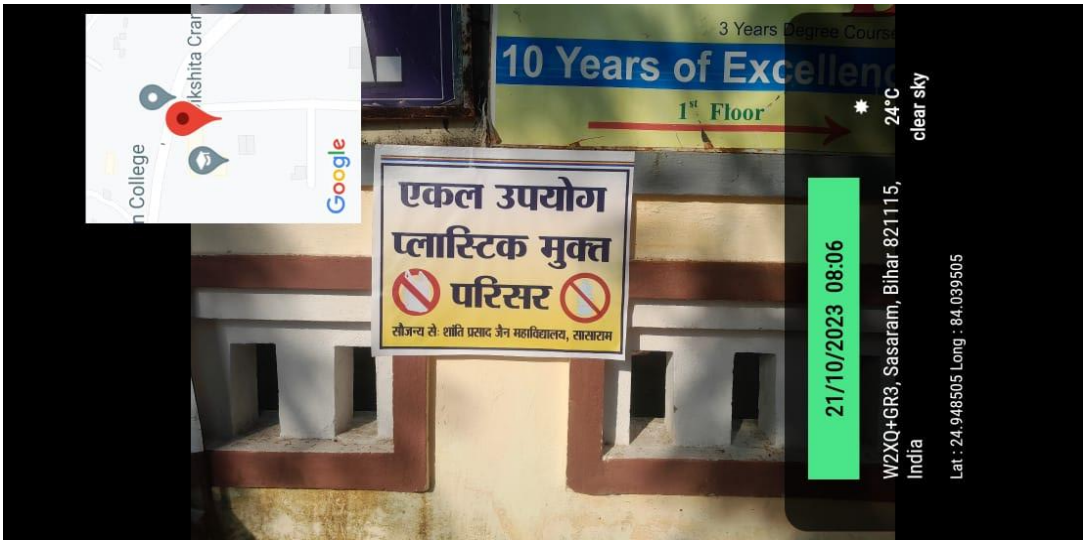
SINGLE USE PLASTIC FREE CAMPUS

Maintaining cleanliness is an important aspect of healthy living because it promotes hygiene and helps us develop our personalities by keeping us clean both externally and internally. As a result, SPJC decided to go single use plastic-free on campus. There are no paper cups, plastic plates, or spoons on campus; instead, we use steel glasses, plates, and spoons. We are only using steel. We had a "single use plastic free campus" to raise community awareness about pollution and to leave a green and pollution-free environment for future generation.



Vermicompost Unit

Introduction

The science of breeding and raising earthworms is known as vermiculture. It defines the exciting potential for waste reduction, fertilizer production, and a variety of future applications.

Vermicomposting is the process of producing organic fertilizer or vermicomposting with earthworms from biodegradable materials. Composting with worms prevents the unnecessary disposal of vegetative food wastes while also reaping the benefits of high-quality compost.

The earthworm is one of nature's "soil scientists." Earthworms have been liberated, providing cost-effective farm relief. Worms are responsible for many things, including transforming ordinary soil into high-quality soil. They decompose organic matter and leave behind castings, which are an extremely valuable type of fertilizer.

M.Sc 4th year and Third-year Zoology students rationalize the methodologies and laboratory findings resulting from their innovative approach to Vermiculture and Vermicomposting.

Advantages of Vermiculture and Vermicomposting

Vermiculture and vermicomposting are two of the most valuable ecological endeavors we've undertaken because they not only protect the environment but also help us learn about its proper methodology.

Vermiculture is environmentally friendly because earthworms feed on anything biodegradable, and vermicomposting helps with garbage disposal. There are no imported inputs required, worms are readily available, and feeding materials are abundant in and around campus plants, leaves, waste, grasses, and used papers. It is also very profitable because the worms and castings are used to grow garden, medicinal, and campus plants.

Vermicomposting has no negative effects on soil, plants, or the environment.

It improves soil aeration and texture, reducing compaction. Because of its high organic matter content, it improves soil water retention capacity. It also promotes better root growth and nutrient absorption, as well as improving soil nutrient status (both macro- and micronutrients).

Precautions for Vermiculture and Vermicomposting

For vermiculture several precautions in doing such process:

1. To ensure that the culture is successful and fruitful.
2. Based on our observations, a vermicomposting pit should be shielded from direct sunlight in order for the worm to survive.
3. The worms may die as a result of direct heat.
4. Spray water on the pit as needed to keep the moisture level up because worms love it.
5. We should also keep ants, rats, birds, and excessive rain away from the worms.

Methodology

The science of worm composting is known as vermiculture. Worms can consume their body weight in fruit and vegetable scraps each day, producing castings as a byproduct. Worm compost is made from worm castings.

During the study, the following methodology was used: -

1.Vermi Bed Cleaning and Preparation: - On November 25th, 2021, our M.Sc 4 th year and B.Sc third year Zoology group began the vermiculture project by cleaning and preparing the previously built vermiculture beds near the auditorium on campus. There are one vermi bed, which measures 8 X 3 X 3 feet and is made of brick blocks.One small tank has been prepared for vermiwashing. We cleaned the vermi bed and began collecting substrates.

2.Substrate Application:

On August 28th, 2018, we applied the substrates to vermi beds after a few days of gathering. In the vermi bed, we mixed loam soil, cow dung, manure, and partially decomposed leaves; in the vermi bed, we mixed cow dung, manure, and partially decomposed rice straw. The following application made use of a variety of substrates.We made certain that the materials were cut or broken into smaller pieces before placing the substrate. Finer materials decompose more easily. We also thoroughly mixed the various media so that the worms could easily digest them. To begin anaerobic decomposition, we moistened the materials and covered the vermi beds with a roof and cover. The substrates were kept in the beds for ten days before the vermi worms were introduced. It took 10 to 15 days for anaerobic decomposition to complete, and only then were they ready for worm consumption.

3.Introducing the Vermi Worms, Red wriggler (Eisenia foetida):-

On August 18, 10 days after placing the substrates in the vermi beds, we introduce the vermi worms into the substrate. In our vermicompost, we used the Red wriggler (Eisenia foetida). Aerobic decomposition takes 7 to 14 days, depending on the materials used and the worm-to-substrate ratio. In our case, each bed has 250 kilograms of substrate, which is enough to feed a one and a half kilogram worm for two weeks. Throughout the period, we moistened the substrate on a regular basis to provide the appropriate moisture (60-80%) for the vermi worms to grow and multiply.

4.Feeding the VermiWorms: -

We fed the worms by adding garden waste after introducing the red wrigglers and then we left. The food waste has been consumed by the red wrigglers after two weeks, leaving behind compost or worm casting.

5.Harvesting of Vermicast: -

Two weeks or ten to fourteen days after the worms are stocked, harvesting will begin. For the final three days before harvest, we didn't water the substrate to facilitate the separation of castings from worms and to keep the castings from getting compact. We actually harvested 340 kg of organic fertilizer from the vermi bed, which contains a mixture of loam soil, cow dung manure, and completely decomposed leaves, on September 25. This was the first harvest of vermicast, or worm manure.

6.Reapplying Substrates: -

We reapplied substrates in the vermi beds and followed the same process after harvesting the vermi cast.

7.Reintroducing the Red Wriggler, or Esenia foetida, also known as the Vermi Worms:

In order to maintain the vermi worm culture and their ability to produce vermi cast, an excellent organic fertilizer, the vermi worms, also known as red wrigglers (Eisenia foetida), must be reintroduced into the vermi beds when new substrates are applied. We added water to the substrates after the worms were added to them to maintain the moisture content necessary for the worms to readily break down the materials. And these procedures will be repeated repeatedly until a sufficient quantity of red wrigglers have been cultured and vermicast has been produced to the point where it can be used for gardening and transferred to the botany department.

8.Using the Vermicast Harvested: -

We utilized our collected worm manure, or vermicast, as an organic fertilizer for the campus's garden and medicinal plants. The remaining organic fertilizer sacks were kept for later use.

Data Analysis

Vermi worms from the SPJC, Sasaram, Department of Zoology were used directly for the vermiculture and vermicomposting project. Eisenia foetida, the scientific name for these vermi worms, is commonly referred to as Red Wrigglers.

Eisenia foetida is a great option for vermicomposting because it is particularly suited to living in a decomposing environment, particularly ones like rotting veggies, manure, and actual compost. It is found in habitats with less competition for food and space, and it does not burrow into the soil. However, among nature's greatest "soil scientists" are earthworms. An earthworm's basic body plan consists of a muscular, slimy, moist outer body surrounded by a tube that houses the digestive system. The body is annular, formed of segments that are most specialized in the anterior. Most earthworms are decomposers feeding on undecayed leaf and other plant matter. From the laboratory activity, we have observed that the vermin worms range from 1 cm to 8 cm. From the 1 kilogram introduced vermi worms, it increases 300 grams each harvest.

In vermicast

Vermicast is an excellent soil conditioner and organic fertilizer. It is created when organic matter or agricultural wastes break down. Worms like the red wrigglers (E. foetida) can produce high-quality vermicast. It has humus that is highly nutrient-rich, including calcium, magnesium, potassium, nitrogen, and sulfur.

The project resulted in crumbly, black vermicast. Nutrient-rich, it is. It will be utilized in landscaping and gardens near college campuses. The vermicompost itself has numerous advantages for the land, such as being a natural insecticide for the soil, a soil conditioner, a fertilizer, and an addition of essential humus or humic acids.In fact, there is a lot of promise for the production of vermicast using red wriggler worms.

Substrates

The substrates, or media in which the red wriggler worms live, were common in the community. In our various substrate treatments, we used a variety of substrates in the vermi beds. We used livestock manure, including dry cow dung, decomposed and partially decomposed plant wastes collected from campus garden plants, and vermicast containing red wrigglers as substrates.

Cow manure contributes to soil fertility by adding organic matter and nutrients, such as nitrogen, that are trapped by bacteria in the soil.

Conclusions

Vermiculture and vermicomposting are both worthwhile and exciting activities. We learned a lot about the methodologies, benefits, and significance of this activity.

After nearly three months of project delivery and execution, we can conclude that:

1. Vermiculture is a significant way of reducing waste, producing fertilizers, and maintaining the ecological balance.

2. Vermicomposting can produce high-quality fertilizers that are superior to other commercial fertilizers on the market.

3. Vermiculture converts farm wastes into organic fertilizer, making it an environmentally friendly technology.

4. Vermiculture increases crop yield and reduces reliance on chemical fertilizers, thereby mitigating climate change and

5. Vermiculture can be turned into a livelihood program and a source of extra income by selling vermicast and worms.

6. Removing worms from their natural habitat and putting them in vermi beds teaches people to take responsibility for their actions. Since they are living things with specific needs of their own,

it is crucial to establish and preserve a healthy habitat in order to allow them to carry out their duties. Your worms will flourish and produce compost for you if you provide them with the proper food and care.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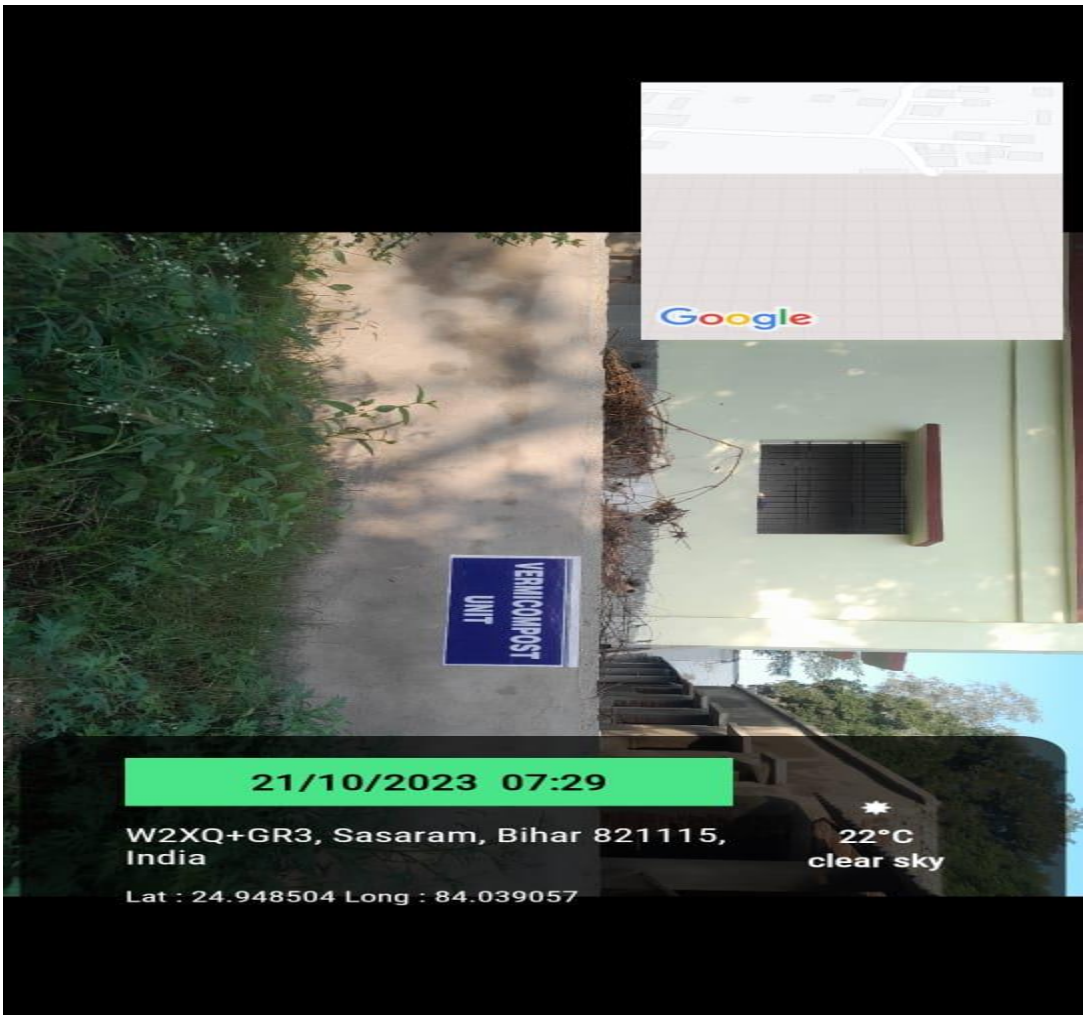
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