

REPORT
On
VERMICOMPOST



DEPARTMENT OF ZOOLOGY

GOVERNMENT DEGREE COLLEGE, RAVULAPALEM

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Minutes of the Meeting :

Keeping in view the importance of vermicompost to the green plants, department of zoology has proposed to prepare compost to enhance soil fertility and to use as bio fertiliser to the plants and trees in the college campus by using cow dung collected from the college surroundings, fallen leaves of the campus trees, soil, coconut fibre and vegetable waste.

Copy of the Resolution, Dated 07/12/2021

The Department of Zoology, Govt Degree College, Ravulapalem met with the Green Audit Committee on 21-12-2021 to discuss about the preparation of vermicompost to enhance soil fertility physically, chemically and biologically. As the compost is rich in nutrition, it is used as bio fertiliser to the plants and trees in the college campus.

Members Attended:

1. Sri Satya Murthy, Vice Principal
2. Smt K.Subhashini, IQAC Coordinator
3. Smt K.Rajani, Lecturer in Chemistry
4. Smt A.S.S.Sowjanya, Lecturer in Zoology
5. Smt.M.Hemalatha, Lecturer in Botany

Resolution, Dated 07/12/2021


It is unanimously resolved to request the principal to accord permission to prepare vermicompost to enhance soil fertility of the college campus by using it as bio fertiliser to the plants and trees in the college campus.


Signatures :

1. 

2. U. Subhash

3. K. Rajani

4. M. H. 

5. A.S.S. Sonjany 

Letter to the Principal

Station: Ravulapalem,

Date : 7/11/2021

To,
The Principal,
GDC, Ravulapalem.

From,
Zoology Department,
GDC, Ravulapalem.

Sub: Preparation of compost in the college campus to enhance soil fertility and also to use as a manure to the green plants by the Zoology Department.

Respected principal,

As studies show that amending soil with vermicast causes seeds to germinate more quickly, enhances rate of seedling growth, increases root numbers and biomass, improves root stress tolerance, leads to earlier flowering of plants, and increases plant yields. When vermicompost is added to soil, it boosts the nutrients available to plants and enhances soil structure and drainage. Vermicompost has also been shown to increase plant growth and suppress plant disease and insect pest attacks.. So the Department of Zoology is going to prepare vermicompost for the trees and plants in the campus. So please give me permission to prepare vermicompost in our college.

Thanking you sir,

Yours faithfully ,

Smt A.S.S.Sowjanya ,

Lecturer in Zoology.

VERMICOMPOST

INTRODUCTION

About 2,350 years ago Aristotle has said, "Earthworms are intestines of the earth." Only in the twentieth century has the truth in this statement been verified and found correct. He was ahead of our times by two and half of millennia. Darwin was another one to state: "No other creature has contributed to building of earth as earthworm."

Vermiculture is basically the science of breeding and raising earthworms. It defines the thrilling potential for waste reduction, fertilizer production, as well as an assortment of possible uses for the future .

Vermicomposting is the process of producing organic fertilizer or the vermicompost from bio-degradable materials with earthworms. Composting with worms avoids the needless disposal of vegetative food wastes and enjoys the benefits of high quality compost.

The earthworm is one of nature's pinnacle "soil scientists." Earthworms are liberated and cost effective farm relief. The worms are accountable for a variety of elements including turning common soil into superior quality. They break down organic matter and when they eat, they leave behind castings that are an exceptionally valuable type of fertilizer.

Advantages of Vermiculture and Vermicomposting

Vermiculture and vermicomposting is one of the most valuable ecological endeavors .Vermiculture is environment friendly since earthworms feed on anything that is biodegradable, vermicomposting then partially aids in the garbage disposal problems. No imported inputs required, worms are now locally available and the materials for feeding are abundant in the locality as market wastes, grasses, used papers and farm wastes. It is also highly profitable, both the worms and castings are saleable .

Vermicompost does not have any adverse effect on soil, plant and environment. It improves soil aeration and texture thereby reducing soil compaction. It improves water retention capacity of soil because of its high organic matter content. It also promotes better root growth and nutrient absorption and improves nutrient status of soil, both macro-nutrients and micro-nutrients (Punjab State Council for Science and Technology, 2010).

Precautions for Engaging in Vermiculture and Vermicomposting

Vermiculturists should also be aware of the several precautions in doing such process to ensure that the project would turn out successful and fruitful. From our hands-on experiences, vermicompost pit should be protected from direct sun light so that the vermi worm would survive. Direct heat possibly causes the worms to die. Spray water on the pit as when required to maintain moisture level because vermi worms are fond of it.

We should also protect the worms from ant, rat, bird and excessive rain.

VERMICOMPOST REPORT

Data Collection

Vermiculture is the science of worm composting. Worms can eat fruit and vegetable scraps, leaving castings as the byproduct. Worm castings are called worm compost.

Clean-up and Preparation of Vermi Beds : The students of II BZC started the vermiculture on December 12, 2021 with the clean-up of 200 litres plastic water drums and started to gather substrates.

Substrate Application : After some days of gathering, we put the substrates to vermi drum on December 21, 2021. We put a mixture of loam soil, cow dung collected from the surrounding areas of the college, partially decomposed fallen leaves of the trees in the college campus, coconut fibre brought by the students from their houses and vegetable waste brought by the hostel students from their hostels. The succeeding application made use of mixed and different substrates. Before putting the substrate, we made sure that the materials are cut or break into smaller pieces. Finer materials could easily decompose (partial decomposition). We also mixed the different media together well for the worms to easily digest these. We have moistened the materials and cover the vermi bed with wet jute bags and tarpaulin cover to initiate anaerobic decomposition. The substrates were kept in the beds for ten days before we put the vermi worms collected by digging the soil of the surrounding farms. It took 10 to 15 days to complete anaerobic decomposition and only then that they are ready for worm consumption.

Introducing the Vermi Worms, Red wriggler (*Eisenia foetida*): After 12 days upon putting the substrates into the vermi drum, we introduce the vermi worms into the substrate on January 3, 2022. We used the Red wriggler (*Eisenia foetida*) in our vermicompost. Aerobic decomposition lasts for 7 – 14 days depending on the materials used and the ratio of the worms to the substrate. Within the period, we moistened (not soggy) the substrate regularly to provide the right moisture (60 - 80%) for the vermi worms to grow and multiply.

Feeding the Vermi Worms: After introducing the red wigglers, we fed the worms by placing vegetable wastes and also fallen leaves of the campus and We placed the vegetable wastes in a different place each time for the worms to easily feed into it. After two weeks, the red wigglers have eaten the food waste leaving behind worm casting or compost.

Harvesting of Vermicast: Harvesting will commence 40 to 45 days after stocking of worms. Prior to harvest, we refrained from watering the substrate for the last three days to ease the separation of castings from worms and likewise preventing the castings to become compact. On February 15, we had the first harvest of the vermicast or the worm manure; we actually harvested a total of 200 kilograms which contains mixture of loam soil, cow dung, coconut fibre, vegetable waste and partially decomposed leaves. The succeeding harvests done by the group is illustrated in the timeline of the activity (see Table 1.1).

Re-Applying Substrates: After the harvest of the vermi cast, we applied substrates in the vermi beds anew.

Re-introduction of the Vermi Worms, Red wiggler (*Eisenia foetida*): The application of new substrates into the vermi beds require the re-introduction of the vermi worms or the red wigglers (*Eisenia foetida*) for the continuity of the worm's culture and for their production of the vermi cast which are very good organic fertilizer . After introducing the worms into the substrates, we sprinkled it with water to keep the moisture on which worms can easily digest these substrates. And these steps will go over and over again until such time that the red wigglers are cultured into a big number and vermicast are produced well that it can be used as a bio-fertilizer to the campus plants, trees and botanical garden of our college.

Using the Harvested Vermicast : Our harvested vermicast or worm manure was used as organic fertilizer for botanical garden of our college maintained by the Botany Department. The other sacks of organic fertilizers were stored for future use.

Timeline of the Vermiculture and Vermicomposting Activity

Date	Activity	Description	Output
December 12, 2021	Clean-up and Preparation of Vermi Beds	Start of the vermiculture project with the cleaning and preparation of the existing vermi drum.	The vermi bed was cleaned and prepared for substrate application
December 12-20, 2021	Gathering of Substrates	Collection of substrates to be applied in the vermi drum.	Substrates such as manure of cow, partially decomposed fallen leaves, coconut fibre, vegetable waste, loam soil were gathered.
December 21, 2021	Substrate Application	Putting of the collected substrates in the vermi drum.	collected substrates were applied in the vermi beds for anaerobic decomposition
January 3, 2022	Red wigglers (<i>Eisenia foetida</i>) Introduction	The vermi worm introduced in the substrated vermi beds were the Red wigglers (<i>Eisenia foetida</i>).	Red wigglers were introduced in each vermi beds.
January 4-12, 2022	Moistening the substrates and feeding the Red	Keeping the substrates moist	Moisture of 60% - 80%

	wrigglers	and feeding the red wrigglers.	of the substrate was provided regularly upon vermi worm introduction. Foods for the worms were also provided every other day such as vegetable wastes.
February 15,2022	First Harvesting of Vermicast	Collecting the vermicast	Two sacks of vermicast were Collected.
February 20,2022	Re-applying of Substrates	Application of new substrates in the vermi drum	collected substrates were re-applied in the vermi beds for anaerobic decomposition
March 5, 2022	Re-introduction of the Red Wrigglers	The Red wrigglers were re-introduced in the vermi bed.	Collected Red wrigglers from the surrounding fields were re-introduced in the vermi bed.

Vermicast:

The vermicast is a good organic fertilizer and soil conditioner. It is produced by the decomposition of organic matter or agricultural wastes. High-quality vermicast can be produced by worms such as the red wigglers (*E. foetida*). It contains humus with high levels of nutrients such as nitrogen, potassium, calcium, and magnesium.

The vermicast produced in the project was black and crumbly. It is rich in nutrients. It will be used in gardens, landscaping, horticulture, and agriculture. The vermicompost itself is beneficial for the land in many ways, including as a soil conditioner, a fertilizer, addition of vital humus or humic acids, and as a natural pesticide for soil.

CONCLUSIONS :

The Vermiculture and Vermicomposting activity is such a worthwhile and exciting venture. We have learned a lot specifically in the methodologies, benefits and significance of this activity.

After almost three months, we can therefore conclude that:

1. Vermiculture is a substantial way of reducing wastes, producing fertilizers and maintaining the balance of the ecological environment;
2. Vermicomposting can produce high-quality fertilizers which are better compared to other commercial fertilizers in the market;
3. Vermiculture converts farm wastes into organic fertilizer, making it an environment-friendly technology;
4. Vermiculture increases crop yield and lessens dependence on chemical fertilizers thus mitigating climate change;
5. Vermiculture can be made into a livelihood program and become a source of extra income through selling the vermicast and also the vermi worms;
6. Taking worms out of their natural environment and placing them in the vermi beds creates a human responsibility. They are living creatures with their own unique needs, so it is important to create and maintain a healthy habitat for them to do .

COLLECTION OF COW DUNG FROM THE COLLEGE SURROUNDINGS



PHOTOGRAPHS

TRANSFERRING THE SUBSTRATES TO DEPOSIT IN VERMI BED



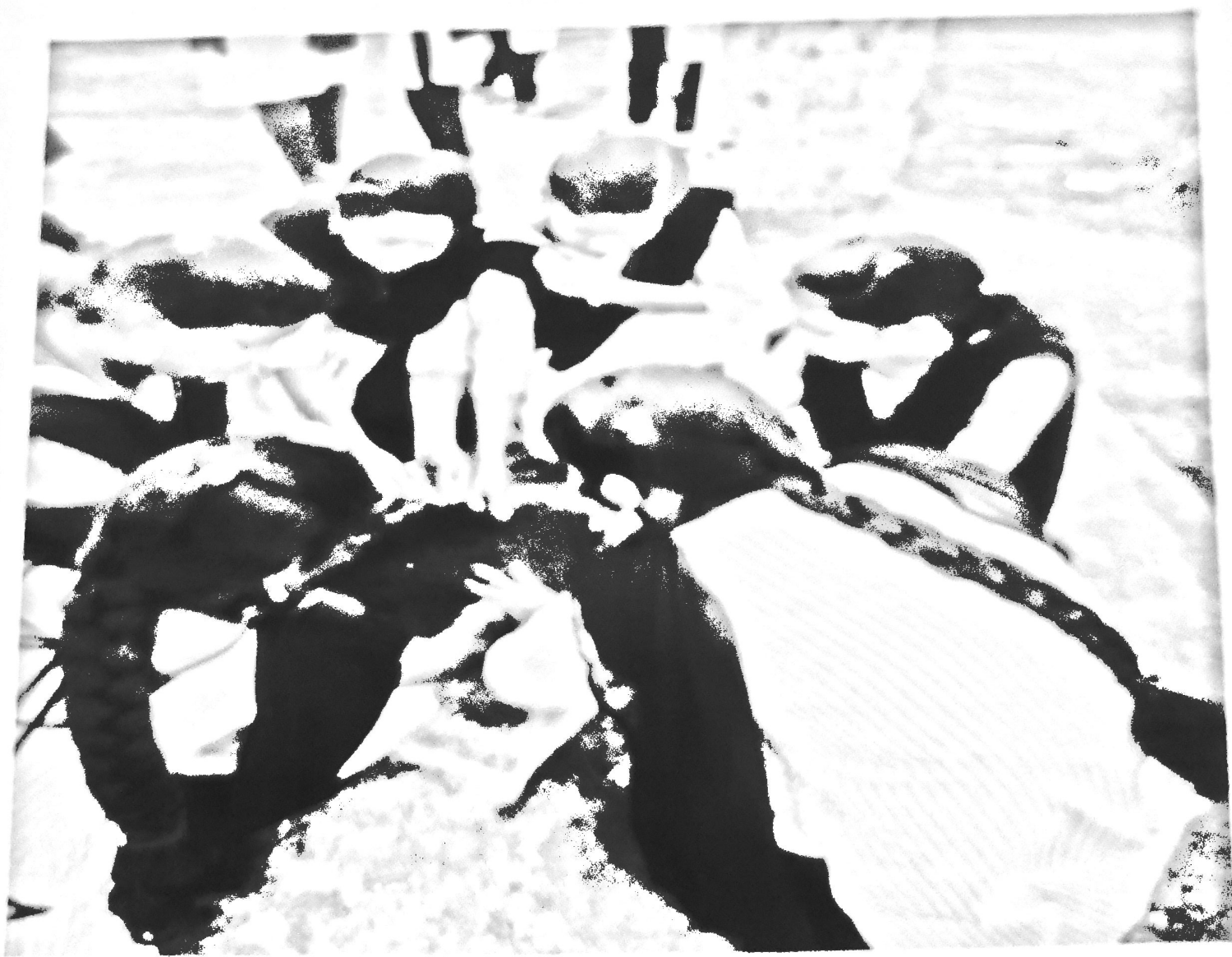
KEEPING THE SUBSTRATES IN THE VERMI DRUM



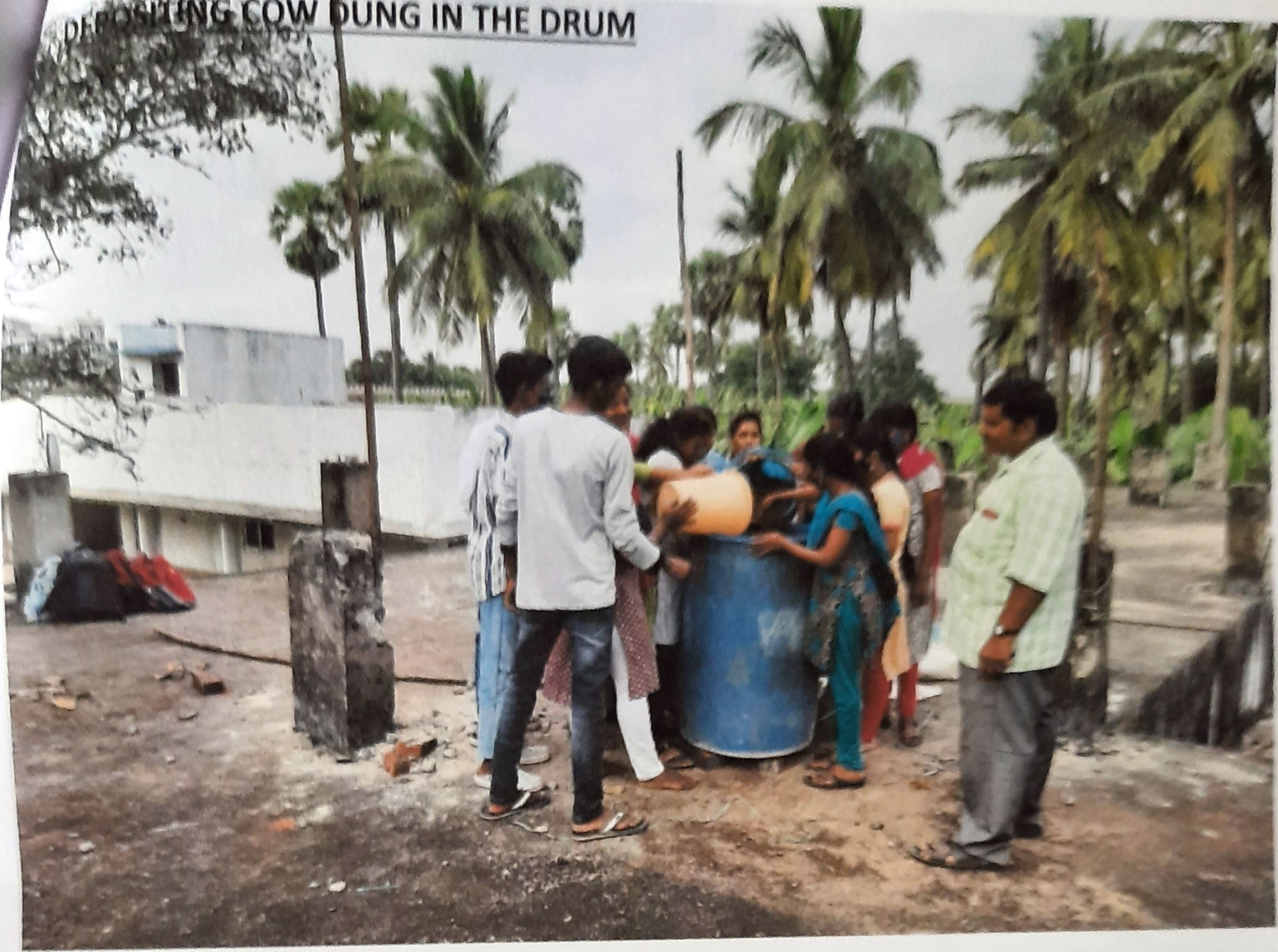
CUTTING DRIED FALLEN LEAVES INTO FINE PIECES



PREPARING LOAMY SOIL TO PREPARE VERMICOMPOST



DEPOSITING COW DUNG IN THE DRUM



COVERING VERMI DRUM WITH TARPULIN COVER



MOISTENING THE VERMI BED



VERMICOMPOST BED AFTER INTRODUCING EARTH WORMS





Signature of the students participated in vermicompost preparation

S.No	Name of the student	Signature of the student
1	S. RENUKA	S. Renuka
2	T.N.S. MADHURI	T.N.S. Madhuri
3	K. SIREESH	K. Sireesha
4	M. JYOTHSNA	M. Jyothsna
5	M. RENUKA	M. Renuka
6	N. MANI	N. Mani
7	B. RIYA	B. Riya
8	B. RAHUL	B. Rahul
9	K. RAMYA	K. Ramya
10	P. BHARATHI	P. Bharathi
11	B. ANU SREE	B. Anusree
12	K. MAHESH	K. Mahesh
13	M.S. NARSADRI	M. Saija narsadri
14	N. SANGEETHA	N. Sangeetha
15	D. RAMA KRISHNA	D. Rama Krishna
16	V.K. CHAITHANYA	V.K. Chaitanya
17	A.D. SNEHITHA	A.D. Snehitha
18	S. SANDEEP KUMAR	S. sandeep kumar
19	CH. VISWA TEJA	Ch. Uswateja
20	R. SATYA NARAYANA	R. Satya narayana
21	Y. NAGA DURGA ARUNA	Y. N.D. Aruna
22	E. PRASANNA KUMAR	E. Prasanna kumar
23	K. VANJITHA	K. vanitha

CH. ARUNA

CH. Aruna