

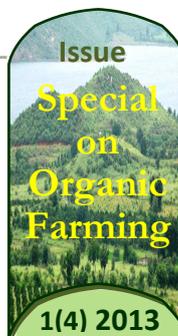


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Coir Compost: A Source of Plant Nutrient in Organic Farming

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Coir pith compost is an aerobic composting. Composting of coir pith reduces its bulkiness and converts plant nutrients to the available form. Coir composting as an organic source helps to enrich our degraded soils and system.

Introduction

The largest by products of coconut is coconut husk from which coir fibre is extracted. They accumulate in the vicinity of coconut coir-fiber extraction units, of which disposal and management remain a major problem. This extraction process generates a large quantity of dusty material called coir dust or coir pith. Large quantity of coir waste of about 7.5 million tones is available annually from coir industries in India. Southern states of India, especially Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, and Orissa, face this problem. The composted pith is excellent organic manure, with a reduced C/N ratio of 20:1, pH of about 6.5, and electrical conductivity of 0.23 dS/cm, making it more desirable soil organic manure. The composted pith did not contain or carry weeds and undesirable pathogens, thus providing a rich soil environment for plant and vegetation growth. Composting of coir pith reduces its bulkiness and converts plant nutrients to the available form.

Coir Pith Composting Technology

- 1. Collection of raw material:** Coir pith is collected from the coir industry without any fiber because these fibrous materials will not get composted and it will hinder with composting process. If fibrous materials are present, it is removed by sieving at the source itself. Otherwise, it has to be removed at the end of composting at the compost yard.
- 2. Site selection for composting:** A separate shady, levelled and elevated area should be earmarked for composting. The shady area conserves the moisture in the composting material. If earthen floor is available the floor can be made to hard by hard pressing and also by applying cow dung slurry. Presence of roof over the composting material is advantageous, since it protects the material from rain and severe sunshine. Coir pith compost is an aerobic composting. So it should be heaped above the soil. Coir pith should

be spread to the length of 4 feet and breadth of 3 feet. Initially coir pith should be put up for 3 inch height and thoroughly moistened. After moistening, nitrogenous source material should be added. The nitrogenous source may be in the form of fresh poultry litter. Fresh poultry litter is recommended @ 200 kg for one ton of coir pith. It has to be proportionally divided and put over the coir pith. After adding, the nitrogen source, the microbial inoculums *Pleurotus* and biomineralizer (2%) are added over the material. Over this one portion of coir pith is added and the same input mentioned above should be added. It is advisable to make a heap up to minimum of 4 feet height. The increase in height retains the temperature generated in the coir pith compost process. If the height is low, whatever the heat generated will be dissipated easily.

3. **Turing of material:** The compost heap should be turned once in 10 days to allow the stale air trapped inside the compost material to go out and fresh air will get in. The other way of giving aeration is inserting perforated unused PVC or iron pipe in the composting material both vertically and horizontally.



4. **Moisture maintenance:** Maintaining optimum moisture is the pre-requisite for uniform composting or waste material. Sixty percent moisture is to be maintained always to wet the compost material. But excess water should not be drained from the waste material. If no water is coming out of the material at squeezing int between the palms, that moisture status is ideal for composting.
5. **Compost maturity:** The period of composting vary from substrate to substrate but normally it takes sixty days (60 days) for some of the physical parameters to be observed in the compost. When the waste material is composted, its volume gets reduced and the compost heap height will be reduced by 30 %. At maturity waste materials are turned to black in colour, emits earthy odour and the waste particle size is reduced. The chemical observation for compost maturity is to be analysed in the laboratory. The chemical

observations are narrower C:N ratio (20:1), less oxygen uptake, less number of microorganism, more amount of available nutrients and highly cation exchange capacity.

6. **Compost harvest:** The composted material which is obtained from sieving is ready for use. If the composition is not used immediately, it should be stored in a open, cool place, to retain the moisture, so that the beneficial micro organism present in the compost will not die. Once in a month, water is sprinkled over the compost material to maintain the moisture.

Nutritive value of raw and composted coir pith compost:

| S. No | Parameters | Raw coir pith (%) | Composted coir pith (%) |
|-------|----------------|-------------------|-------------------------|
| 1 | Lignin | 30.00 | 4.80 |
| 2 | Cellulose | 26.52 | 10.10 |
| 3 | Carbon | 26.00 | 24.00 |
| 4 | Nitrogen | 0.26 | 1.24 |
| 5 | Phosphorous | 0.01 | 0.06 |
| 6 | Potassium | 0.78 | 1.20 |
| 7 | Calcium | 0.40 | 0.50 |
| 8 | Magnesium | 0.36 | 0.48 |
| 9 | Iron(ppm) | 0.07 | 0.09 |
| 10 | Manganese(ppm) | 12.50 | 25.00 |
| 11 | Zinc(ppm) | 7.50 | 15.80 |
| 12 | Copper(ppm) | 3.10 | 6.20 |
| 13 | C:N ratio | 112.1 | 24:1 |

Benefits of Composted Coir Pith

- The addition of composted coir dust improves soil physical properties *i.e.* soil texture, structure and tilth, sandy soil become more compact and clayey soil becomes more arable.
- It improves the soil aggregation, cation exchange capacity and water holding capacity (more than 5 times its dry weight) contributing towards increased soil moisture.
- The bulk density of both the sub surface (15-30 cm) soil is reduced to considerable extent with the application composted coir pith.
- Composted coir dust contains all plant nutrient elements and it can provide a supplemental effect along with inorganic fertilizers.
- Coir pith compost application increased the soil native microflora because of addition of humic materials.
- Ammonification, nitrification and nitrogen fixation are increased due to improved microbiological activity.

Application of Coir Pith Compost

- It is recommended to be applied @ 5 tons of composted coir pith per hectare of land.
- It is advised that composted coir pith should be applied basally before take up the sowing.
- For nursery development in poly bags and in mud pots 20 % of composted coir pith can be mixed with the soil and sand before filing it in the poly bag or mud pot.
- For applying to the established trees like coconut, mango, banana and other fruit bearing trees, minimum 5 kg composted coir pith is required.

Limitation in Using Composted Coir Pith

- It is not economical to buy composted coir pith and put in the farm for large areas. It is better to prepare compost in the own farm.
- Before buying composted coir dust, it should be ensured that the material is composted completely and quality analysis certificate is available with the material.
- If immature compost is applied to the soil, even after entering into the soil, it will undergo decomposition inside the soil, by taking nutrients from the soil. Because of this, standing crop will get affected.

Conclusion

The composted pith did not contain or carry weeds and undesirable pathogens, thus providing a rich soil environment for plant and vegetation growth. Coir pith is used as a growth medium in horticulture but still its use in agriculture as a good carbon source is limited due to wider carbon and nitrogen ratio and lower biodegradability due to high lignin content. So coir pith is composted to reduce the wider C:N ratio, reduce the lignin and cellulose content and also to increase the manorial value of pith. Because of its less bulkiness and supplying capacity of nutrients in their available form, need here lies for coir composting as organic source to enrich our degraded soils and system.