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Sustainable agriculture through vermicomposting technology in India

Statement of the Problem: Green revolution in India (1967-1987) made the country self-sufficient in food grain production. However, indiscriminate use of chemical fertilizers and pesticides for the last few decades made the soil unproductive with loss of biodiversity and the environment polluted. So, rejection or reduced use of chemicals and practice of organic farming for recovery of soil health, increase in food grain production and biodiversity conservation have been suggested.

Methodology & Theoretical Orientation: Epigeic earthworms such as *Eisenia, Eudrilus* and *Perionyx* have been successfully cultured in organic wastes kept in cemented tanks under suitable temperature (26°C-30°C) and moisture (50%-60%) conditions for production of vermicompost. Different doses (@2.5 tons/ha – 20 tons/ha) of harvested vermicompost were applied (RBD technique) in the soils of paddy, pineapple and tea plantations in Tripura.

Findings: Vermicompost, rich in plant-available nutrients (avN, avP, avK etc.) and plant growth factors, when applied to soil: improved soil aggregation, water use efficiency, nutrient uptake etc. Dramatic yields of paddy, pineapple and tea were recorded following application of 10-20 tons of vermicompost/ha. A significant ($p<0.05$) and gradual increase in density and biomass of earthworms were also noticed with increase in amount of vermicompost applied.

Conclusion & Significance: Crop yield was very much related to the concentration of vermicompost, beyond the level of which production declined. Vermicomposting and its application to soil has several advantages: i) reduce organic pollution, ii) produces organic manure for application in agro-ecosystems, iii) increases biodiversity, iv) production of high quality earthworm proteins from wastes and its utilization as feed for poultry birds and fishes.

Figure 1: Physico-chemical changes in the soil following application of vermicompost (↑ increase).

Biography

Priyasankar Chaudhuri is a Professor of Zoology at Tripura University (a central university), did his PG and PhD from the Calcutta University, Kolkata. He is an eminent earthworm scientist with more than 80 research papers in National and International Journals of repute. He is the author of the book "Kenchor Jeevan Baichitra: Kencho Prajukti (2006)" written in Bengali on the Biology and Ecology of earthworms in North-East India with special emphasis on vermiculture and vermicomposting. He has participated in more than 25 National and International Symposia and visited Avignon (France) 1990, Vigo (Spain) in 1998, Cardiff (UK) 2002 and Shanghai (China) 2016 to present his research papers in International symposia on Earthworm Ecology and Agricultural Sciences. He was elected as the Fellow of Zoological Society, Kolkata (1998) and Fellow of the Society of Applied Sciences, India (2010). His biography has been cited in the Who's Who in Science and Engineering 2006-2007 (Marquis, USA). The Academic Forum of the Society of Earthworm Ecology and Environmental Research (SEEER) awarded Certificate of Appreciation to him as an Earthworm Biologist in 2012. He was selected as one of the "Inspiring Teacher of Tripura University", Tripura in 2013. He has been honored with "Science Excellence Award" in 2015 and "Bharat Siksha Ratan Award" in 2016".

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