



# Role of vermicompost and vermiwash as a biotic indicators for enhancement of soil health in sustainable agriculture

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**Abstract :** Vermicomposting is a promising method of transforming organic wastes into usable substrates. In this process, the digestive tracts of certain earthworm species (e.g. *Eisenia foetida*) are used to stabilize organic wastes. The final product is an odorless, clean, peat-like substance, which has good structure, moisture holding capacity, organic material containing relatively adequate quantities of N, P, K and several micronutrients essential for plant growth. The end product of vermicompost is rich in essential macro and micronutrients along with microorganisms in a very simple form. Adding vermicompost not only improves the soil structure and fertility but also leads to improvement in overall plant growth and thus increases their yield. Vermiwash is liquid plant growth regulator, which contains high amount of enzymes, vitamins and hormones like auxins, gibberellins etc. along with macro and micronutrients used as foliar spray. These inputs maintain soil fertility by improving physical, chemical and biological soil properties as well as sustain soil organic carbon and humic substances and can be used to promote the development of beneficial organisms in the soil. It improve soil structure, water holding capacity, seed germination, drainage, base exchange capacity, checks soil erosion and also helps in the uptake of humic substances or its decomposition products influencing the overall growth and metabolism of plants, also improves the hormonal and biochemical activities of humus substances. Hence, these can used very beneficially as a biotic indicators for enhancement of soil health in sustainable agriculture.

**Key Words :** Vermicompost, Vermiwash soil health, Sustainable agriculture

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## INTRODUCTION

In view of the high cost of inorganic fertilizers and wide gap between addition and removal of plant nutrients by the crop, the recycling of organic wastes has become the necessity in agricultural systems. Intensification of agriculture has adversely impacted on the biodiversity, whereas, the increased use of agrochemicals and declined use of organic manures under intensive cultivation has not only contaminated the ground and surface water but has also disturbed the harmony existing among the soil, plant and microbial population. There has been a growing public concern about adverse impacts of chemical fertilizers and pesticides on the environment and on the safety and quality of food is not properly used. Organic manures are bulky material added in large quantities mainly to

improve soil fertility, to maintain humus status and to provide favourable conditions for soil microorganisms. This helps in replenishment of nutrients eliminated by crops or otherwise protect the plant nutrients to be lost through leaching and soil erosion. Thus, organic manures supply practically all the elements required by the crop. It provide all macro and micronutrients, improve the soil structure and provide food for soil microorganisms and soil nutrients are released slowly over time (Worthington, 2001) and can enhance the restoration and productivity of soil (Hornick and Parr, 1987; Parr and Hornick, 1992).

### Vermicompost :

Vermicompost (also called worm compost, vermicast, worm castings, worm humus or worm manure) is the end-