

ORGANIC MANURE FOR CROP PRODUCTION *

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The use of chemical fertilizers in the developing countries has increased considerably during recent years. In many tropical countries it has brought substantial increases in crop yields and has also been a principal input in the cultivation of high yielding crop varieties. High yielding varieties also require higher nutrient input than ordinary varieties.

The nutritional depletion of soils by these high demanding crops coupled with the destruction of the vegetation through farming, felling of trees for timber, bush fires and over grazing impoverish the soils if soil management practices are neglected.

Organic matter improves the soil for plant growth. Sources of organic materials are available to every farmer i.e. residues from harvests, crop straw, stalks and any vegetable matter, urban or kitchen wastes, brush woods, animal manure etc. Therefore attempts should always be made to use organic manures because it improves the soil physical condition, soil nutrient status and soil biological properties.

A new method developed in Europe is to make compost out of brush wood and use it as fertilizer. This method can be used with advantage in countries like Sri Lanka, where the raw material is available in plenty for the farmer.

Preparation of Brush Wood Compost

There are two methods for preparation of brush wood compost.

Manual Method

1. Raw materials

- (a) The raw materials should be plant debris
- (b) Several varieties of plants are mixed

- (c) The plant materials are chopped to small particles using a machine or manually by a knife
- (d) Diameter of the largest particle should be below 8 mm
- (e) Any mineral fertilizer or chemical (excepting Calcium hydroxide which is sometimes added to control the pH of the mixture) is never added

2. Humidification

These materials are soaked in water for at least 24 hrs. (Normally this process is done on rainy days).

3. Formation of Compost Pile

- (a) Materials must remain undisturbed for a minimum of two weeks (for starting the fermentation process)
- (b) Heaps are carded by fork and form a triangular pile of width 2.2m height 1.6m with a minimum volume of about $4m^3$
- (c) The pile is covered with soil or old compost layer of 2 cm thickness
- (d) Temperature is allowed to rise up to $60^{\circ}C$ (if it is too high water should be added to control the temperature $60^{\circ}C$).
- (e) After 90 days, compost is formed and can be used for crops as manure
- (f) When the compost is formed the largest pieces of material can be crushed between the thumb and the forefinger

Industrial Method

- (a) Living plant material from forests and urban areas are collected and transported by tractors
- (b) Materials are chopped using a machine (diameter of largest particle should be below 8 mm)
- (c) Water is applied using "sprinklers" for minimum period of 24 hours
- (d) Materials must remain undisturbed for minimum of two weeks
- (e) Heaps are carded using a machine and a triangular pile is formed
- (f) Dimensions are double figures of the manual method
- (g) Temperature is allowed to rise up to 70°C
- (h) Materials are kept for 6 months for fermentation and then used for crops.

Chemical composition of the Brush Wood Compost

	After 1 month	After 3 months
pH	5.7	7.1
Total N (%)	0.43	0.97
P ₂ O ₅ (%)	0.12	0.17
KO (%)	0.30	0.48

Application of Brush Wood Compost

- (a) For agricultural crops
- 50-80 tonnes/ha

- (b) For market gardening
- 100 tonnes/ha

- (c) Creation of an agricultural soil industry region
- 500 tonnes/ha

- (d) For the tree culture
- Sufficient experience is not available but
planting time 60 kg/tree

- (e) In dry region to cover the soil
- 10 cm thickness as a mulch

A coconut grower can prepare a compost pile in his own land to meet the requirement of manure for coconut using the plant debris obtained from hedges, livefences, shrubs, weeds available in his own land. In addition green matter from road side bushes and jungles also can be used for compost.

In addition to the supply of essential plant nutrients for coconut, compost improves soil structure in such a way that it facilitates root penetration of coconut palm which in turn gives rise to a wide spread root system. Soil aeration is also increased due to improved soil structure. The moisture retention capacity of soil can also be enhanced by addition of compost.

The multiplication of the population of soil micro-organisms and earthworms as a result of compost application would enhance the supply of plant nutrients to the palm and improve the soil structure. The nutrient retention ability of soils can be improved by compost addition. All these factors ultimately lead to formation of good fertile soil which may give a better coconut yield.