

MAKING COMPOST

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MAKING COMPOST

II. Materials for making compost

All organic materials, e.g. plant wastes or residues can be used in making compost.

The materials include dry and wet materials.

Dry Material: Little water content, with high carbon/nitrogen (C/N) ratio which decomposes slowly.
e.g. Rice straw, sugarcane residue residues, banana leaves, rice husk, tree leaves.

Wet Materials: high water content, with low C/N ratio which decomposes quickly.
e.g. Chicken manure, animal manure, green manures, leaves of leguminous trees, grass clippings.

The mixture used in compost usually is: 6 Dry materials: 3 wet materials: 1 soil

1.1 Carbon – to – Nitrogen Rates

All living organisms are made of large amounts of carbon (C) combined with small amounts of nitrogen (N). The balance of these elements in an organism is called the C/N ratio. This C : N ratio is an important factor determining how easily bacteria can decompose organic waste during the composting process.

The microorganisms in compost use carbon (C) for energy and nitrogen (N) for protein synthesis. The proportions of these two elements used by the bacteria averages about 30 parts of carbon to 1 part of nitrogen. Given a steady diet of C : N at 30:1 ratio, bacteria can work on organic material very quickly.

Table 1. C:N rates of some common organic materials

Material	Ratio
Vegetable wastes	12-20 : 1
Cow manure	20 : 1
Leaves	40-80 : 1
Corn stalks	60 : 1
Sawdust	100-500 : 1
Grass clippings	12-25 : 1
Bark	100-130 : 1
Fruit wastes	35 : 1
Fresh poultry manure	10 : 1

Source: Steinegger, D.H. & Janssen, D.E. (1993). Garden compost. Neb Guide. G86-810-A.

Table 2. Materials for Making Compost

Brown Materials (dry - high carbon wastes)

Hay
Leaves
Corncobs and cornstalks
Nutshells
Sawdust
Straw
Vegetable stalks

Green Materials (wet – higher nitrogen wastes)

Coffee grounds
Vegetables scraps
Cover crops (green manure)
Fruit wastes and grains
Grass clippings
Manure
Seaweed
Weeds
Eggs and eggshells*
Feathers*
Fish and Seafood Scraps*

* Most animal scraps slow down decomposition

Source: The Beauty of Compost Heaps

II. Procedure of Making Compost

A. Piling up compost heap

1. Make a movable wooden frame (Figure 1). This serves as a guide in stacking, as the piles go higher.
2. Select a level area near a water source, and it also receives an equal amount of sunlight and shade.
3. Place a layer of dry brown materials such as branches, leaves and straw at the base of the pile first. These are high carbon materials, provide for air circulation from the bottom of the pile.
4. Place green wet materials such as grass clippings or manure (high nitrogen materials) as the second layer.
5. Add a thin third layer of soil. This forms the first pile. The purpose of using soil is to introduce microorganisms needed to break down the organic mater in the pile.
6. The ratio of the materials for piling the heap is:
Dry materials : Wet materials : Soil = 6 : 3 : 1
7. Place a hollow bamboo stick in the center of the pile for aeration.
8. If there is a lot of sappy materials in the heap, no additional water is needed. If the material is dry, it should be watered well as the heap is built.
9. Repeat the procedures 3 to 5, move the wooden frame up as the additional piles are made. Build the heap until 4 feet high (Figure 2).

The purpose of having the heap up to 4 feet high is:

- To develop and retain heat to destroy harmful bacteria.
- To generate fungus and good bacteria. The fungus produces antibiotics which destroy most harmful bacteria and break down the plant structure rapidly.
- The good bacteria and microorganisms begin to thrive and take over as the compost heap cools.

10. Remove the wooden frame.
11. Cover the heap surface to prevent excess rain from soaking or sun drying up the heap.
12. The temperature should reach 55° to 70 °C, after a few days and it will kill off most pathogen, weeds and seeds.

B. Turning Compost heap

1. Turn the pile every 2 weeks.

The purpose of turning is to improve aeration, speed up micro-organism activity and ensure uniform decomposition. The pile is reconstructed, material previously on the top and sides of the pile should be moved to the center.

2. During the decomposition process, if there is not enough moisture, water the pile to maintain conditions conducive for the composting process.
3. If the heap is too wet and too compacted, turn it and sprinkle dry soil or dry materials on it.
4. The decomposing process usually takes 3 to 4 months, it depends on the air temperature and the mixtures.
5. The compost is finished decomposing when the pile cools off, and the volume decreases to about one-third of its original volume.
6. Good compost smells good, and is black brown in colour, crumbly and has an earthy odour with pH 7.0 to 7.2.
7. It is not necessary to add limestone to the compost pile, as the organism function well with a pH between 4.2 and 7.2. The compost naturally becomes less acid as it matures.
8. The length of time necessary for the composting process depends on several conditions.
 - Carbon – to – nitrogen ratio of the materials used
 - Surface area of particles

- Aeration
- Moisture
- Temperature

III. Advantages of Using Compost in Crop Cultivation

- Improve soil structure
- Increase soil fertility
- Improve water / moisture retention
- Increase resistance of plants to pests and diseases
- Provide nutrients to plants

IV. Diagnosing Composting Problems

1. The pile is producing a bad odour

The pile may be too wet, too tight, or both. Turn it to loose and allow better air exchange in the pile.

If it is too wet, also turn the pile, but at the same time, add dry new materials.

Odour may indicate that animal products are in the compost pile.

2. No decomposition seems to be taking place.

The pile is too dry. Moisten the materials while turning the pile.

3. If the compost is moist enough and the centre is warm but not hot enough for complete breakdown.

The pile is too small. Collect more materials to make a larger pile. Turn and mix the old ingredients that may have only slightly decomposed into the new pile.

If the pile is not small, more nitrogen may be needed.

4. If the pile is moist, sweet smelling, with some decomposition, but still does not heat enough.

There is not enough nitrogen available for proper decomposition. Mix a nitrogen source such as fresh grass clippings, manure or fertilizer into the pile.

Figure 1. Wooden Frame for Making Compost

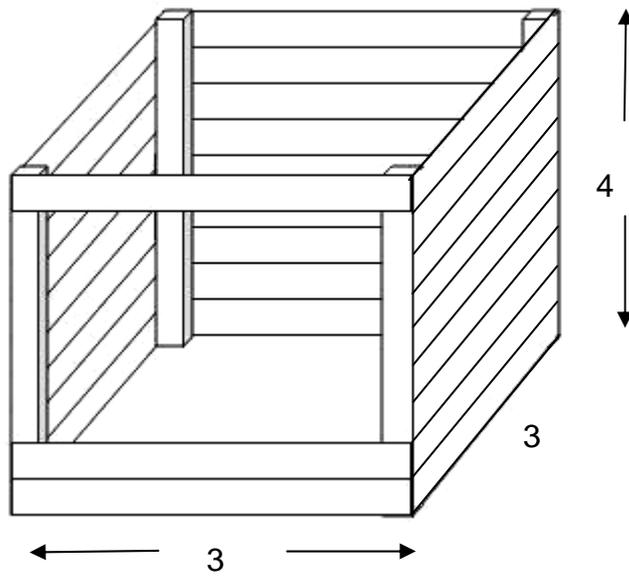


Figure 2. Composting Process

