

## Vermiwash-A liquid booster for crop growth

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### Introduction

Vermiwash is a clear and transparent, pale yellow colored liquid extract containing excretory products and mucus secretions of earthworms along with micronutrients from the soil organic molecules. It is a rich source of vitamins, hormones, macronutrients and micronutrients that can be obtained from vermin composting beds and is used as an organic fertilizer for crop plants. Vermiwash also acts as a plant tonic and helps to reduce several plant diseases. A mixture of Vermiwash with cow urine (1:1) in 10 liters of water acts as biopesticide and liquid fertilizer.

### Advantages

- Vermiwash is rich in dissolved nutrients and amino acids which are easily obtainable for plants.
- It is a non-toxic and eco-friendly compound, which arrests the bacterial growth and forms a protective layer for their survival and growth.
- Vermiwash at 5 to 10 percent dilution inhibits the mycelial growth of pathogenic fungi.
- As a foliar spray, it was reported to initiate flowering and lasting inflorescence.
- It can be used as a liquid fertilizer applied to the rhizosphere.
- It acts as a plant tonic and thus helps in reducing several plant pathogenic fungi.
- It increases the number of micro-organisms in the soil which helps in decomposing soil organic matter.
- The Vermiwash contains necessary plant nutrients, plant growth-promoting hormones, enzymes, symbiotic microbes in addition to the macronutrients and micronutrients.
- It can be used as a foliar spray as well as soil application whereby it acts as a pesticide and natural fertilizer for the crop plants in sustainable agriculture. Vermiwash is a part of Good Agriculture Practice (GAP).

## **How to prepare Vermiwash**

Vermiwash preparation is a simple and easy process. Vermiwash is collected after the water passes by a worm culture column. It can be formed by allowing water to percolate by the tunnels made by the earthworms on the organic waste filled in a plastic barrel. Then water is allowed to fall drop by drop from a pot hung above the barrel into the vermicomposting system.

Vermiwash units can be set up in a barrel of 250-liter capacity. Drill a hole at the bottom of the container and then fix a tap to it. At the bottom of the barrel, fill pieces of bricks up to a height of 10 to 15 cm or 10 to 15% of the container. Add a layer of gravels to another 10 cm and then add another layer of coarse sand 10 to 15 cm or 10-15% of container. Water is then made to flow through these layers to enable the setting up of the basic filter unit and also to make it free from impurities. On top of this layer is located 30 to 45 cm layer of loamy soil. Place hay on top of this layer of soil use a closely spaced wire mesh below to separate them. Pre decomposed organic wastes or cow dung (10 days old) are added and then moistened. Introduce about 1000 to 1500 juvenile or adult earthworms into the Vermiwash container and moisten the Vermiwash unit every day. To obtain Vermiwash, continuously suspend water from a small bucket of 5 litres capacity with a single hole at its center. Place cotton wicks or bamboo sticks in the holes so the water trickles down. The water gradually percolates to the bottom through the compost carrying with it nutrients through the filter unit. Fill the container with 4 to 5 liters water every day to keep the unit moist.

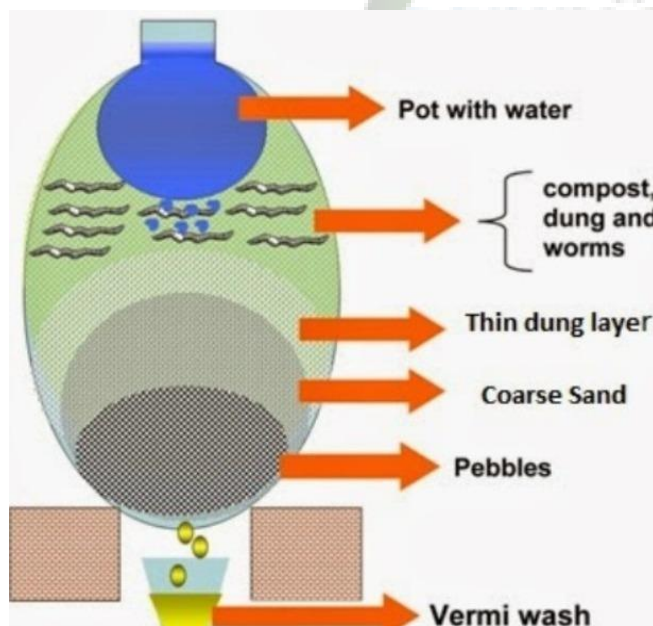
After 7 to 10 days, the Vermiwash can produce in the container. On the 15 days, about 35 to 40 liters of Vermiwash can be produced. The collected Vermiwash must be stored in a cool and dry place. The Vermiwash can be diluted to 10 to 15% and can be treated as a pesticide or fertilizer on the crop plants or on the soil.

## **Role of Vermiwash in sustainable crop production**

Vermiwash can be used as a potent biofertilizer to develop the germination and seedling survival rates in crop plants growing on nutrition depleted soils thus paving the way for sustainable agriculture using organic farming practices. It could be utilized efficiently for sustainable plant production at low input basis green farming. Vermiwash recorded significant growth and productivity in the black gram. Vermiwash is a natural growth supplement for tea, coconut and also horticultural crops.

## How to Use

- The seedlings, the cuttings of plants can be dipped in the diluted solution of Vermiwash solution (5 times with water) for 15 to 20 minutes before transplantation.
- The Vermiwash is diluted with water for 5 times and after that sprayed on the crops.
- Vermiwash is diluted about 10 times with water and soil is drenched with the solution to prevent some of the soil-borne pathogens as it has anti-microbial properties.
- Soil application enhances the nutrient uptake by the plants and thereby it acts as a natural fertilizer for the crop.
- Vermiwash alone or mix with cow urine is an excellent growth promoter. Dilute one litre/0.5 litre of Vermiwash + 0.5 liters of cow urine in 20 lit of water and use as a foliar spray. Three to four applications are required for excellent results.



## Chemical composition

|   |                      |
|---|----------------------|
| pH  | 7±0.03               |
| EC  | 0.25±0.03            |
| Organic carbon                            | 0.008±0.001          |
| Nitrogen                                  | 0.01–0.001%          |
| Phosphorous                               | 1.70%                |
| Potassium                                 | 26ppm                |
| Sodium                                    | 8ppm                 |
| Calcium                                   | 3ppm                 |
| Copper                                    | 0.01ppm              |
| Iron                                      | 0.06ppm              |
| Magnesium                                 | 160ppm               |
| Manganese                                 | 0.60ppm              |
| Zinc                                      | 0.02ppm              |
| Total heterotrophs (actinomycetes) CFU/ml | 1.79×10 <sup>3</sup> |
| Nitrosomonas CFU/ml                       | 1.01×10 <sup>3</sup> |
| Nitrobacter CFU/ml                        | 1.12×10 <sup>3</sup> |
| Total fungi CFU/ml                        | 1.46×10 <sup>3</sup> |

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(Source: <http://w.w.w.erfindia.org/vermiwash.asp>)