

Composting

A Household Guide





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Welcome to the world of composting. So what is it all about?

Composting is a natural process of decomposition that turns garden materials and vegetable food scraps into a dark, crumbly and earthy smelling material called compost.

Compost is rich in nutrients and full of life and when used in your garden and on your plants, feeds the ecosystem of the soil and slowly releases nutrients that plants can absorb. Using compost is the foundation of maintaining healthy soil for stimulating all plant growth and creating a beautiful garden. And even if you don't have a garden, you can still compost. You might have access to a communal green area where your compost can be used or, with some of the new systems now available for city dwellers, you can make your own and use it for your indoor plants.

This brochure provides an introduction to composting and how to do it yourself. It goes through how it works and also the different systems that are used in Irish homes today, including:

- *Compost Heaps and Compost Bins (the most common types of composters in Ireland)*
- *Tumblers & Turning Systems*
- *Vermicomposting (worm bins)*
- *Food Burial and Food Digestion*
- *Bokashi*
- *High Tech Household Systems*
- *GrassCycling*
- *Mulching*

For more detailed information on each of these systems, on the *Biology and Essentials of Composting, Using your Compost and How to Make Your own Compost Bin* go to our website **STOPFoodWaste.ie**



Why compost?

So you can reap the rewards!



SAVE MONEY

On average, food and garden wastes make up over 1/3 of the contents of your rubbish bin. Wasting food and waste disposal is expensive so by preventing food waste and composting what you can you will save money on your bills.



PREVENT WASTE AND CONSERVE RESOURCES

By composting at home, you reduce the need to collect, process, treat and/or dispose of biodegradable materials. This saves landfill space and the fuel needed to move things around.





PROTECT BIODIVERSITY

Peat moss from Ireland's bogs and peatlands has been used for many years as a soil improver and for potting mixes. Peatlands are home to many wonderful species of flora and fauna. By composting at home, you will reduce the need to purchase peat moss and in turn help protect the biodiversity of Ireland's peatlands.

PRESERVE OUR ENVIRONMENT

Most food and garden materials end up in our landfills. Here they rot underground and produce foul liquids, odours and methane, a greenhouse gas 21 times more potent than Carbon Dioxide. Composting at home is the most environmentally friendly way to manage biodegradable materials and puts them to productive use.

BUILD HEALTHY SOIL



Compost is magical stuff – especially if you have made it at home yourself. It is full of nutrients and life. It improves the soil's fertility, texture, structure and moisture & nutrient-holding capacity. And remember, healthy soils grow healthy, disease resistant plants.

Composting at home makes sense!

The Biology of Composting and how it works

Composting is a biological process that requires food (organic materials), water and air. Composting involves a wide variety of organisms which are naturally present in our environment.

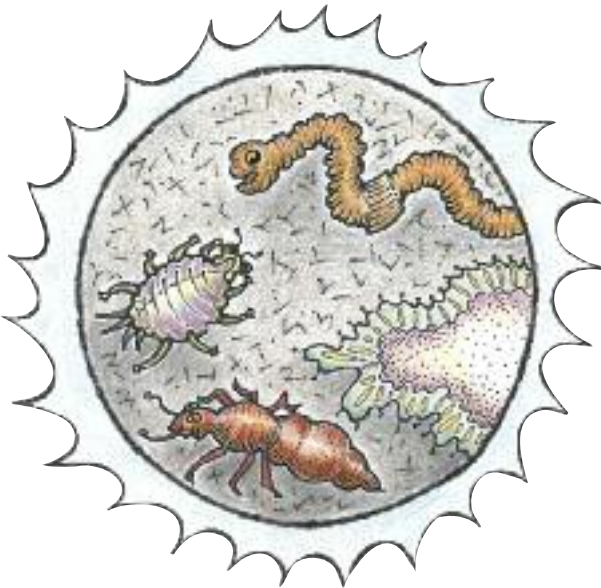
Here is what happens...

In the beginning of the composting process, soil bacteria are the first to start breaking down plant tissue- they are the most numerous and effective decomposers.



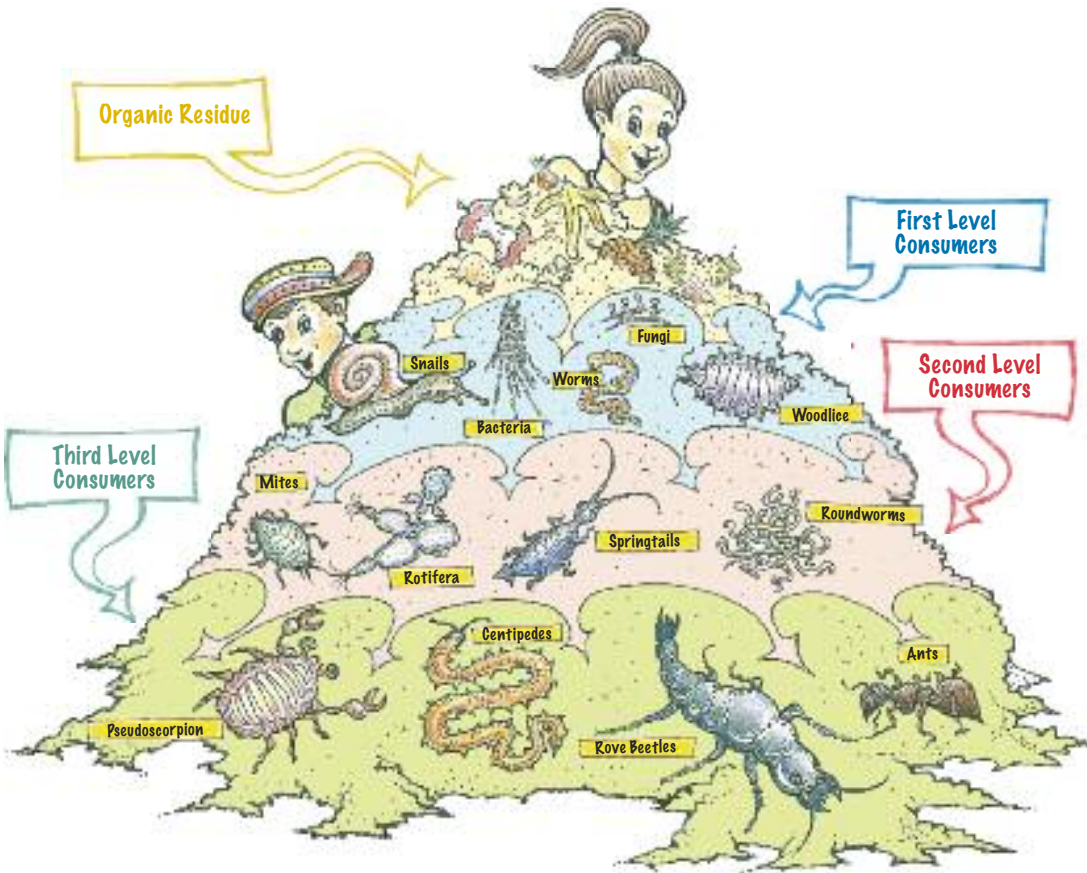
Other composting organisms, including protozoa, fungi, moulds, worms, snails and other insects, also take part later on in the composting process. No one organism or group of organisms are responsible for composting.

It is a succession of creatures that makes it all happen. It's a web of life similar to the ecosystem in the soil.



Food Web of the compost pile

Energy flows in the direction of arrows



“The compost pile is really a teeming microbial farm”

Composting Essentials

The ingredients for good composting!

Composting and the organisms involved, like all other life forms, need food, air and water to survive and thrive. The five essential for successful composting are:

GREEN & BROWN MATERIALS



PARTICLE SIZE & SURFACE AREA



MOISTURE



5

Essentials of
Composting

AERATION



SIZE OF HEAP





1. NUTRIENTS: GREEN AND BROWN MATERIALS

Composting organisms thrive on a balanced diet of nitrogen-rich **green** and high-carbon **brown** materials. The **greens** provide protein needed for growth and reproduction while the **browns** supply energy. Fresh green grass clippings are high in nitrogen; dead brown leaves are high in carbon. Separately, these materials may not compost well: grass cuttings tend to compress, turn gooey and smell bad; while leaves by themselves break down very slowly. Mixing them together though is a perfect composting mix. Just like baking a cake, it is important to always balance **green** wet materials with drier **brown** materials. Try half and half to start with and see how it goes for you.

For example, if you want to compost food scraps (which are a **green** material), you will need to balance them with a dry (**brown**) carbon source like hedge prunings, straw, saw dust, wood shavings, autumn leaves, shredded cardboard or paper.

Composting food on its own or with grass cuttings will not work very well either and can lead to your compost turning slimy and smelly. If this does happen, mix in some brown materials to balance things out.

Remember that variety is the spice of the compost pile's life! So mix it up and add as much variety as you can.

2. PARTICLE SIZE AND SURFACE AREA

When it comes to composting, the smaller the particle, the faster it will break down. This is because composting works from the surface of materials inwards. So to speed up composting:

- Chop woody materials up with a sharp spade or shears.
- As you garden, use your pruning shears to cut materials into pieces no longer than 10-20 cm.
- Run over leaves or weeds with a lawn mower, or
- Put woody trimmings through a shredder.

Chopping materials up helps make a better mix when forming your compost heap. Keeping materials smaller also makes it easier to turn the heap later on for faster composting. Ideally you want a mix of fine and coarse materials in your heap, for example small **green** grass clippings with chopped up **brown** hedge trimmings.

Composting Essentials

The ingredients for good composting!

3. MOISTURE

All life needs moisture to survive and composting is no different. Too little moisture and the composting organisms die off or go dormant. Too much moisture and the heap can drown and potentially turn slimy in your composter! Anaerobic bacteria, which thrive in the absence of air, can then take over and create a bad smell. Ideally the materials should be moist to help the decomposition which starts on the surface of the materials.

Maintaining the proper moisture level is easy:

- If your compost heap dries out, spray it with water when you are turning it.
- Keep your composter in a shady spot so it will not dry out.
- Always cover compost heaps with plastic, old carpet or some plywood. In most countries, this is to keep moisture in, but in Ireland, this is to keep the heap from getting too wet from all the rain!
- At the start, if the weather is dry and hot, give the brown materials a good spray with water before mixing them into your compost heap.

So remember, your compost heap should be moist (like a wrung out sponge) but not soaking wet.

4. AERATION

Just as with water, all composting organisms need oxygen. To promote good aeration and therefore good composting:

- Create lots of tiny air pockets by adding stems, stalks, wood chips and other rigid materials. With a good blend of materials and adequate moisture, the heat produced from composting creates a chimney effect, drawing air into the composting materials and promoting air flow through it.
- Put your composter on a few inches of coarse materials at the bottom. This raises it slightly above the ground and helps air to flow underneath and up through the compost. This also improves drainage from the heap if it gets too wet.
- Don't build the heap too big as larger piles can become compacted and this can squeeze the air pockets from the heap. While smaller heaps will get more air than larger ones, they do not heat up as much (see "Size of Heap" for more).
- Turning your compost regularly helps fluff up and aerate the materials. This helps restore the air spaces needed for the compost to "breathe". Depending on your energy level and your need for compost, your compost can be turned weekly, monthly, annually or not at all!

5. SIZE OF HEAP

While the size of the heap will be determined by the amount of material you have to compost and the system you chose to use, the ideal size is about one cubic metre. A heap of this size can be made with materials accumulated over time (cool composting) or made all at once (hot composting).

When a large heap is made all at once with the optimal conditions for composting – the proper balance of nutrients, air and water – the breakdown of materials is so rapid, that the compost generates heat and can get as hot as 70°C. Heaps of one cubic metre in size or greater also have an ability to hold heat better because they self insulate.

Smaller heaps aren't as good at holding heat and tend to dry out quickly, though bins with solid sides and a lid help keep smaller heaps warm and moist (like the compost bins provided by your local authority).

Just remember, larger compost heaps may require a little more work with turning to introduce air into the middle.

Additives

While compost additives (“activators,” “accelerators,” “starters”, etc.) are often recommended for home composting, none of these ingredients are essential for composting. If there are sufficient quantities of green materials, combined properly with brown materials, then these should provide all the activation needed.

Compost additives usually contain nitrogen fertiliser, dried enzymes, microbes or other nutrients. These help when starting off or if you want to “kick start” or speed up the process after the winter, but are not essential.

The main point is that there are plenty of composting organisms already present on the materials and they are ready to start working when the conditions are right.



What Can be Composted?

The Do's and Donts of the composting pile.

Essentially anything that was once living can be composted. However, to avoid generating odours and attracting pests such as rats, birds and flies, it's best to limit home composting to just plant derived materials. That means no animal products, parts or pieces. Strictly a vegetarian diet for your pile!

Now if you have some meat sauce from plate scrapings or dressing on a left over salad, don't worry about it- Compost away!

What you are trying to avoid are things like bones, meat trimmings, skins, fat, guts, etc. as these can attract pests.

Do Compost...

GREENS

From the Garden:

Grass cuttings , garden plants, weeds, potted plants, cut flowers, house plants.

Weed seeds in your compost heap can be bad news but if maintained properly the heat from the compost will eliminate most of them. The best thing to do is pull out weeds before they go to seed or remove the seed heads before composting.

From the Kitchen

Vegetable trimmings, fruit peels, cores and rinds, tea bags, coffee grounds and filters, baked goods including bread (in small quantities only) rice and other grains, pasta and cereals, cooked or uncooked vegetables.

BROWNS

From the Garden:

Leaves, twigs, hedge prunings, shredded tree trimmings, straw or hay, pine needles, cones, bark.

From the Kitchen:

paper towels, paper napkins, uncoated paper plates and cups, soiled cardboard (like pizza boxes) - Must be torn up or shredded to be used effectively.

Remember: always balance **green** materials with **brown** materials



Don't Compost...

From the Garden:

- × **Diseased plants, leaves or Insect infested plants.**
- × **Invasive weeds that spread by root or runner such as ivy, briars, bindweed, buttercup, dock, thistle.**
- × **Timber or large woody materials.**

From the House

- × **Anything animal based like meat, fish, poultry, dairy (including cheese), oils or grease.**
This includes bones and shells.
- × **Vacuum cleaner bags and their contents.**
- × **BBQ and coal ashes.**
- × **Nappies or sanitary towels.**
- × **Dog and cat pet wastes.**
- × **Chemicals and pharmaceuticals.**

Many compost heaps do not get hot enough to kill off diseased or contaminated garden materials so it is best to keep these out of your compost.

While most of the food scraps you generate in your kitchen can be composted it is best to keep animal products out as they can potentially cause odours and attract pests.

There are other household wastes that should not be added and for more information on why these should be kept out of your compost visit **STOP**FoodWaste.ie and check out our Frequently Asked Questions (FAQs) section.


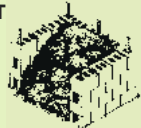










Remember: When in doubt, throw it out!

Which System is best for Me?

There are lots of ways to make good compost. The best method is the one that is most convenient for you. There are many different systems in use today, including compost bins supplied by your local authority. But how do you know which one is best for you? Also, some can be expensive so the question becomes... "Can I make my own?" Luckily you can, but you need to figure out which is the right system for you first.



There are many different systems to choose from. The most common methods are listed below under the types of material to be composted at home. This might help narrow things down a bit for you.

FOOD ONLY	GARDEN MATERIALS ONLY	FOOD AND GARDEN MATERIALS TOGETHER
FOOD BURIAL & FOOD DIGESTION 	COMPOST HEAPS & BINS 	COMPOST HEAPS & BINS 
WORMERIES 	TUMBLERS & TURNING SYSTEMS 	TUMBLERS & TURNING SYSTEMS 
BOKASHI 	GRASSCYCLING 	TUMBLERS & TURNING SYSTEMS 
HIGH TECH SYSTEMS 	MULCHING 	TUMBLERS & TURNING SYSTEMS 

Here we give an overview of these systems to help you choose the ones that best suite your needs. If you require more specific information on any of these systems, including how to building one yourself, please visit our website STOPFoodWaste.ie where each system is discussed in detail.

1. COMPOST BINS AND COMPOST HEAPS

This is the most common form of composting in Ireland with many local authorities supplying these compost bins at reduced prices. With this form of composting materials are simply added to the heap, composting area or bin as they are generated. Generally, materials that are added in one season are ready as compost for the next. The speed of composting and the quality of the end product can be improved by chopping and mixing materials as they are being added, monitoring and maintaining the proper moisture levels, operating more than one heap or bin at a time and turning the compost regularly. This type of composting works best if given plenty of air pockets and space for air to flow through so adding twigs, woodchips, straw, and cardboard helps. And always remember: try for a good mix of **greens** and **browns** – these are the essential ingredients.

Suitable Materials:

Soft landscape materials to start with, e.g. grass cuttings, weeds, leaves, old plants, flowers, etc. Vegetative food scraps can be buried into the composting materials once the compost heap is well established.

Main Advantages:

- Simple, low maintenance system. Better if turned regularly - it will compost faster.
- Ideal for homes with small gardens and for people who do not want to spend a lot of time working on their compost.
- Can also be used to compost turf/sod or leaves on their own.



This is the simplest form of composting and is a slow, cool no fuss way of composting.



2. TUMBLERS AND TURNING SYSTEMS

Turning systems can be multi-bin, tumblers or rolling spheres. The best way to operate these is to make a whole batch at once and then turn it every 5 - 10 days, depending on the system used. Batches of compostable materials are mostly made up of a combination of **green** and **brown** garden materials (make sure they are chopped up). Some food scraps can be added when the batch is made or when the materials are turned for the first time.

For multi-bin systems, the heap is turned every week or two and then allowed to mature for a month or more. Compost can be ready to use in less than 8 weeks, but remember to keep it covered from the rain and check regularly for moisture levels during dry, hot weather.

For tumblers and spheres, materials can be added as they are generated but making up a batch of materials is best. Through regular turning of the barrel or sphere materials are mixed thoroughly and compost quickly.

Suitable Materials:

Soft landscape materials to start with, e.g. grass cuttings, weeds, leaves, old plants, flowers, etc. Vegetative food scraps can be incorporated into the mix at the start or can be buried into the composting materials once the composting has started within the first week or two.

Main Advantages:

- Produces high-quality compost in as little as 8 weeks when done properly.
- High temperatures can kill plant diseases and destroy weed seeds.
- Multi-bin systems are ideal for the avid gardener with lots of outdoor space who doesn't mind the work and wants all the compost the system can produce.



These are a fast way to compost and, when done properly can get as hot as 70°C.

System?

3. FOOD BURIAL AND TRENCHING

Burying vegetative food scraps is an ancient practice and has been in use in Ireland for many years. The traditional methods used are food burial (where food is buried in holes) and trenching (where food is buried in trenches). Once you have your hole or trench dug, a batch of food is then added. The key is to chop up your food wastes into small pieces and then mix them with the soil at the bottom before covering over with the remaining soil. This is then allowed to break down in the ground and, because it is buried, will not attract any pests or animals.

Suitable Materials:

Vegetative food scraps – remember, the smaller the pieces the quicker they will break down.

Main Advantages:

- Simple way to deal with food scraps.
- Decomposes in 1-2 months.
- Enriches soil over time.
- Ideal for allotment gardening. Can be done in conjunction with a rotation system in a veggie patch.



Food burial, or trenching, involves digging a hole or trench 12" deep and burying your vegetative food scraps.

4. FOOD DIGESTION CONES

These look like regular compost bins but have an extra buried chamber under the ground. They use heat from the sun to speed up the composting process. Digesters have tight fitting lids and holes or mesh screens in the bottom which provide access to the soil. When digging these systems in always try and place them in a well drained sunny spot.

With these systems you simply add in your food scraps which gather in the underground chamber and decompose out of harms way. Some systems use additives, such as inoculants, enzymes, or nutrients to accelerate break down and stimulate the composting process.

Suitable Materials:

All food wastes can be added but make sure to chop them up so they will decompose faster. These do not handle garden wastes or grass.

Main Advantages:

- Can handle consistent supply of food scraps.
- Only need to empty system every 1-2 years.
- Can be used to compost or digest meat, fish and pet wastes.



All food scraps, including meat and fish, can be composted using a food digester.



System?

5. BOKASHI

Bokashi is a good way to deal with your food scraps, especially if you have limited garden space. In an airtight container EM, which is a combination of naturally-occurring bacteria and yeast, anaerobically ferment organic wastes. All kitchen wastes including cooked food, bread, cheese and uncooked meats can be composted in this way. When finished in the Bokashi system, the fermented or 'pickled' materials are buried in your garden where they break down very quickly. The materials can also be mixed and buried within your compost heap but it is best to bury them in the garden soil.

Suitable Materials:

All food wastes (if chopped up into small pieces they will decompose faster).

Main Advantages:

- It can compost all domestic food waste, though you will need some garden space to bury the 'pickled' materials.
- Because the system works under airless conditions there are few smells so it can be used indoors – though any warm and dry place will do.
- It is a compact system that can be put anywhere, including your kitchen.



Bokashi is a composting process that uses Effective Microorganisms (EM) to ferment kitchen food waste in an airtight bin.

6. WORMERIES

Worm bins can be a great way to manage food scraps and they produce the highest quality compost. Trays, cans, plastic bins or boxes can be used to house the worms – but remember to keep the lid on as the worms like a dark and moist environment. Food is then buried into a moist carbon-based bedding – usually made of shredded paper, cardboard, leaves, straw, rotted manure, wood shavings and/or sawdust. Once the worms eat the food scraps, the compost can be harvested as often as every few months but more usually once or twice a year. In addition, you can collect the worm tea and dilute it down to use as a liquid fertiliser.

Suitable Materials:

Vegetable food scraps and paper.

Main Advantages:

- The worm castings are rich in nutrients and contain hormones that stimulate plant growth. The stuff is magic plant food but should be diluted if placed directly onto plants.
- These systems produce the highest quality compost but require some attention to get the most out of them.
- It is easy to make your own, especially if you have access to some well rotted manure for your worm supply!
- They are a wonderful opportunity to teach children about the wonders of life.



Worms are nature's best composters!

7. HIGH TECH SYSTEMS

When people think of composting they usually think of large gardens and green compost bins. Recently, new high tech systems have been developed for city living. These usually consist of an insulated and airtight container that speed up the composting process and keep odours to a minimum through using a filter system. Some use small amounts of electricity to speed up the composting process and do all the mixing for you. To ensure that a good quality compost is produced, sawdust pellets can be added along with the food scraps to ensure that a good green/brown mix is maintained. Two examples are the Naturemill and Biolan 220.

Suitable Materials:

All food wastes though the larger pieces should be chopped up first.

Main Advantages:

- They can compost all kitchen scrap materials, though they are expensive to buy.
- Because these units are sealed, and use filter systems for any odours generated, they can be used indoors – though any warm and dry place would be ideal.
- Some are fully automated systems that heat and turn the composting materials for you.
- They are very compact and are ideal for those with no garden or limited space.



Just like everything else composting is evolving and going high tech!

8. GRASSCYCLING

GrassCycling is the natural recycling of grass by leaving grass clippings on the lawn when mowing. Once on the ground, the clippings, which contain 80-85% water, decompose quickly returning valuable nutrients like nitrogen back into the soil. However, there is a little more to GrassCycling than that. You may need to de-thatch and aerate your lawn every year or two to ensure that it works properly. But remember, leaving cuttings on your lawn all season long provides the same level of nutrients as one fertiliser application per year. GrassCycling is simple, easy and it works!

Suitable Materials:

Any lawn area.

Main Advantages:

- If you have a large lawn, GrassCycling will significantly reduce the amount of materials you are handling for collection or for home composting.
- The cuttings reduce the need for both water and expensive fertiliser.
- People who GrassCycle, spend up to one third less time cutting their lawns but remember, don't cut your grass too short. You leave it a bit longer than normal so the clippings are not too big.



This is a simple method of cutting grass and leaving the cuttings on the lawn- although there is a little more to it than that!!

9. MULCHING

Mulching or “sheet” composting mimics nature’s way of recycling nutrients within our ecosystem. Like a forest floor where leaves, twigs and branches fall to the ground and break down over time, mulch provides a layer of protection for the soil. In addition, the decaying material feeds the ecosystem of microorganisms, worms and insects allowing this diverse community of organisms to thrive. As the materials break down further, nutrients are released and become available to plants within the soil.

Mulch is often used in garden paths but more often around perennial shrubs and trees to suppress weed growth, hold in soil moisture, prevent erosion and slowly release nutrients to the soil.

Suitable Materials:

Shredded brushy materials such as tree trimmings or shrub prunings, leaves, grass cuttings and unscreened compost.

Main Advantages:

- Mulching is ideal for people with lots of shrubs and trees.
- Use of mulch cuts down on weeding and watering work.
- Provides a welcome habitat for birds and other wildlife.











































Mulch is any substance placed on top of the soil to protect it and keep weeds down – it’ll make your life easier around the garden!

Which System is best for Me?

To help you choose the composter that best suits your needs have a look at our traffic light system on the following page. This gives you an idea of the benefits and drawbacks of each system under a number of key headings.

Space Required	Cost	Capacity	Time required to maintain*	Takes Food Waste?
Small Doesn't usually need a garden	Reasonable Under €50	Large 6 people +	A Little	Yes
Big Garden area beneficial	Moderate Between €50 and €150	Moderate 4/5 people	Some Time required for turning	Yes But must be careful
Biggest In general needs a garden/soil area	Expensive Over €150	Low 3/4 people	Most Requires looking after including manual turning	No




It must be noted that there is always a degree of maintenance associated with each of these systems. Most require some initial maintenance but once up and running can be relatively maintenance free.

Name	Space Required	Cost	Capacity	Time required to maintain*	Takes Food Waste?
Compost Heaps and Bins - Purchased & DIY					
Turning Systems - Multibin					
Turning Systems Tumblers/Spheres					
Food Burial Trenching					
Food Digestion Cones					
Worm Composting Vermicomposting					
Bokashi					
High Tech Systems					

So what now...

How do I know when it is ready?

Use your senses to tell when compost is ready:

-  **Look at it:** If the compost is dark in colour and it is hard to recognise the original raw materials - it looks ready.
-  **Touch it:** If the compost is not hot or warm and has a texture of rich soil, breaks apart easily and is crumbly to the touch - it feels ready.
-  **Smell it:** If the compost has a pleasant earthy smell, and it looks and feels ready, then it is ready!

If the composting material is hot, smells strong, or you can recognise the raw materials in the pile- then it is not ready to use and will need more time. Just let it rot a while longer.

How Do I Use Compost Around My Home?

Where there are plants, there is a need for compost. Compost has so many uses you will never run out of ways to use this black gold.

Compost can be used as a:

- Mulch in annual or perennial planting areas.
- Topdressing on lawns or turf areas.
- Soil amendment when preparing the soil for planting turf, annuals, perennials, shrubs or trees.
- Ingredient in a potting mix of two-thirds garden soil and one-third compost.
- Ingredient in a seed starting mix of half sand and half compost.
- Way to make compost tea.

To learn more about using compost around your home and any other aspect of home composting visit the Frequently Asked Questions (FAQs) section of our website... **STOPFoodWaste.ie**



Happy
Composting!

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The STOPFoodWaste programme is developed by the EPA as part of the National Waste Prevention Programme

COMPOSTING IN YOUR LOCAL AREA

To learn more about composting in your area talk to the Environmental Awareness Officer in your local council. They will have information on local composting workshops and can provide you with information on all aspects of composting.