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Compost: A Tool for Waste to Best

(*Sateesh Kumar Dhaked, Dr. Vinod Kumar Yadav and Ashvinee Mehta)
College of Agriculture, Agriculture University, Kota, Rajasthan
*Corresponding Author's email: dhakedsateesh@gmail.com

Abstract
In India, agricultural and industrial trashes are found in huge numbers. They are rich in plant nutrients. Composting these wastes is an excellent waste disposal option since it increases the availability of plant nutrients, destroys pathogens, eliminates bad odour, and is simple to handle. As a consequence, pollution issues and harmful chemical bio-magnification in many biological systems can be reduced. The compost has ability to increase soil productivity by enhancing the physical, chemical, and biological qualities of the soil, allowing plants to grow more efficiently. In the days of increasing the fertilizer price and in view of the necessity to improve the yield of rainfed areas, it is imperative to look for this agricultural waste recycling by composting.

Keywords: Benefits, Composting, Methods, Phases of compost.

Introduction
Compost is a mass of decaying organic matter produced by decomposition of vegetable and animal waste with various additives. The compost done from agricultural waste such as weeds, rice, straw, sugarcane trash and other plants and waste is called agricultural compost. Average the nutrient content in farm compost is 0.5% N, 0.15% P_2O_5 and 0.5% K_2O. The compost produced by the city is rejected as garbage and the waste of specks of dust is known city compost. Contains 1.4% N, 1% P_2O_5 and 1.4% K_2O. Natural waste in landfills generates methane a powerful greenhouse gas. By using composting wasted meals and exclusive organics, methane emissions are appreciably decreased.

What to be compost
Fruits, Vegetables, Eggshells, Paper, Grass clippings, Yard trimmings, Shredded newspaper, Fireplace ashes, Cotton and Wool Rags, Houseplants, Sawdust, Wood chip, Leaves, Yard trimming, Cardboard and Nut shells.

Phases of composting
Composting is primarily a biological process in which aerobic and anaerobic breakdown organic materials to reduce the C/N ratio of the substrate. Compost is an amorphous, brown to the dark brown humified substance that forms as a result of composting. It includes 3 phases:

1. **The heating phase**: Within 3 days of creating the corn pile (heap), the temperature in the pile rises to 60 to 70°C and Usually it remains at this level for 2-3 weeks. Most of the decomposition occurs during heating Stage. Moisture is also essential to the composting process because bacteria require moist conditions to their work. The need for water is greater during the heating phase due to the higher temperature The vigorous activity and

evaporation that occurs during this phase. As heat increases, the pH of the compost pile rises.

2. **The cooling phase:** Lowering the temperature, the fungi settle and begin the decomposition of straw, fibers and metal material. When the temperature drops, the pH of the composting material decreases (*i.e.* increases the acidity).
3. **The maturing phase:** During the maturation phase, nutrients are mineralized and humic acid and antibiotics are built up. In the maturing phase, the compost requires much less water than in the heating phase.

Methods of agricultural wastes composting

1. **Indore Method:** Before stacking, the waste materials are first cut into small pieces of 5-10 cm in size and dried to 40-50% moisture. They are then scattered in layers of 10-15 cm thickness in pits with a width of one meters, a length of 4-6 meters and a depth of one meters. Using earth or night soil, the heap is adequately hydrated with faeces. A sufficient amount of water is sprayed over the heap to wet the composting materials to a moisture content of 50%. Periodic turnings are given to aerate the material, generally three times at 15, 30 and 60 days after filling and the material is covered with a thin layer of soil approximately 2-3 cm deep. It is a too expensive method. The compost produced by this process would have 0.8% N, 0.3% P_2O_5 and 1.5% K_2O.

2. **Bangalore Method**: This approach is also known as the hot fermentation method of manure generation. Normally, the depot can contain roughly 200 pits with a 1-5m gap between them. The first step is to build a 15-cm-high pile of garbage. Then night soil is dumped on top of it and distributed to a thickness of 5 cm. The hole is filled to 15cm above ground level with a final layer of refuse of 15cm on top after alternating layers of refuse and night soil are filled in alternate levels. To prevent moisture loss and flies breeding, this can be dome-shaped and coated with a thin coating of red dirt or mud. For roughly three months, the materials are allowed to sit in their current state without being turned or watered. In about six months, the C/N ratio is lowered to less than 20:1 and the manure is ready for usage. This approach would provide compost with 1.5% N, 1.0% P_2O_5, and 1.5% K_2O.

3. **NADEP Compost:** First invented by Narayan Deotao Pandharipande (also popularly known as "Nadepkaka"). The method is similar to heap composting, but it is carried out in brick-lined enclosures with air holes on all sides. However, this approach has the problem of requiring a considerable amount of dirt, which is not always desired or acceptable.

4. **Windrow Composting (leaf composting):** Windrows of 2.5-4m width at the base, 2.5-3m height, and any appropriate length are produced first, depending on the availability of leafy materials. Under ideal climatic circumstances, the leaf compost with a neutral pH (6-7) will be ready in 6-9 months.

5. **EMO Composting:** EMO Composting or Effective Micro-Organisms, is an indoor composting system that may be utilized by anyone who like this type of composting or who lives in a unit. The Bokashi is the most common device that uses EMOs, although it may also be used in other indoor systems, and some systems also utilize a carbon filter in the lid to filter smells. The Bokashi System does not allow you to put anything from your kitchen.

6. **Tumbler Composting:** Tumbler composting comes in a variety of forms and sizes, from single to double units and may be purchased commercially or manufactured at home. You'll probably need two of these systems so you can let one decay for a few months before emptying it. You fill the second one while this is going on. If you have a lot of green and brown garbage to dispose then this is a fantastic solution to use.

Various types of enriched compost

Compost is often bulky because it has a low amount of nutrients. Compost is expensive to prepare, store, transport, and apply to soils. Therefore, this drawback of bulky manure can also be resolved by making enriched compost by adding N, P, K, and micronutrients either individually or in combination**.**

A. **Enrichment with Nitrogen:** Adco process of preparation of this type of compost proposed by Hutchinson and Richard. According to this process plant materials of wide C/N ratio require addition of mineral N to narrow the C/N ratio.

B. **nrichment with Phosphorus:** By adding superphosphate (SP), Dicalcium Phosphate (DCP) and rock phosphate (RP) during composting, phosphorus-enriched compost can be prepared. A more sensible and useful strategy is to enrich compost by adding insoluble sources of P, such as low-grade RP.

C. **Enrichment with Potassium:** When composting, potassium-rich minerals like feldspar and mica can be added to improve the compost.

D. **Enrichment with Bioinoculant:** One method of increasing the nutritional content of compost products is the enrichment of composts with bacteria or micro-organisms that fix nitrogen and phosphate and potassium. The last *Azotobacter chroococcum* treatment improves N-content by fixing atmospheric N_2 in the compost pile. Along with rock phosphate, phosphate-solubilizing microorganisms including *Aspergillus awamori*, *Pseudomonas striata*, and *Bacillus polymyxa* can be added to the composting mass. These bacteria aid in the solubilization of inorganic phosphates that are sporadically soluble.

Factor affecting rate of composting

i. **Moisture content:** The amount of moisture in the composting pit is crucial to the breakdown of organic materials.

ii. **Temperature:** Many kinds of bacteria (mesophillic and themiophillic) that participate in the breakdown process prefer temperatures between 35 and 50 °C. The eradication of harmful organisms and weed seeds requires a high temperature of up to 70°C.

iii. **pH:** Most bacteria prefer a pH range of 6 to 7.5

iv. C/N ratio: during decomposition, a significant proportion of C is lost as CO2, changing the C/N ratio from 70:1 to 20:1. This continues until the C level drops to zero and microbial activity ceases.

Benefits of compost

- Compost reduces the need of chemical fertilizers.
- Compost promotes better yields of agricultural plants.
- Compost can help beneficial useful resource reforestation and habit revitalization efforts through enhancing inflamed, compacted, and marginal soils.
- Compost can be used to remediate soils inflamed through risky waste in a price effective manner.
- Compost complements water retention in soils.
- Compost offers carbon sequestration.

Shortcomings

- ✓ pathogen detection
- ✓ low nutrient status
- ✓ long duration of composting
- ✓ long mineralization duration and
- ✓ odor production.

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