Management of Organic Food Waste by Producing Bio Fertilizer

012. Ilboru

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Introduction:

This project was conducted to find a solution on poor waste management mainly organic food waste in our school. We came up with the idea of experimenting on **vermicomposting** which uses worms (*Eudrilus eugenae)* to decompose food waste from our school kitchen to produce bio fertilizer.

The food waste were pre composted then introduced into the bins for **21 days** where by regular adding of food was conducted every week together with adding water to moisten the compost. After 21 days the food waste were completely turned into compost and sample were analysed to determine physical and chemical parameters available in the compost that conform to the FAO standards that could be used for agriculture activities.

Method:

Materials - 0.5 inch shredded damped newspaper; 1 kilogram worms; 10.5 Kilograms food scraps; 2x 20 litres plastic bins; 1 drill; 1 Spray bottle; Polythene bag; Thermometer; Balance; Nylon.

Selection of vermicomposting worms

For composting we selected the *Eudrilus Eugenae* - see photo to right - due to its suitable characteristics. It is especially adapted to living in a decaying environment, such as rotting vegetables, manure and actual compost, which makes it a very good choice for vermicomposting. It does not burrow into soil, and is found in habitats where other worms will have a very difficult time surviving, therefore lessening the competition for food and spaces for them. **1kg** of worms were collected from damps in Ilboru secondary school and kept indoors to regulate the temperature (**16°C-30°C**).

Waste collection: In our school we produce a total average **398 kilograms** of waste as according to that collected on Saturday 19, March 2016.

Results:

Samples were collected from each vermicompost bed about 500 gm and kept in the polythene bag which is free from adventitious contaminations.

Each sample bag was labelled and sealed air tightly to analyse physio-chemical characteristics of vermicompost, and to conform to the FAO standards.

Physical parameters of vermicomposting

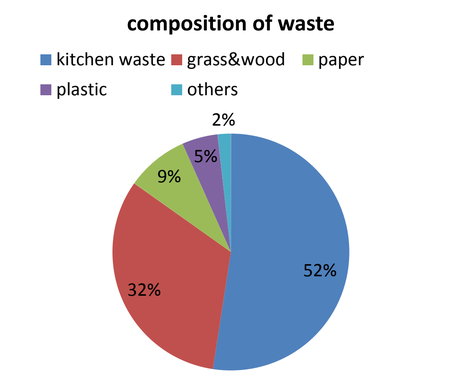
1. Particle size (through the 4.0 mm IS sieve)
2. Colour (of vermicomposting from Bin#1 and #2)
3. Odour (foul odour absent from Bin#1 and #2)
4. Bulk density (g/cm^3)
5. Moisture (% by weight)

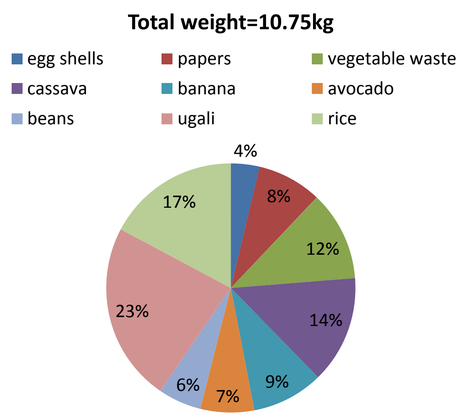
Physical Characteristics

Sr.No	Parameters	Bin no.1	Bin no.2	Average value in %
1	Colour (dark brown to black)	black	black	black
2	odour	No odour	No odour	No odour
3	Particle size(4mm IS sieve)	93.70	94.10	93.90
4	moisture	24.80	23.50	24.15
5	Bulk density(g/cm^3)	0.87	0.90	0.89

Chemical Characteristics

Sr.No	Parameters	Bin no.1	Bin no.2	Average value %
1	pH	6.8	7.06	6.93
2	Conductivity (ms/	3.27	3.45	3.36
3	Organic carbon	23.0	21.2	22.1
4	Nitrogen	0.95	0.90	0.93
5	C/N ratio	24.21	23.55	23.9
6	Total Phosphorus(as)	17.7	17.8	17.8
7	Potassium(as O)	0.75	0.82	0.79
8	Calcium	5.7	5.8	5.75
9	Magnesium	0.3	0.28	0.29
10	Sulphur	0.4	0.45	0.43





Conclusions

Vermicomposting appears to be the most promising as high value bio-fertilizer which is not only increases the plant growth and the productivity by nutrient supply but also is cost effective and pollution free. Use of vermicompost promotes soil aggregation and stabilizes soil structure. This improves the air to water relationship of soil, thus increasing the water retention capacity and encourages extensive development of root system of plants. Commercial vermicomposting will be a boon for socio-environ-economic transformation of Tanzania. It could create companies; Waste Collection Company; Vermiculture Company; and Vermicomposting Company.

References

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