TIPS FOR MAKING HOMEMADE COMPOST

By Ralph T. Lampman

1. What is Composting?

Composting is a natural biological process in which soil-inhabiting organisms break down various organic materials, such as leaves, grass-clippings, and food wastes. When decomposition is complete, a dark, brown, powdery material called humus has been produced. As you can tell by its rich earthy aroma, the finished compost is full of nutrients essential for the healthy growth of your plants and crops. "Compost happens" as long as there is air and water in the environment.

2. Why Should I Compost?

- Without healthy soil, we would be risking the health of ourselves. If you can appreciate that most of the food we eat comes from the soil in some way or another, you would probably understand why the health of the soil is so important to us all. Composting will stimulate the growth of rich productive soil that is vital to our crops, plants, and the environment.
- Approximately 1/3 of household waste in the U.S. is composed of organic materials, including food scraps and yard wastes. However, these wastes could be recycled for the purpose of composting. We can prevent the landfills from overloading by cutting down on these types of wastes.
- It is very easy to make compost happen. With minimum cost and labor, you can build a composting structure suited for your particular needs at home. You will actually save money because you will no longer need to purchase soil fertilizers for your garden.

3. What Makes Good Compost?

Microorganisms (bacteria, fungi, and protozoa) and visible macroorganisms (worms and insects) in the soil are called decomposers, and they feed on dead organic matter, contributing to the composting process. So long as there is enough food (i.e. kitchen scraps and yard wastes) for them to live on, compost will happen naturally. However, the length of time necessary for the composting process depends on the following six factors: carbon-to-nitrogen ratio(C:N ration); surface area of the ingredients; volume; aeration; moisture; and temperature.

I. Carbon-to-Nitrogen Ratio (C:N Ratio)

For decomposers carbon is essential as it provides the energy source for them, and nitrogen is crucial as it supplies protein to build their bodies. Consequently, an ideal compost will have a good C:N ratio, which is said to be about 30:1. You can achieve this balance by simply mixing different organic materials into your pile, and no complicated, heavy math is necessary in doing so. Table 1 will help you estimate the composition of your entire pile.

C:N Ratios of Common Organic Wastes

Vegetable Wastes	12:1
Rotted Manure	20:1
Straw	80:1
Leaves	40 - 80:1
Paper	170:1
Sawdust	400:1

In addition, the C:N ratio can be varied according to how fresh the material is. For example, fresh, green leaves will have a lower carbon level than 60:1, whereas dry, brown leaves will have a higher carbon level than 60:1. Since soil tends to have a higher carbon level than the ideal C:N ratio, adding more nitrogen-rich materials usually results in a faster composting process.

II. Surface Area of the Ingredients and

The more surface area your ingredients hold, the faster the decomposers work on them. In other words, if your ingredients are chopped into smaller particles, there will be more areas for the decomposers to munch on. Hence, using a shovel, a shredding machine, or a lawn mower to break large, coarse materials down to small pieces will help stimulate the decomposing process.

III. Volume

If your whole pile is larger than 5 ft. cubed, most likely the microorganisms at the center will not decompose efficiently due to the lack of breathable air inside the pile. On the other hand, if your pile is smaller than 3 ft. cubed, it will probably be susceptible to great heat loss at the center since there is not enough insulation between the pile and the air outside. Therefore, constructing an adequate size of compost pile becomes important as well.

IV. Aeration

In the soil are aerobic decomposers, which require air to function, and anaerobic decomposers, which do not need air to function. Aerobic decomposers are more dominant in the composting process, so increasing aeration into the soil is very crucial. The more air passages in your pile, the faster the decomposition. Chopping up the ingredients and adding materials, such as straw and weeds which contain ample air passages, are effective ways to increase aeration.

V. Moisture

Water is indispensable for the decomposers as well. To have fast compost going, your pile should be moist but not necessarily wet. An ideal compost pile is said to be as moist as a "wrung-out sponge." Therefore, adding water where the climate is dry and sheltering the pile where the climate is extremely rainy becomes indispensable.

VI. Temperature

In general, the hotter the pile, the faster the decomposition process. Then, your question might be, "How do I make a hot pile?" If you have a good C:N ratio, an adequate volume of ingredients that are chopped up well, as well as enough air and water, most likely you will have a very hot pile in the range of 110 to 140 degrees F. Nevertheless, if you live in a very cold climate, it might not work out the same way for you. In that case, you will have to relocate the compost pile to an area that is at least higher than 50 degrees F so that the decomposers can keep up their "hard work" with composting. However, another thing you could do is just keep adding your ingredients even when it freezes in winter, and the compost will take place again when it thaws in spring.

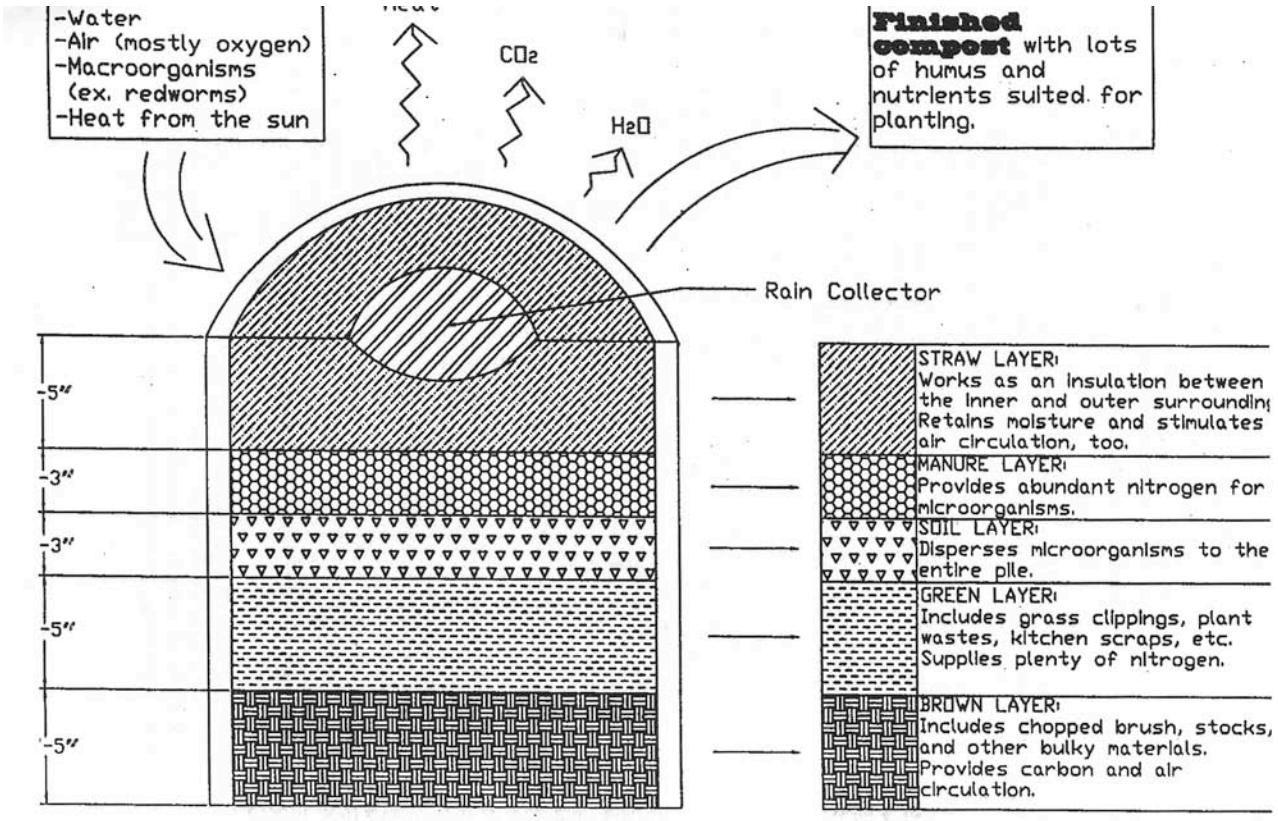
The composting process can take as little as one month or as long as 12 to 24 months depending on how well you satisfy the above requirements. Many composting experts suggest that making layers with the different ingredients will enhance the composting rate of the pile (Figure 1). By using the layering method, it becomes much easier to keep track of the proportion of ingredients that have been added into the pile. Wetting each layer of material before piling them up together and mixing the layers before adding another set of layers are some tips to make the compost process even faster. Contrary to this conventional layering method, Victor Dalpadado, a Sri Lankan compost master, contends that mixing all materials thoroughly before making a pile generates a faster compost pile than using a layering method. The solution is up to you; try it yourself, and see which method works better for your own garden!

4. What Ingredients Can I Put in My Pile?

For those who are not quite sure what ingredients are beneficial or detrimental to compost, the following information should be of great use for you:

- Ingredients that are good for compost:
  Grass/lawn clippings, hay, kitchen wastes, leaves, manure, straw, weeds and other garden wastes, wood chips & sawdust, wood ashes, sod, corn stalks, chopped corn cobs, shredded newspaper, etc.
- Ingredients that are bad for compost:
  Chemically-treated wood products, diseased plants, human wastes, pet wastes, meat, bones, fatty food wastes, grease, pernicious weeds, weed plants containing many seeds, etc.

If you would like to know more on why these materials are good or bad, visit the web site "What to Compost" at http://net.indra.com/~topsoil/What_to_Compost.html and "What NOT to Compost" at http://net.indra.com/~topsoil/What_NOT_to_Compost.html.



5. What Types of Composting Methods Are There?

The number of ways you can compost is almost innumerable, but they could be categorized into five major groups. The following includes a brief description of each method as well as its advantages (+) and disadvantages (-):

I. Holding Unit

Description – Containers or bins that hold yard and garden materials until composting is complete.

Traits - (+) Relatively easy to make
(+) Good for small compost
(-) Slowest way to compost

II. Turning Unit

Description – A series of bin or a rotating bin that allows organic material to be turned on a regular basis.

Traits – (+) Fastest way to compost (3 –24 weeks)
(-) More labor required for maintenance
(-) Greater expense to buy or effort to build

III. Worm Composting

Description – A bin of your preferred size with plenty of red worms (red wigglers) that can digest kitchen wastes efficiently.

Traits – (+) Effective for food scrap composting
(-) 2 lb. of worm necessary for 1 lb. of garbage per day
(-) Temperature has to be within the range of 50 to 75 degrees F

IV. Heaps

Description – A heap of organic materials without any holding structure.

Traits – (+) Least expensive way (no structure needed)
(-) Turning it over makes it process faster (extra labor)
(-) Appearance is not as neat and tidy as others are

V. Soil Incorporation

Description – A trench in the soil that can decompose kitchen wastes efficiently.

Traits – (+) Effective for food scrap composting
(+) Fast way to compost if the conditions are good (1 month)
(-) Slow way to compost if the conditions are bad (1 year)

6. What Do I Need for Each Composting Method?

Here are the requirements and materials necessary to build the following specific structures:

Wire-Mesh Holding Unit (Fig. 2)

- woven wire fencing
- Wire or 3 or 4 small chain snaps (to fasten the end)

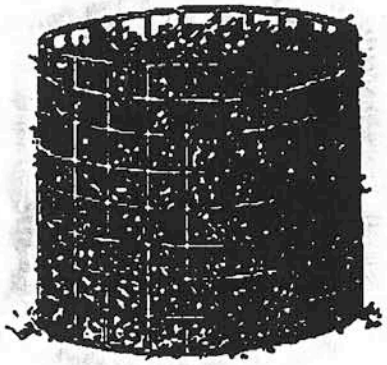


Fig. 2. Wire-Mesh Holding Unit (Fick and Whelan 2000)

Snow Fence Bin (Fig. 3)

- Prefabricated snow fencing
- Durable string
- Two-by-fours (as corner posts)

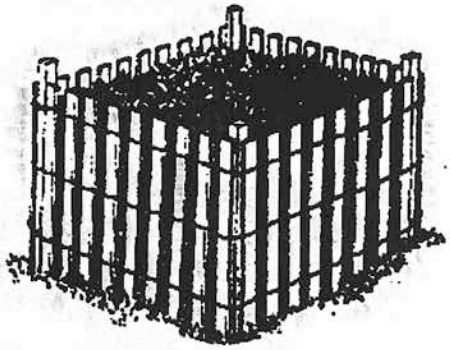


Fig. 3. Snow Fence Bin (Fick and Whelan 2000)

Block or Brick Bin (Fig. 4)

- Bricks, cement blocks, or rocks
- To increase aeration, mortar should not be used

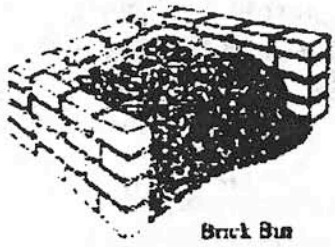


Fig. 4. Brick Bin (Ohio State University 2000)

Multiple Bins (Fig. 5)

- 3 or more bins in series
- Large amount of compost ingredients

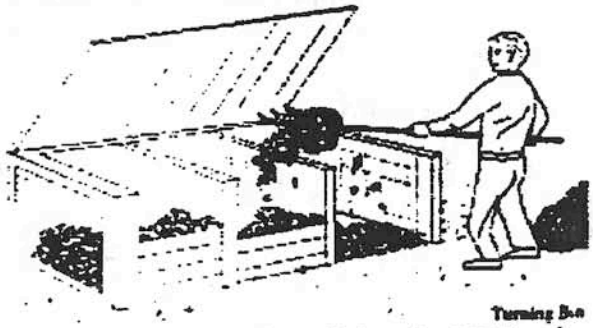


Fig. 5. Series of Bins (Ohio State University 2000)

Rotating Barrel (Fig. 6)

- Might be easier to purchase than to make (Check other web sites for more information)

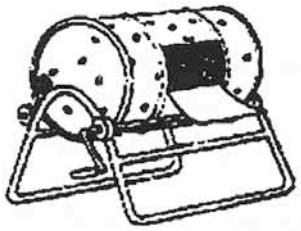


Fig. 6. Rotating Barrel (Fick and Whelan 2000)

Worm Composting (Fig. 7)

- Red worms
- Shredded, moistened newspaper, corrugated cardboard, or sawdust
- Semi-heated indoor space (50-75 degrees F)
- Drainage and ventilation holes on the bottom

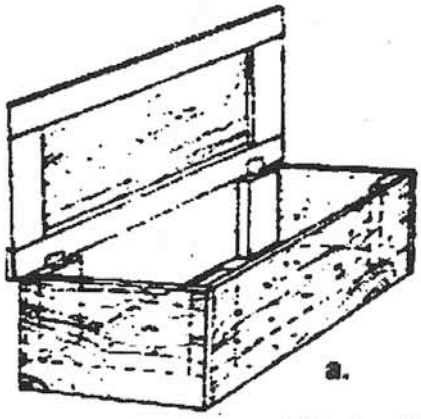


Fig. 7. Worm Composting (Fick and Whelan 2000)

Heaps (Fig. 8)

- Pile that is at least 3 ft. high and 5 ft. wide (Length could vary according to the needs)

Fig. 8. Compost Heap (Fick and Whelan 2000)

Soil Digging (Fig. 9)

- Open space at least 8 inches below ground level
- No fatty food wastes allowed

Fig. 9. Soil Trench (By Ralph T. Lampman)

BASIC COMPOSTING GUIDE

1) Add food scraps (no more than 5 gallons at a time).
2) Add an equal amount of dry material (dry grass, straw, leaves).
3) Add a thin layer of topsoil.
4) Turn at least once a week.
    - Repeat this Process Until the Bin is Full.
    - Shovel out Finished Compost from Bottom or Begin Filling Second Bin.
5) Continue steps 1 through 5.

TIPS: For a single-bin system, only mix the top 12 inches when turning.
Composting meat and dairy may attract rats and other pests.

COMPOST TROUBLESHOOTING GUIDE

What's the problem?	Why is it happening?	What to do?
It smells putrid	lack of air	turn pile
	too wet	keep covered
	too much fresh material	add straw, leaves, etc
It's not decomposing	too dry	water the pile
	too cold	add lawn clippings or more food scraps
Too many flies	----------	add a thin layer of soil or ash to surface
Rodent problems	----------	secure wire mesh over any openings on bin

Reference

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