



## Potential Significance and uses of Vermiwash in Agriculture

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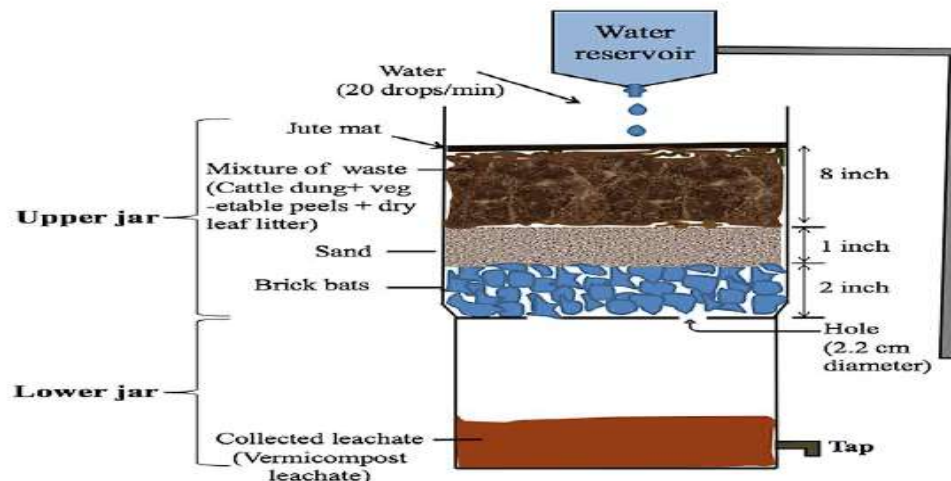
Due to increasing population & development of human Civilization globalization, industrialization, hunger to find something new in the field of science & technology has increased the problem of environmental degradation. Wide scale use of chemical fertilizer & pesticide destroyed

the fertility of soil & its health. Large scale application provides suitable environment for insect pest to destroy crop plant & produces the harmful diseases for crops and human mankind. Vermiwash is a transparent liquid biofertilizer. It is a mixture of excretory components and mucous secretion of earthworms and

organic micronutrients of soil which may be used as a organic fertilizer for better growth & yield of plants. Vermiwash is a liquid fertilizer collected after the passage of water through a column of worm activation. It is a collection of excretory products of earthworms along with major macro & micronutrients of the soil and soil organic molecules that are useful for plants. This bio-liquid is rich in nutrients and plant growth hormones. Vermiwash is nutritive fluid filtered through body of earthworms which promotes growth and works as

organic pesticides. It is very useful as a foliar spray. The drops of water made the upper surface as well as different layers of sand, dung and concrete mixture wet and moist. Decomposing of dung is done by earthworm species which releases various useful substances. Water sprinkled on the upper layer passes through the dung decomposed by the earthworm. Some coelomic fluid and excreta of earthworm gets mixed with the water which is finally called “VERMIWASH”.

### Preparation of vermiwash



The vermiwash unit can be installed using a large barrel/drum, large bucket or an earthen pot. Barrels of plastic, iron or cement can be used, with one end closed and one end open. Larger pipes of cement can also be used. Stand this pipe on a high base and close it from the bottom. Poke a hole (1 inch wide) in the side near the base at the bottom. Put T pipe in this hole and seal it with the help of washer. Keep the pipe half an inch inside and outside so that the pot can be easily placed at the bottom. Fit the tap in the hole of the outside T pipe and put a nut in the other hole, which will be useful for cleaning the pipe from time to time. This tap can also be conveniently

mounted in the bottom of the barrel. Leaving the tap open, lay 2-4 inch thick brick pieces or 10-12 inch thick layer of mortar in the barrel. Pour water on it which will drain out from the bottom. Spread an 8-12 inch layer of coarse sand over it. Then add water and remove it from the tap at the bottom. Spread a layer of 1-1.5 feet loam soil on top of it. Moisten it and add 50-50 epigeic and anazoic earthworms. Soil is not required if only epigeic earthworms are to be used. Only 2-4 inches of soil layer can be added. Put a layer of cow dung on it. Add water slowly and turn off the tap after the excess water is drained. Moisten the unit daily with the tap open for 20-25 minutes.

During this earthworms will start making vermicompost. Place a second container to

collect the vermiwash under the tap of the drum.

### Composition of vermiwash

Nutrient elements	Vermicompost	Vermiwash
<b>Ph</b>	6.9	6.8
<b>Organic carbon(%)</b>	14.1	-
<b>N(%)</b>	1.5	0.005
<b>P(%)</b>	0.98	0.0025
<b>K(%)</b>	1.1	0.063
<b>Ca(mg/kg)</b>	2760	786
<b>Mg(mg/kg)</b>	4100	328
<b>S(mg/kg)</b>	600	-
<b>Fe(mg/kg)</b>	11200	0.151
<b>Mn(mg/kg)</b>	1290	213
<b>Zn(mg/kg)</b>	180	0.132
<b>Cu(mg/kg)</b>	38	0.117

### Vermiwash effect on crop and soil health

Vermiwash at low concentrations is effective in bringing seed germination and seedling growth. The germination percentage and seedling growth in terms of length of hypocotyl and radical was maximum in 10% vermiwash treatment in both the experimental plants but response to Gibberellic acid and 20% Vermiwash slightly varied between the two plants. Vermiwash is a liquid fertilizer used in organic farming as supplement for providing nutrients effectively and quickly. Vermiwash (VW), generally used on the foliage of the plant, is a liquid bio fertilizer collected by the passage of water through a column of worm activation. Various

reports shows that the use of Vermiwash produces growth effects. Vermiwash influences on soil structure, forming stable aggregates and improving the physical, chemical conditions for plant growth and nutrient uptake. They also improve soil fertility by accelerating decomposition of plant litter and organic matter and, consequently, releasing nutrients in the form that are available for uptake by plants. Using vermiwash and vermicompost may attribute the significant increase in nitrogen of the soil by using vermiwash and vermin compost due to the presence of nitrogen fixing bacteria, which increase the nitrogen content of the soil.

### Vermiwash as a Disease Control

Target	Treatment	Outcome
<b>Mite</b>	As foliar to leaf bean	Significant repelling effect on treated leaves
<b>Root knot nematode</b>	Vermiwash applied as foliar	Inhibition of egg hatching
<b>Fungus</b>	Vermiwash applied to wheat crop	Inhibited growth of pathogenic fungi
<b>Nodulation</b>	Vermiwash applied to soyabean	Increase nodules and root biomass