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Introduction

Once people start composting, they get hooked! It is a very simple and satisfying process: not only will your dustbin be lighter, but it won't smell so disgusting—and nor will your compost heap, if you follow the simple instructions in this booklet.

Even where people do not have gardens, they often have access to communal green spaces which they either can manage themselves or in partnership with the local council; and green spaces need compost! I've been taken on a tour of housing estates in London, where green spaces are not much in evidence, and there's plenty of composting going on, with the finished compost being used in window boxes, hanging baskets and on open community spaces (see page 20 for more on this).

Some people who do have gardens have extremely small ones, but fortunately you can compost in a very small space.

Many people have been offered cut-price composting bins by their Local Authority, but all too often there has been little information or support to go with these bins, with the result that many bins have later been found discarded unused, or used for other purposes. Other Local Authorities have had remarkably successful campaigns in which every single bin sale is accompanied by a thorough training session, and further supported by a compost 'hot line' and regular get-togethers, so that people can share experiences and get further help.

Composting has become a hot political issue. Under European law, Britain must reduce the amount of 'waste' going to landfill, particularly waste which can be composted. To do this, we have to massively increase the amount of recycling and composting. A hierarchy has

been introduced, which puts disposal of waste by incineration and land-filling as the worst options, and the best option as reducing the amount of material being wasted in the first place.

With the enormous problems that face the world, it may seem that our individual efforts are going to be completely insignificant, but many problems we confront are created by individual actions, and we do have enormous powers. We can all choose to shop ethically and environmentally. With composting, we can address more than one issue at once. Not only can we stop buying peat-based compost, but also we can make peat-free compost ourselves from materials we commonly put in the dustbin. Up to two-thirds of the average dustbin contents can be composted. One third is organic matter, largely food waste. Another third is paper and cardboard, which can also be composted. Not only is this a good way to significantly reduce the amount that you are putting in your dustbin, but you now have a much better mix to add to either a composting system or a wormery system.

Of course, paper (magazines and newspapers) can go for recycling, and some councils also take flat-packed cardboard, but we all have plenty of cardboard packaging, toilet roll centres, egg boxes, kitchen paper, cereal boxes and cardboard boxes that can be composted.

I'm currently the Chairman of the Community Composting Network. We have as our mission statement, 'Everyone composting!' We feel that just about sums it all up. If everybody were composting, then the environment we all live in, from the local level right up to the whole planet, would be in a far better state. This booklet will give you all the information you need for successful composting.

Nicky Scott

Acknowledgements

Special thanks to Bob Gale for all the wonderful illustrations; John Elford for his faith in commissioning the book; all my colleagues at the Community Composting Network for their comments, especially Richard Gomme, Nick McAllister, Hugh Baker, Steve Tinling, Louise Halestrap, Judith Thornton and Holly Tiffen; last but not least, all my other colleagues tirelessly working to promote composting and recycling in Government— and eating far too few biscuits in the process!

What is Composting?

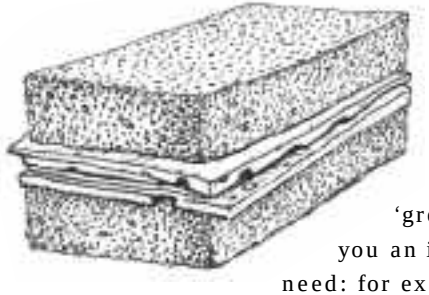
Everything that lived recently could be composted

Natural products that were once part of a living organism, such as wood and wool, are not only food for a host of insects and other creatures but will slowly rot if the conditions are right. Composting is a way of accelerating this process by creating the ideal conditions for a variety of small organisms, most of which are only visible through a microscope.

Getting the mix right

Composting depends on the bringing together the materials that you want to compost, in roughly the right proportions. There are basically two types:

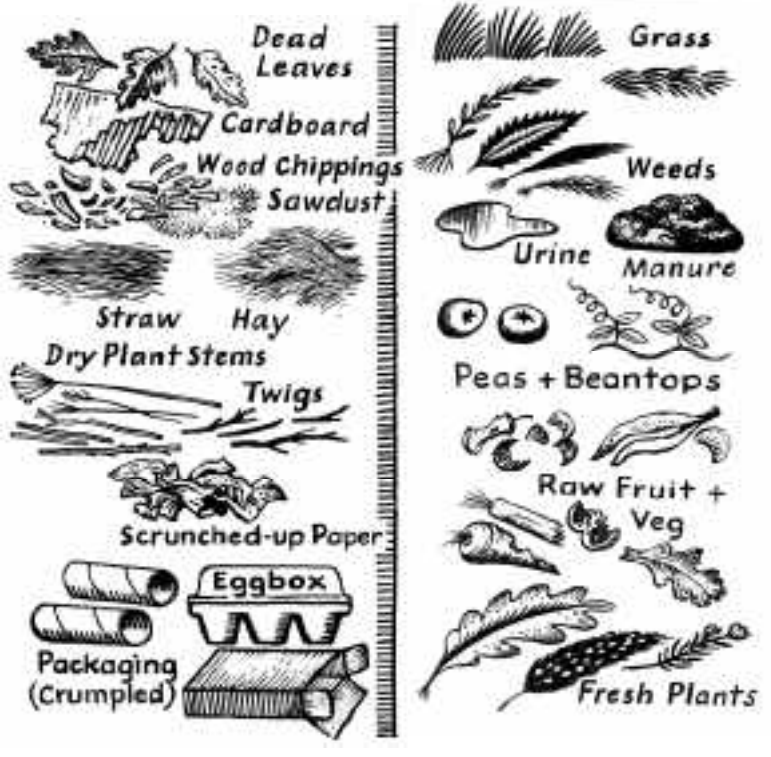
- 'Greens': the wet, soft, green materials (high in nitrogen), and
- 'Browns': dry, harder, absorbent materials (high in carbon)



Bread and cheese

An analogy I like comes from the Centre for Alternative Technology (CAT): they refer to bread (dry, hard, 'brown', carbon) and cheese (soft, wet, 'green', nitrogen). This analogy also gives you an idea of the relative volumes that you need: for example a bucket of kitchen waste needs to be mixed with a bucket of scrunched up paper and cardboard or other 'browns', such as garden shreddings. In fact you can add a lot more paper and cardboard than this—just put it all in your kitchen bin together!

- If you get the proportions roughly right everything composts readily.
- If it's too wet it stagnates and goes smelly.
- If it's too dry—it just doesn't do anything.
- Material for composting needs to be wet, but also with plenty of air spaces, much like good soil. If soil is healthy it will have a good structure with plenty of air spaces and damp like a wrung out sponge. The same conditions are ideal for compost making.
- So if you create the right conditions, the bacteria, fungi, and countless other micro- and macro-organisms responsible for composting, will thrive.



Browns **Greens**

You can always add more micro-organisms by adding a light sprinkling of healthy topsoil, or even better, inoculate with some of the previous batch of compost (also see section on *Activators* on page 27).

Conclusion

- Get the mixture right from the start and Compost Happens!
- The most important thing to do is to mix dry, absorbent, carbon into wet sloppy stuff. Otherwise it starts to smell really unpleasant!
- The aerobic bacteria, which do most of the work breaking down the raw materials into compost, need both air and water. (See opposite for more on *Life in the Heap*).
- A pile of dry carbon-rich materials, like branches, sawdust, woodchip etc, is not going to cause a problem. It will just sit there very slowly decomposing without any nasty smell unless you mix something high in nitrogen with it.

Remember: even if you disregard all the above information, and just dump and run, eventually everything will get eaten by something or other, and converted into a dark crumbly substance that will positively enhance your soil.

Life in the Heap

The whole secret of compost making is to set up the ideal environment for the bacteria, fungi and other creatures that are concerned with the decomposition process. They thrive in a moist but not waterlogged environment, with plenty of air: ideally everything is coated with water but there are air spaces between.

What is astonishing is the amount of life that a compost heap supports. A gram of healthy soil (roughly a teaspoon) contains about a billion microscopic organisms predominantly bacteria and fungi, but literally thousands of different species. Then in the top nine inches of soil there are other larger fauna: mites, springtails, spiders, ants, beetles, centipedes, millipedes, slugs and snails 10,000–100,0000 per square metre (and that's just in the top 9 inches!). And of course earthworms (30–300 per sq. metre)— these are not the same as the worms found in compost heaps. Now that's a staggering amount of soil life in each gram, in each square metre, and in each acre.

And compost heaps are richer than soils

Given the right conditions, colonies of bacteria can double every hour. A compost heap provides those conditions. The hundred thousand million or so bacteria in a teaspoonful will double in an hour— and keep on doubling, reaching astronomical numbers. It is primarily this phenomenal rise in the numbers of bacteria, all respiring, consuming and reproducing, converting the energy stored in the materials in the heap, which gives rise to the heat.

It's not just the bacteria that multiply in the heap, although the thermophilic (heat-loving) bacteria are the ones that really thrive in the heat. As the heap cools, there's plenty of food to go around for everyone. Compost heaps become a magnet for all kinds of creatures, including some bigger ones. Predatory beetles move in on larvae and smaller creatures; frogs and toads do likewise, as do slow worms and grass snakes, which love the warmth in a heap. Birds will visit to pick off insects and larvae, and bats will even visit at night. For wildlife value alone, it's worth making compost.

Questions & Answers

Here are some brief answers to questions that people often ask about composting. The subjects are discussed in more detail later in the book.

Why should I compost?

A third of the average dustbin is taken up with potentially compostable materials—two thirds, if you include paper and cardboard. Your dustbin could be considerably lighter and instead of filling up landfill sites you could be improving your garden soil (see page 26).

What can I compost?

Anything that recently lived *could* be composted, but you need to be careful with certain materials such as meat and fish (page 15), and animal faeces (page 31). However you can compost all your fruit and vegetable trimmings, food waste, grass cuttings, old plants, prunings, hedge clippings, hair, paper, cardboard and so on.

Are there different methods of composting?

Yes, composting means controlling the decomposition process: basically, speeding it up. You can speed it up by hot composting (page 12) or more slowly by cool composting (page 10). Or you can use other systems such as wormeries (page 21), fermentation (page 17) or in-vessel composting (page 19).

Will composting attract pests and diseases?

Some materials—such as cooked food wastes and fruit—can attract flies, mice, rats, foxes etc. These are best dealt with by composting in a container (page 19), by fermentation (page 17), or by feeding to worms (page 21). All of these systems use a container.

Do I need to treat cooked and processed food differently from vegetable trimmings etc?

Cooked food, and even some raw fruit and vegetable trimmings such as potato peelings, will attract a variety of pests (see above).

These materials need to compost in enclosed containers. But if you grow your own vegetables you can end up with masses of trimmings—most of these are fine in a normal composting system.

What's the best method for a small garden?

You obviously need a compact container. The plastic composter bins that councils promote are fine for garden composting, but you may want to have a pest-proof container as well—see above.

Will my compost heap smell?

A compost heap should not smell unpleasant—if it does, then it is lacking air. It needs turning and something dry and airy mixed with it. The easiest solution is to always add plenty of scrunched up paper and cardboard as you go—it's a great way of getting rid of all that packaging, cereal boxes, envelopes, toilet roll centres, egg boxes and so on (page 4). Having a small shredder can be a boon (page 13).

Can I compost diseased plant materials?

You can, but there is a risk involved. When you become a confident 'hot composter' (page 12), the hot composting process will kill off plant diseases. Putting on compost has been proved to help prevent and cure plant diseases (page 29).

What can I do if I produce more compost than I can use?

Serious gardeners never have enough compost: they mulch their gardens, treat the lawn, feed houseplants, make hanging baskets, fill tubs etc. So if you can't use it, give it to gardening friends.

I live in a city flat, and only have a balcony. How can I compost?

It can be done. Some people even keep worms inside—I've seen them in a cunningly designed window seat! A wormery will not take up much space on a balcony—or you could ask the council if they could help start a community scheme (page 19).

Where can I buy composting bins?

You can buy them at garden centres and hardware stores—any many local councils offer subsidised bins.

Cool Composting

The compost bin that most people are familiar with is the plastic 'Dalek'-type bin, promoted by many Local Authorities. There is some variation in size and colour, and whether or not an access hatch is provided.

Because they have a small capacity (less than a cubic metre), they do not hold the heat well and are only suitable for cool composting. Most people will be cool composting most of the time, whether in a plastic bin or in a larger heap, as hot composting only works when you have large quantities at one time.

Mix and dump

You will generally be adding a fairly small amount at a time. Even so, you want to make sure that each time something is added to the heap, particularly if it is wet and smelly, it is mixed with something dry and absorbent. You can either keep a separate bin for paper, card, or even part-rotted woodchip or sawdust etc, next to your compost bin so that you can mix as you go along, or just mix it into your kitchen bucket in the same way.

The 'Dalek' type of bin is fine for this kind of 'cool' composting. A cool compost system will soon have plenty of worms in it working away from the bottom upwards. In fact, without even trying you will be operating a kind of hybrid system, with some composting going on at the top and a wormery at the bottom.

Lifting the lid

You may well find that you get masses of tiny flies that fly up when you lift the lid. These will mostly be harmless fruit flies, which are particularly attracted by—well, fruit, as it happens! One way to control them is to leave the lid off the bin (or half off) for a while. This allows access to larger predatory beetles, which will set up home in your bin and will soon be feasting on fruit fly larvae. You can also wrap fruit waste in paper, or bury it in the heap—don't be tempted to use fly spray!

Siting the bin

A compost heap is best sited on soil, but will even work on concrete, as long as you put in the right mixture of materials and add light sprinklings of healthy soil to introduce soil micro-organisms, or a large dollop of compost or well rotted manure. Worms will even find their way across tarmac and concrete to colonise your heap! They will like it even more if you have a good bedding layer for them to colonise: moist, scrunched-up cardboard is ideal. Putting the bin in the sun will speed up the process, but it will still work in the shade. Put it anywhere that's convenient, but not too close to the house.

High-fibre compost

The real key to cool composting is the inclusion of plenty of high fibre. Paper and card are derived from the cellulose in wood, and provide the carbon that the process needs. Make sure paper is not in flat sheets, and is scrunched up. Add plant matter too (dry stems will create airways), and fresh fruit and vegetable trimmings are ideal. Keen composters add shredded harder woody material—one way to shred them is to run a mower over them. Pernicious weeds need to be killed off before being included (see page 28). Cooked foods, bread, oil, fat, cheese and meat etc are more problematic (see page 16).

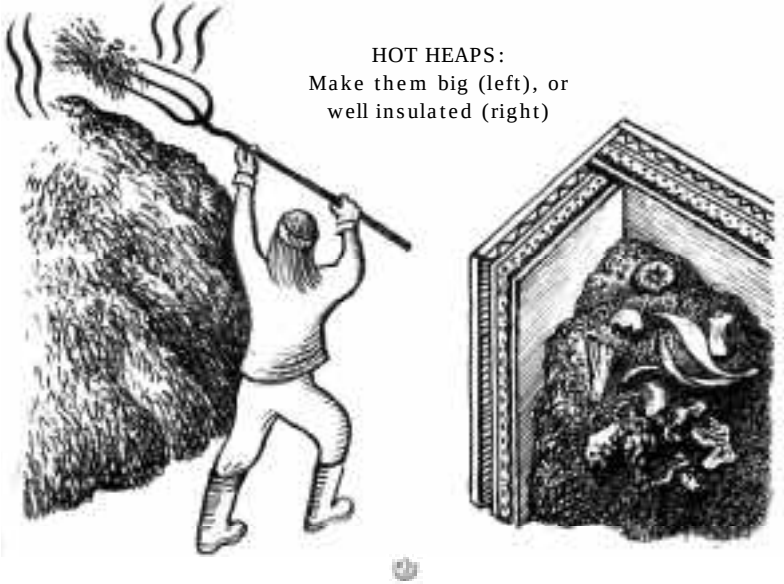
Hot Composting

When all the conditions are right, a compost heap can get really hot. However, unless the heap is big enough (or very well insulated), this heat will rapidly dissipate (see page 31).

It isn't really necessary to make a hot heap unless you want to cook weed seeds and roots, or to rapidly kill any potential diseases or pathogens.

Making a hot heap

- To make a hot heap, first gather all your materials together.
- The best time is when the growing season is in full swing, when you can go and gather plant material to bulk up your heap.
- Nettles and other weeds can always be found somewhere—neighbours might be happy to help you with materials.
- You might be able to get hold of some strawy manure; your local hairdresser will happily give you hair; the greengrocer, spoiled fruit and veg; the brewery will give you hop waste, and so on.



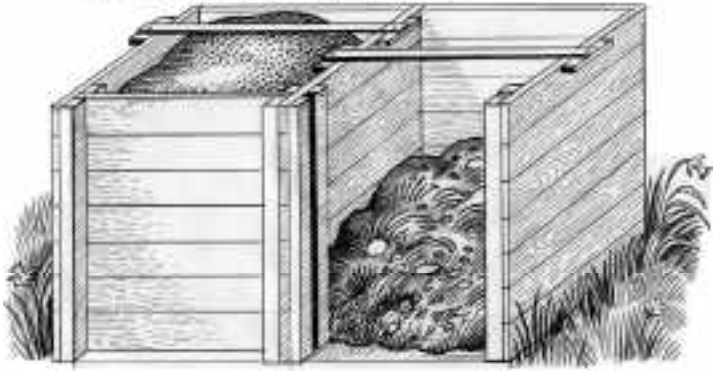
HOT HEAPS:
Make them big (left), or
well insulated (right)

Very small shredders, like this one, run very quietly and some crush rather than chip, which many composters prefer

- You could have bags of leaves saved from the autumn, or a nice pile of partly rotten wood chip.
- A shredder can be really useful for the tough and bigger stuff!
- Don't forget the cardboard and paper you can add. Choose a time when you can add hedge prunings and grass cuttings.
- In short, assemble as much as you can. It should be enough to completely fill a four-foot (1.2 metres) by four-foot bin to a similar depth or more. It can be smaller than this, but if so you will really need to insulate the bin first.

- The 'Rolls-Royce' design for this type of heap is the New Zealand box (see below), but you can make a cheap simple version out of old pallets. These can simply be tied together, and you can easily insulate them if desired and line the inside with cardboard sheets to cover up the gaps.
- Start with a layer of material high in carbon (i.e. the tougher, drier stuff): not not too thick — just a few inches.

The New Zealand Box



• Follow with a thinner layer, high in nitrogen — e.g. grass cuttings.

• Add water as you go, if the materials are on the dry side.

• Adding small amounts from a previous heap will 'inoculate' the heap with countless micro-organisms. So if you have it, put in the uncomposted top layer of a previous heap.

When the heap is built, cover it with some plastic sacks or sheet to keep in the water vapour which will be given off, and some old carpet which will help to keep the heat in.

Troubleshooting

After a day or so, the heap should be very hot: when you take the covers off you should be able to see the steam rising. If not, the mixture wasn't right:

• **It could be too dense and wet**: If wet, it needs opening up. Re-mix, adding something to absorb the water, to let the air in and to add carbon.

• **Or too light and airy**: If dry, it needs watering, or remixing with something green and sappy. Do not turn large musty dusty heaps. Wet them down first; otherwise, to avoid breathing in the fungal spores, wear a dust mask.

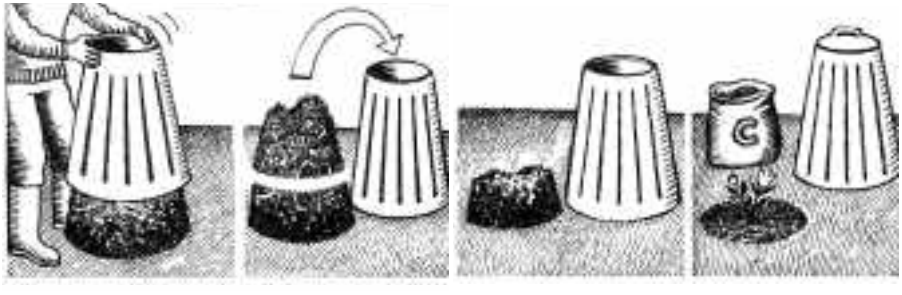
Monitoring and Turning

A large heap made in one go will rapidly heat up in a few days, then start to cool down. Keen composters have a thermometer on a probe, so that they can monitor when the temperature drops. At this point they turn the heap. The advantage of doing this is that you can mix all the ingredients: you can move the materials which were on the outside towards the middle, and vice versa. You can also check the moisture content etc, and adjust if necessary. After turning, the heap should re-heat and again it can be turned, to accelerate composting.

How Long Does it Take?

Cool composting will take six months to a year, or longer for dense clumps or unshredded woody material. Pre-shredding or chopping plant matter up with a sharp spade will speed up the process, as will turning a cool heap. Follow the stage drawings on the next page, and make sure that when you put materials back in, that you mix it all up with some finished compost as a 'starter', and some fresh matter in to balance its wetness or dryness. (See *What is composting?* at the beginning of the booklet.)

Hot compost can be made extremely quickly. After two or three turns, all the weeds and roots should have been cooked up. All this can happen in less than a month. The compost can be used at this stage as a mulch, but it is best left to 'simmer' and then gradually cool down and mature. As it cools, the worms and other small creatures move in to finish off the process. They will gradually turn the entire mass into a rich dark material resembling sticky chocolate cake! This will take a further six months to a year, depending on the season. When it's too cold, worms and other organisms just slow right down or stop.



1. Lift up the entire compost bin
2. The uncomposted top section can go back in
3. The compost can be harvested
4. Either bag it to use later, or use straight away

Many people will opt for a second composter. however it is easy to lift the whole bin, scoop the top section off—which will only be partially composted—and harvest the finished layer at the bottom.

What do I do with Kitchen waste?

Every household generates masses of material which should be composted. Even if you don't have a garden you can make compost for use in tubs, hanging baskets or to be used on some communal space (see *City composting* on page 19).

Food wastes need to be composted with more thought and care. Cooked food, dairy produce, bread, raw meat, potato peelings, root vegetables and whole fruits are food to a variety of creatures you don't want. They are really best dealt with in some kind of enclosed system: see *Worms* (page 21) and *City Composting* (page 19). However, the rest—fresh, raw vegetable tops and tails (leek trimmings, carrot tops, etc), fruit peel, onion skins, dead flowers, tea leaves, tea bags, coffee grounds and so on—can be added to the compost heap, although they still tend to be rather wet and smelly (they're high in nitrogen and water). The easiest thing to do is to mix them half-and-half with paper and cardboard (high in carbon and air, and absorbent of water), as this gives a good carbon to nitrogen ratio C:N.

Save up all cardboard tubes, egg boxes, envelopes without their windows, and so on. The paper and cardboard is an ideal way to soak up the liquids from the kitchen scraps. Line your kitchen bin with plenty of newspaper and/or cardboard and it will help keep it clean too.

You can add the above to a garden composting system, or just mix it up with the trickier materials (still not forgetting the cardboard and scrunched paper, though) and deal with it in an enclosed system.

How to deal with meat and fish

The most obvious thing is to produce as little food waste as possible! Many people, of course, have a dog that will eat much of their left-overs. I never put meat or fish on my compost heap. Any bones get boiled up for stock, then dried out thoroughly and crushed. Finally they go into the compost or wormery.

Some food can be suitable for feeding to wild birds, especially in the winter, which is the time when all animals and birds are most desperate for food and when the compost heap slows right down. You can mix fats with breadcrumbs, seeds etc to put out for the birds. A half-coconut (or other container) can be filled with a hot fat mixture, for this purpose. When it has cooled and solidified hang it outside.

However, the ultimate pets for transforming waste are worms! See page 21.

The 'green cone' composter (see drawing opposite) consists of a basket like a washing basket, which is buried in the ground with a double skin cone, which is all that is visible above ground. This makes it difficult for rats to get in. The material breaks down and is pulled into the surrounding soil by worms. Since kitchen waste is largely, liquid much of this also goes into the soil where the nearby plants can take it up. This is more of a waste disposal option though, as you don't harvest the compost.

Fermentation This system, called Effective Micro-organism 'EM Bokashi', uses bacteria, which thrive without air to convert the material. Unlike most airless systems, EM Bokashi does this without unpleasant smells. Many foods are preserved using fermentation processes, such as sourdough bread, beer, and sauerkraut. With EM Bokashi you generally have two sets of buckets. Each set is a pair of buckets, which fit together (see drawing) The one on top has holes drilled in the bottom, so that liquids can collect underneath in the second bucket. Every time material is added a little sprinkling of the micro-organisms is added, and the material is pushed firmly down

The E M Bokashi airless system

and resealed. When the top bucket is full another set of buckets is started, and when that set is full the first set is emptied. You can either bury the contents, which very rapidly break down in the soil, or add them to your compost heap where they are no longer attractive to rats. For more information on Bokashi, see *www.livingsoil.co.uk*.

Burying Many gardeners bury kitchen scraps, particularly in the winter in a trench, which will become the site for runner beans in the following season. Don't do this with woody materials, though, as it causes 'nitrogen robbery'(i.e. it takes the nitrogen away from the growing plants).

City composting—see page 19.

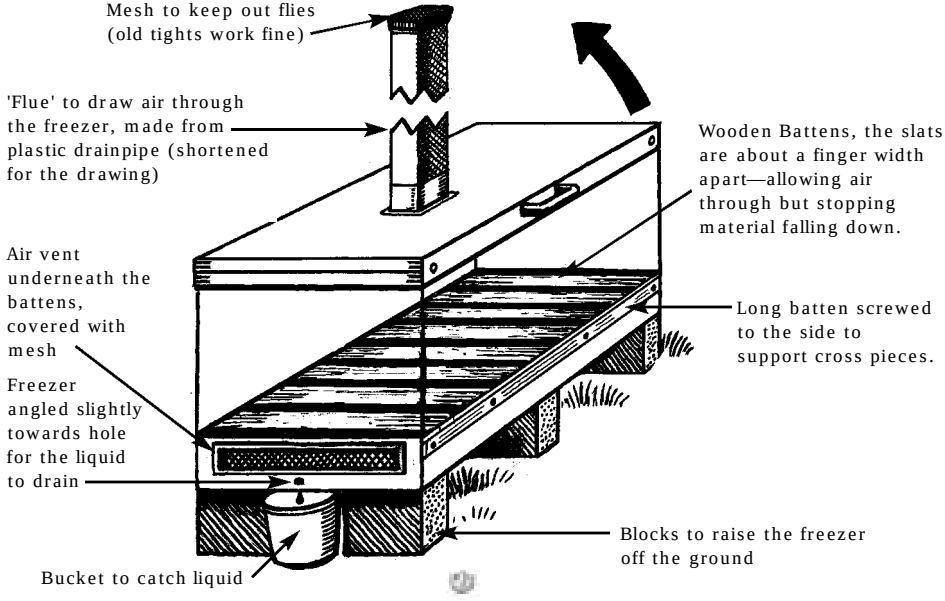
Incorporating into a hot heap This is most likely to happen in the summer, when you can quite easily bury kitchen scraps and cover them with abundantly available fresh material.

City Composting

We have to reduce the amount of compostable material going into landfill sites. The trouble is that composting food waste in the open air attracts flies, birds and other animals: the potential to spread disease is obvious. But if we can do the first, hot phase of composting in the extremely controlled conditions inside specialised composting containers, we can guarantee the temperature required to kill all the potential pathogens. The commercial composting sector utilises a variety of high tech, extremely expensive in-vessel composting units.

A Simple Low-Tech Solution

You don't have to go to all the expense of the commercial sector to make an in-vessel composter. All you need is a container which is sealed and well insulated, but which can also let air flow through it. A simple solution is to use an old de-gassed chest freezer. All over the country people are clubbing together to make compost (see the Community Composting Network in the Resource section), and you too could share a freezer system between a few households—see below.



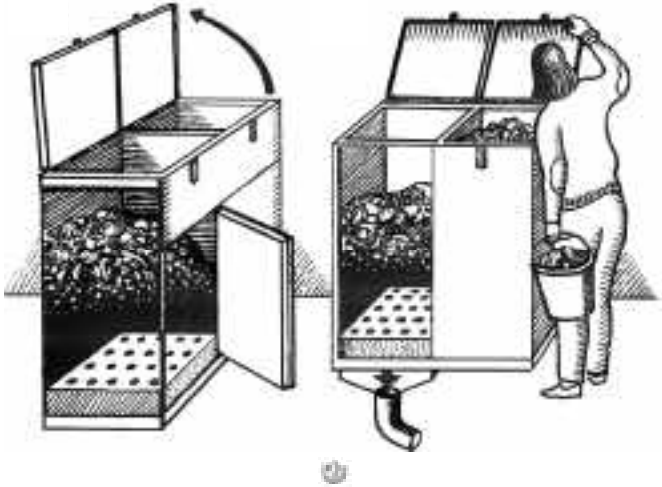
Composting without Gardens

I saw a more refined-looking version than the freezer (see previous page) on a housing estate in London. There was a small communal garden over the road, but the estate itself was just tarmac. The composting unit was housed in a smart stainless steel box, which contained two composting sections. A grid on the bottom allowed any liquid to drain off into a pipe, which in this case led to the sewer. When the box was opened it was easy to see the finished black compost at the bottom and the layer thick with worms just under the fresh food layer. The worms had found their own way to the composting unit and managed to squeeze in! This was in the middle of a sea of tarmac and concrete. This system was really a sealed 'hybrid' system. The top section was hot composting but because relatively small amounts were being added all the time and it wasn't an insulated container, the environment was perfect for worms, which could get away from the heat by burrowing down, if they needed to.

The local council had helped them set it all up and had helped them with window boxes and hanging baskets as well as planning the communal garden over the road.

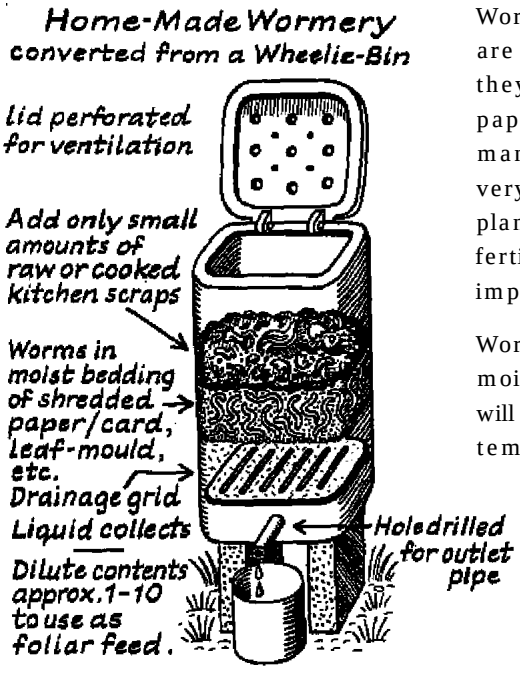
Another high-rise estate has installed a mechanised in-vessel composter called the 'Webbs Rocket', to deal with the estate's food waste.

You really don't have to have a garden to make compost! If you live on an estate, maybe your local council could help you out too.



Worms and wormeries

I prefer the term worm farming to worm composting. It reminds you constantly that what you are doing is keeping livestock, and you are responsible for their welfare.



Worms eat rotting matter, and are particularly useful because they will eat your food waste, paper and cardboard. Their manure, called 'worm casts', is very beneficial for all soils and plants. It is used more as a fertiliser than as a bulky soil improver.

Worms like it to be cool and moist, but not too cold. They will not be very active at low temperatures, and if it gets too hot, they will climb out if they can. If they get too wet, they may drown or migrate.

Starting off with worm farming

- When you are starting from scratch, as with any animal, you have to provide a suitable living environment.
- Containers can be home-made or bought, but whichever kind you use you must start the worms off with a generous bedding layer.
- This can be leafmould, finished compost (preferably sieved), shredded-up newspaper and/or cardboard, well rotted sawdust or woodchip, or a mixture of any or all of these.
- Whatever it is, it must be thoroughly wetted—especially paper and cardboard, as worms will die if they dry out.

- After you introduce the worms into the container, let them settle down for a day or two. They will be quite happy eating what's in there.
- Only feed them small amounts at a time: they don't want a great pile of stuff dumped on them as it can compost and generate heat—and they like it cool!
- They can eat about their own weight in food each day.

Wormeries should ideally have a large surface area, but unfortunately most of them are designed to look like wheelie bins (see drawing) with a very small surface area. The main advantages of these bins are that:

- You can tap off the liquid that's produced to water down as a liquid feed for plants, and
- They take up less space.

However, if you don't regularly tap off the liquid, the container will gradually fill up with it and drown all your worms—and knock you out with the odour!

If you separate out your materials so that fresh vegetable trimmings mostly go in your compost heap and the kitchen scraps go in the wormery, then you won't create masses of liquid.

Many large containers (such as old dustbins and barrels) can be adapted to become worm bins. If they have a hole in the bottom, you can easily plug this with some chicken wire doubled over. A good lid is vital to keep rats out. It doesn't have to seal completely—a small gap allows beneficial beetles in, which will keep the small fruit fly larvae in check. You can also buy, or make wooden wormeries. These give a larger surface area and are easier to manage, although they do take up more space. There are also stacking wormeries, such as the 'Can o'Worms'.

Harvesting

Wormeries take a long time to fill up with worm casts. When they are getting pretty full, the best thing to do is to remove the freshest material plus the layer immediately underneath. This will contain most of the worms; put the whole lot to one side. It can all go back into your wormery when you have harvested the worm casts.

If you want to harvest every last worm:

- Tip the rest of the material in the bin out on to a sheet of plastic or tarpaulin laid out on the ground.
- Make little piles of the compost all over the sheet and the worms will go to the bottom.
- By the time you've had a tea break the worms should be in position for harvesting.
- Pick the tops off all the piles—put the compost in a bucket as you go, the worms will be at the bottom against the plastic sheet.
- If you really want to increase the population, you can pick through the compost carefully looking for the egg cases, which look a bit like rather large grape pips.

Using Worm Casts

Worm casts are the crème de la crème of composts, and are best used by the handful rather than the wheelbarrow load. Think of worm casts as fertiliser, not compost: a little goes a long way. Give all your pot plants, window boxes, hanging baskets a top dressing. Water them thoroughly first, and then top dress with a handful or so of worm casts. You can do the same with any garden plants.

Leafmould and Grass

Making leafmould is ridiculously easy: you just gather up leaves and put them somewhere to stop blowing around! In a large garden, the common solution is to build a wire enclosure to be filled up with leaves. The only additions you need are water, and time. The leaves are broken down by being gradually consumed by fungi. Some take several years to fully break down, so you need to keep collecting them each year. If you only have a small garden, you may prefer to fill plastic bags with leaves instead. Make sure the leaves aren't bone dry—there must be enough water for the fungi to decompose them.

Fast leafmould (composting leaves)

You can speed up leafmould production by picking them off grassy areas using a lawnmower. This chops up the leaves and mixes them with grass, which is high in nitrogen. The grass is also mostly water, so you end up with the magic mixture of carbon and air (in the leaves), nitrogen and water (in the grass cuttings), and micro-organisms (on both). If you make a decent pile of these, they will heat up!

Cardboard mould

You can also layer cardboard with grass cuttings to make a wonderful leafmould/peat substitute. Just make a layered stack of thin layers of grass with flat cardboard sheet between.

Peat substitute

Whatever method you use, you will end up with leafmould. This resembles peat, and can be used in much the same way, but unlike peat, it is a renewable resource. Leafmould is an invaluable ingredient in seed and potting mixes (see *Using Your Compost* on page 26), so don't let those leaves go to waste! If you only have very small amounts of leaves, they can just be added to the compost heap, wormery etc.

Grasscuttings—leave them on the lawn!

Although grass cuttings are really useful in composting systems, they can also be a headache, especially in large quantities. You have to incorporate them into a heap in very thin layers, and you really have to do it as soon as they are generated. (This is where the stack of cardboard sheets comes in handy) So why not just leave them on the lawn instead? As long as the grass is not too long it will not form a thatch on the top. Besides, continually removing grass cuttings impoverishes the soil. This is great for wild flower meadows, but not for lush lawns.

Using Your Compost

All kinds of compost mixtures can be made for plants. We need one mix for seed raising, and a stronger mix for pricking out and growing on. Plants need to have mixes which both hold water and allow drainage. Most of the materials for compost mixes can come from the garden: principally sieved compost, leafmould and even molehills or good sieved soil. Many growers steam-sterilise soil for mixes to kill weed seeds, and some even use the heat from the composting process to achieve the same end.

Sometimes it is enough to just have sieved compost as the sole ingredient for growing plants on. More usually though the compost is 'opened up' by the addition of sharp sand, vermiculite, or something similar.

Recipes

Recipes don't have to be slavishly copied in either cookery or gardening: for one thing, the raw materials vary. Use your senses, feel the mix, squeeze it, smell it, put some in a pot and water it, and see what it does. Try a 'mix' for potting which is just pure sieved compost. For seeds, try compost made from composted leaves and grass or cardboard and grass. With other mixes, try leafmould and soil, plus some sharp sand (not builders' sand) or grit: e.g. two parts (buckets) compost, one leafmould, one soil and one sand.

Activators

Compost made correctly doesn't need an activator. Commercially available activators are generally either chemical nitrogen, which can have a detrimental effect on the micro-organisms in the heap, or a bacterial culture, which is unnecessary given the ideal conditions in the heap for the rapid growth of bacteria colonies. If you want to introduce more bacteria, the easiest way is to always inoculate each heap with a proportion of the previous heap. Also the odd light sprinkling of soil will introduce countless millions of bacteria.

Nevertheless, some people swear by activators:

- Urine is probably the cheapest and best.
- Seaweed (either freshly harvested, as liquid concentrate, or as a dried meal).
- Biodynamic gardeners and farmers, who follow the teachings of Rudolph Steiner, always put special herbal preparations into their heap. These can be bought from the Biodynamic Association (see *Resources* section).
- Maye E. Bruce formulated a simplified version consisting of the main herbs used in the biodynamic preparations in the 1930s. This can still be obtained through the Henry Doubleday Research Association and is called QR, which stands for quick return. The main herbs in QR are camomile, dandelion, valerian, yarrow, nettle, and powdered oak bark. (Be careful adding these plants, as some are quite pernicious weeds, and small bits of root not properly composted could take hold and thrive in your compost.)

- Nettles compost extremely well, and are a valuable addition to any compost heap.

Dealing with weeds

Unless you are confident that you have a really hot heap, which will cook pernicious weeds, it's probably best to exclude them from your compost heap. But weed roots contain lots of valuable minerals, so it's a great shame to waste them. One option is particularly useful for very earthy weed clumps like couch grass. You make a neat stack of the earthy clods, and then cover up the whole heap with thick black plastic to exclude all light. This needs to be left for about two years to be sure that all the weeds have died, and the result is a lovely rich loam. Smaller amounts can be treated in light-proof bags.

Another option is to drown the weeds to release their minerals. They can either be put in a hessian sack and weighed down in a barrel of water, or simply stuffed into a barrel of water and a cover put on. After a few weeks, the whole lot will rot and smell awful—so do it well away from human habitation! The smelly water can be used on plants (the smell will go away very quickly), and the plant remains can now be safely composted.

- Plants die without light
- Most plants will 'drown' in water.

Fly tipping is illegal, and has doubtless caused the spread of plants like these.

Japanese Knotweed

Japanese knotweed is extremely pernicious and difficult to kill. You can be prosecuted for taking it to centralised composting sites or fly tipping it. Although the tops, or canes, can be composted, even the tiniest piece of the crown will regenerate. If you have it on your property, you could try cutting the fresh green top growth off regularly. (Beware mowing it, as it can spread the plant further afield unless done with care.) This will have to be done at least once a month for several years. The green tops can be composted—but make sure that you don't have any of the crown with it! Once you have weakened the plant, you can then dig over the ground and remove as much root and crown as you can. These are best burnt,

as composting is too risky. Don't plant anything where the knotweed was, because more is bound to come up and you must remove all the re-growth! Knotweed will come up through tarmac and concrete, and even treatments with herbicides take several years to kill off the plant. For more advice on knotweed, look at *www.ex.ac.uk.knotweed* or contact your local environment agency.

Compost 'teas'

Compost gardeners have always maintained that compost has healing and disease-suppressing qualities. Now the anecdotes are being confirmed by scientific evidence.

Many plant diseases, including clubroot, which affects the cabbage family, white rot, which affects the onion family, brown rot, which affects potatoes, and many field crop diseases can be suppressed by the application of compost. Compost is the key to building and maintaining healthy soils. As we've seen, the life in the heap mirrors the life in the soil. It is the complex relationships of (principally) fungi and plants which is so important. Making your own compost and adding it to your soil is one of the best things—if not the single most important one—that we can all undertake to benefit the planet.

Some authorities are now claiming that 'compost teas' are equally beneficial. You can make a brew by putting a sack of compost in a barrel of water for a few days: strain add more water and foliar feed your plants (this is similar to the 'juice' you can tap from a worm bin or a 'freezer' system). Undoubtedly more research is needed in this area but one thing is for sure—it's not going to do any harm and could be very beneficial. Don't spray plants in full sun, and for maximum effect add a drop of liquid soap and aim to coat leaves both above and below.

What can't I compost?

You can't compost materials that never lived—like glass, plastic, metal, stone. Large pieces of wood will take an awfully long time—unless they have been chipped up, which vastly increases their surface area. Often large pieces of wood are better used as firewood or as wildlife refuges—many beetles depend on this kind of habitat. Some, like the stag's horn beetle, have become very rare because of people being over zealous in cleaning up their gardens of rotting lumps of wood. Newts and toads spend lots of time under rotting piles of wood, so find a place to make a wildlife pile, instead of trying to compost it all.

High Risk Materials

Dog and cat faeces These can contain parasitic worms which can cause blindness, and therefore it is generally not recommended that they are composted, especially when there are children around. Personally I think they are better composted than left lying around: a carefully made hot compost will destroy these pathogens. Composting is incredible in the way that it purifies diseased matter, but you must treat it with respect. Wash your hands carefully after handling compost—especially if you have been more adventurous with what you do compost. Some commercial cat litter is now compostable.

Nappies Disposable nappies are an environmental time bomb, as well as being unpleasant and hazardous items in the dustbin. Buried in landfill sites they are said to take centuries to break down. Where possible, it is best to use re-useable nappies. You either, buy and wash them yourself, or use a nappy laundry service. There are also nappies now made with bio-degradable plastic: these could be composted, urine is safe enough but faeces need to be composted carefully with plenty of other material to make a suitable mix.

Coal Ash Although coal was formed from living organisms, it was at a time when our atmosphere was different: coal ash contains high levels of sulphur. Very small amounts are not going to be a problem, but too much will poison the soil. (Wood and charcoal ash, however, are fine for composting.)

Pernicious Weeds Be very careful when composting persistent weeds—see page 28.

Diseased Plants Composting is an amazing process: an astonishing number and variety of organisms are involved, and the heat generated can easily reach 60–70°C. Plant and animal pathogens as well as weeds are destroyed by the heat generated, and the hotter it gets the more quickly they die.

Weed seeds and human and plant pathogens are killed during the first few days of hot composting when the temperature is above 55°C. But even above just 40°C, few will have survived after a month or so. To ensure complete pathogen removal, it's important to mature your compost. The warm, post-hot composting phase produces the 'hygienisers', i.e. the organisms that attact pathogens, including those that produce antibiotics. You need a well managed, regularly turned, hot system to tackle diseased plants (which is why most gardening experts will tell you to burn them), but the bacterial 'fire' of the compost heap is just as effective!

Meat, fish and cooked foods Special care needs to be taken with these materials. See *What can I do with kitchen waste?* (page 16), *City Composting* (page 19) and *Worm Farming* (page 21).

General advice If you can confidently compost these materials, do it!

Waste not —compost!

Resources

Books & video

Backyard Composting by John Roulac, UK edition edited by Nicky Scott (Green Books)

The Rodale Book of Composting Rodale Press, USA

Composting by Dick Kitto, Thorsons

Composting for All Video with Nicky Scott—see below

Magazine

The Growing Heap, the magazine of the Community Composting Network

Organisations

The Community Composting Network
67 Alexandra Road,
Sheffield S2 3EE
Tel 0114 2580 483
ccn@gn.apc.org
www.othas.org.ukk/ccn

Also available from Green Books:

Composting for All with Nicky Scott video

30 minutes approx.
ISBN 1 900322 07 2
£10.00 inc VAT

The Composting Association

Avon House, Tithe Barn Road,
Wellingborough, Northants,
NN8 1DH *www.compost.org.uk*

Biodynamic Agricultural Association
Painswick Inn, Stroud, Glos.
Tel/Fax: 01453 759501
www.anth.org.uk/biodynamic

Green Books
Foxhole, Dartington, Totnes
Devon TQ9 6EB
Tel 01803 863260
greenbooks@gn.apc.org
www.greenbooks.co.uk

The Henry Doubleday Research Association (HDRA)
National Centre for Organic Gardening, Ryton-on-Dunsmore
Coventry CV8 3LG
Tel 02476 303517
www.hdra.org.uk

Mucking In: A Guide to Community Composting:
A pack produced by HDRA and the Wildlife Trust. Available from The Community Composting Network.