3. For a product to be registered with the FPA as pure organic fertilizer, it must have 5-7% total NPK with at least 1.5% N and at least 10% carbon. The organic matter must be 10% and above with a neutral to slightly alkaline pH.

BENEFITS FROM BOF APPLICATION:

- Increases yield and improves quality of crops
- Improves soil structure: better soil aeration, increases water-holding capacity
- Improves chemical properties of soil: corrects acidity, restores soil fertility by enriching soil with trace and other micronutrients and organic matter
- Restores microbial balance and enriches soil with micro-fauna

HOW MUCH BOF TO APPLY:

The rate of application depends on the kind of crop to be fertilized. BOF application ranges from 10-20 bags/ha or 2-6 kg/tree for bearing plantation crop like coconut. Initially, this recommendation must be combined with 50% of the recommended rate of inorganic fertilizers.

ADVANTAGES OF THE TECHNOLOGY

- Reduced dependence on inorganic fertilizers
- Renewable and locally available raw materials
- Contribute to proper waste disposal
- Generate employment opportunity
- Contribute to biodiversity
- Lessen environmental pollution

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Bio-Organic Fertilizer Production

BIOORGANIC FERTILIZER (BOF) FROM COIR DUST AND ANIMAL MANURES

Bioorganic Fertilizer (BOF) is a processed inoculated compost from any organic material that has undergone rapid decomposition by the introduction of homogeneous microbial inoculants. This is different from fresh organic fertilizer where natural decay process is brought about by the action of heterogeneous microbes present in the organic matter.

Compared with the traditional composting method, microbial inoculation hastens the decomposition from three months to just 3-4 weeks. Inoculants are commercially available in selected areas in the country but could be easily accessed.

Trichoderma harzianum , a single celled fungus hastens the decomposition of organic materials especially those high in lignin and cellulose like rice straw, coir dust, bagasse and weeds.

Commercial inoculants *i.e* Greenmix, Mabijon composter are enriched with other beneficial microbes like the nitrogen fixing bacteria, *Azotobacter.*

To produce quality organic fertilizer, plant residues like coir dust, bagasse, mudpress, rice straw etc. must be mixed with animal residues. Leguminous plants could be part of the substrate to substitute part of the manure.

MATERIALS

Raw materials:

I. The amount depends on the desired quantity of heap and ratio of plant residue and animal manures which could be 1:1, 2:1 or 1:2. For a 4 ton heap at 1:1 ratio you need:

- Coir dust (2T)
- Chicken manure (1T)
- Swine manure (1T)
- Inoculant (1% of weight of raw material-40kg)

II. Small tools and implement

- rakes
- Shovel
- Spading fork
- sprinklers or water hose
- plastic laminated sack as cover
- wheelbarrow
- Weighing scale
- Siever (wire mesh size of ¼ of an inch)
- Protective wear: gloves, mask, hat, boots

PROCEDURE

Site selection:

The ideal composting site is shaded and well drained and near a source of water. However, open area could be used. Four tons of agricultural waste can be composted in a space measuring 4m x 6m.

Preparation of raw materials:

Collect the required amount of coir dust, chicken manure and swine manure. Discard stones, plastics, metals and other non -biodegradable materials. Note their moisture content and weights. Divide coir dust into three parts.

III. Piling of materials

Step 1. Spread 1/3 of coir dust as the first layer. Water to about 60% moisture content. Press the sample in your palm and when the water does not fall freely, then it is almost within the right water content. Apply the required amount of inoculant on top (0.5% of the weight of the material in a layer.)

Step 2. Spread evenly the chicken manure on top, water and inoculate.

Step 3. Repeat steps 1 and 2 but use swine manure instead of chicken manure. Apply the inoculant on top of the fourth layer combining the weight of materials in the fourth and fifth layers.

Step 4. As the topmost layer, spread evenly coir dust but do not inoculate. This serves as a buffer for odor.

Step 5. Cover the heap with laminated plastic sack to conserve moisture and prevent rainwater from getting into the pile. Incubate for 4-7 days.

IV. Mixing and turning over

Step 6. After 4-7 days, turn and mix thoroughly the materials. Water if needed during turning. Return the cover. Repeat step 6 at weekly interval.

V. Harvesting, sieving and further processing

Step 7. After three or four weeks, harvest the material. Ripe compost has dark brown to black color, no offensive smell, temperature is ambient and with 35% moisture content or lower. Screen the organic fertilizer through manual siever or mechanical sifter.

Step 8. Inoculate the sifted material with 0.5% of the inoculant, store for three days under shade.

Step 9. Put BOF in 50 kg plastic-lined sack and seal. Do not pile directly on concrete flooring but provide wooden platform and stack not more than 10 sacks high. Store not more than 6 months in an aerated but dry area.

QUALITY CONTROL MEASURES:

For a good quality bioorganic fertilizer, observe these points:

1. Separate the dry materials from wet ones.

1. Monitor periodically the temperature of the heap. It must be within the right temperature range. The heap must heat up over 40^0C 24 hours after heaping. Within the first week, desired temperature is 40-50^0C. If this temperature is not reached, check wetness of the materials. Remove the cover, turn over the heap to allow excess moisture to escape. Temperature must reached up to 62^0C.