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## Rapid city composting technique and nutrients evaluation for sustainable agriculture: A study for clean India mission

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**Abstract**

Garbage management in urban and rural areas is major issue, especially after the slogan given by Prime Minister as a "Clean India Mission". There is always a need to know about Waste Management; whether solid or liquid, degradable or non-degradable. The natural decompose of material take long time but resent technique used for decomposing take short time. Culture of thermophile bacteria and other bacteria such as PSB and rhizobium which is beneficial to farm land is applied on segregated (degradable) garbage. The compost which is prepared using Rapid City Composting Technique is more effective for sustainable agriculture compare to normal methods. The biological, chemical and physical properties of agricultural soil will be increased with application of city compost. Also improved farmer's economy and decreased consumption of chemical fertilizer. The products like fruits, vegetables and grain which are grow with city compost are healthy to peoples. This technique also clean our society and make our city pollution free.

**Keywords:** Pollution, population, compost, farmer, agriculture and society

**Introduction**

Solid waste management in urban and rural areas is major issue during last few years, especially after the slogan given by Prime Minister as a "Clean India Mission". Increasing population and level of awareness are two main reasons for proper solid waste management. The environment and the community are affected, if municipal waste management teams do not proper waste decomposition (Ayalon *et al.*, 2001) [1]. City compost production is considered an economic and environmentally friendly technique for reduce the waste going into open land. The application of city compost can improve soil health and fertility as well as sustainability of agricultural production by increasing soil organic matter and supplying essential nutrients. Organic matter is a major component of a healthy soil and it plays an important role for maintain soil physical, chemical and biological properties (James, 2013) [6]. City compost is organic matter that has been decomposed by waste materials which collected from urban and rural areas and apply as organic fertilizer. City compost containing high concentration of essential nutrients which is responsible for plants growth and it is used in gardens, horticulture and agriculture (Chakrabarti and Sarkhel, 2003) [2]. City compost is also useful for erosion control, land and stream reclamation. Rapid City compost technique is resent technique for decomposition of waste material. It is also time consuming and economic method. The main objects of this study are public awareness, pollution control, agriculture economy and Clean City.

**Methodology**

Steps were followed for rapid composting at small scale

**Garbage collection**

Door to door dry and moist garbage were collected separately with the help of municipal corporation management team by garbage collection vehicle.

**Separating**

The degradable and non-degradable materials were separated using mini separator and separated material were send to recycling process.

**Grinding**

The rotating cylindrical grinder was used. The garbage material passes through the two shells, it is ground into smaller pieces and thoroughly mixed. The ground material falls out the bottom and through a screen where the larger pieces are screened out.

### Composting

The final degradable material was treated with water and bacteria culture (mesophilic or thermophilic). This process repeated for 20-30 days. During decomposition, the internal temperature of the pile may reach 54 °C, which helps kill many of the weed seeds that might be present.

### Nutrients Evaluation in City Compost

The major nutrients and some essential physicochemical parameters were analyzed using standard methods. The pH and electrical conductivity of compost were determined in 1:2.5, compost: water suspension (Jackson, 1973) [5]. Organic carbon was determined by the back titration method (Walkley and Black, 1934) [9] and TOC was determined ash dry method. Available phosphorus content was determined with ammoniummolybdate spectrophotometric blue color method (Olsen, *et al.*, 1954) [7]. The water soluble K and Ca the amount of compost were determined by using a flame photometer (Reeuwijk, 2002) [8].

**Table 1:** Nutrient status of City compost

S. No.	Parameter	Value
1	Moisture %	5%
2	pH	7.60
3	EC (ms <sup>-1</sup> )	5.32(ms)
4	TOC %	12 %
5	P (ppm)	205
6	S (ppm)	54
7	Ca (ppm)	8800
8	K (ppm)	1050
9	N (ppm)	950

\*P, S, Ca, K and N concentration are water soluble form

### Soil health and crop productivity

The results revied in table-1, city compost contain sufficient concentration of nutrients. Compost which improves soil properties by adding nutrients and increases microbial and enzyme activity in soil as well as stimulate plant growth and thus increase the yield of crops (Hossain, 2017) [4]. The application of city compost can improve soil health and fertility as well as sustainability of agricultural production by increasing soil organic matter and supplying essential nutrients. The application of city compost with NPK gives batter production of vegetable crops (Ghaly, 2010) [3].

### Conclusion

City compost is nutrients rich organic manure which is produce by city garbage. In this study we applied rapid composting steps composting and final manufactured compost analyzed with different chemical parameter. In this study we observe that the city compost containing high nutrient level. Organic matter is a major component of a healthy soil and it plays an important role for maintain soil physical, chemical and biological properties. The former shell applied city compost at their filed so they can improve the soil health and decreased the rate of chemical fertilizer conception. The technique composting also clean our society and make our city pollution free.

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