

Making a Compost Pile

By Carl Burkybile, Healing Hands International Director of Agriculture Education,
cburkybile@hhi.org

What is Composting?

When you come right down to it, finished compost is no more than “rotted” (decomposed) organic matter that has been broken down by microorganisms to provide nutrients and humus to the soil. Composting is a natural process that began with the first plants on earth and has been going on ever since. Composting can be observed in every forest, meadow, swamp, and prairie. The modern practice of *composting is little more than speeding up and intensifying natural processes*. While we can provide recommendations for making compost, keep in mind that no matter what you do, no matter what organic material you use, you can expect to come up with reasonably good usable compost.



Why Compost?

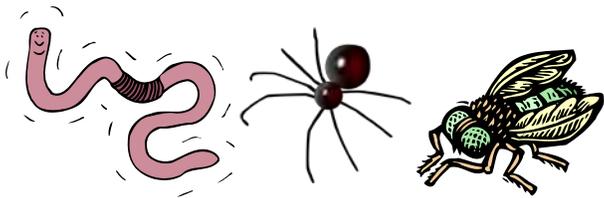
Composting is a way of using organic waste (plant residue, yard waste, animal manure, kitchen scraps, etc.) to create “free fertilizer”. Instead of adding waste to landfills, composting results in creating a useful organic soil additive.

How Compost Helps Your Soil

Compost contains macronutrients such as nitrogen, phosphorus, and potassium as well as a variety of micronutrients. As microorganisms in the compost digest the compost, nutrients are released over time for use by the plants. The organic matter binds with soil particles (sand, silt, and clay) to improve soil structure. This improved structure means improved moisture holding capacity and more space for oxygen and root growth. Remember that roots do not grow through soil particles. They grow between particles so the looser the soil the easier it is for roots to grow and develop.

How Decomposition Works

Composting's lowest common denominators are the organisms that make the decomposition possible. Microorganisms (too small for us to see) including bacteria and fungi and macro organisms (large enough for us to see) including earthworms, insects, spiders, and nematodes are the digesting agents in compost. As the organic material is digested or decomposed the locked up nutrients are released.



What Do Compost Organisms Need

Macro and microorganisms need carbon (the energy source), nitrogen (a protein source), oxygen, and moisture. Carbon materials are plant materials like plant residue, leaves, straw, sawdust, corn/maize stalks, etc. Bulky plant material provides the food source for the microorganisms. Nitrogen sources serve as the protein source to help microorganisms break down the carbon material. Oxygen is needed to allow aerobic bacteria to grow and release energy while breaking down carbon compounds into carbon dioxide and water.

Moisture is also important in the decomposition process. Too little moisture slows decomposition and too much forces out the air, suffocating aerobic bacteria. Macro organisms such as earthworms, mites, grubs, and insects help the bacteria by ingesting and chewing the compost material into smaller pieces. The increased surface area helps the microbes as they continue the digestion process. Earthworm casings and excrement also add to the nutrients in the compost.

Composting Procedure

Let the organic matter that is available in your area guide you as you begin your composting experience. The ideal compost pile size is two meters x two meters x two meters. The minimum suggested size is one meter x one meter x one meter. A round compost bin can be made using wire fencing fastened to metal fence posts. A square bin can be made using shipping pallets covered with chicken wire. Carbon sources (plant material, preferably green), nitrogen sources (animal manure or legume plants), water, oxygen, warm temperatures, pressure provided by the weight of soil, and microorganisms are needed to make compost. The greater the variety of things in your compost pile, the better. The greater variety is likely

to result in more types of microorganisms and a balance of available nutrients. Also remember that a compost pile smaller than one meter x one meter x one meter will lack the mass and weight needed for the composting process to move forward.

Steps:

1. Foundation layer: start with a 15 to 20 cm (6" to 8") layer of coarse material such as maize stalks, maize cobs, or small branches to allow oxygen to enter the bottom of the compost pile. If a shipping pallet is used on the bottom it becomes the foundation layer.



2. Veneer layer: a floor layer of material such as banana leaves, cabbage leaves, or newspapers that will keep fine material from blocking the air inlet in the foundation layer.



3. Next add 25 cm (10") of green vegetation (carbon source) such as plant residue, dried grass, leaves, or anything that grows, and then water the layer with a hose or sprinkler can.



4. Add a 5 cm (2") layer of a nitrogen source such as animal manure or legume plants. This layer is the fuel that gets the bacterial action going and starts the decomposition process.



5. Add a 5 cm (2") layer of soil or termite mound to provide weight and pressure and a source of microorganisms to the compost pile.



6. Adding a layer of kitchen scraps, ashes, eggshells, etc. at any place in the compost heap will further enhance the inoculation of bacterial action in the compost heap. Do not use animal parts, blood, or animal fat as they will attract rodents and other animals.



7. Water each layer to moisten it as it is added to the compost pile.



8. Continue alternating layers of carbon and nitrogen sources until the heap is the desired height. Remember that soil layers will provide additional

bacteria and nitrogen as well as weighting down the compost pile.



9. The middle of the compost heap is where the greatest activity occurs and where the first compost will be ready to harvest. The temperature in the middle of the pile will reach 150 degrees F or 65 degrees C. The decomposition rate is affected by temperature, moisture, size and type of vegetation, and how often the pile is mixed or turned. Warm moist compost piles decompose quicker. Chopping plant material or running it through a shedder speeds up decomposition. The more often you turn the compost pile, the quicker it decomposes. Compost barrels may be turned every day. Most people will not take the time to turn the pile more than once every 2 to 4 weeks. A compost pile not turned at all will decompose in a year's time. Rather than harvest the entire compost pile at once, some people will harvest the middle of the compost heap and rebuild the pile. If it doesn't rain, watering the pile once a week will



Finish by mulching the top of the compost pile with dried plant material (maize stalks, grass, etc.).



speed the decomposition. The compost that you harvest is sometimes called “black gold” because of its color and value in raising plants. Mature compost is loose, easily worked, and contains the nutrients that plants need. It holds needed moisture while at the same time allowing excess water to drain through the soil.

10. Farming God’s Way Trainer’s Reference Guide author Grant Dryden recommends turning the compost pile at three day intervals three times and then turning the pile four or five times at 10 day intervals. While the turning process is complete in two months, Dryden suggests allowing the compost to cure another four months prior to use. Good compost will be dark brown or black with crumbly structure and a sweet smell. Mature compost can be stored without losing nutrient

value, but monitor its moisture level, not allowing it to become dry.

11. Digging a trench around the base of a compost pile will help direct excess water away from the pile.

12. The wet season, when plenty of green vegetation is available, is a great time to start compost piles.

Recommended Reading Resources:

“Let It Rot! The Gardener’s Guide to Composting” By Stu Campbell

“All New Square Foot Gardening” By Mel Bartholomew

“Farming God’s Way Trainer’s Reference Guide” By Grant Dryden

Copywrited Material – January, 2013

This material may be copied for use in a workshop, but it cannot be sold.

JOIN OUR HUNGER FIGHTING TEAM

Where people use the techniques we teach for dry season farming, it is like an oasis in the desert. After attending a village workshop, Timothy said, “What you have taught me is more valuable than money. It will not only impact me but also my children and my grandchildren. May God bless you. Come again and again to teach us more.”

One billion people go to bed hungry every night. Every six seconds a child somewhere in the world dies of hunger. Malnutrition contributes to more than half of all childhood deaths. We can make a difference! God can use our hearts, hands, talents, and resources to transform the lives of hungry people. We challenge you to join our “Hunger Fighting Team”.

Your donation will help us impact families who need our help:

\$15 will buy a drip irrigation kit for feeding a family

\$300 will buy drip kits to feed 150 people

\$1,000 will fund a village food sustainability workshop

\$5,000 will establish a learning center with a demonstration farm

Contact Carl Burkybile, Healing Hands International Director of Agriculture
cburkybile@hhi.org