





CONTENTS

Acknowledgements

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The information provided in this booklet is specific to a cool temperate climate. Strategies and techniques for composting food waste in warmer climates will vary.

- × Text by Good Life Permaculture | www.goodlifepermaculture.com.au
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Food Waste Facts	4
Reduce Food Waste & \$ave Money!.....	6
Benefits of Composting	8
Universal Ingredients	9
What Food Scraps Go in Compost?.....	10
Worm Farms	12
Rapid Composting.....	16
Compost Bins	18
Compost Tumblers.....	20
Bokashi Bins	21
Chickens	22
Composting Dog & Cat Poo	24
What's Wrong with my Compost?.....	26
Grow Your Own Food	28



FOOD WASTE FACTS

How much food do we waste in Australia each year? The National Food Waste Strategy completed in 2017 unearthed these facts:

- \$20 billion is lost to the economy through food waste.
- Up to 25% of all Vegetables produced don't leave the farm- 31% of carrots don't leave the farm, equating to a cost of \$60 million.
- The total cost of agricultural food losses to farmers is \$2.84 billion.
- Households throw away 3.1 million tonnes of edible food, that's close to 17,000 grounded 747 jumbo jets.
- Food waste costs to households vary from \$2,200 to \$3,800.

Once disposed in landfill, food waste rots and becomes anaerobic, which transforms the organic material in the food into methane and carbon dioxide. Unfortunately methane is 25 times more harmful to our atmosphere than carbon dioxide. It is estimated that 7.6 million tonnes of carbon dioxide equivalent will be generated from food waste disposed of in 2014–15 over the life of its decay. Food waste also causes issues with odour, leaching, attracting vermin, and is a potential source for disease¹.

Each week Kingborough Council collects 105 tonnes of waste from 11,500 general waste bins – on average, that's around 9.1kg per bin. Of this, approximately 50% of that waste is compostable materials.

This is where Kingborough residents can help make a big difference by removing all compostable items from their kerbside bin and put them into a compost bin!

¹ National Food Waste Strategy, 2017:
www.environment.gov.au/system/files/resources/4683826b-5d9f-4e65-9344-a900060915b1/files/national-food-waste-strategy.pdf



www.foodwise.com.au

THE EARTH'S ATMOSPHERE



REDUCE FOOD WASTE & SAVE MONEY!

Before you even start thinking about composting, think about how you can reduce the amount of food waste you create in the first place. Here's some helpful information to get you started.

WORK OUT YOUR WASTE

- × Do a test for one week and collect every scrap of food you would normally throw in the rubbish. Store this in a separate bin to find out how much your household produces in one week. Not only will this get you motivated to compost, it'll also help you choose what type of compost system/s will best suit your household.

MEAL MAPPING

- × Before going shopping, look in your fridge, freezer and cupboards to see what you already have. Incorporate these ingredients into your meal plan for the next few days or week.
- × Write a list of meals you'd like to eat that week and then work out the ingredients you need for each one.
- × Choose ingredients that are easy to use for more than one meal, i.e. you could have roast potatoes and veggies one night and potato and leek soup another.
- × Sharp shopping.
- × Always take a shopping list with you that's based on the meal mapping you've just completed.
- × Buy fruit and vegetables that are in season as they'll stay fresher for longer at home, are usually more affordable and have less food miles.³
- × Resist impulse buying due to being hungry or bargain foods that you may end up not using later on.
- × Don't forget to take your own shopping bag with you!

³Food miles: The distance traveled by the food you eat.



CLEVER COOKING

One of the best ways to prevent food waste is to follow a recipe and to think about portion sizes – use your hands to help you work out how much food you really need per person.

- × Potatoes, rice, pasta and legumes should be the size of your clenched fist.
- × Fruit, nuts and seeds should be the size of one cupped hand.
- × Vegetables and greens should equal two cupped hands.
- × Meat and eggs should be the size and thickness of your palm.
- × Cheese, spreads and dressings should be the size of your thumb.

SAVVY STORING

Storing your food properly means you won't end up throwing it out, which is basically like throwing money out.

- × Make sure your fridge is set between 3 -4 degrees and your freezer at -18 degrees and has all seals working.
- × Put leftovers in sealed containers and cover your vegetables with a clean tea towel to absorb excess moisture.
- × Store potatoes in a cool dark place with no exposure to sunlight (which causes them to sprout).
- × Store your dry foods (flour, pulses, pasta) in air tight containers in your pantry.
- × Keep bread in a bread box (not fridge), if it starts to go stale, store it in the freezer.
- × Love your leftovers.
- × Learn to see leftovers as your helpful friend as they're quick and tasty meal options!
- × Make sure you store them in sealed containers in your fridge.
- × If you're not going to eat them within a few days, store them in your freezer.
- × Research different recipes you can use some of your leftovers in.

BENEFITS OF COMPOSTING

HEALTHY SOILS = HEALTHY FOOD = HEALTHY PEOPLE

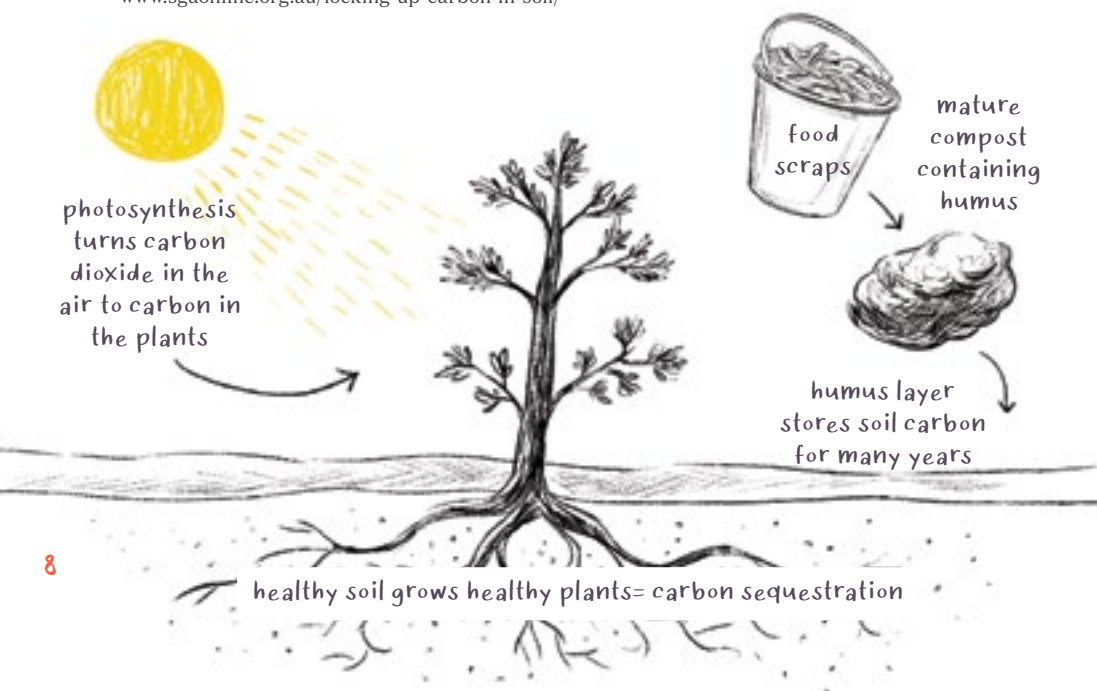
Compost is a natural process where organic matter breaks down to form nutrient-rich humus, perfect for food production. The great thing about composting is that it can happen anywhere, any time. Whether you're living on a farm or in a high-rise apartment (with access to some earth) there's a solution for you.

COMPOSTING SEQUESTERS CARBON

By composting, not only are you reducing methane gases from being emitted from landfill (as seen on page 5), you're also mitigating one of the biggest challenges of our time - climate change.

How, you ask? Firstly, compost creates humus. Humus consists on long chains of carbon atoms that last a long time in the soil. Secondly, when compost is added to soil it becomes healthier with improved soil structure and increased soil biological activity. Therefore, the plants growing in it become healthier too and their capacity to photosynthesise is increased meaning they're capturing and sequestering more carbon from the air and storing it in the soil⁴.

⁴www.sgaonline.org.au/locking-up-carbon-in-soil/



UNIVERSAL INGREDIENTS

While there are a range of recipes and systems for making compost, they all have four universal ingredients in common.

- × **Carbon materials:** Dry and brown materials including straw, dead leaves, shredded office paper/newspaper with soy-based inks (no glossy paper), sawdust and cardboard.
- × **Nitrogen materials:** Fresh materials including green grass clippings, food waste, some animal manures and seaweed.
- × **Water.**
- × **Air.**

CARBON TO NITROGEN RATIOS OF COMMON MATERIALS

Most compost systems require a carbon to nitrogen ratio of 25-30:1 (except worm farms). When choosing what to put into your compost system, knowing how strong they are in nitrogen or carbon will help you make informed decisions on how much to add.

MATERIAL INPUTS	CARBON - NITROGEN RATIO
Fish guts	10:1 Really high in nitrogen
Chicken poo	10:1
Mixed, fresh food scraps	15:1
Fresh grass clippings	15:1
Fresh cow poo	17:1
Fresh horse poo	27:1
Pea straw	40:1
Wheat straw	50:1
Newspaper	60:1
Cardboard	100:1
Dry sawdust	200:1 Really high in carbon

COMPOST ACTIVATORS

Compost activators are nutrient-dense ingredients that you can add to your compost system to ensure that it too is nutrient-rich. Add any of the following plants leaves in modest amounts to your compost system for improved results.

- × **Yarrow, comfrey, stinging nettle, plantain and dandelion.** You can also add small amounts of "rock dust" to remineralise. Rock dust is available from nurseries and some quarries, look for a quality product that's tailored for food production.

WHAT FOOD SCRAPS GO IN COMPOST?

The short answer is-all of them!

FOOD SCRAPS FOR WORM FARMS

For small worm farms, you can put all fruit and vegetable scraps, including cooked left overs, tea, crushed eggshells, coffee, dairy, bread and very small amounts of citrus and onion/garlic skin. The trick with citrus skin is to add them in moderation, mixed in with other food scraps and to cut them up to the size of a 20-cent coin or smaller. In larger worm farms, you can also add some meat in moderation without any large bones.

FOOD SCRAPS FOR SMALL COMPOST BINS, TUMBLERS AND BOKASHI BINS

You can put all fruit, vegetable food scraps, crushed egg shells, dairy, breads, small amounts of meat (without big bones), cooked left overs, coffee, tea and small amounts of cooking oils. Make sure you chop up food waste so it's the size of a 20-cent coin to accelerate the composting process.

THINGS YOU SHOULD NEVER PUT IN YOUR WORM FARM, SMALL COMPOST BIN, TUMBLER AND BOKASHI BIN INCLUDE:

- × **Plastics.**
- × **Weedy plants, twitch grass (and other runner grasses), ivy, thistles and gorse to name a few. These plants need a large hot compost pile to kill them or, send them to the City of Hobart's large-scale composting facility in South Hobart.**
- × **Diseased plants.**

FOOD SCRAPS FOR THE LARGE RAPID COMPOST PILE

As well as all food waste, you can also add green waste from your garden, including unwanted seeds, weedy and some diseased plants. If you live in a more rural area where roadkill is prevalent, consider collecting these small dead animals and including one in the centre of a hot compost pile. They'll add valuable nutrients and you'll also prevent prey animals from congregating on the roads – which often leads to more road kill.

FOOD SCRAPS FOR CHICKENS

Chickens will love your food scraps including all leafy greens, grains (cooked or raw), small amounts of meat, soft fruits and vegetables and all the green waste from your garden. Make sure you chop all food scraps up into small pieces so they can eat them quickly.



CAN I PUT WOOD ASH INTO MY COMPOST SYSTEM?

Wood ash is the product from a wood fire and is an alkaline material. Adding a lot of it to your compost system can make it too alkaline for general food production (which mostly desires a neutral pH of 6.5). You can sprinkle in a small amount of wood ash into all compost systems, but some other ways to use it on your property include:

- × **Controlling pear and cherry slug (*Caliroa cerasi*) that attacks cherry, quince and pear trees. Dust some large handfuls of ash over the plant, the insects will shrivel up and dry quickly. Repeat this a few times over the season for best results.**
- × **If you have chickens, put some ash in a tray (150mm deep) and let them use this as dust bath to help prevent mites. You can also put some in their chicken yard, mixed in with green waste, chicken manure and food scraps, you will create a balanced deep litter.**
- × **Small amounts sprinkled directly around all vegetable seedlings can help prevent slugs and snails from eating them.**

WHAT SHOULD I DO WITH LARGE BONES?

Larger bones will struggle to compost quickly in most composting methods reliably. Left over large bones can be burnt in a wood fire and returned to your landscape as outlined above or, buried directly in the garden to break down slowly.

OTHER USES FOR CITRUS SKINS

- × **If you have a wood fire at home, dry your citrus skins on top of it. Once they're 100% dry, use them as fire starters, similar to paper!**
- × **Add citrus skins into a jar of white vinegar and let them sit for one week. Strain and use as a cleaning solution in your kitchen and bathroom. The mushy citrus skin left over can be rinsed under fresh water and added to your compost system in small amounts.**

TEA BAG TROUBLE

Some tea bags contain polypropylene plastic, a sealing plastic, to keep the tea bags from falling apart. Find a brand that doesn't use this plastic or, use loose leaf tea instead.

WHAT CARBON MATERIALS CAN I PUT IN MY COMPOST BIN?

There are a large range of dry carbon materials you can source for your compost system. These include straw, shredded office paper, newspapers that use soy-based ink, aged sawdust and cardboard. Never use glossy magazines or brochures as the chemical inks can compromise the compost's health.



WORM FARMS

Compost worms eat food scraps, transforming them into the worm castings and liquid fertiliser. The two most common compost worms are the red wriggler (*Lumbricus rubellus*) and the tiger worm (*Eisenia fetida*). Unlike the common earthworm, they love a nitrogen-rich environment so you don't need to add regular carbon. Buy compost worms at your local nursery or, ask a friend or local community garden if you can take a handful of worms from their existing worm farm in exchange for doing some weeding in their garden.

DID YOU KNOW THAT ...

When compared to the original soil, worm castings (the worm's poo) enhance the soil's health enormously, they have approximately:

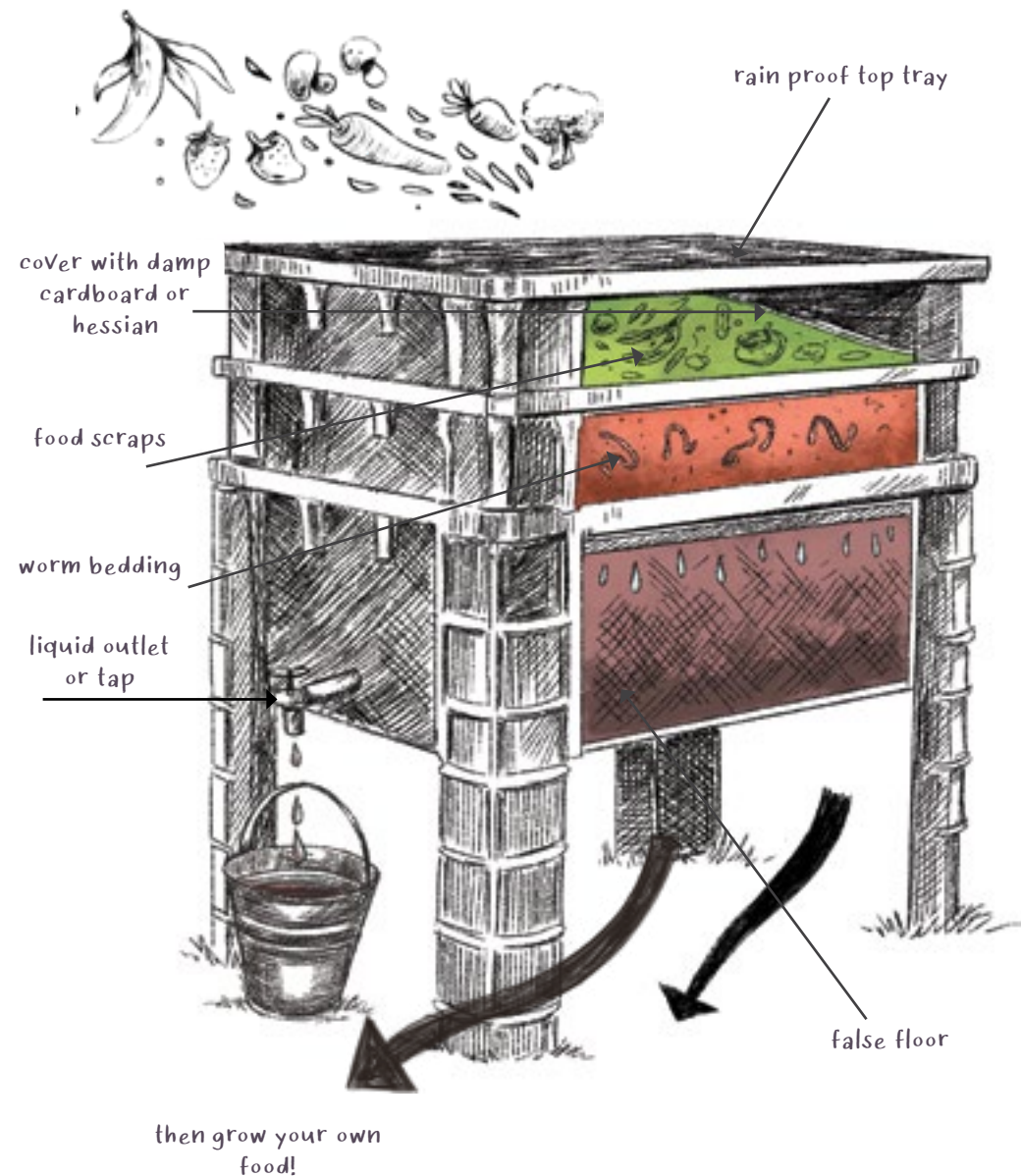
7 times the available PHOSPHOROUS
6 times the available NITROGEN
3 times the available MAGNESTUM
2 times the available CARBON
15 times the available CALCIUM

SETTING UP YOUR WORM FARM

Regardless of what type of worm farm you're setting up, they all follow three steps.

1. Add a layer of bedding to the bottom of the worm farm made from either straw, mature compost, shredded paper (with no inks) or coco peat (15cm deep). Lightly water it in, this is where worms can initially live and retreat to as needed.
2. Add your compost worms directly on top, spreading them out across the surface.
3. Add food scraps chopped to the size of a 20-cent coin and cover with a damp blanket (a piece of hessian, cardboard or woollen blanket).

That's it! Continue to slowly add food scraps, increasing the quantities as the worm population increases. If your worm farm is raised off the ground, catch the brown liquid from the tap with a bucket. Harvest mature worm castings by removing the castings (with worms) onto a tarpaulin on the ground. Compost worms hate the sun so will wriggle into the centre of the pile. Wait 10 minutes and then gently remove the outer layer of the pile which will now be mainly empty of worms. Repeat this process until you have a small pile of mostly worms left in the middle. Return these to your worm farm and add the worm castings to your garden.



WORM FARMS

(CONTINUES)

WHERE SHOULD I LOCATE MY WORM FARM IN THE GARDEN?

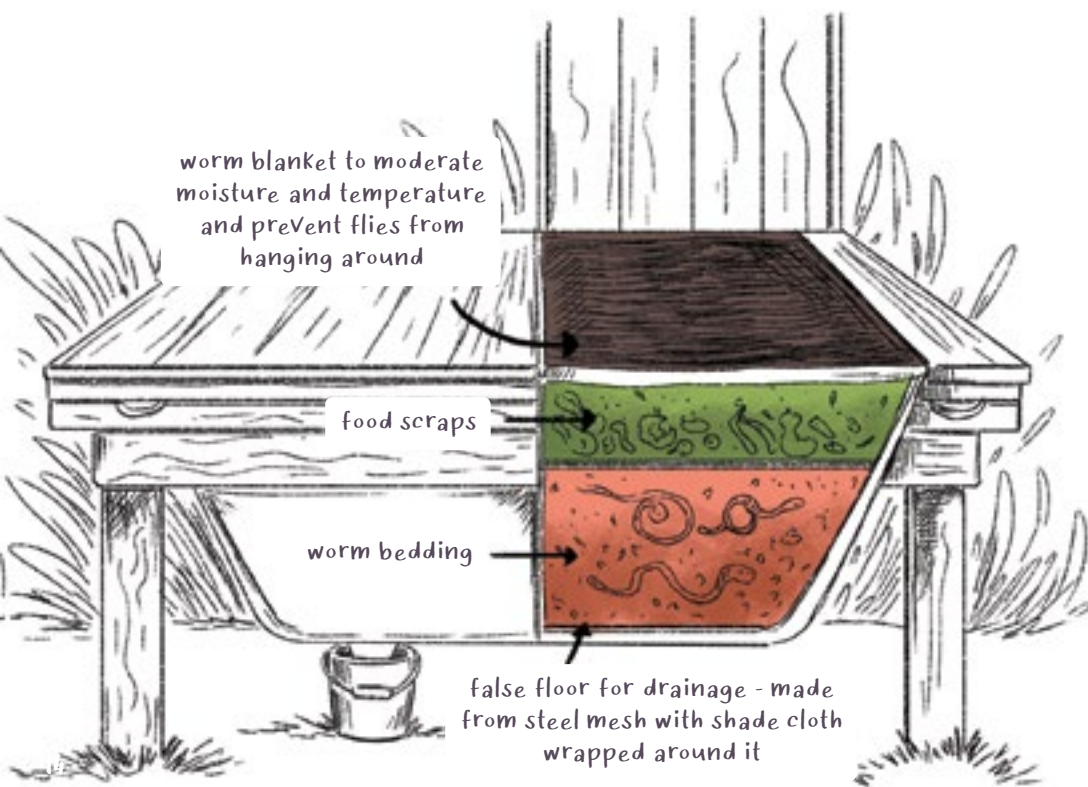
In summer, keep your worm farm in an area where it gets morning sun and afternoon shade. In winter, the cold will make your worms slow down drastically, place them in full sun the whole season to help them stay active.

FERTILISING YOUR GARDEN

Both the worm castings and liquid are effective fertilisers for your garden. Simply add the castings directly to your garden (or pop a handful in a watering can when watering), or as part of a propagation mix. Dilute the brown liquid until it's the colour of weak tea – then water your grateful garden with it.

BUILD YOUR OWN WORM FARM SEAT

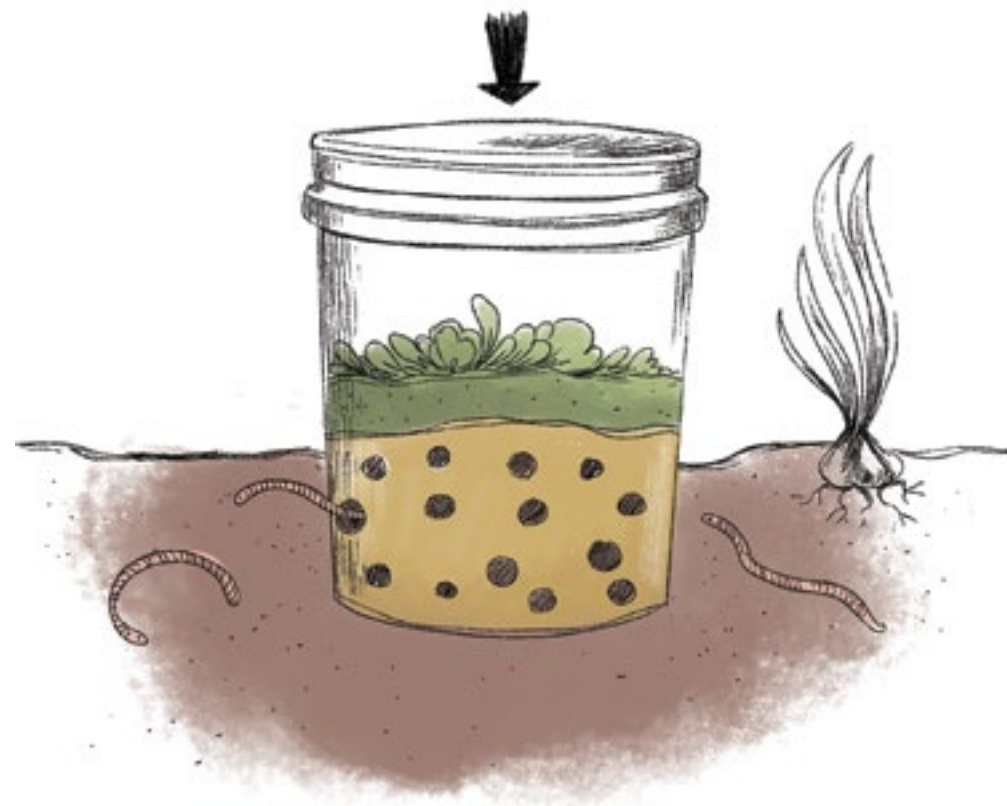
With an old bath set in a hardwood timber frame, you can make a worm farm seat!



MAKE YOUR OWN WORM TOWER

Make your own worm tower from a recycled 20L bucket. Drill holes into the sides and bottom of your bucket, bury it $\frac{3}{4}$ into your veggie garden and add some soil on the base and then food scraps on top with some compost worms. The worms will travel in and out through the holes, spreading the nutrients into the food garden.

Bury a rain proof bucket pre-drilled with holes into your Veggie patch and place food scraps directly into it.



RAPID COMPOSTING

Rapid (hot) composting (originally called the Berkeley method) is perfect for people who have big gardens with lots of green waste coming out of them and need compost for food production. The common nitrogen ingredients used in this composting system include veggie crops being pulled out (and are still green), animal manures and mixed food waste. While for carbon, you'll often use straw or hay, all ingredients are chopped or mulched up to ensure the composting process is rapid!

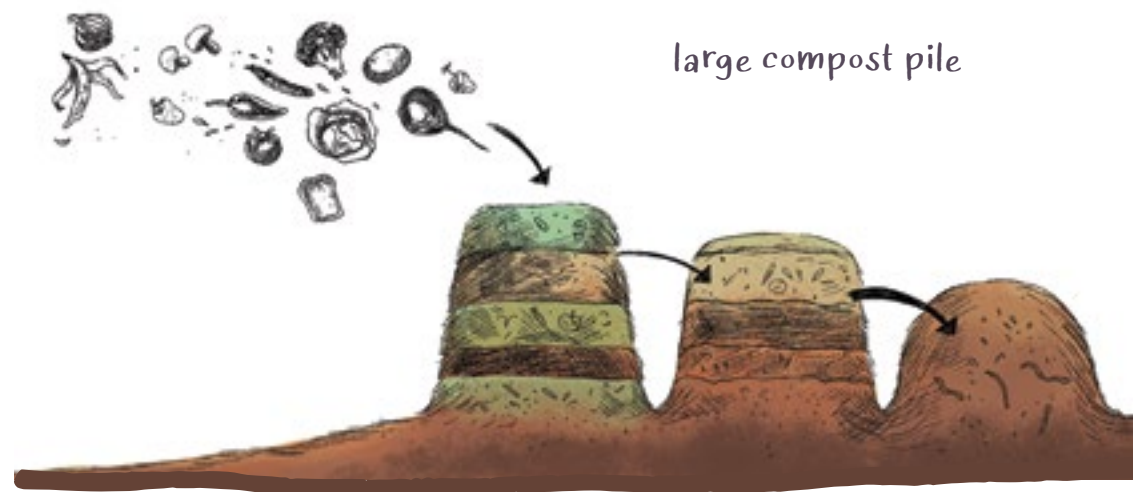
This pile needs to be at least one cubic meter and is sometimes called hot (thermophilic) composting as, with this volume, it heats up to 55-65 degrees. This is the perfect temperature to kill off pathogens (bad bugs), weeds, unwanted seeds and diseased plants, but not harm the beneficial biology.

You can build a large compost pile in a structured compost bay, in a round of chicken wire (supported with timber stakes) or free-standing with no structures at all.

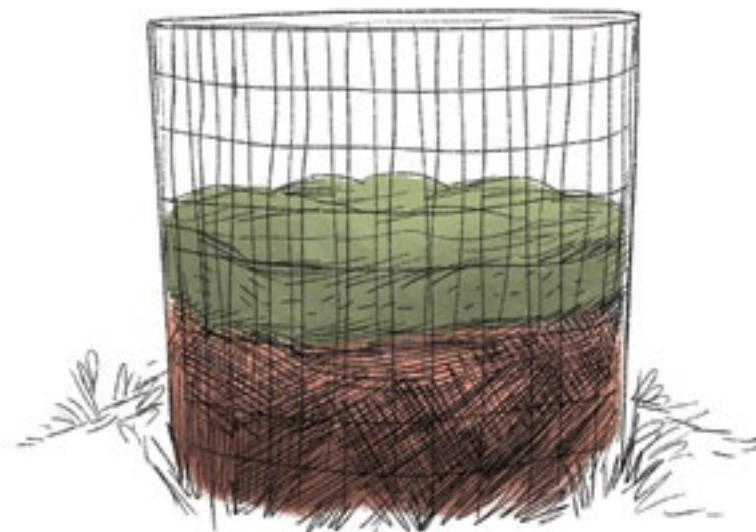
If you are not confident with building a large hot compost pile, send diseased plants to the councils compost facility

HOW TO BUILD YOUR COMPOST PILE

- × Locate your compost pile directly on the earth to allow the soil biology to travel into your compost pile. Put a layer of small branches down first to help with drainage and air flow.
- × Add a carbon layer around 15cm thick and water this in.
- × Next, add a layer of nitrogen materials around 7cm thick, followed by another layer of carbon materials. Repeat this layering system until the pile is at least 1.5m high as it will sink down to 1m over a few days.
- × Add water between each layer to ensure that the pile is evenly moist.
- × The carbon/nitrogen ratio is approximately 25-30:1. Don't be afraid to experiment with the materials you have available to find what works well for your context.
- × Always make sure you cover your compost with a layer of carbon or a hessian/felt cover. This will prevent it from drying out.
- × Once you've built your pile, leave it for 4 days, until it reaches 55-65 degrees. A compost thermometer can help you know how hot it is. Turn the pile inside out, so it can compost evenly.
- × After this, turn the pile every second day for two weeks. After 18 days (or so), you should have beautiful brown compost ready to go back into the garden.
- × If you don't turn the compost, it will still compost in the middle, but will take longer to compost and be less regular in texture. If not turned disease spores may also survive.



Chicken wire helps create a vertical edge to the compost pile, ensuring there is maximum volume and heat.



COMPOST BINS

Cold (mesophilic) composting occurs when the compost system is smaller than one cubic metre. Carbon and nitrogen materials are added gradually, meaning the whole process of composting generally takes longer.

The small compost bin has the exact same approach to layering carbon and nitrogen materials as the large compost piles shown on page 16 or 17. To start, put down a 15cm layer of carbon and then add a 7cm layer of nitrogen (mixed food scraps cut up to the size of a 20-cent coin) and repeat until the bin is full. Also add water between each layer as you go. Never add weedy or diseased plants to a cold compost system.

Because you're adding materials gradually things will compost at different rates, meaning you'll have mature compost at the bottom while you still have fresh food scraps at the very top. For this reason, you need to have at least two compost bins so you can rotate between them, letting one rest (and mature) while you use the other.

You can turn your compost bin using a "compost screw". This handy tool accelerates the composting process. Don't start turning the bin's contents until it's filled and has rested for a few weeks.



If rodents are coming into your compost bin from under the earth, add a layer of "vermin mesh" directly to the bottom to stop them from being able to dig under. You can buy vermin mesh from most hardware stores. Place the mesh on the ground and mark out a circle approximately 10cm bigger than the bin's base. Fold this extra bit of mesh over the existing lip on the compost bin – this is enough to hold it in place.

Alternatively, keep your compost bin on a free-draining, hard surface such as some bricks to reduce the likelihood of rodents getting in. Make sure any liquid drains to some nearby earth.

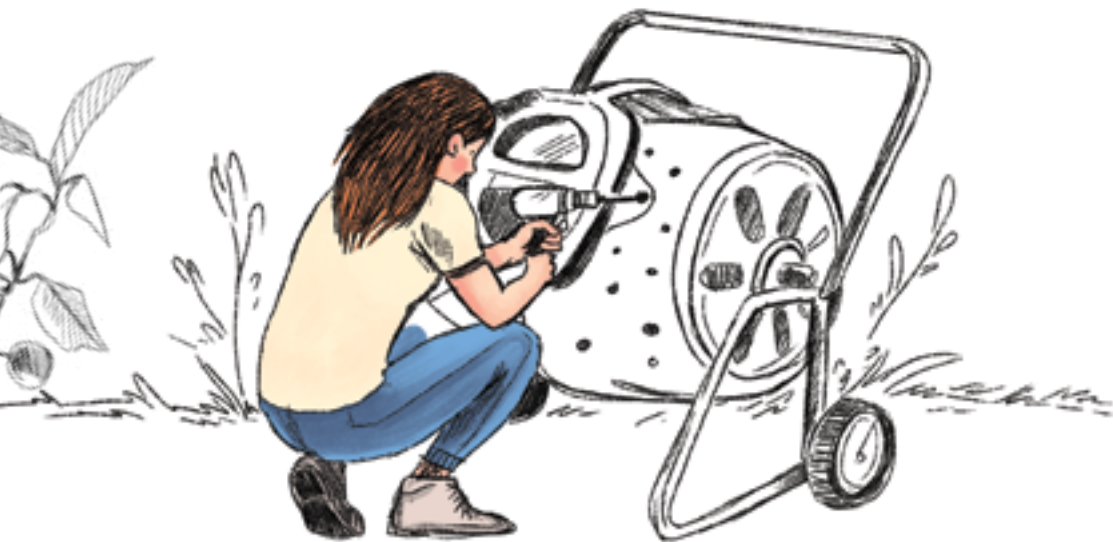
Hot tip: Have a weather proof bin storing dry carbon materials directly next to your compost bin. This will make it nice and easy for you to add a carbon layer each time you add your food scraps.



COMPOST TUMBLERS

Compost tumblers are a great option for people with limited space, rodent issues or are looking for an ergonomic option that limits bending and lifting. To make sure they work well, here are some basic tips to follow.

- × Before adding food scraps, make sure you take an extra 10 seconds and chop them up to the size of a 20-cent coin. This will help them break down quickly.
- × Every time you put in food scraps, add some fine carbon material as well such as shredded paper or straw. Just like the small and large compost piles, you're aiming for a carbon to nitrogen ratio of 25-30:1.
- × To aid in good drainage and increased air flow, drill hundreds of 10mm holes into your tumbler with a power drill.
- × Place them in full sun over winter. During summer place them where they get morning sun only, so they don't dry out too much.
- × Only fill your tumbler $\frac{1}{2}$ - $\frac{3}{4}$ full, otherwise they get too heavy to turn.



BOKASHI BINS

'Bokashi' is Japanese for "fermented organic matter." Bokashi bins are designed to be used in your kitchen. The system includes a purpose made bucket⁶ (with lid and a drainage tap) and a dry bran mixture (made from rice husks and wheat) that has been inoculated with effective microorganisms. The microorganisms ferment the food scraps, eliminating any bad smells. The fermented materials are a biologically active living material that can then be transferred to your garden to finish composting in the ground where it improves soil health.

HOW TO USE YOUR BOKASHI BIN

- × Add your food scraps into the bin as you make them. All food scraps can go into the bin including dairy, meat (without large bones) citrus and cooked food. Just make sure you take the time to chop the scraps into the size of a 20-cent coin to accelerate the composting process.
- × Sprinkle in the inoculated bran mixture directly after adding food scraps and press the scraps down to remove air pockets. If it starts smelling gross, add more bran.
- × Continue to add food scraps until your bucket is nearly full, and then let it sit for around ten days to ferment. Every few days you will need to drain off any liquid, dilute this with fertile water and add to your garden.
- × Next, bury the contents in soil so they're completely covered. From here the composting process will continue with the aid of the effective microorganisms in the bran material. If you don't have your own garden, find a friendly neighbour or community garden to take your biologically activated food scraps to.

⁶The bokashi bin's size can vary and can be up to 20 litres in volume.



CHICKENS

To compost some of your food waste and some (or all) of your green waste from your garden, consider keeping chickens. Importantly:

- × You can't rely on JUST chickens to eat all your food scraps, but they will love some of them, including leafy greens, bread, leftover meals, grains and veggies. Don't give them rhubarb or avocado leaves as these can be poisonous.
- × Have at least one other type of compost system that you put other food scraps in that aren't appropriate for the chook's run such as a worm farm or a compost bin.
- × Chop the larger food scraps up to the size of a 20-cent coin before putting them in with your chickens to help them eat them all up quickly.
- × Give the food scraps to the chickens in the morning so they have all day to eat them before dark – when the rodents come out. If there's still food scraps left at the end of the day, rake them up and put them in a compost bin or worm farm to prevent attracting rodents.
- × Chickens are best when you have a vegetable garden where excess green waste can be thrown into their run. This can help form the very important "deep litter".

WHAT'S A DEEP LITTER?

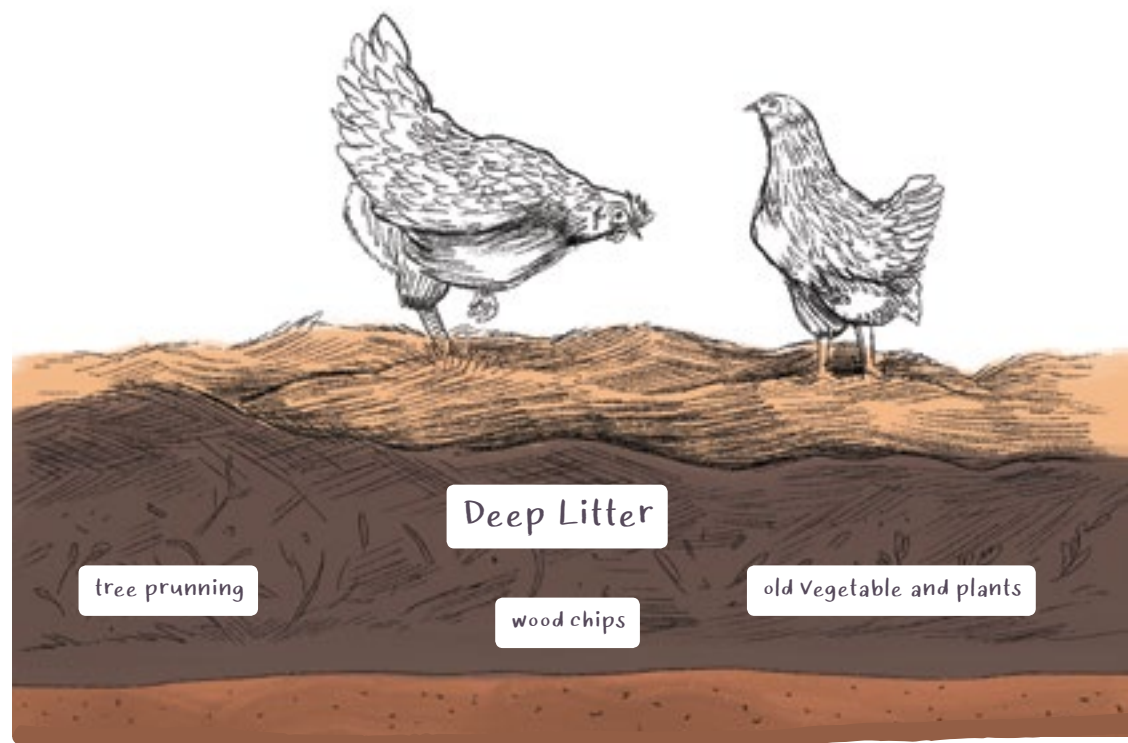
A deep litter system is a clean and fertile compost heap inside your chicken's run. It's created by placing a thick layer of carbon (10cm – 30cm deep) in the yard such as straw or woodchips which soak up manure and moisture. In addition to this, you can also add bulk green waste from your garden to provide fresh greens for your chickens and form more depth in the litter.

Once you can see your deep litter breaking down you can either add more carbon materials on top or move it into a compost pile system (outside the chicken's run) to further break down and mature as compost. As long as you don't have any unwanted seeds, weedy or diseased plants in there, you can also apply it directly to your garden as a mulchy compost blend.

BREEDS

There are many chicken breeds to choose from. Good egg layers that are friendly and suitable to a backyard include the:

- Australorp
- Rhode Island Red
- Isa Brown
- Barnevelder
- Wyandotte



YOU CAN KEEP CHICKENS IN THE HOBART MUNICIPALITY PROVIDED:

- × They are kept at least 6 metres away from any dwelling and at least 1 metre away from a fence or boundary.
- × The structures, buildings, enclosures or areas that the poultry have access to are maintained in a clean and sanitary condition.
- × They do not cause a nuisance through smell, noise, rodents, flies or drainage.
- × The owner takes all necessary steps to prevent any nuisance that may arise as a result of the keeping of poultry.

COMPOSTING DOG & CAT POO

You can compost your dog or cat poo in a worm farm dedicated just for this purpose. Choose a worm farm system that's contained so it isn't touching the soil, this will prevent any possible cross-contamination with parasites that may be in your pets poo. Every time you add pet poo to the worm farm, cover it with a blanket so it's not exposed. A worm blanket is simply a piece of damp hessian, cardboard or a woollen blanket. Follow the same guidelines outlined on page 12 to set up your worm farm.

CAT POO

Cat poo has a few more considerations than dog poo due to the possible presence of a parasite called *Toxoplasma gondii* which can't be eradicated through composting. This parasite is generally transmitted through undercooked meat, soil, or in cat poo. Symptoms of infection generally pass unnoticed in adults but can be dangerous to unborn children and native wildlife. Cats are the only definitive hosts for *Toxoplasma gondii*, meaning cat owners need to follow a few basic guidelines to stay safe.

THE RSPCA RECOMMENDS THE FOLLOWING APPROACH TO PREVENT TOXOPLASMA GONDII

- ✗ Remove faeces from the kitty litter box twice a day and safely disinfect with boiling water.
- ✗ If you are pregnant or immune-compromised, avoid changing cat litter if possible. If no one else can perform the task, wear disposable gloves and wash your hands with soap and warm water afterwards.
- ✗ When gardening in potentially contaminated soil, wear gloves and wash your hands with soap after gardening.
- ✗ For further information, consult your doctor and vet.

KITTY LITTER OPTIONS

- ✗ Choose a compostable kitty litter that will break down quickly.
- ✗ If possible, make your own kitty litter with dry sawdust – this will break down much more quickly compared to shop-bought litter products.

WHERE TO PUT YOUR MATURE CAT POO COMPOST

Even though your cat poo may be contaminated it can still be beneficial for your soil. Once it has finished composting in your worm farm, bury it in your ornamental or native gardens at least 150mm deep with a thick layer of mulch on top. This will reduce the likelihood of local wildlife being exposed to it.

Never put the mature compost near any food gardens.

DOG POO

While dogs are not able to be a host for *Toxoplasma gondii*, they can still be infected by it. Because of this risk, follow the same instructions for composting dog poo that have been outlined for cat poo.



WHAT'S WRONG WITH MY COMPOST?

HELP! MY COMPOST IS...

- **BREEDING MAGGOTS:** Remove any meat or excess food. Add a sprinkle of lime and cover with a layer of carbon such as a hessian or wool blanket.
- **REALLY SMELLY:** It's too wet and likely to be anaerobic (not enough air), mix in more carbon materials, turn and add a touch of lime which will help bring it back into balance. Alternatively, you may have overloaded your compost system with too much food waste. Remove some and start a second compost system to cater for the amount of food waste you're producing.
- **INFESTED WITH ANTS:** Your compost system is probably too dry or has exposed food. Add water if dry and cover any exposed food scraps on top of the system with carbon and hessian/felt. You can also turn the compost if in a compost bin or pile.
- **TAKING AGES TO BREAK DOWN:** You may need some more nitrogen and/or water to get the party started. Add more nitrogen (food scraps, some manures, green lawn clippings) and water. If using a small compost bin or large compost pile, pull them apart and rebuild them to get a good balance of carbon and nitrogen throughout the pile.



- **SWAMPED WITH SMALL BLACK "VINEGAR" FLIES:** Some Drosophila flies (also known as vinegar flies) aren't a bad thing – however a lot can become annoying. Make sure you have no exposed food scraps by covering the top of the compost with a layer of carbon such as a piece of hessian or wool blanket. You can also place a small jar of vinegar in the top corner of the bin, this will attract and drown excess flies.

- **HOME TO RATS AND MICE:** Reduce the amount of food you're putting into the system (especially bread and meat). If you have a small compost bin, add vermin mesh on the bottom of the compost bin to prevent rodents digging under. You can also dig your bin in 20cm into the earth or place it on a free-draining hard surface (bricks or concrete). Make sure any liquid leaving the system is draining into nearby earth.

If rodents are really bad, consider building a worm farm made from a recycled bath as shown on page 14 – rodents can't chew through baths with hardwood timber lids.

- **MY COMPOST TUMBLER HAS BECOME GROSS AND STINKY:** It's likely to not be draining well due to their limited air and drainage holes. With a power drill, drill hundreds of holes around its full circumference, 10mm in size. This will drastically increase the air flow through the system and allow excess moisture to drain freely.
- **MY COMPOST TUMBLER IS TOO HEAVY TO TURN:** Only fill your tumbler up $\frac{1}{2}$ - $\frac{3}{4}$ of its capacity to ensure you can still turn it easily.
- **MY CHICKENS ARE ATTRACTING RODENTS:** Only give the amount of food scraps that they can eat in one day and give it to them in the morning rather than the night (when the rats come out and the chooks go to sleep). At the end of each day, rake up any leftover scraps and put them into a worm farm or small compost bin to keep them out of any rodent's reach. Don't put large chunks of food scraps into their run as they'll just sit there, waiting for rats and mice to come eat them. Ensure the chicken's grain is secured in a rodent proof container.
- **THE WORMS ARE TRYING TO ESCAPE!** It's likely your worm farm has become too acidic for the worms to be happy there. To prevent this from happening, add a small handful of dolomite lime every two months to maintain a health pH level between 6 – 7. You can source a simple pH kit from your local nursery.



GROW YOUR OWN FOOD

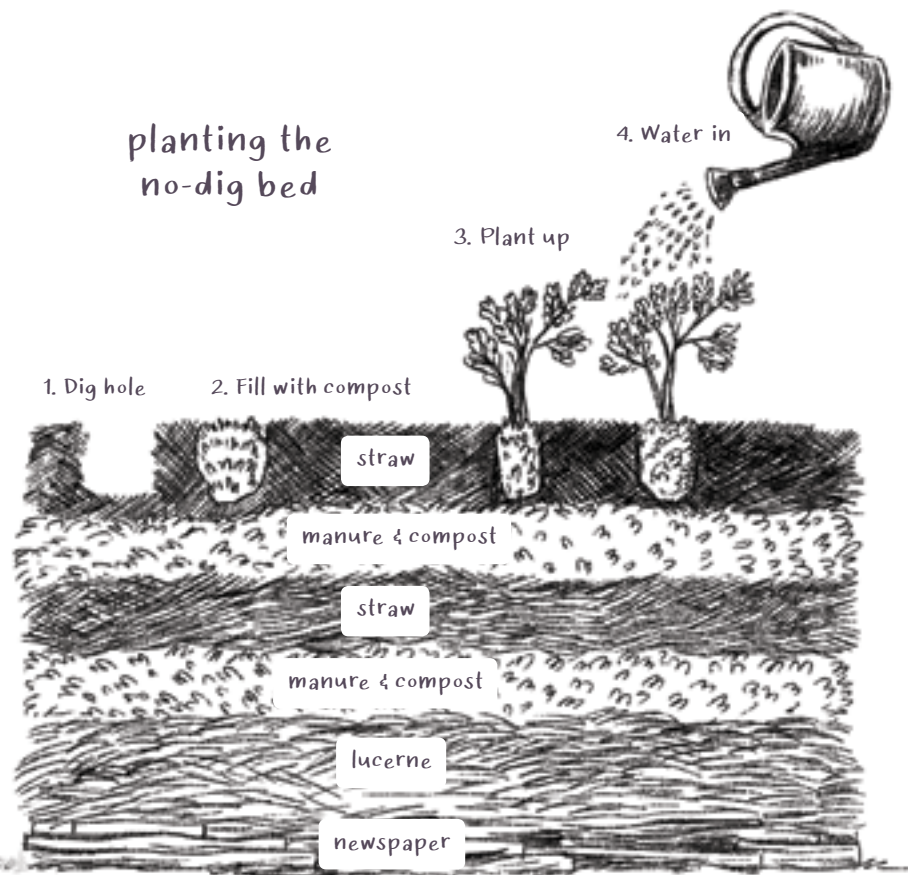
Once you've made your nutrient dense compost, you're all set to grow some of your food. Add the mature compost directly to existing orchards or vegetable beds to improve soil health. Haven't got a garden yet? There are many ways to start a vegetable garden, one of them is to build a no-dig garden.

NO DIG GARDENING

Developed in 1977⁸, the no dig garden is a type of raised garden bed which involves no digging! It can be built directly on the ground or in a raised garden bed which has no contact with the original soil (a great option if your soil's contaminated or poor quality). Sometimes called lasagne gardening, you're simply layering different types of carbon and nitrogen materials on top of one another with water in between. Here's how to make your own.

- ✕ Mow your grass short or, set up your raised garden bed where you would like it. If building directly on the ground, have some garden edging already established to outline the bed and hold all the ingredients together.
- ✕ Lay a .5cm layer of soaked newspapers (with soy-based ink) or cardboard on the ground, this will slow the grass from growing back. Never use glossy paper as the chemical inks can harm the soil life and make sure there's no sticky tape on the cardboard you're using as this won't break down in the soil.
- ✕ Add a 10cm carbon layer directly on top, this could be straw, aged hay, mixed brown leaves or shredded paper. Lucerne hay is best, but use what you have available. Water in well after every layer from here on in.
- ✕ Add a 5cm layer of nitrogen materials on top. This could be cow/horse poo, mature compost or fresh grass clippings. This is the only layer where you can add mixed food scraps in, as they're buried deeper they're less likely to attract rodents and birds.
- ✕ Add another 10cm layer of straw or hay or other carbon material.
- ✕ Another 5cm layer of fresh grass clippings, compost, worm castings or manure.
- ✕ Add another 10cm layer of straw or other carbon material.
- ✕ Repeat this process until you have a garden bed approximately 50cm high - it will sink and settle down to around 30cm in height over a week.
- ✕ Finish with a straw layer. Into this layer, make small pockets into the straw and add two handfuls of mature compost. Plant seeds or seedlings directly into these pockets and water them in.

planting the no-dig bed



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