

RESEARCH PAPER:

Assessment of windrow composting plant's performance at Keru, Jodhpur, India

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SUMMARY

Open windrow composting methods are become increasingly popular in India for processing of municipal solid waste (MSW). Windrow composting plant at Keru, Jodhpur consists of 100 TPD capacity of MSW processing. The plant was monitored over a period of one year (March 2010 to February 2011) and physico-chemical analysis was carried out for the composting process of six weeks. The indicators for windrow composting process were developed. It has been observed that the windrow composting process was gradual throughout the composting period. The compost production efficiency was found to be 60 per cent. The concentrations of C, N, P, K, C/N and pH of the produced compost were 9.05 per cent, 0.68 per cent, 0.56 per cent, 0.65 per cent, 13.52 and 8.03, respectively. The quality of compost was compared with the quality control parameters prescribed by FCO and found lower compliance in terms of C, P and K. Hence, the segregation of MSW at source is recommended so that biodegradable and non-biodegradable fractions of MSW should be collected separately and only biodegradable fraction should be used for windrow composting. This will improve the efficiency as well as the quality of compost.

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Composting is the controlled decomposition of organic matter through biological process, resulting in nutrient-rich humus, called compost (Narayana, 2009). Composting has a long tradition in India. The compost made out of urban heterogeneous waste is found to be of higher nutrient value as compared to the compost made out of cow dung and agro-waste. Composting of MSW is, therefore, the most simple and cost effective technology for treating the organic fraction of MSW. Full-scale commercially viable composting technology is already demonstrated in India and is in use in several cities. Its application to farm land, tea gardens, fruit orchards or its use as soil conditioner in parks, gardens, agriculture lands etc., is, however limited on account of poor marketing (Asnani, 2006).

India generates about 50 million tones of MSW every year from cities. Generation of MSW has continuously been increasing due to rapid expansion of the cities / towns with massive migration of population towards urban centres (CPCB, 2000 ; Asnani, 2006). More than 90 per cent of these wastes are dumped on outskirts of town and cities, which have

serious environmental implications in global warming by emission of green house gases (GHGs). Composting MSW is seen as a low cost method of diverting organic waste materials from landfills, while creating a product for agriculture purposes (Sharholly *et al.*, 2008).

A study was undertaken for performance assessment of MSW windrow composting plant at Keru, Jodhpur, Rajasthan, for the period of one year. The MSW samples from every stage of composting process were collected and analyzed for physico-chemical parameters. Further, the compost production efficiency of the plant was also studied for the period of one year. After interpreting the results obtained from the study, the suggestions and recommendations were posed for improving the efficiency of the plant as well as the quality of compost.

EXPERIMENTAL METHODOLOGY

Site specifications:

The windrow composting plant of 100