Ecofriendly Vermicompost on the Productivity of "Haldi" and "Brinjal" Crops

S. Senigarpu
Dr. C. V. Raman Science College, Sironcha

Abstract:

Vermicompost is widely employed now days in Agriculture to enhance productivity of many crops as it provide essential plant nutrients. They are considered as eco-friendly biological soil conditioner and applied for the sustainable agriculture development.The Vermicompost was prepared by a tank method, using Eiseniafetida and Eudriluseugeniae earthworm species. The substrate used was the mixture of feedstock and cow dung in 6:4 proportion having moister 40% and pH 7.2 at atmospheric temperature. Total organic carbon found to be 25.50%. An odorless, dark brown casting obtained was dried, ground to powder, sieved and used as manure to apply in the field of Haldi and Brinjal.An experimental study was carried out to analyze the percentage of plant nutrients such as Nitrogen, Phosphorus and Potassium (NPK) in the Vermicompost.The prepared and analyzedVermicompostfound to contain, 25.8 % organic carbon,1.58%Nitrogen, 0.27%Phosphorus and 0.68%Potassium. The application of this Vermicompost for Haldi and Brinjal crops found to enhance 20% yield.

Keywords: Vermicompost, E.fetida, Eudriluseugeniae, Soil conditioner, Earthworm.

Introduction:

Biological and agricultural scientists all over the world, after getting utterly disappointed by modern chemical fertilizers which affect National Seminar 'Advances in It is one of the most cost efficient and eco- friendly method of organic matter decomposition. In an ideal condition earthworms can consume practically all kinds of organic matter and digest them. One kilogram of worms can consume one kilogram of organic matter every day. Vermicomposting involves aerobic decomposition of organic matter, plant residues by earthworms.Vermicompost is rich in plant nutrients such as Nitrogen, Phosphorous and Potassium (Augustine, 2000). It is free from Pathogens because they are killed in the worm's gut. The rate of Vermicomposting depends upon the activity of earthworms and soil condition such as moisture, temperature and aeration. EARTHWORMS Aristotle, the Greek Philosopher, referred earthworms as "intestines of earth" because of their habit of ingesting and ejecting the soil. The main activity of earthworms involves the ingestion of soil, mixing of different soil components and production of surface or sub surface castings. The earthworms consume the soil organic matter and convert it into humus within a short period of time and increase the soil fertility (Sujatha et al., 1999). In the temperate climate, the most common vermicomposting worms are Eisenia fetida and Euripus Eugenia. Eudriluseugeniae is popularly known as the African Worm or Night Crawler. It is blackish large worm that grows extremely rapidly in temperate climate.Eiseniafetida is non-burrowing earth worm and reddish in color. It is capable of ingesting and excreting organic material at a faster rate compared to other non-burrowing species.Earthworms are the silent scavengers of earth they degrade all types of organic matter and convert them into

a good growth medium for plants. The beneficial effect of vermicompost,an organic manure in improving soil fertility productivity is well documented.

Material and Methods:

1) Earth worm selected for study Vermicompost was prepared by using two species of earthworms, i)Eisenifetida, (Red wriggler earth worm). Eiseniafetida is non-burrowing earth worm and reddish in color. They have a life span of about 28-30month. They eat about 90% of organic matter and thrive best at temperature of 23-40o C and moisture levels of 40-45%.Eiseniafetida species are capable of ingesting and excreting organic material at a faster rate compared to other non-burrowing species. (Muthukumaravel et al., 2008)ii) Eudriluseugeniae is popularly known as the African Worm or Night Crawler. It is blackish large worm that grows extremely rapidly in temperate climate.

2) Preparation of vermicompost :- The vermicomposting process was done in lab scale. The Vermicompost was prepared by a Tank method using different feedstock containing cow dung, agriculture waste, municipal waste; paper mill sludge etc. cow dung was obtained from nearby farm. Cow dung is reported to influence the rate of vermicomposting by increasing the amount of micronutrients and nitrogen content. The cement tank measuring 1.5x 36ft was constructed by bricks and cement, keeping the square holes on every side for proper aeration and ventilation. The outlets of size,10x3mm were kept at the four corners of each chamber to facilitate collection of the vermiwash throughout the vermicomposting process. Shade was constructed for the protection from sunlight, rain and other predators. The shading also stimulated the growth and reproduction of worm. The raw material was collected and prepared for the worms as ready to consume feedstock. It was mixed with cow-dung in 6:4 proportion having moisture 40% and pH 7.2, at atmospheric temperature. The feedstock was placed into tank up to 10cm layer. Then partially decomposed cow dung with sufficient amount of water to reduce the temperature was spread for 10 to fasten the process of decomposition .

Result and Discussion:

Earthworm selected for study i.e. Eiseniafetida and Eudriluseugeniae were used for Vermicomposting. Black-brown, odorless vermicompost obtained 30 days of feedstock decomposition. The prepared vermicompost was analyzed to determine the content of plant nutrients.

Conclusion:

Effect of Vermicompost on Haldi and Brinjal crops. The present study revealed that vermicomposting is an alternate technology for the management of agricultural waste. This is a ecofriendly and cost effective method. Vermicompost may play a significant role in protecting environment as it uses agricultural

References:

1) **Bhat, J.V. and P.Khambata, (1994).** Role of earthworms in agriculture"Indian Council of Agriculture Research (ICAR), New Delhi,series no.,22:36

2) **Singh,R.D.,(1993).** Harvesting the earthworms for Sustainable AgricultureInstitute of National organic Agriculture, Pune, PP: 1-16.

3) **Albanell,E, Plaixatsj., Cabrero T. (1988).** Chemical changes during Vermicomposting of sheep manure with cotton industrial waste.Biology and Fertility of soil.PP . 266-269

4) **Dr.AugestineSelvaseelan D. (2000).** Earthworm on soil fertility and Productivity. TamilNadu Agricultural University and Indian council of Agriculture Research

5) **Sujatha Lilly S. and Kannaiyan,S.(1999).** Earthworm a potential bio resource in sustainable agriculture.Bio resources Technology for sustainable Agriculture,Pp. 351-365

6) **Ansari, A.A. and RajpersaudJ.K. (2012).** Physicochemical change during Vermicomposting of water hyacinth and grass cropping. ISRN soil science, Article JD 984783 PP. 1-6

7) **Bano K., Kule, R.D. and Gajanan, G.N. (1987).** Culturing of earthworm *Eudriluseujenial* for cost production and assessment of worm cast as bioferilizers. Jr. Soil Biol. Ecol. 7, pp.8-104