VERMI CULTURE

For increased soil fertility and increased food production

BY SAMUEL NDERITU

Red wigglers *Eisenia fetida*

Vermiculture, (Vermi-compost) is the product of the composting process using various species of worms, usually red wigglers, white worms, and other earthworms, to create a mixture of decomposing vegetable or food waste, bedding materials, and vermicast.

Vermicast (also called worm castings, worm humus, worm manure, or worm feces) is the end-product of the breakdown of organic matter by earthworms. These castings have been shown to contain reduced levels of contaminants and a higher saturation of nutrients than the organic materials before vermicomposting.

Vermi compost contains water-soluble nutrients and is an excellent, nutrient-rich organic fertilizer and soil conditioner. It is used in farming and small scale sustainable, organic farming.

Vermicomposting can also be applied for treatment of sewage. A variation of the process is vermifiltration (or vermidigestion) which is used to remove organic matter, pathogens and oxygen demand from wastewater or directly from blackwater of flush toilets.

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How does Vermiculture composting benefit the soil?

- Vermicompost improves soil structure, texture, and aeration as well as increasing its water-holding capacity. Your plants will grow stronger and have deeper root systems for better drought tolerance and disease resistance.
- Worms are necessary to help produce top soil. Worms help the environment by decomposing organic material (food and yard waste) turning it into a natural rich organic soil amendment. The end result is called vermicompost, wormpoop,or worm castings.
- Vermicompost provides a tremendous source of nutrients for plants that dramatically improves the texture and fertility of soil. This replaces valuable nutrients taken out of the soil when fruit and vegetables are harvested. Vermicomposting adds beneficial organisms to the soil. These microorganisms and soil fauna help break down organic materials and convert nutrients into a more available food form for plants.
- Like composting, vermiculture composting is natures way of completing the recycling loop. Being born, living, dying, and being reborn again. Adding compost to soil aids in erosion control, promotes soil fertility, and stimulates healthy root development in plants.

In addition, Vermiculture provides the following benefits

- Provides nutrients to the soil
- Increases the soil's ability to hold nutrients in a plant-available form
- Improves the soil structure'
- Improves the aeration and internal drainage of heavy clay soils
- Increases the water holding ability of sandy soils
- Provides numerous beneficial bacteria

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Types of Vermi worms

Epigeic

- Thriving on soil surface, they convert the organic waste into humus very quickly.
- They have a high metabolic activity but it lasts only for a limited period.
- They need a huge amount of organic content as a part of their feed.

- Although they have a short life span, their rate of reproduction is very high.
- Some of the commercially grown species belonging to this group are *Eisenia foetida, Eudrilus euginae, Perionyx excavatus, Lumbricus rubellus* and *P.arborjcola.*

Endogeic

- Species belonging to this category live just below the topsoil surface where mineralized aluminum oxide, iron oxide and clay occur.
- They burrow into the soil making tunnels horizontally as well as obliquely thus increasing the aeration.
- They feed on organic matter that are undergoing degradation at different levels.
- They improve the soil texture and structure.

Diageic

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- Diageic worms make permanent burrows and are deep dwelling in the soil.
- The organic litter is collected from the soil surface and stored in the burrows which are fed upon by the earthworms.
- The excrements are disposed on the outside of the burrows.
- Thus these are worms help in mixing the surface organic matter into the sub-terranian soil.
- They also help loosen the soil.