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### Vermiwash: Use in Organic Agriculture for Improved Crop Production

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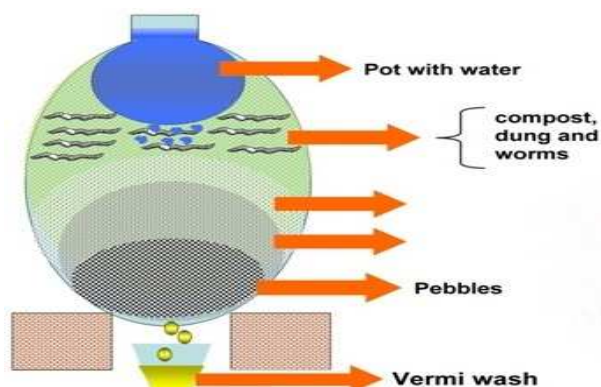
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Vermiwash is an organic drainage obtained from units of vermicompost. The water that passes through the vermiculture, resulting in washing of the live and dead earthworms, soil microorganisms and decomposed organic matter, carries all the dissolved substances. It is rich in dissolved nutrients and amino acids and therefore, is a good source for plant nutrients in organic agriculture.

#### Introduction

Conversion of biodegradable matter into enriched compost is possible with the use of earthworms and this technology known as vermicomposting. Earthworms consume raw materials and excrete it in digested form called worm cast which is rich in nutrients, growth promoting substances, beneficial soil micro flora *etc.* Presently, in organic farming systems, commercial vermin-culturists have started to promote a product called vermiwash. Such products would certainly have the soluble plant nutrients apart from some enzymes, organic acids, growth hormones and mucus of earthworms. It seems to possess an inherent property which acts not only as a liquid organic fertilizer but also as a mild biocide. Vermiwash is one of the by-products/indispensable parts of vermiculture and vermicomposting industry, having combination of secretion and wash of earthworms. It is an organic fertilizer obtained from units of vermiculture/vermicompost in the form of drainage. There is no special device required to collect the vermiwash except for a tap which is fitted at the bottom of the containers where earthworms are cultured. Even during the period of normal management of the vermiculture, water is sprayed regularly to maintain adequate moisture and excess water is drained which contains some essential plant nutrients. The quality of vermiwash produced by earthworms depends on the vermicompost that is used (Sreenivas 2000).

The water that passes through the vermiculture, resulting in washing of the live and dead earthworms, soil microorganisms and decomposed organic matter, carries all the dissolved substances. As the water can dissolve some vermicasts, containing lots of nutrients, they find their way into vermiwash. The basic principle of vermiwash preparation is very simple.



Source: <http://www.vknardep.org/services/sustainable-agriculture/technology/vermi-wash.html>

Earthworm worked soils have burrows formed by them called as drilosphere. Water that passes through these burrows washes the nutrients from these burrows to the roots to be absorbed by the plants (Somani et al. 2008). This principle is applied in the preparation of vermiwash.

Before spraying on any plants dilute vermiwash with water (10 percent) and drench the soil to prevent from soil borne diseases. Before transplanting, seedlings are dipped in vermiwash solution for about half an hour after diluting it with water (5 times). Mix vermiwash with cow urine and dilute it with water to use it as a pesticide and foliar spray (1 litre vermiwash+1 litre cow urine+8 litres water) or dilute with 10 percent cow urine or neem extract or garlic extract to use it as a natural biopesticide. It can be added to compost pits to hasten the degradation process. Different soluble plant nutrients such as N, P, K, Ca and micronutrients are the main nutrients present in vermiwash. Different types of hormones such as cytokinins, auxin, different amino acids, vitamins, enzyme cocktails of proteases, amylases, urease and phosphatase, some other secretions and many useful microbes such as heterotrophic bacteria, fungi, actinomycetes including nitrogen fixing bacteria like *Azotobacter* spp., *Agrobacterium* spp., *Rhizobium* spp., phosphate solubilizers are present in the vermiwash.

Vermiwash is rich in dissolved nutrients and amino acids which are easily available for plants. It is also a non-toxic and ecofriendly compound, which arrests the bacterial growth and forms a protective layer for their survival and growth. Vermiwash at 5-10 percent dilution inhibits the mycelial growth of pathogenic fungi. It also has the capacity to encounter worms thereby saving the crops and their productivity. As a foliar spray, it was reported to initiate flowering and long lasting inflorescence. It can also be used as a liquid fertilizer applied to the rhizosphere. No pathogen can survive in this fluid, thereby protecting the earthworms from the diseases caused by pathogens. It acts as a plant tonic and thus helps in reducing many plant pathogenic fungi. It increases the rate of photo synthesis in crops/plants. It also increases the number of micro-organisms in the soil which helps in decomposing soil organic matter (Tripathi et al. 2005).

### Conclusion

As vermiwash seems to possess an inherent property which acts not only as a liquid organic fertilizer but also as a mild biocide, it can be used as an effective input in organic agriculture for both soil health and disease management for sustainable crop production.

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