Futrastic trend of Application of Earthworm in Agriculture

Author-

1. Prof. J. M. Petare

Asst. Prof.

Dept. of zoology,

SSGM college, kopargaon

1. Nagar
2. Prof. S. N. Jagtap

Asst. Prof.

Dept. of chemistry,

RBNB college, Shrirampur

1. Nagar

Abstract

Vermicomposting is described аs Bioxidation & stabilization of organic material involving the joint action of earthworme and microrganisms. Beneficificul effect of the vermicompost used in Agricultural Production. Earthworm & vermicompost can boost horticultural production without agrochemicals. Vermicompost produced by the activity of earthworms in rich in macro and micronutrients. Reduced use of water for irrigation reduced pest attack, termite attack. reduced weed growth 4 faster growth of germination & rapid seedlings growth 4 development.

Introduction –

 In recent year the disposal of organic waste from domestic, agicultural & industrial sources has caused Increasing environmental & economic problems and many diff technologies to address this problem have been developed... Worm farming known as vermiculture is the process of harnessing earthworm to convert organic waste into world's most nutrient rich fertilizer called worm manure.

The beneficial effect is using vermicompost based substrates in agriculture it accelerates growth increase crop ye yields creats a favourable environment for beneficial micro organisms, permanently improve soil structure.

What is vermicomposting?

Vermicomposting is generally defined the solid phase decomposition of organic residuces in the gerobic environment by exploring biological activity of earthworms and microorganisms.

vermicompositing involved the compasting of organic waste through earthworm activity. It has proven successful in processing sewage & solids from waste water, materials from brewries, Paper waste. food & animal waste as well as horticultural residuces from dead plants (humas)

The end product for finely with high porosity divided peat like ma vermicompost is a & water holding capacity that contains most nutrients in forms that are readily taken up by the plants. These earthworms caste are rich in organic matter & have high rates. of mineralization that implicates a greatly enhanced plant availability of nutrients.

 The vermicomposting Process different phases during the process

1. Initial pre composting phase - The organic waste in pre composted for 15 days. before being fed to earthworms. During this phase, readily decomposable compound like humas are degreaded & the potential volatile substances are eliminated which may be toxic to earthworms
2. Mesophilic phase - During this phase earthworms through their characteristic function of breaking up organic matter, combine it with the soil particles & enhances microbial activities & condition organic waste materials. for the format off organic manure.
3. Maturing & stabilizinon phase - vermicompost is a peat like material containing most nutrients in plant available. forms such as nitrates, phosphates, calcium. Potassium, magnesium etc. It has high Porosity water holding capacity & high Surface area that provides abundant site for microbial activity & for the retension of nutrients. The nutrients status the vermicompost obtained from different org. material is given in table ( Garg, Gupta 2009).

Chemical composition of vermicoms (Garg, Gupta 2009)

|  |  |
| --- | --- |
| Characteristic | Value |
| Organic carbon % | 9:15 to 17.88 |
| Total nitrogen % | 05 to 0.9 |
| Phosphorous % | 0.1 to 0.26 |
| Potassium % | 0.15 to 0.256 |
| Sodium % | 0.55 to 0.3 |
| Calcium &magnesium % | 22.67 to 47.6  |
| Copper % | 2·0 to 9.5 |
| Iron % | 5.0 to 9.0 |
| Zinc % | 5.7 to 9.3 |
| Sulphur % | 128.0 to 548.0 |

Role of vermicompost

Beneficial role of vermicompost (Adhikom 21/4 )

1. Red worms casting contain a high Percentage of high humus. Humus help soil perical form into clusters which, create channels for the pa Passage, of air and improve capacity of hold water.
2. Humus is believed to aid in the prevent of harmful plant Pathogen, fungi, nematodes, bacteria
3. A worm casting is biologically active mound containing thousands of bacteria, enzymes & residuces of plant maternal. that, were not digested by the worms.
4. Castings contain nutrients that are readily available to plants.
5. The activity of the worms gut is like q miniature composting tube that mixes. conditions & inoculates the reciduces.
6. Worm casting are the best imaginable. Potting soil for greenhouses as well as gardening & farming.
7. Plant growth Regulating activity - some studies speculated that the growth responses of plant from vermicompost appeared more like hormone induced activity associated with high level of nutrients, humic acid humates in vermicompost.
8. Ability to develop Biological resistance-

 vermicompost role in the nutrition of agricultural field has attracted attension of, researchers world wide only in recent decades.

Effect of vermicompost on agricultural

 Crop Performance

* yeid. - studies on the production of imp vegetable crop like tomata, eggplant have yielded very good so result (Adhikary.20/2) vermicast produced higher garden pea green pod plant, higher green grain weight the compost support plant growth
* Growth- Vermicompost promoted excellent. growth in the vegetable crop with more flower 4 fruit vegetable development (Adhikay20/2)
* Nutrient content - vermicast produced higher Percentage of protein content 4 carbohydrate In garden pea as compared to chemical fertilizer (Adhikary 20/2)
* Plant protection - Accordingly, vermicompost also Protects plant against various pests & disease. either by suppressing or repelling them or including biological resistance in plant. (sinha et al., 20/3).
* Human health - organically grown fruits & regetables especially on earthoworms & vermi - Compositon have been found to be highly nutritious, rich in proteins, minerals & vitamins a antioxidants than their chemically grown Counterpart can be highgly be recical to human health

Beneficial Impact of vermicompost on soil (sinha, 20/4b)

* Increase the 'soil organic matter (SOM), & prevent soil erosion. soil structure Increase beneficial soil microbes, microbial activity & nutrients.
* Improve cation exchange capacity. Reduces bulky density of soil, prevent soil compaction & erosion.

suppression of soil born plant diseases. Increases water holding capacity of soil. Remove soil salinity sodicity Maintain optimal PH value of soil.

Vermicompost ideal S! organic manume for better growth 4 yield of many

Plants due to following reason. (Joshi et al.24/1 1. vermicompost has higher nutritional value than traditional composts.

2

. This is due to increased rate of minerali- zation + degree of humification by the. Laction of earthworms.

3. Vermicompost has high porosity, aeration.

4

drainage, water holding capacity. . presence of microbiota particulary fungs bacteria 4 actinomycetes makes it suitable for plant growth.

5

. Plant growth regulators & other plant growth influencing material produced by micro- organisms are also prevent invermicompost.

6 product of cytokining 4 auxins was found in organic wastes that were Processed by earthworms.

Conculsions

vermicompost produced by the activity. of earthworms is rich in macro 4 micronutrients, vitamins growth hormones. enzymes such as proteases, amylases, lipuse cellulose 4 chini chitinase & immobilized microflora vermicompost is optimal.

organic manure for better growth & yeield] of many plants. It can increases the Producth of crop 4 prevent them from harmful pests without polluting the environment Application plan of vermicompas increased growth, improved plants nutrient content T 4 improved the quality of the fruits 4 seeds.

\*

Refrences

Adhikay, 5. 2012-vermicompost, the story of organic gold. A review.- Agricultural sciences, 3 = 905-917, Anonymous. 2009.

Barik, T., Gulati. J. M. L, Gamayak, L.M., Bastia, ok 2011. Production of vermicompost from agricultor. waste- Agric. Review, 31 (3); 172-183. Dominguez, J. Edwars, C.A. 2004. vermi composting

organic waste: A review - In soil zoology for Sustainable Development in the 2167 century Earthworms for ecofriendly Resource efficient Agriculture, In book: Resources use in Agriculture (PP. 54-94). publisher I

sir springer Nature Singapore.

Estonian Crop Research institute, jogeva alevik J. Agmissepa 1, 4830g, Estonia Review! vermicompost, its importance & benefit in a

Futrastic scope

Earthworm of Earthworm farming in Agriculture an alternative protein sounce in Protein potultry & fish

Farming the increasing waste product became the main. concern in the end of

world Populath Milions of ton's of waste are being generated everyday worldwide, & now? Lit is a big challenge for managing the financial & ecological expense of these waste.

For sustainable development, a chief part of municipal wastes has biological garbage eo friendly which can be converted into eo material like vermicompost. Earthworms activities increases the soil

fertility by improving soil formath, soil porosity. water infiltration decomposition of organic. material humus format" & promoting nutrient cycles which ultimately help in plant.

growth. Due to their beneficial activities they cause the main challenge in Soil properties therefore they are known as soil "Ecological engineer." Earthworm also act bioindicator.