

Black Gold in Agriculture

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SUMMARY

Vermicomposting is the scientific method of making compost by using earthworms. They are commonly found living in soil, feeding on biomass and excreting it in a digested form. Vermicomposting turns the kitchen waste and other green waste into dark, nutrient – rich soil. Due to the presence of microorganisms, it maintains healthy soil. Vermicomposting is an eco- friendly process that recycles organic waste into compost and produces valuable nutrients.

INTRODUCTION

Vermicomposting is the process by which worms are used to convert organic materials (usually wastes) into a humus-like material known as vermicompost. The goal is to process the material as quickly and efficiently as possible. Earthworms consume biomass and excrete it in digested form called worm casts. Worm casts are popularly called as Black gold. The casts are rich in nutrients, growth promoting substances, beneficial soil micro flora and having properties of inhibiting pathogenic microbes. Vermicompost is stable, fine granular organic manure, which enriches soil quality by improving its physicochemical and biological properties. It is highly useful in raising seedlings and for crop production. Vermicompost is becoming popular as a major component of organic farming system. Vermiculture is the culture of earthworms. The goal is to continually increase the number of worms in order to obtain a sustainable harvest. The worms are either used to expand a vermicomposting operation or sold to customers who use them for the same or other purposes.

Species suitable for vermicomposting

There are different species of earthworms viz. *Eisenia foetida* (Red earthworm), *Eudrilus eugeniae* (night crawler), *Perionyx excavatus* etc. Red earthworm is preferred because of its high multiplication rate and thereby converts the organic matter into vermicompost within 45-50 days. Since it is a surface feeder it converts organic materials into vermicompost from top.

Important characteristics of red earthworm (*Eisenia foetida*)

Characters	:	<i>Eisenia foetida</i>
Body length	:	3-10 cm
Body weight	:	0.4-0.6 g
Maturity	:	50-55 days
Conversion rate	:	2.0 q/1500 worms/2 months
Cocoon production	:	1 in every 3 days
Incubation of cocoon	:	20-23 days





Figure: Vermicompost of *Eisenia foetida*

Potential benefits of vermicomposting

- Vermicompost appears to be generally superior to conventionally produced compost in a number of important ways;
- Vermicompost is superior to most composts as an inoculant in the production of compost;
- Worms have a number of other possible uses on farms, including value as a high quality animal feed;
- Vermicomposting and vermiculture offer potential to organic farmers as sources of supplemental income.

Vermicompost has the following advantages over chemical fertilizers.

- It restores microbial population which includes nitrogen fixers, phosphate solubilizers etc.
- Provides major and micro- nutrients to the plants.
- Improves soil texture and water holding capacity of the soil.
- Provides good aeration to soil, thereby improving root growth and proliferation of beneficial soil microorganisms.
- Decreases the use of pesticides for controlling plant pathogens.
- Improves structural stability of the soil, thereby preventing soil erosion.
- Enhances the quality of grains/ fruits due to increased sugar content.

Benefits of vermicompost

There are numerous benefits of Vermicompost.

- You will notice a good growth of the plant with the use of Vermiwash.
- Good farming is possible with its use while a reduction in the cost of water and chemical fertilizers.
- It makes the environment healthy.
- Increases fertility of land at low cost.
- Enhances physical, chemical, and biological properties of soil.
- Plant protection medicines are reduced due to their use. The cost of production also gets reduced.
- Nutritive value of vermicompost

The nutrients content in vermicompost vary depending on the waste materials that are being used for compost preparation. If the waste materials are heterogeneous one, there will be wide range of nutrients available in the compost. If the waste materials are homogenous one, there will be only certain nutrients are available. A fine worm cast is rich in N P K besides other nutrients. Nutrients in vermicompost are in readily available form and are released within a month of application.

The common available nutrients in vermicompost is as follows

Organic carbon	:	9.5 – 17.98%
C/N ratio	:	11.64
Nitrogen	:	0.5 – 1.50%
Phosphorous	:	0.1 – 0.30%
Potassium	:	0.15 – 0.56%

Sodium	:	0.06 – 0.30%
Calcium and Magnesium	:	22.67 to 47.60 meq/100g
Copper	:	2 – 9.50 mg kg-1
Iron	:	2 – 9.30 mg kg-1
Zinc	:	5.70 – 11.50 mg kg-1
Sulphur	:	128-- 548 mg kg-1

To farmers:

- Less reliance on purchased inputs of nutrients leading to lower cost of production
- Increased soil productivity through improved soil quality
- Better quantity and quality of crops
- For landless people provides additional source of income generation

To industries:

- Cost-effective pollution abatement technology

To environment:

- Wastes create no pollution, as they become valuable raw materials for enhancing soil fertility

To national economy:

- Boost to rural economy
- Savings in purchased inputs
- Less wasteland formation

CONCLUSION

Earthworms serve as “nature’s plowman” and form nature’s gift to produce good humus, which is the most precious material to fulfill the nutritional needs of crops. Vermicompost can be used for all crops *viz.*, agricultural, horticultural, ornamental and vegetables at any stage of the crop. The utilization of vermicompost results in several benefits to farmers, industries, environment and overall national economy.

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