

Compost:

Composting is a natural biological process in which soil-inhabiting organisms break down various organic materials, such as leaves, grass-clippings, and food wastes. When decomposition is complete, a dark, brown, powdery material called humus has been produced.

Benefits of Compost:

Composting is a viable means of transforming various organic wastes into products that can be used safely and beneficially as biofertilizer and soil conditioners. A number of problems associated with the use of raw and unstable organic wastes as soil amendments can be resolved through composting, such as malodors, human pathogens and undesirable physical and chemical properties. During the composting process, organic wastes are decomposed. Hence, plant nutrients are mineralized into plant available forms, pathogens are destroyed, and malodors are abated. Besides improving the physical structure of the soil, compost has other benefits listed as under:

- I. Utilizes rainfall or irrigation water more efficiently, because less moisture is lost due to evaporation and runoff by permitting better water absorption.
- II. Modifies temperature extremes in the soil, keeping it cooler in the summer and warmer in winter.
- III. Adds a bank of biological activity to the soil, which contributes to more efficient nutrient uptake and tying up of certain ions.
- IV. A buffering capacity (resist change in pH) is added to the soil with the addition of compost.
- V. Because of its tremendous cation-holding capacity, the addition of compost to the soil would allow for the holding of plant nutrients for a longer period of time.

Composting Materials:

- a. Most yard wastes can be composted, including leaves, grass clippings, plant stalks, vines, weeds; twigs and branches. Compostable food wastes include fruit and vegetable scraps, coffee grounds, eggshells and nutshells. Other compostable materials straw, livestock manure, bone meal and blood meal.
- b. Materials should not be composted if they promote disease, bad odors and attract pests. These include meat, fish, poultry, dairy products, foods containing animal fats and plants infected with or highly susceptible to diseases.
- c. Materials that should be composted only in limited amounts include wood ashes (a source of lime) and sawdust (requires extra nitrogen).

Various Methods of Compost Production:

Composting practice has been used for centuries by the farmers to convert organic wastes into useful biofertilizers and soil amendments. More specifically, composting is a microbiological process that depends on the growth and activity of mixed population of bacteria, actinomycetes and fungi that are indigenous to the wastes being composted. Composting can be conducted by either aerobic or anaerobic methods. However, the aerobic mode is generally preferred. Basically there are two acceptable systems for compost production;

1) Cool System

This is simply a pile of leaves, grass clippings, eggshells, pea pods, etc., which slowly decompose into humus. Because of the low temperature associated with this type of compost production, weed seeds and plant diseases are not killed. Such a system takes four to six months to produce compost; hence nutrient leaching (especially nitrogen) could take place.

2) Hot System

The purpose of this system is to accelerate the decomposition process resulting in killing of most weed seeds and plant pathogens. In this high-temperature, bacterially active system, it is best to turn the composting material every three to four days. Once activated, the temperature is expected to range between 120-160°F (49-71°C). The decomposition will go faster in summer (as short as three to four weeks) and take more time in the spring and fall. The average finished compost can be expected to have the following principal constituents available for plant growth:

Water	10-15%
Organic matter	10-20%
Nitrogen	0.8%
Phosphorus	0.45%
Potassium	1.45%
Lime	1.25%
Magnesium	0.3%

Farmyard Manure:

Farmyard manure and household waste are major sources of nutrients for food crops in many parts of the tropics. Cattle dung is also a potential source of plant nutrients. The use of farmyard manure or compost as a nutrient source for food crop production depends largely on the prevailing farming system. In some areas, where crop and livestock production are somewhat integrated, farmyard manure could become a major nutrient source for food crops and reduce the need for fertilizer.

Green Manure Crops:

Timely applications of organic materials with a low C/N ratio, such as green manure could bring into line nutrient release with plant demand and minimize the amount of inorganic fertilizer needed to sustain high crop yields for short-cycle crops such as maize, rice, and soybean, all of which have a high nutrient demand. Leguminous green manures and cover crops are able to:

- i. Enrich the soil with biologically fixed N
- ii. Conserve and recycle soil mineral nutrients
- iii. Provide ground cover to minimize soil erosion
- iv. Require little or no cash input.