MASSIVE OPEN ONLINE COURSE ON ORGANIC FARMING

JAIVA KRISHI: ARIVUM PADANAVUM

PROJECT REPORT

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SUBMITTED BY,

ANIMA KRISHNA

UNIVERSITY REG NO: 200021057444

KRISTU JYOTI COLLEGE OF MANAGEMENT AND TECHNOLOGY, CHANGANACHERRY

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CHAPTER 1
INTRODUCTION

Fertilizer is the most important component that the plant uses in its growth and development. Natural fertility of the soil takes a hundred years before it produces. Some decayed plants and animals are sources of organic fertilizer.By definition, organic fertilizers are derived from animal or vegetable matter, compost manure. In contrast, the majority of fertilizer is extracted from minerals (phosphate rock) or produced industrially (ammonia). Naturally occurring organic matter/organic fertilizers include animal waste from meat processing, peat, manure, slurry and guano. Organic farming produces nutrient rich, fertile soil which nourishes the plants. Keeping chemicals off the land protects water quality and wild life.

Organic farming gives benefits to man and to all livingorganisms in order to achieve high production in vegetable farming to add nutrients to the soil. Bone meal and blood meal are two fertilizer options that come from natural sources, enriching soil with nitrogen and phosphorous.
Blood meal is a natural way to boost all-important nitrogenlevels in the soil. Without nitrogen, plants simply can't grow. Scott (2004) said that blood meal is one of the richest non-synthetic sources of nitrogen, which is a crucial component of plant cells and one of the basic components of chlorophyll, the substance that helps plants convert sunlight into sugars.

Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.

Organic fertilizers are naturally available mineral sources that contain moderate amount of plant essential nutrients. They are capable of mitigating problems associated with synthetic fertilizers. They reduce the necessity of repeated application of synthetic fertilizers to maintain soil fertility. They gradually release nutrients intothe soil solution and maintain nutrient balance for healthygrowth of crop plants. They also act as an effective energy source of soil microbes which in turn improve soil structure and crop growth. Organic fertilizers are generallythought to be slow releasing fertilizers and they contain many trace elements. They are safer alternatives to chemical fertilizers. However, the improper use of organic fertilizers leads to overfertilization or nutrient deficiency in the soil. Hence, controlled release of organicfertilizers is an effective and advanced way to overcome these impacts and maintain sustainable agriculture yield.

Organic fertilizers comprise a variety of plant-derived materials that range from fresh or dried plant material
to animal manures and litters to agricultural by-products. The nutrient content of organic fertilizers varies greatly among source materials, and readily biodegradable materials make better nutrient sources. Nitrogen and phosphorus content is lower, often substantially lower, in organic fertilizers compared to chemical fertilizers. Moisture is another factor that reduces or dilutes the nitrogen and phosphorus concentrations of organic fertilizers. Thus, it can be cost ineffective to transport high- moisture organic fertilizer long distances. However, use of locally available sources is perfectly reasonable if its use is consistent with the production strategy.

Nutrient value of animal manures is more variable than that of agricultural by-products. The animal's diet, the use and type of bedding material, manure age, and how it was stored are factors that affect manure nutrient value; these factors can vary seasonally on and among farms, and regionally or on a larger geographic scale. In contrast, nutrient content of agricultural by-products is less variable but can be affected by the industrial process used to produce the by-product. However, it always is advisable to analytically determinethe nutrient content of the organic fertilizer.

Organic fertilizer is an essential source of plant nutrients and soil. Organic fertilizers differ from chemical fertilizers inthat they provide nutrients for your plants while creating healthy soil. They are considered a greener option. The nutrient elements contained in organic fertilizer are mostly inorganic state, so it is difficult for crops to use themdirectly. Through the action of microorganisms, a variety of nutrient elements are released slowly to provide nutrients to plants continuously.

Organic products are ideal for your landscape, because they feed the soil, creating a sustaining environment. Healthy soil leads to healthy plants.1 But when you garden organically, you do much more than nourish your plants. As in nature, an organic soil alive withmicrobes and fungi releases nutrients slowly to plants. By enriching the soil with organic supplements and encouraging the growth of naturally occurring beneficial organisms, you give your plants the tools they need to access nutrients in the soil and the strength to protect themselves from harmful pathogens and pests. Take the natural approach and amend with soil conditioners, such as earthworm castings, which add organic matter, including humid acid, and desirable microorganisms to your garden soil. This helps make soil borne nutrients, such as iron, moreavailable to plants.

Significance of Organic Fertilizer

With the continuous development of modern agriculture, the role of organic fertilizers in agricultural production is becoming more and more important. Agricultural products grown with organic fertilizers have good taste and can effectively maintain the unique nutrition and flavor of fruitsand vegetables, and also play a pivotal role in the protection and improvement of the soil environment.
Therefore, it is necessary for us to apply and understandorganic fertilizers.

Nowadays, there is a phenomenon in agricultural production that on one side, excessive use of chemical fertilizers brings soil acidification and eutrophication of water bodies, and on the other side, improper accumulationof livestock and poultry manure causes pollution. We replace chemical fertilizers through organic fertilizers, so that the combination of agriculture and animal husbandry more closely, the use of livestock and poultry manure, but also to improve the quality of agricultural products, which isa multi-benefit good.

Soils with large amounts of the organic matter remain looseand light, retain more water and nutrients and promote thegrowth of soil microorganisms, thereby improving plant health and root development. Organic fertilizers widely used for vegetables (tomatoes, lettuce, cucumber), fruits (strawberries, grapes, citrus), Cashcrops (grass, flowers, cannabis).

The Principal Role of Organic Fertilizer on soil properties

As a key component of agricultural sustainability, organicfertilizer contributes greatly to improving soil fertility. Therefore, the objective of this review is to revise the role of organic fertilizer on agricultural product and productivity.The newly sourced artificial fertilizer had a short-term benefit, but it had severe long-term side effect such as soil toxicity and decline soil fertility. Afterward, the idea of organic farming was acceptable to developed organic agriculture system. The use of organic fertilizers has advantage of being cheap, improving soil structure, texture and aeration increasing the soils water retention abilities and stimulating healthy root development. Organic fertilizerhas many sources such as minerals, animal source, sewage sludge and plant. Vegetables, animals and residue materialshad a contribution to improve soil organic matter content insoil. Therefor it is recommended that, using integrated nutrient management is a continuous improvement of soil productivity on longer term basis through appropriate use of organic fertilizers (animal manure, plants residue and sewage sludge) and their scientific management for increments of optimum growth, yield and quality of different crops.

Pros & Cons of Organic Fertilizer

1.Pros-

Boost both nutrient efficiency and organic matter content in the soil**.** It improves water movement into the soil and, in time, add structure to the soil. Organics feed beneficial microbes, making the soil more comfortable towork.

A. Enhanced soil fertility and improved soil texture,drainage, and aeration.
It can help the soil continuously condition and rejuvenated,thereby improving soil texture, drainage, and aeration.

B. Enhance the quality attributes of produce as well as yieldIt contains a large number of nutrients needed by plants, which provide relatively smooth and lasting nutrients to plants and have a long aftereffect.

C. Total Environmentally friendly
They are renewable, biodegradable, sustainable, andenvironmentally friendly.
It does not contain the harmful chemicals that contribute tothe pollution and contamination of water and land.

2.Cons-

Before nutrients can be released into the soil, microorganisms need to break down the organic components. As organisms need suitable temperature and sufficient water to do their jobs, the effectiveness of organicfertilizers is limited by these factors.
So organic fertilizers may take much longer to take effectthan chemical fertilizers.
But please be patient, when microbial populations re- establish themselves, organic fertilizers will be faster andmore efficient.

CHAPTER- 2

MATERIALS AND METHODS

2.1 LOCATION

College Place: KRISTU JYOTI COLLEGE CHANGANACHERRYKOTTAYAM DISTRICT

Student Place: KULATHOOR PO VAIPURPATHANAMTHITTA DISTRICT

2.2 Method Selected for Composting

BIN COMPOSTING:

BIO BINS are the earthen made similar to gardenpots, polypropylene pots.

Bins are usually made from recycled plastic and can come in different shapes—from square to cylindrical.All options have a lid to cover the container. These bins are a good cold-composting choice for urban and suburban locations. They do, however, present some difficulties. They cannot be used for hot composting, for example, because the closed bin makes it difficult to maintain the required temperature. The containers also hold a limited volume of material.

2.3 Sources of Waste

- Fruits and vegetables waste
- Crushed eggshells
- Coffee grounds and filters
- Tea bags
- Houseplants
- Neem leaves
- Kitchen wastes
- Sawdust
- Wood chips
- Hen waste
- Fish waste
- Fireplace ashes

NB: Plastic, battery, oily materials, bottles and liquifiedfood waste shall be avoided

2.4 Material Used for Composting

- Bio Bins
- Garden pots

2.5 Time taken for Composting

After completing all the steps for composting, an enrichedcompost manure will get after 40-65 days

2.6 Weather Conditions Prevailed

The changes occurring in weather condition does not affect the composting process. Composting process can be done either summer or monsoon season. I had initiated the composting processon summer season. The materials required for making the compost has been kept close the changes of weather condition does notaffect the composting process.

COMPOSTING PROCESS

In this process, three pots are used

1. First, collect our household waste both dry and wet in our kitchen. Leftovers of food, fruit peels, and tea bags are wet wastewhereas dry leaves, paper, are dry waste

2. Secondly, put both these wastes in two different containers in the kitchen. When the wet waste container isfull, put its contents into the first compost pot.

3. Then add dry leaves of the same quantity as the waste and semi-composted material, buttermilk or cow dung to start with the decomposition process.

4. Turn the pile around every other day. Keep the pile at theright level of dampness. If it is too wet, add dry leaves and stir and if it is too dry add water and stir.

5. Once it is full, leave the pot open for 30-45 days for thecomposition to happen. Then move the semi-composted matter into a larger container or bin.

6. After 45 -60 days of the last filling the compost is takenout.

CHAPTER -3

OBSERVATIONS AND DATA COLLECTIONS

Table.1. Process of Garden pot filling

POT	DATE OF POT FILLING	KITCHEN WASTE		DRY WASTE		
		Types	Approx. weight	Types	Approx. weight	
1	10/01/2022	Veg waste and fish waste	500g	Dry leaves	600g	
2	10/01/2022	Bananapeel	3	Newspaper	2 sheets	
3	Egg shell rice water					

Table2. Observation on the composting process

SL NO	DATA COLLECTED	FIRST DAY 10/01/2022	AFTER 7 DAYS 17/01/2022	AFTER 14 DAYS 24/01/2022	AFTER 21 DAYS 31/01/2022	FINAL DAY 20/02/2022
1	COLOUR	MIXED	BROWN	GREYISH BROWN	DARK BROWN	BROWN BLACK
2	CONSISTEN CYNATURE	WET AND DRY	SOLID DRY	SLURRY	CRUSTY	LIKE SOIL
3	SMELL	YES	NO	NO	NO	SOIL SMELL
4	MOISTURE	MOIST	MOIST	MOIST	DRY	DRY
5	OBSERVED ANTS /HOUSE FLIES	YES	NO	NO	NO	NO
6	APPROX. TOTAL WEIGHT	1.5 kg				

CHAPTER- 4

PHOTO GALLERY

IMPLEMENTATION AND MATERIALS USED

CHAPTER 5

COST BENEFIT ANALYSIS

The whole project was performed with no investment. Most of the things were available nearby. As bins were not available here, I have used garden pots. Cow dung were brought from nearby houses. This brings a clear understanding that more organic fertilizer can be generated and cultivate organic vegetables in our home itself. By making the organic manure there is no loss because most of the materials used are easily available at my house. The projectrequires some sort of physical hard work which made us familiarwith our nature.

CHAPTER 6

CONCLUSION

Composting is an easy, enjoyable and can be done almost anywhere. Composting is an easy way to deal with problems such as air pollution, environment pollution and such other related problems. By composting one can produce nutrient rich soil that are beneficial to plants.

By doing organic composting as project at home I realized the use and significance of making manures at home with 0 investment. Composting can also improve soil fertility and can offer protection from potential plant diseases as well.

Proper composting can ensure minimum pests as the compost itself contains various micro-nutrients that act as pesticides. Composting organic waste can help in reducing the overall impact on the environment. Composting at home can be a fun activity when we have people to help & guide us.

I used the produced compost to all my plants and the growth was surprising. Since we used organic manures, harvesting was more than we expected.

CHAPTER 7

ABSTRACT

Organic manure is good for both our crops and soil. As the population increases wastes per sector also increases. So asan initiative to decrease the waste in an effective way zero waste management programmes are implemented. For our small-scale gardening in our home, setting up a bio compostis highly recommended. I was also able to learn more aboutorganic manure and composting process through the MOOC course given by MG University. This compost making was a good experience as well as very enjoyable.