

Anaerobic composting

1. Bangalore method of composting

(Small scale composting/ Traditional Method)

This method of composting was developed at Bangalore in India in 1939. It is recommended where night soil and refuse are used for preparing the compost. The method overcomes many of the disadvantages of the Indore method, such as the problem of heap protection from adverse weather, nutrient losses from high winds and strong sun, frequent turning requirements, and fly nuisance. However, the time required for the production of finished compost is much longer. The method is suitable for areas with scanty rainfall.

Pit preparation: Trenches or pits about 1 m deep are dug; the breadth and length of the trenches can vary according to the availability of land and the type of material to be composted. Site selection is as per the Indore method. The trenches should have sloping walls and a floor with a 90–cm slope to prevent waterlogging.

Filling the pit: Organic residues and night soil are put in alternate layers. After filling, the pit is covered with a layer of refuse of 15–20 cm. The materials are allowed to remain in the pit without turning and watering for three months. During this period, the material settles owing to reduction in biomass volume. Additional night soil and refuse are placed on top in alternate layers and plastered or covered with mud or earth to prevent loss of moisture and breeding of flies. After the initial aerobic composting (about eight to ten days), the material undergoes anaerobic decomposition at a very slow rate. It takes about six to eight months to obtain the finished product.

Passive composting of manure piles: Passive composting involves stacking the materials in piles to decompose over a long time with little agitation and management. The process has been used for composting animal wastes. However,

the simple placing of manure in a pile does not satisfy the requirements for continuous aerobic composting. Without considerable bedding material, the moisture content of manure exceeds the level that enables an open porous structure to exist in the pile. Little if any air passes through it. Under these circumstances, the anaerobic micro-organisms dominate the degradation. All of the undesirable effects associated with anaerobic degradation occur. Where a livestock management system relies on bedding to add to livestock comfort and cleanliness, the bedding becomes mixed with the manure and creates a drier, more porous mixture. This provides some structure and, depending on the amount of bedding, enables the mixture to be stacked in true piles. The bedding also tends to raise the C:N ratio of the manure.

A mixture of manure and bedding requires a considerable proportion of bedding to provide the porosity necessary for composting. At least equal volumes of bedding and manure are required. Where the amount of bedding is insufficient to provide a porous mix, additional dry amendments must be provided by either increasing the bedding used in the barn or adding amendments when piles are formed. Manure from horse stables or bedded manure packs (animal bedding and manure mixture) can often compost in piles alone, whereas non-bedded manure from dairy, swine and many poultry barns needs drying or additional amendments. The pile must be small enough to allow passive air movement, generally less than 2 m high and 4 m wide. This passive method of composting is essentially wind-row composting but with a much less frequent turning schedule. It is a common method for composting leaves. It demands minimal labour and equipment. Passive composting is slow because of its low aeration rate, and the potential for odour problems is greater