

A SIMPLE INTRODUCTION TO HOME COMPOSTING



WHAT IS COMPOST?

Compost is partially decomposed organic material. Organic means that the material was, at one stage, part of a plant or animal. Compost is produced in the natural environment from decaying leaves and litter on the forest floor.

WHY SHOULD I COMPOST?

By composting your garden or kitchen wastes you can reduce your household rubbish by about one third or even as much as half. Composting is a critical step in reducing the volume of waste needlessly sent to landfill for disposal. Composted organic material is also a very valuable resource. It can be used to feed your garden, potted plants, greenhouse plants and is also an excellent soil conditioner. It saves you money as you don't need to buy garden compost.

From an environmental point of view, you are making an important choice in using peat-free compost in your garden. By choosing peat-free alternatives you are helping to protect Ireland's remaining bogs. Home compost heaps can also provide a home for garden wildlife and provide food for birds and hedgehogs.

HOW DOES COMPOSTING WORK?

Composting is a natural biological decay process, which converts organic wastes into a crumbly, sweet smelling earth-like substance. If you do nothing more than pile your organic waste in a heap in your garden composting will happen by itself! The micro-organisms (bacteria, fungi etc) which produce compost just need oxygen from the air, nitrogen and trace elements from the raw materials, water and a little time to do the job.

Good home composting is a matter of providing the proper environmental conditions for microbial life to do the job. Compost is made by billions of microbes (fungi, bacteria, etc.) that live in the soil and digest the garden and kitchen wastes (i.e. food) you provide for them. If the pile is cool enough, worms, insects and their relatives will help out the microbes. All of these will slowly make compost out of your garden and kitchen wastes under any conditions. However, like people, these living things need air, water, and food. If you maintain your compost bin or compost heap to provide for their needs, they'll happily turn your garden and kitchen wastes into compost. Remember to have to correct mix of **GREEN** and **BROWN** materials!

To successfully compost at home you will need the following:

1. **Air**
2. **Water**
3. **Food (Kitchen scraps & garden waste)**





AIR	WATER
<p>Composting microbes are aerobic – i.e. they need air to survive. Some compost ingredients, such as green grass clippings or wet leaves, break down very easily into slimy layers that air cannot get through. To make sure that you have adequate air in your bin it is necessary to have a good mix of ingredients. It is also a good idea to poke it with a stick every so often and occasionally it may be necessary to leave the lid off for half a day. If you have a compost heap you can turn the pile to get air into it. This means completely breaking it apart with a spade or garden fork and then piling it back together in a "looser" condition.</p>	<p>Ideally, your compost heap or contents of your compost bin should be as moist as a wrung-out sponge. If you are using dry ingredients, such as autumn leaves or straw, you'll need to moisten them as you add them to the heap or bin. Kitchen fruit and vegetable wastes generally have plenty of moisture, as do fresh green grass clippings and garden trimmings.</p>
FOOD	
<p>Broadly speaking there are two major kinds of 'food' that composting microbes need, namely browns and green. The correct mix of browns and green is essential. <u>THE RULE OF THUMB IS 1 GREEN: 3 BROWN</u></p> <p>Browns are dry, dead plant materials such as straw, dry brown weeds, autumn leaves, and wood chips or sawdust. Torn up or shredded newspapers or cardboard egg boxes are also suitable. These materials are a source of energy for the compost microbes. Because they tend to be dry, browns sometimes need to be moistened before they are put into a compost system. Browns – decompose over a long period – rich in carbon</p> <p>Greens are fresh (and often green) plant materials such as green weeds from the garden, kitchen fruit and vegetable scraps, green leaves, coffee grinds and tea bags, fresh horse manure, etc. Compared to browns, greens have more nitrogen and provide a critical protein source for the micro-organisms. Greens – compost activator – rich in Nitrogen</p> <p>A good mix of browns and greens is the best nutritional balance for the microbes. This mix also helps add air and water into the heap or bin. Browns for instance, tend to be bulky and promote good aeration. Greens, on the other hand, are typically high in moisture, and balance out the dry nature of the browns.</p>	

NB: "Green" and "Brown" are terms used to simplify the material types, it does not necessarily mean that they are all green and brown in colour.

GREENS ✓	BROWNS ✓
✓ Grass Cuttings (Small Amounts)	✓ Straw & hay
✓ Weeds/Nettles (Avoid weed seeds if possible)	✓ Old cotton T-shirts (torn up)
✓ Urine and Manure (rabbit, gerbil, guinea pig, pig, sheep, cow & horse)	✓ Dry plant stems & twigs
✓ Raw fruit and vegetables including peels	✓ Torn up paper
✓ Fresh plants e.g. clippings	✓ Torn up light cardboard (e.g. cereal boxes, egg boxes, toilet roll centers etc)
✓ Tea leaves & coffee grindings	✓ Pet and human hair
✓ Seaweed, algae and garden pond cleanings	✓ Egg shells (rinsed and broken up)
✓ Wood/peat ashes	✓ Torn up newspaper

PART I - A GUIDE TO HOME COMPOSTING BINS AND HEAPS



INTRODUCTION

Home composting can be done in a variety of ways, the most common being compost **heaps** or compost **bins**. When choosing a site for your bin or heap ensure it is sheltered, sunny and convenient to the kitchen.

SETTING UP A COMPOST HEAP

Compost heaps are suitable for dealing with larger volumes of kitchen and garden waste. For this reason they are best suited to large gardens with enough space to make and maintain the heap. Due to the larger quantities of organic waste breaking down, compost heaps generate heat, which helps the composting process.

The recommended size of a compost heap is 4ft x 4ft – pallets are ideal. As with all composting systems a good mix of material is needed. The temperature in the heap will rise to approximately 60°C. For this reason the heap will need to be turned approximately once a fortnight.

The compost is ready when most of the material is broken down. It will be fine to crumbly in structure, almost black in color and will have a good earthy smell.

The heap will need to be covered, plastic sheeting can be used to keep the moisture in and carpet can be placed over it to keep the heat in.

GETTING STARTED WITH A COMPOST BIN

Compost bins are sometimes more suitable for an urban or suburban garden where space is limited. There are several types of compost bins on the market; most are made from recycled plastic, have an open bottom for standing on grass or soil and have a door or hatch at the bottom for taking out finished compost. Compost tumblers are also available with removable lids (these are suitable for people who have only paved yards as they do not need to be placed directly on the soil).

Step 1: Find a suitable site for your home composter, and place on bare soil or grass. It is best to lightly dig over and loosen any grass.

Step 2: Prepare by gathering a reasonable amount of organic waste to start filling your composter.

Step 3: Start with a layer of woody material (e.g. old straw, twigs, shredded heavy duty cardboard) to promote good air circulation. Do not mix at this stage.

Step 4: Next place alternate layers (3-4 inches) of "green" and "brown" materials in your composter. Use green materials such as horse/cow manure, grass clippings and

uncooked food scraps. **Remember that for every one layer of green material you should add three layers of brown material.**

Step 5: Add a sprinkling of water between each layer.

Step 6: Whenever you add a food scrap layer, always cover it with a brown layer to prevent odors and flies.

Step 7: The compost in the bins will shrink over the following weeks and months. Continue to add and mix until the composter is 80% full.

Step 8: Compost is generally ready to use when it looks like a dark rich crumbly soil.

Compost can be ready in as little as a few months or as much as 12-24 months, depending on frequency of mixing and the combination of materials used, and also weather conditions.

Remember - Compost Happens!

DO'S AND DON'TS IN COMPOSTING

DO COMPOST ✓	DO NOT COMPOST X
Leaves	Meat, fish and bones
Grass (not wet)	NO Cooked Food
Plants & Weeds (no ripe seeds)	Plastics, Glass
Old potting soil	Metals
Soft plant stems	Fats and oils
Uncooked Fruit scraps	Dairy products
Vegetable trimmings	Dog/cat litter
Egg shells (crushed & rinsed)	Cheese, meat or other sauces
Tea bags	Disposable Nappies
Coffee grounds with filters	Diseased plants
Shredded paper	Barbeque or coal ashes
Wood ash and shavings	Large pieces of timber
Manure-rabbit, gerbil, guinea pig, pig, sheep, cow & horse	Chemicals

HOW CAN I USE MY COMPOST?

Outdoor/indoor potted plants: mix compost with equal amounts of garden soil and sand

Flower beds and vegetable plots: dig your compost into the soil in your planting areas.

"Compost tea": half fill a bucket with compost; fill rest of bucket with water; stir and allow to settle for approximately three days. Use liquid from top of bucket to feed plants.

Lawn top-dressing/seed-starter dressing: sieve compost and mix with equal parts of sand.

Tree/shrub planting: blend compost with existing soil and place at bottom of planting hole.

Mulch (semi finished compost): apply to base of plants and trees for moisture retention and weed control.

Use compost in spring and summer.

Herbs prefer poor soil, so avoid using compost on them.

MAINTENANCE & PROBLEMS

TIPS FOR GOOD MAINTENANCE:

- Both carbon and nitrogen are needed to build a balanced compost heap or to fill a compost bin. Fine materials such as grass clippings should be added in thin layers so that they do not compact.
- DO NOT add meat (cooked or raw) dairy products, diseased plants or weeds that have already gone to seed.
- Keep the composter moist but not wet. Moisture content should be like a well squeezed sponge. Add water if compost pile or bin contents are very dry after mixing. Water the pile occasionally if it becomes too dry.
- If using a compost bin – loosen the composting material every so often, with a stick or garden fork to introduce air into the mix.
- If using a compost heap, take a garden fork and mix the material from the edges of the compost pile into the middle for more even decomposition.
- For faster decomposition in heaps and bins, chop large materials into smaller pieces and mix older materials with newer materials.
- Bags of autumn leaves will provide a good supply of "brown" materials for your composter. Place leaves in black plastic bag and punch a few holes in it. Leave to break down for a year or so. Do this now for next year's supply.
- The compost bin will compost better if filled to approx 3/4 capacity.

TROUBLESHOOTING:

Q: I've got a problem with flies in my composter, what should I do?

A: Fruit flies will be attracted to exposed fruit peels. Always bury your food scraps in the composter, wrap fruit in newspaper and put a few sheets of damp newspaper on top of the composter and peel back when new material is to be added.

Q: Nothing is happening in my composter, what should I do?

A: The ratio of carbon to nitrogen may be wrong in your composter. **Remember that for every one layer of green material you should add three layers of brown material.** Additional carbon material (browns) may be needed. Add more "browns" (e.g. shredded newspaper, light cardboard) and mix thoroughly. Stir your composting materials every 4 weeks to add air and if possible keep your composting bin covered with a piece of old carpet in winter to keep the composting process going during the colder months.

Q: My composter looks slimy and wet, what should I do?

A: It may be too wet or may have compacted into a slimy mess. There may be too many green materials in the bin. Add some soil or paper, mix in some brown material; introduce air by mixing with a garden fork; and then cover it all with a layer of "browns". Grass clippings should be added in thin layers to avoid compaction.

Q: My compost smells, what should I do?

A: The most common cause of bad smells is not burying food, or cooked food. Always bury food waste under at least 2 inches of bedding or compost. Never place cooked food in your compost bin. Bad smells can also be caused by anaerobic conditions which are usually caused by over wet conditions in the bin, it may also be caused by lack of air, so loosen up the pile, break up clumps, and turning the pile always help aeration. Air can also be introduced by keeping the lid off the bin for half a day. A layer of brown material at the top of the bin will also minimize odors eg a few sheets of damp newspaper.

Q: My compost bin is attracting pests, what should I do?

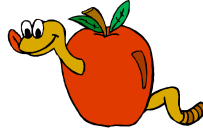
A: Burying food waste will deter vermin as there will be no odors to attract them. Always keep the lid of your composting unit closed at night and make sure the hatch is secured. Narrow wire mesh attached to the bottom of bottomless bins should help. Ensure NO cooked food or meat is placed in the bin.

Q: My compost pile is dry and not doing anything, what should I do?

A: Add some fresh greens, mix and use natural accelerators such as nettles, sea weed, coffee grindings, weeds, manure etc

For Further information on home compost bins or compost heaps or to purchase a home compost bin please contact Fingal County Council Environmental Awareness Section on 01 8906286 or email envserv@fingalcoco.ie .

Part II - A GUIDE TO HOME WORMERIES



INTRODUCTION

What are the benefits of worm composting?

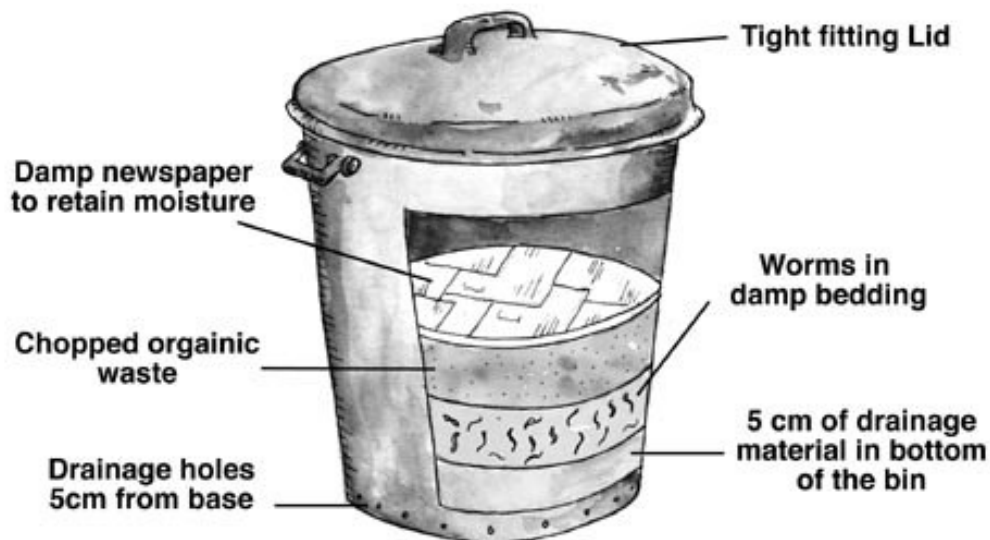
- Its a great way to recycle organic waste into excellent compost for enriching your soil
- Reduces the amount of rubbish you send to the landfill each week thus saving you money and reducing pressure on the environment
- As with compost heaps or bins, it reduces the amount of peat you use – leaving it in the bog where wildlife depends on it and saving you money on compost
- Gives you the satisfaction of doing some practical recycling at home and getting in touch with nature.

Where can I get a vermicompost system?

There are several suppliers of worm compost systems. You can expect to pay approximately 150 Euro for a worm system.

Can I make my own worm system?

Yes, you can make your own system by buying a suitable plastic container. This should have a well fitting lid, holes drilled along the base to allow excess water and organic leachate to come out of the bin, be big enough for your needs (60-90 litres), strong enough to take occasional knocks and the weight of the compost, and allow for relatively easy emptying once the bin is full. An ordinary black plastic rubbish is ideal.



Making the worm bin:

1. Drill holes near the bottom of the bin to allow any excess water to escape.
2. Put some gravel in the bottom to allow for drainage
3. Place a sheet of perforated heavy-duty plastic on top of the gravel
4. Put a layer of 'bedding' on top of the plastic for the worms. This can be one of or a mixture of the following materials: moist leaf mould, moist shredded paper, strawy manure, rotted compost.
5. Next add the brandling/tiger worms on top of the bedding. These can be obtained from any of the suppliers listed below (expect to pay approx. Euro 50), fishing tackle shops, heaps of rotting farm manure or working compost heaps. If you know of someone who has a wormbin, maybe they have enough to spare to get you started. You will need at least 250 gms to begin.
6. Finally, cover the worms with a sheet of wet newspaper. This acts to retain moisture and heat.

A bin of this construction would be enough for the waste of a 2-person household and is an ideal way to get a feel for how to vermicompost at the start. Once you have got the hang of the process you can add additional bins or scale up to larger containers.

What about pests and vermin when I vermicompost?

Provided you do not compost large quantities or rotting meat material, and you use a sealed container there should be no vermin problems. Put a lid on the bin to keep the flies out.

Do I need to look out for anything in particular when I start my bin?

In the beginning, cover the waste with wet newspaper to keep in moisture and prevent the organic material from drying out. Water the surface of the mixture if it gets dry. As the bin fills with organic compost there is less chance of it drying out, so the newspaper can be removed. When first feeding the worms put the food in one corner of the bin, so they have somewhere to move if they do not like the food. Be careful not to overfeed the worms. As their population increases you will be able to increase the amount and frequency with which you feed them. In general, you should see newly added soft green material eaten within a 2 week period. Tougher plant materials may take a bit longer for the worms to digest.

Should the worm bin be located in any special location?

Worms like to be kept warm so keep the bin away from the cold winds and frosts, ideally situating the bin in a sheltered spot that is sunny for only the early part of the day. Avoid very sunny locations as too much sun could overheat the bin which will cook the worms. If you want your worms to keep on making compost during the winter, it may be necessary to locate them in a shed or garage where temperatures do not fall below freezing.

As the weather get colder keep an eye on the bins to make sure the worms are still active and breaking down the organic matter. You may have to slow down the rate at which you add food or you might want to throw an old blanket or towel over the bin to keep it warm. A build up of too much food may result in it putrefying and the bin will begin to smell.

How much material can I feed my worms each week?

It's claimed that worms will process half their own body weight in organic matter each day. So 1kg of worms will process 1/2kg of organic waste per day. However, the rate of organic matter breakdown is also very much related to the conditions the worm bin is exposed to. In cooler winter weather the processing rate can be slower, while in the summer the worms turn over organic material very quickly.

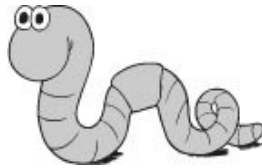
The amount of airflow in the bin is another factor that is important - worms are living organisms and need air, so opening the bin regularly is important (this will happen anyway as you add fresh organic material for them to break down). It is best to get a 'feel' for your own worm bin. Watch the food you put in, and when it has nearly gone, you can put more in. Over time, the feeding rate will become faster as your worm population increases.

As a Rule of Thumb: Feed your worms little and often

What can I compost?

Virtually any organic waste can be put in the worm bin - but, for various reasons, some materials are best dealt with in other ways. The main ingredients will tend to come from your own house. It is important to have a mix of materials and you will learn with experience. A separate bin in the kitchen to collect compostable scraps would be helpful. Anything not of living origin will not compost (i.e. metal/glass/plastics). Avoid orange peel (citrus fruits), perennial weed roots and weed seeds, and grass mowings.

Small quantities of meat scraps may be added to the bin, but avoid large quantities of meat that have gone off and may have become colonised by maggot larvae. If these are added to a bin, the maggots will continue to grow and develop into flies.



What materials can I put in a worm bin?

PLEASE ADD

Kitchen and household scraps - Old fruit and vegetables, cut flowers, tea leaves, coffee grounds, crushed eggshells, etc.

Paper & Cardboard - Small amounts, torn up (avoid magazines and colour inks). Mix well with other items. Wood Ash -Provides potassium and lime

Hair - From the family pet, or the family, moistened

Leaves - Add a little at a time. If there are large amounts these are best made into leaf mould in a separate heap.

Grass cuttings - Caution - High in nitrogen and a good "activator", but care must be taken not to overwhelm the compost bin with grass as it can turn into a slimy mess. Mix well with other materials. Do not add more than 2 handfuls of grass clippings to a 70-90 litres worm bin at any one time.

DO NOT ADD

Dog & Cat droppings - This type of animal manure may carry parasites

Man-made fibres - These will not rot

Material infected with diseases - Composting may not kill these diseases

Materials sprayed with weed killers - The residues may remain in the heap

Meat bones

Are there any other potential problems?

Avoid too much acidic material such as lemon and orange skins, these can be hard for the worms to digest. Adding egg shells to the mix on an on-going basis will help keep the pH balance.

Be careful how much food you add: too much may heat up the bin and drive the worms away, leaving the food to putrefy and the bin will begin to smell which a well run bin does not.

Where do I get the worms?

The worms needed for composting are known as tiger or brandling worms. They can be obtained from fishing tackle shops, from someone else that has a worm bin or from an old compost heap. They are smaller than true earthworms and they tend to have yellow bands between the segments at the "tail end" of the worm. For useful addresses, see list below.

Can I use garden earth worms in the bin?

No, earthworms are a different species and they are not adapted to living in fresh organic material like the tiger / brandling worms. In a worm bin they will die after a short while.

What are the little white worms I sometimes see in the worm bin?

The tiny white worms you see on the food on the surface of your bin are called Enchytraeids. They are also called 'Potworms' or 'White Worms'. They won't harm your bin or the compost worms. They are actually composters too. If you get a lot of them its an indication that the bin is slightly acidic. Consider adding a sprinkling of lime and you'll notice them gone in a few days.

How many worms do I need?

If you don't add too much material at the start and let the population of worms in the bin increase naturally you could start with as few as 100 worms. The trick at the start, however, is not to overfeed the worms. Ideally for a 70-90 litre bin it is recommended to use 250 gms of worms.

What about the liquid that starts to come out of the holes at the end of the bin?

The brown watery liquid coming out the holes at the end of the bin results from the break-down of the vegetable matter in the bin which can be as much as 95% water. The liquid is rich in minerals and nutrients ideal for plant growth so don't throw it away. Place your bin on 3 red bricks or wooden blocks over a tray to collect the liquid. Scoop it out and store until you want to use it. Dilute it one part to 3 parts water and use it to feed plants in the garden or for indoor plant containers.

Once the bin is full what do I do?

This means it is time to harvest your compost. Get a couple of empty buckets and transfer the top six inches of fresh kitchen waste to the buckets along with all the worms. The deeper you go into the bin, the more brown and decomposed the compost becomes. Once you can't identify individual waste any more, you are into compost. The compost will improve if left for a few weeks or months in a plastic bag. As you transfer the compost to the bags collect as many of the worms as you can and return them to the fresh material from the surface of the bin. They'll provide you with a population to start a new bin.

What can I use the compost for?

Vermicompost is a gardener's dream and very fertile material. It can be used for just about anything in the garden or container gardening but it should not be used for seedling germination as it is too rich.

In general, it is better to mix it with leaf mould, c oir or shredded wood compost to make material suitable for potting on container grown plants or as a rich mix for tomatoes, cucumbers, beans and window boxes. If you have a lot of material, it can be used to enrich soil in the garden or vegetable plots.

What about worms in the compost once I use it?

They are not a problem and in fact if you store your compost for a while in a plastic sack you'll find that the number of worms decreases quite dramatically (presumably the result of fresh food material being absent).

For Further information on suppliers of worms required for wormeries or pre-made wormeries please contact Fingal County Council Environmental Awareness Section on 01 890 6286 or envserv@fingalcoco.ie