How-to guide

Making Waste Work: A Toolkit

How to turn organic waste into compost

A step-by-step guide

How-to guide 5

Part of
Making Waste Work: A Toolkit
for community waste management in low and middle income countries

Zoë Lenkiewicz and Mike Webster
Illustrated by Susan Hatfield
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wasteaid.org.uk/toolkit

WasteAid UK is a charity working to make an impact on the global waste emergency by:

- Partnering with local organisations to improve the health, environment and livelihoods of people without waste services.
- Building the skills of local people to deliver practical solutions to the waste management crisis in their own communities.
- Raising awareness of the benefits of proper waste management and campaigning for greater change.

www.wasteaid.org.uk

CIWM (Chartered Institution of Wastes Management) is the leading professional body for the resource and waste management sector, representing around 6,000 individuals in the UK, Ireland and overseas. It awards the title of Chartered Waste Manager to qualifying members.

The objectives of the CIWM are to advance the scientific, technical and practical aspects of wastes and resource management worldwide for the safeguarding of the natural environment, to promote education, training, and research in wastes and resource management, and the dissemination of knowledge of the topic; and to strive to achieve and maintain the highest standards of best practice, technical competence and conduct by all its members.

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5 How to turn organic waste into compost

Waste from plants and animals can be used to make compost. Composting is a natural process that recycles organic material into a soil conditioner that improves soil quality and increases food yields.

Summary: Composting is the natural breakdown of organic materials through mixing with oxygen from the air to form a stable, soil-like material.

Waste materials: Food waste, agricultural waste, animal dung, used animal bedding, wood chips.

Product: Chemical-free soil conditioner / compost.

To produce a quality product, always use clean materials which have been kept separate from other wastes at the source.

Benefits:

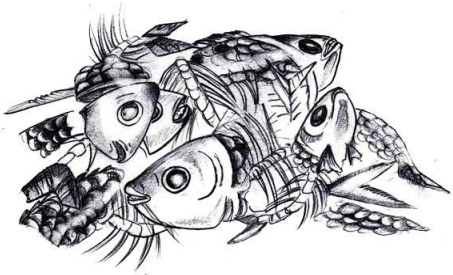
- **Compost increases organic matter in the soil.**
- **Higher yields** – increasing the amount of organic matter and plant nutrients in the soil can improve crop yield potential.
- **It can be used, at least in part, instead of expensive inorganic fertilisers** – compost contains slow release, crop-available nutrients, including nitrogen, phosphorus and potassium. It also contains plant micronutrients such as magnesium and sulphur.
- **Better soil structure and water management** – compost improves soil structure, which improves water infiltration and retention and is good for crops.
- **Inhibiting pests and diseases** – the organic action of compost can help to inhibit pests and diseases within the soil.
- **Fuel savings and traffic tolerance** – compost improves soil structure, making it easier to work with. If you are using a rotavator or tractor it will use less fuel. Improving soil structure will make it more resistant to compaction from tractors and will extend the conditions in which it can be worked.

Key Ingredients: Carbon and Nitrogen

The fastest way to produce compost is to use about two parts of green material to one part of brown material. This will ensure that there is the correct balance of nitrogen and carbon for the composting microbes to work.

If there is too much carbon, the composting process will be slow. If there is too much nitrogen you may end up with a smelly pile. It is important that air gets into the pile to help it decompose quickly, therefore aim to ensure that the pile has enough structure.

The compost should be slightly moist. If it is too dry, add a small amount of water and mix in.



NITROGEN-rich material (green): Smelly organic waste such as animal dung, fish heads, bones and guts, green grass and leaves.

CARBON-rich material (brown): Woody organic waste such as small branches, dry leaves, coconut husk and groundnut shell.

Figure 1: The correct balance for composting is about two parts of nitrogen-rich material (green) to one part of carbon-rich material (brown).

Composting is generally a safe activity, but:

There can be a risk from disease from the compost heap. You should always wear gloves when handling compost and wash your hands afterwards.

There can be spores from fungus in the compost heap. People with breathing problems should avoid turning compost heaps. Do not open a bag of compost with your head right over it. Damp down compost before use. It is advisable to use a mask when handling dry compost.

There are many ways to build a good compost heap. It needs to be protected from the wind and preferably not able to dry out too much.

Two different types of compost heap are described here: the Triple Pit, and the Layered Cell.

Triple Pit Compost

Dig three pits in the ground. Place the mixture (two parts green material and one part brown material) in the first pit.

After a week, remove the material and put it in the next hole, mixing it up. This helps air reach every part of the compost and speeds up the process.

After another week, move the material to the third pit.

Finally, move the compost into a small heap at the side to allow it to 'mature' for a few more weeks. It will be ready when it smells earthy and looks brown, usually within another 6 or 7 weeks.

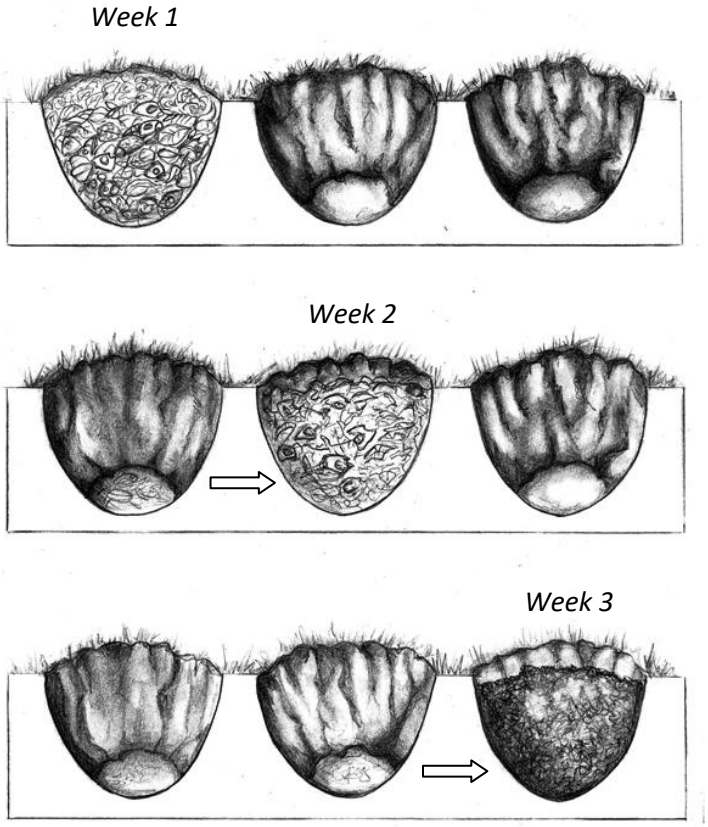
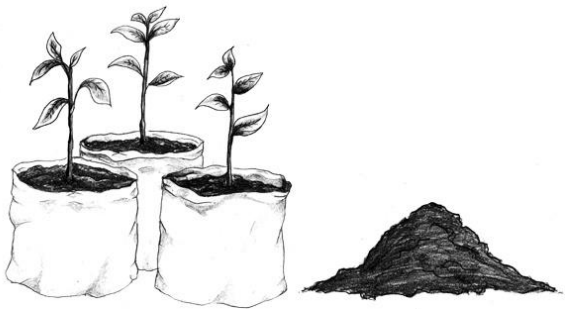


Figure 2: The triple pit composting process.

You can be composting material in all three pits at the same time, each pit one week older than the next.



Layered Cell Compost Heap

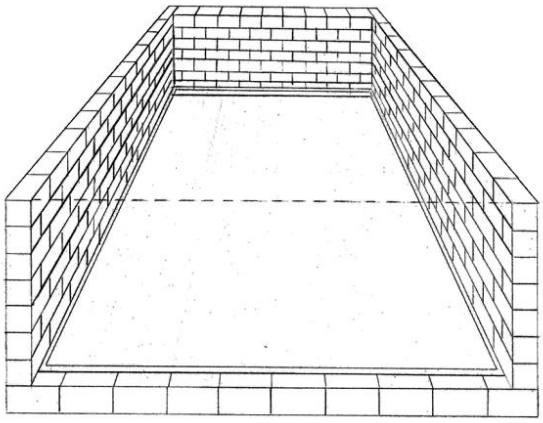


Figure 3: The size of your composting cell will determine how much organic waste you can compost.

Build a cell (as shown in the picture). You can build it on the ground, or raised up on legs to keep vermin out.

On the bottom layer, put branches and twigs or groundnut shells to improve air circulation and drainage.

Then put a middle layer of mixed 2 parts nitrogen-rich material (green) and one part carbon-rich (brown) material.

If it is particularly smelly or likely to attract pests, add a layer of finished compost over the top. Leave for 6 to 8 weeks, making sure it does not dry out.

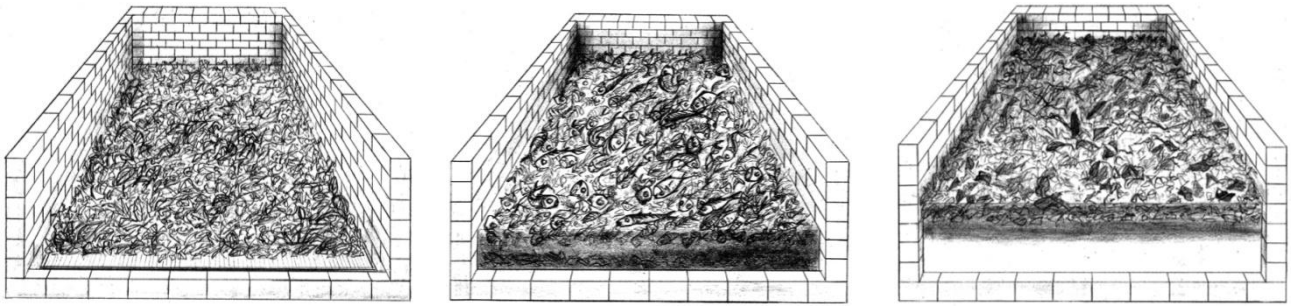


Figure 4: The layered cell composting process.

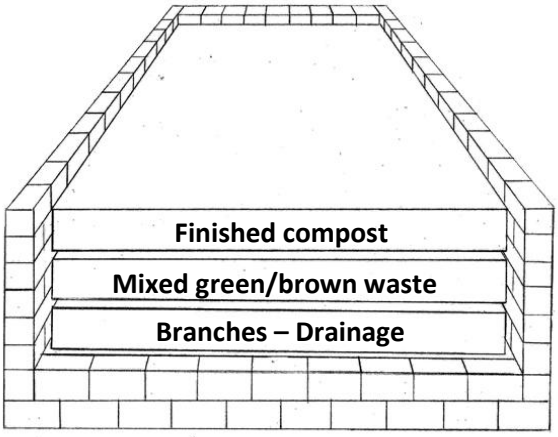


Figure 5: The completed layered cell composting heap.

After 6-8 weeks, sieve the compost to remove any large un-composted parts, which go back in the hole/cell to compost for next time.

Allow the composted parts to mature for around 3 more weeks before using.

It will be ready when it smells earthy and looks brown.

Marketing and selling compost

If you want to sell your compost to farmers or gardeners, you should sieve it. You may have to give away free samples to convince people that something made from 'waste' will be good for their crops. One way of convincing them is to grow a market garden on your site using your compost to demonstrate how well it works.

Talk to farmers and agricultural stores to see how much people pay for imported compost. Can you supply yours at a lower price?

Remember to explain the benefits of using compost, from the beginning of this How-to guide.

More help and advice

There is plenty of information on the internet to help you produce high quality compost. These resources are free to access:

- *Master Composter Manual* (1998). Cornell Waste Management Institute.
- Ali, M. *et al.* (2004) *Sustainable Composting: Case studies and guidelines for developing countries.* WEDC, Loughborough University.
- Rouss, J. *et al.* (2008) *Marketing Compost: A Guide for Compost Producers in Low and Middle-Income Countries*. SANDEC/EAWAG.
- Rynk, R. (1992) *On-Farm Composting Handbook*. Northeast Regional Agricultural Engineering Service, Cooperative Extension (607) 255-7654.