in winter. However, it can take a shorter or longer time depending on the method, what goes into the bin, time of year and regularity of turning.

Do I need to add water to my compost bin?

If you add to your compost a 50/50 mix of nitrogen, materials that are wet, and carbon materials that are dry, it should be a crumbly consistency.

Frequently asked questions
Ngā putuputu pātai

Worm farming
Pāmu noke

How many worms do you need to start a worm bin?

1,000 is OK, but a bin takes some time to get going; 2,000 worms (500g) will get a worm bin working much more quickly and efficiently.

What food can and can't go into a worm bin?

Worms like a diet of fruit and vegetables with 30 percent of their diet being carbon. Carbon material can be provided in the form of scrunched up envelopes, handee towels, tissues, shredded paper; any paper that's not shiny and coloured or has a plastic film coating is OK. Worms don't like citrus, bread, meat, onions, garlic, excess kiwifruit or large amounts of grass and leaves.

What do I do if there are lots of fruit flies?

Add a decent sprinkling of lime and wait a day or two. If you stiil have flies in your bin, add more lime and carbon material (e.g. paper or dried leaves).

Do I need to lime my worm bin?

A small handful of lime or gypsum once a month helps to keep the food sweet.

What do I do if I go on holiday?

Add to the bin as follows:

- One to two weeks, empty out your fridge of any fruit and vegetables
- Two to three weeks, dried grass or coconut fibre from garden centre or worm grower
- Four plus weeks, coconut fibre block from garden centre or worm grower

How much do I dilute the worm 'tea'?

Worm tea is very high in nitrogen and needs to be watered down to about 1:10, or so it's the colour of weak tea. The liquid is so rich that it can be harmful if not diluted.

What can I do with the worm casts?

Worms casts can be mixed with potting mix, seed raising mix and compost (about 20% casts to 80% mix), and is the perfect medium into which to plant seedlings, plants and trees. Casts do not have to be diluted for use in the garden, but make sure they are tilled into the soil. For best results, add compost and mulch as soil cover.

Frequently asked questions
Ngā putuputu pātai

Bokashi

Where is the best place to keep my bucket?

Out of the direct sunlight but in a warm place e.g. hot water cupboard or laundry.

What are the signs of good fermentation?

- Juice production
- A sweet vinegar smell
- Presence of white fungal threads

How long will a bag of Compost-Zing last me?

The average family uses a bag every eight to 10 weeks.

Can I use the bucket juice?

Yes, it should be drained every two to three days and used immediately. For direct soil applications, dilute with water 1:100, for foliar applications dilute 1:1000 or pour neat solutions to clean drains.

How deep should I bury my fermented waste in the garden?

Dig a shallow trench about 30cm deep. Place food waste in trench and mix in some soil. Cover over with remaining soil. You can plant over the waste after 7-10 days.

Information in this booklet was originally published in ‘Composting - a ‘how to’ guide’

The ‘Composting - a ‘how to guide’ was written with help from the Kaipatiki Project, Auckland, with WormsRus for providing information from its website.

The following councils were also involved in publishing the original brochure:

- Te Kaunihera o Manukau City Council
- Auckland City Council
- North Shore City
- Papakura District Council
- Franklin District Council
- Rodney District Council
- Nelson City Council
- Tasman District Council

createyourowneden.org.nz

14 Commerce Street, Whakatāne 3120
Private Bag 1002, Whakatāne 3158

P. 07 306 0500
E. info@whakatane.govt.nz
W. whakatane.govt.nz

WHAKATĀNE District Council
Kia Whakatāne au i ahau