Composting – teacher information sheet

Basic Soil Management

For soil to maintain its capacity to support plant growth and high crop yields, it must be managed properly. Landslides, flooding and erosion can decrease soil capacity. Soil management is designed to minimise the impact of these processes, and means using soil wisely so that it can continue to support plant growth over the long term. One way to maintain soil fertility is to make and apply compost.

What is compost?

Compost is a mixture of organic matter that has decomposed and is used as an organic fertiliser. It is very rich in the major and minor nutrients needed by plants for healthy growth.

Organic matter includes dry leaves, green grass clippings or food peelings, and animal manure. Dry leaves produce carbon for heat energy; and green clippings, food peelings and animal manure provide nitrogen and microorganisms to help break down the organic matter (the decaying process). Compost acts as a soil conditioner and fertiliser, and adds humus. In some circumstances it can also act as a pesticide. Composting also requires water and oxygen for the living organisms that help in the decomposition process (Figure 1.4).

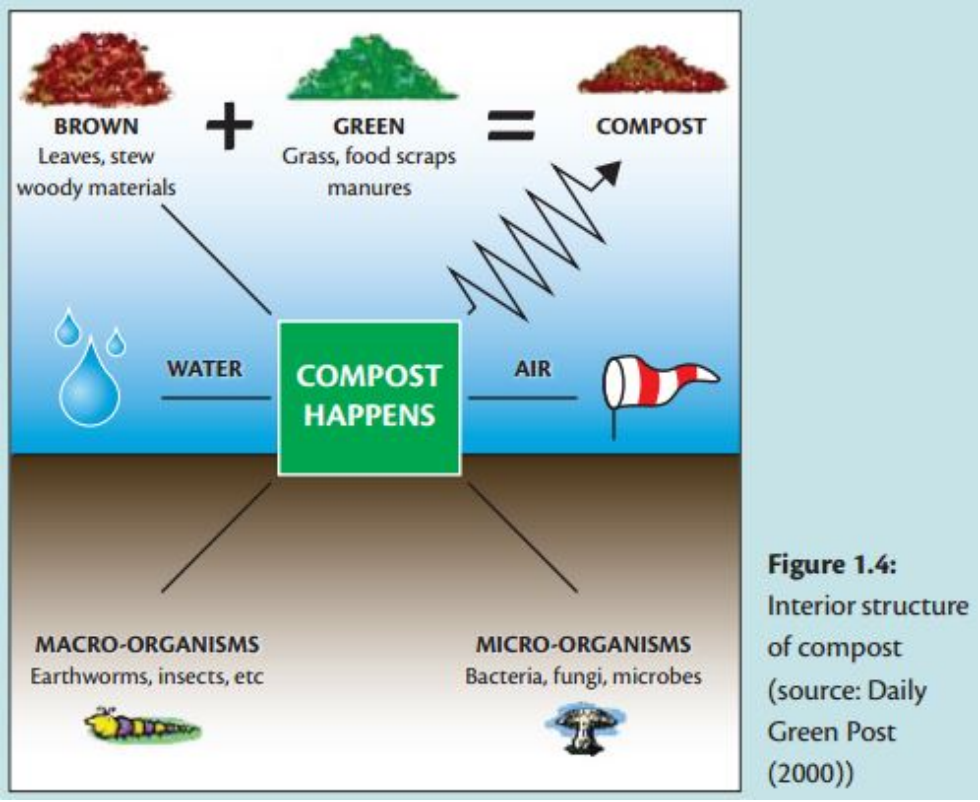

Figure 1.4: Interior structure of compost (source: Daily Green Post (2000))

Compost agents. (Seta-Waken, Malie, Utama & Palaniappan, 2016, p. 28).

Advantages and disadvantages of using compost

Table 1.5: Advantages and disadvantages of composting

Advantages ☺	Disadvantages ☹
1. Waste products are made use of properly and recycled 2. Adds nutrients, reconditions the soil and improves soil structure 3. Cheap 4. Helps to clean up contaminated soil 5. Kills plant diseases and pests in the soil	1. Produces odour/smell 2. Attracts pests such as rodents and other insects 3. Labour intensive 4. Time consuming

(Seta-Waken, Malie, Utama & Palaniappan, 2016, p. 28).

Types of compost

There are two compost types that farmers may prefer to make and use:
1. 18–30-days compost (Table 1.6 and Table 1.7)
2. 3-months compost (Table 1.8 and Table 1.9)

18–30-days compost

Table 1.6: Materials needed to make 18–30-days compost

1. Sticks or bamboo to build a stockade with its shelter
2. Kunai grass, sago leaves or plastic sheet for the roof
3. Dry leaves, green grass clippings and fresh animal manure
4. Sack bags or banana leaves to cover the compost
5. Ropes or tie wire for tying edges of the stockade

Table 1.7: Steps in making 18–30-days compost

1. Build a 1m (length) × 1m (width) × 1m (height) stockade and allow for a similar sized area to turn the manure.
2. Chop dry leaves and green leaves together.
3. Thoroughly mix the chopped leaves with fresh animal manure.
4. Combine the mixture and pile to make a heap up to 1 m high.
5. Cover the heap with the sack bag or banana leaves.
6. After 3 or 4 days turn the heap and continue to turn after every 2 days.
7. In 18–30 days the compost should be ready for use.

3-months compost

Table 1.8: Materials needed to make 3-months compost

1. Sticks or bamboo to build a stockade with its shelter
2. Kunai grass, sago leaves or plastic sheet for the roof
3. Dry leaves, green grass clippings and fresh animal manure
4. Sack bags or dry banana leaves to cover the compost
5. Ropes or tie wire for tying edges of the stockade
6. Green manures such as legumes
7. Topsoil

Table 1.9: Steps in making 3-months compost

First stage: Making a heap

1. Build a 2.5m (length) × 2m (width) × 1.5m (height) stockade and allow for a similar sized area to turn the manure.
2. Chop dry leaves and green leaves together and make a layer about 15 cm thick.
3. Sprinkle a thin layer of animal manure about 2 cm on top of the first layer.
4. Add a second layer of plant materials, preferably green manure.
5. Sprinkle wood ash or charcoal dust on top of the green manure.
6. Each layer should be 30 cm thick.
7. If the weather is dry, sprinkle 4 L of water to make the layer damp.
8. Repeat the above steps until you have a heap about 1.5 m high.
9. Cover the heap with 10 cm of topsoil to minimise nutrient loss.

Second stage: Turning the compost

1. Turn the heap using a fork after 1 month.
2. Move the materials from the top and sides of the heap to the middle of the new heap.
3. Turn the heap every 2 weeks until the compost becomes dark grey in colour.

Third stage: Monitoring progress

1. From 8 days onwards, push a stick into the middle of the heap and pull it out. If it feels hot this is a good sign that decomposition is occurring.
2. The compost will be ready for use when it becomes hot and greyish in colour. This takes 3 months.

The only significant difference between these two compost methods (18-30 days compost & 3 months compost) is the time frame for the manure to be ready for use.

How to apply compost

Compost can be used in the following ways:

- broadcasting—scatter compost onto the soil surface prepared for planting
- incorporating—dig or plough compost into the soil before planting
- side dressing—make a hole at the side of your plant, place manure into the soil and mix, and then cover the hole.

Note that if you are not ready to use the compost immediately, it can be stored in the shade or covered with 10 cm of topsoil to minimise nutrient loss.

Information taken from

Seta-Waken P., Malie R., Utama P. and Palaniappan G. 2016. Introduction to basic crop production, post-harvest and financial management practices: a training manual for smallholder vegetable farmers in western Pacific island nations (ed. by C.J. Birch and B.E. Chambers). Monograph Number 176 Australian Centre for International Agricultural Research: Canberra, ACT. http://aciar.gov.au/node/25047

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