EFFECT OF VERMICOMPOST ON THE GROWTH RATE OF COMMONLY GROWN HERBS

Dr. K.Tabassum, Mrs.Juvaria Azmath
Lecturers,St.Ann's College For Women,Hyderabad,Telangana.

ABSTRACT: With the increase in population,there has been tremendous demand for food.In order to meet this demand, the cultivation of food cropsis done using more and more pesticides.The rampant use of pesticides has lead to loss of fertility in soil,release of green house gases and in long term effect the animals and human beings.Vermicompost is a complete organic manure which is not only beneficial in the long run but also retains the soil fertility without causing any harm to us.The present paper aims at studying the effect of vermicompost in comparision to pesticides on the common herbs.The research involves common herbs so that even a common man can use vermicompost in the kitchen garden.The plants grown by vermicompost were found to be more taller,stronger with high growth rate when compared to the plants treated with pesticides.

KEYWORDS:earthworms,fertilizer,soil,water,vermicompost,growth

INTRODUCTION:

Earthworms have been on the Earth for over 20 million years. They have faithfully done their part to keep the cycle of life continuously moving. They are nature's way of recycling organic nutrients from dead tissues back to living organisms. Ancient civilizations, including Greece and Egypt valued the role earthworms played in soil. The earthworm is a natural resource of fertility and life.

Earthworms live in the soil and feed on decaying organic material. After digestion, the undigested material moves through the alimentary canal of the earthworm, a thin layer of oil is deposited on the castings. This layer erodes over a period of 2 months. So although the plant nutrients are immediately available, they are slowly released to last longer. The process in the alimentary canal of the earthworm transforms organic waste to natural fertilizer. The chemical changes that organic wastes undergo include deodorizing and neutralizing. This means that the pH of the castings is 7 (neutral) and the castings are odourless. The worm castings also contain bacteria, so the process is continued in the soil, and microbiological activity is promoted.

Vermicomposting is a process by which organic waste is converted to bio fertilizer using earthworms. Vermicompost contains major and minor nutrients along with growth hormones, antibiotics and vitamins which are beneficial for the growth of crops, flowers and fruits settling and resistance to pest and diseases. Compost also contains calcium and humus which improves soil structure and moisture holding capacity

It is the process of turning organic debris into worm castings. The worm castings are very important to the fertility of the soil. The castings contain high amounts of nitrogen, potassium, phosphorus, calcium, and magnesium. Castings contain: 5 times the available nitrogen, 7 times the Vermiconversion available potash, and 1 ½ times more calcium than found in good topsoil. Earthworm castings have excellent aeration, porosity, structure, drainage, and moisture-holding capacity. The content of the earthworm castings, along with the natural tillage by the worms burrowing action, enhances the permeability of water in the soil. Worm castings can hold close to nine times their weight in water

VERMICOMPOST VS CHEMICAL FERTILIZERS:

The most important aspect of compost produced by earthworms is that it is 100% organic. There are no harmful chemicals and it does not need to be mixed with anything. Vermicomposting produces a product that is naturally designed to benefit plants in several different ways. The most significant benefit is that the nutrients in earthworm compost are very easily absorbed by the roots of plants. Unlike chemical fertilizers, vermicompost is not easily flushed from the soil because of the worm mucus that it contains. Plants have longer to obtain the nutrients and get the maximum benefit. As the compost is passing through the body of the worms it is enriched with bacteria and microbes. These help plants to become more disease resistant and also repel some plant pests. The presence of increased microbial activity can make the area much more attractive to birds which also help to remove plant pests. Among the hormones that earthworm compost contains are hormones that help plants to grow. Germination of seeds is encouraged, the growth of the plant is stronger and the crop yield improved. This natural support for the plants is not available with chemical fertilizers. The distribution of the compost through the soil also helps to encourage healthy root growth. Vermicompost is a colloid and holds up to nine times its own weight in water. This can make a huge difference when there is a dry spell. The water is held at an organic level so tends to evaporate slowly while still being available to the plants. Chemical fertilizers bombard plants with huge amounts of nutrients that are going to drain by and eventually be washed out of the soil by the rain.This is avoided by using compost which is lower in nutrient content but which does not get washed out of the soil. The nutrients are held in place and released slowly so that the plants receive what they need over a prolonged period.

The Chemical Fertilizers which are very rampant in use have many disadvantages.Theyare primarily made from nonrenewable sources, including fossil fuels.They grow plants but do nothing to sustain the soil. The fillers do not promote life or soil health, and even packages labeled "complete" do not include the decaying matter necessary to improve soil structure. In fact,

chemical fertilizers don't replace many trace elements that are gradually depleted by repeated crop plantings, resulting in long-term damage to the soil.Because the nutrients are readily available, there is a danger of over fertilization. This not only can kill plants but upset the entire ecosystem.Chemical fertilizers tend to leach, or filter away from the plants, requiring additional applications.Repeated applications may result in a toxic buildup of chemicals such as arsenic, cadmium, and uranium in the soil. These toxic chemicals can eventually make their way into your fruits and vegetables.Long-term use of chemical fertilizer can change the soil pH, upset beneficial microbial ecosystems, increase pests, and even contribute to the release of greenhouse gases.

OBJECTIVES:

- To minimize the organic waste in the campus.
- To prevent environmental pollution.
- To improve the quality of soil.
- To enhance germination, growth and yield.
- To make the plants healthy, resistant to diseases.
- To produce higher quality crops and better yield than chemical fertilizer
- To improve root growth and structure
- To enriche soil with micro-organisms (adding plant hormones such as auxins and gibberellic acid)

METHODOLOGY:

Nine Pots were taken and **three herbs** were planted namely:
Hibiscus cannabinus
Menthalongifolia
Portulacaoleracea

The three plants of different species were treated with **vermicompost**, three with **pesticide super phosphate**, three remaining were left **without treatment**.

The plants were allowed to grow for a period of **4 months**

OBSERVATION:

Name of the plant	Characters	Vermicompost	Pesticide Super phosphate	Naturally grown
Hibiscuscannabinus 	Length of the herb	32 cm	15 cm	14 cm
	Width of the stem	1 cm	0.4 cm	0.3 cm
	Width of the petiole	0.2 cm	0.1 cm	0.1 cm
	Leaf quality	Big	Small	Small and effected by pests
Portulaca oleracea 	Length of the herb	20 cm	12cm	8 cm
	Width of the stem	1.5 cm	1 cm	0.8 cm
	Width of the petiole	0.6 cm	0.3cm	0.1cm
	Leaf quality	Broad	Small	Tiny
Mentha Longifolia 	Length of the herb	20 cm	10 cm	7 cm
	Width of the stem	0.5 cm	0.3 cm	0.2 cm
	Width of the petiole	0.2 cm	0.1 cm	0.07 cm
	Leaf quality	Broad	Small	Tiny and effected by pests

VERMICOMPOST PLANTATION

Hibiscus cannabinus

Menthalongifolia

Portulacaoleracea

PESTICIDE PLANTATION

Hibiscus cannabinus

Menthalongifolia

Portulaca oleracea4

NATURAL PLANTATION:

Hibiscus cannabinus

Menthalongifolia

Portulacaoleracea

RESULT:

The use of vermicompost for growth of plants was found to be much better and safer option than pesticides.The plants which were grown using vermicompost showed a good growth and were found to be healthy and resistane to disease than when compared to the plants grown with pesticide.

CONCLUSION:

Using earthworms creates a product that is natural. The cycle of regularly over-dosing the soil is broken. Plant health is promoted by long term exposure to nutrients and the soil condition will continue to improve.Vermicompost is a renewable and environmentally friendly resource. A totally natural product, vermicompost can help reduce the need to apply chemical fertilizers Vermicompost may also contain plant growth regulators that improve plant growth. The nutrients in vermicompost can help plants grow more vigorously; produce bigger blooms and both increase and improve the quality of crop yields.