
Composting as an Organic Fertiliser

By Mrs. Farzana Panhwar, June 2005

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Abstract

Our purpose to produce compost is to develop ecologically sound solution to utilise wastes, by cheapest methods and provide environmental friendly way to produce valuable fertiliser for crop production.

Panhwar fruit farm is located 25°-37'N and 68°-36'E of Hyderabad, where we start using our own compost on 100 acres (42 hectares) fruit orchards. We made compost by putting following things together. There are:

1 cubic meter	=	35.2 cubic feet - sawdust.
Urea	=	1 kg.
Triple phosphate	=	1 kg.
Potassium sulphate	=	1 kg.
CuSO ₄	=	200 grams.
ZnSO ₄	=	250 grams.
FeSO ₄	=	250 grams.
MnSO ₄	=	150 grams.
Boron	=	150 grams.

Scientific results

The following are the scientific results:

Advantages of composting are multi fold and digestion of bulky organic matter to almost to one third its original volume but increase in nutrient level of nitrogen, phosphate and potash to multiple- fold. The product is readily available to the plants in their most acceptable form and is easy to transport, store and apply. Due to its stability in dry conditions and use by plants, simply when wet. It does not leach down and micro-nutrients in its are readily taken by root in chelated form.

Compost can also be partially dissolved in water and solution contains ingredient can be mixed with water for foliar feed of the plants. Almost any non-synthetic organic matter can be converted into compost by addition of the ingredient discussed above in quantities to produce a balanced product.

Our approach to composting

Although composting consist of transforming organic matter rich into carbohydrates and deficient in nitrogen to be converted into new and stable product by involvement of an aerobic bacteria which consume carbohydrates in the process of their metabolism and converting nitrogen into stable product and micronutrients like copper, zinc, manganese, iron into their chelate organic form for ready application to soil as well as its use as propagation media. The common raw materials for farm composting are: crop residue, grass clipping, leaves, newspaper, peatmose, straw and wood chips and saw dust. Factors affecting the composting process include oxygen, aeration, nutrients (C:N ratio), moisture, porosity, structure; texture, and particle size, pH, temperature and time. It is suggested to use two parts leaves and one part grass clipping result into fast decomposition with no odour produce. The best compost consisted of three times as much plant matter as manure.

The various types of composting include:

- Thermophillic composting.
- Vermicompositing.

Composting experience at Panhwar Fruit Farm

In Pakistan usually people use flood irrigation, which create temporarily anaerobic conditions after every application, which is frequent in our hot and dry weather, resulting into reduction in yield. We therefore, planned to irrigate indirectly by planting the trees on ridges about 2 meter wide and 25 - 30 cm high and applying water in furrows. Furrow width varies between 2.4 - 4.0 meters depending upon the type of fruit tree. We dump grass grown in the furrow under the trees on the ridges as mulch and put irrigation water in the furrow. It seeps horizontally in the ridges and while evaporating it moistens mulch which in presence of air and moisture is attacked by fungus, bacteria, insects their predators earthworms and in three month, when a new layer of grasses growing in the furrow is dumped on the ridge. This is compost in its most acceptable form.

The pan-evaporation is approximately 30 cm per month from 15th April to end August. Winter are mild, but evaporation of 4 - 6 cms is common in January the coldest month. Average annual rainfall is 15 cms, which occurs in July - August and is spread over 7 days. Rainfall of 12.5 cm can occur in 24 hours once in 10 years. Annual evaporation is 2.3 meters.

We find following Scientific Results

- Compost increases the rate of infiltratin. It increases the water holding capacity many times. It increases soil aeration. It form humic acid which act as stimulant plant growth. It is an excellent soil conditiones which helps in reducing the soil born plant diseases. It promotes the growth of bacteriophages which destroy harmful bacteria. The outer side of compost heap provides ideal condition for beneficial insect multiplication.
- Compost helps in maintaining soil strucutre, it retain air, moisture and nutrient for the crops grown. It also helps in controlling soil erosion. It promotes the growth of myeorrhizae associated fungi. These fungi are essential for the growth of certain species. Composting high carbon manure bedding mixtures lower the carbon/nitrogen ratio to accepteable levels for rapid application. The use of compost in potting mixes and in seedlings beds also helped to reduce the need to apply soil fungicides in the production of certain horticultural crops.
- It acts as better buffer solution as it forms organic acid in presence of humus, which lowers the pH and all insoluble nutrients becomes easily soluble in acidic soil. If plants are treated with liquid extract of compost, it prevents attack by fungi like blight and mildew. If helps in neutralisation of soil toxins. If soil have more aluminium in hinder in the absorption of phosphorus but due to compost it forms organic acid, which in turn forms stable compound with iron and aluminium, so aluminium does not harm to the plants.

Conclusion

Composting practice at our farm brings fruit plants into fruiting within 24-36 months which other wise comes to production in the 5th year. This is because plants are healthy and there is less attack of diseases.

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