

BASELIOS POULOSE II CATHOLICOS

COLLEGE, PIRAVOM

MOOC ORGANIC
FARMING
REPORT 1

SUBMITTED BY,

AASTLE MATHEW S

BSC ELECTRONICS

DECLARATION

I, AATHIRA JEEVAN, Reg. No 230021041885 of BSC Programme,2023-2026, hereby declare that this report entitled MOOC Organic Farming Report is the record of authentic work carried out by me as a part of MOOC on Organic Farming offered by Mahatma Gandhi University, Kottayam, and has not been submitted to any other university for the award of any degree/Diploma.

Place: Piravom

Signature of Student:

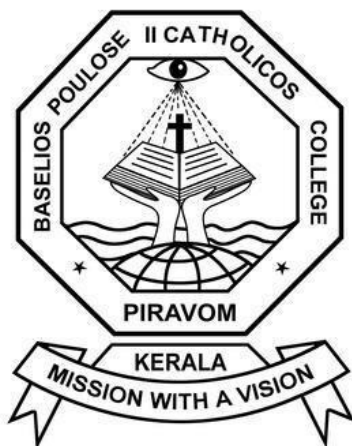
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Name of Student

BASELIOS POULOSE II CATHOLICOS COLLEGE

PIRAVOM

DEPARTMENT OF COMPUTER APPLICATIONS



CERTIFICATE

Certified the bonafide record of project work done by Ms.
AASLE MATHEW S with Reg. No 230021041885 of BSC
Programme,2023-2026(year of study) as a part of MOOC on
Organic Farming offered by Mahatma Gandhi University,
Kottayam.

Place: Piravom

Head of Department :

Mentor

Date & Seal

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DATE OF SUBMISSION :

SEMESTER : SIXTH SEMESTER

ABSTRACT

Organic manure farming has gained significant attention in recent years as a sustainable and environmentally friendly approach to agriculture. This abstract provides an overview of the key aspects and benefits of organic manure farming.

Organic manure, derived from organic materials such as compost, animal dung, and crop residues, plays a crucial role in improving soil fertility and promoting healthy plant growth. It enriches the soil with essential nutrients, enhances its water-holding capacity, and fosters a diverse and balanced soil microbiome.

This paper explores the various types of organic manures, their preparation methods, and the importance of nutrient balance in organic farming systems. It highlights the role of organic manure in reducing chemical fertilizer dependency, mitigating soil degradation, and enhancing crop yield and quality.

INTRODUCTION

Organic manure farming, often referred to as organic farming or organic agriculture, represents a holistic and sustainable approach to cultivating crops and raising livestock. In contrast to conventional farming methods that heavily rely on synthetic chemicals and fertilizers, organic manure farming centers on the utilization of organic materials to enhance soil fertility, nurture plant health, and promote environmental stewardship. This introduction provides an overview of the fundamental principles, historical roots, and the growing importance of organic manure farming in modern agriculture.

Organic manure farming is deeply rooted in traditional agricultural practices that date back centuries. Long before the advent of synthetic chemicals, farmers relied on natural materials such as compost, animal dung, and crop residues to replenish soil nutrients and sustain crop yields. These age-old techniques were based on the

principles of recycling and harnessing the regenerative power of the natural ecosystem.

ADVANTAGES

1. Soil Health: Organic manures enrich the soil with essential nutrients, improve its structure, and stimulate beneficial microbial activity. This focus on soil health is fundamental to organic farming.
2. Chemical-Free: Organic manure farming avoids the use of synthetic chemicals, pesticides, and genetically modified organisms (GMOs). Instead, it relies on natural and sustainable methods for pest and weed control.
3. Biodiversity: Organic farms often promote biodiversity by providing habitat for beneficial insects, birds, and other wildlife. Crop rotation and polyculture are common practices in organic systems.

4. Sustainability: Organic manure farming is aligned with the principles of sustainability. It seeks to minimize the environmental impact of agriculture by reducing greenhouse gas emissions, conserving water, and protecting natural resources.

5. Healthy Food: Organic produce is perceived as healthier and safer by consumers, as it generally contains fewer pesticide residues and synthetic additives.

6. Local and Community-Based: Organic farming often supports local economies and communities by fostering direct relationships between farmers and consumers through farmers' markets and community-supported agriculture (CSA) programs.

FARMING

1. Soil Health and Fertility:

- Compost: Organic farmers use compost, which is composed of decomposed organic matter like kitchen scraps, crop residues, and manure, to enrich soil with nutrients and improve its structure.
- Cover Crops: Cover crops like clover and legumes are planted to protect and enhance soil between main crop seasons. They help prevent erosion, fix nitrogen, and improve soil health.
- Crop Rotation: Organic farmers practice crop rotation to prevent soil depletion and reduce the buildup of pests and diseases associated with specific crops.

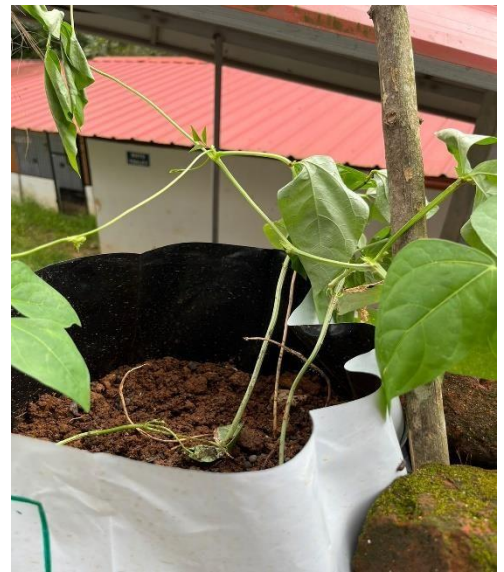


2. Natural Pest Management:

- **Beneficial Insects:** Encouraging natural predators like ladybugs, spiders, and parasitic wasps helps control pests without chemical intervention.
- **Biological Control:** Introducing beneficial organisms, such as nematodes or bacteria, to control specific pests.
- **Trap Crops:** Planting attractive crops near the main crop to divert pests away from valuable plants.

3. Weed Management:

- Mulching: The use of organic mulches like straw or wood chips suppresses weeds and retains soil moisture.
- Mechanical Methods: Manual weeding, tilling, and the use of flame weeders can be employed to control weeds without herbicides.



4. Non-GMO and Organic Seeds:

- Organic farming prioritizes the use of non-GMO and organic seeds, avoiding genetically modified organisms commonly used in conventional agriculture.

5. Livestock Integration:

- Organic farms may include livestock as part of their system, using their manure to fertilize fields and rotating animals through pastures to prevent overgrazing.

COMPOST

Organic compost is a nutrient-rich, dark, crumbly substance created through the natural decomposition of organic materials. Composting is an eco-friendly and sustainable way to recycle kitchen and garden waste, returning valuable nutrients to the soil for plant growth.

Appeared as Dark Brown to Black in color: Organic compost typically has a dark, earthy color due to the decomposition of organic matter.

Crumbly Texture: It has a crumbly, friable texture that is easy to handle and spread.

Nutrients: Compost is rich in essential plant nutrients such as nitrogen (N), phosphorus (P), and potassium (K), along with other micronutrients. These nutrients are released slowly and provide a natural source of nourishment for plants.

Homemade Compost can be produced at home using a compost bin, pile, or tumbler.

Commercially Many garden centres and suppliers offer bagged or bulk compost for purchase.

Composting reduces landfill waste and methane emissions, contributing to a more sustainable environment.

Composting can take a few months to a year, depending on various factors such as temperature, moisture, and the mix of materials.

Compost can be part of homemade or commercial potting mixes for potted plants.

It's used as a top dressing for existing plants to provide slow-release nutrients and improve soil health.



COWDUNG

Cow dung is a valuable resource for organic farming, serving as an effective compost material. Its use in agriculture dates back centuries, owing to its numerous advantages. Cow dung is nutrient-rich, containing essential elements like nitrogen, phosphorus, and potassium, which are released gradually during decomposition, providing a consistent nutrient supply to plants. Additionally, it contributes organic matter to the

soil, improving its structure and water retention capabilities, making it particularly beneficial for soils with poor fertility. Cow dung also introduces beneficial microorganisms to the soil, enhancing microbial diversity and aiding in the breakdown of organic matter, making nutrients more accessible to plants. Its near-neutral pH helps balance soil acidity, making it suitable for a wide range of crops. To ensure its safe and effective use, cow dung should be composted before application to mitigate the risk of harmful pathogens

It can be mixed with other organic materials to create a balanced compost mix and applied as a soil amendment or mulch while avoiding direct contact with plant roots and stems. Quality control is essential, as cow dung should come from healthy cows, and caution should be exercised to avoid dung from animals treated with antibiotics or medications. Incorporating cow dung into organic farming practices is just one element of a holistic approach that includes crop rotation, cover cropping, and natural pest management to maintain soil health and achieve sustainable crop production, all while adhering to local agricultural regulations and guidelines.

KITCHEN WASTE

Composting kitchen waste is a sustainable and ecofriendly practice that can significantly reduce the amount of organic material sent to landfills while producing nutrient-rich compost for your garden. The first step in kitchen waste composting is to set up a designated container in your kitchen for collecting organic waste. It's essential to use a lidded container to prevent odors and discourage pests. Suitable materials for composting include fruit and vegetable peels, coffee grounds, tea bags, eggshells, and non-meat food scraps. However, it's crucial to avoid including meat, dairy products, oily or greasy items, and diseased plant material in your kitchen waste compost. These materials can attract pests and slow down the composting process.

To create a balanced compost pile, mix your kitchen waste with other organic materials like leaves, grass clippings, and small branches. This mixture helps maintain the right carbon-to-nitrogen ratio for efficient decomposition.

Aeration is another essential aspect of kitchen waste composting. Regularly turn or mix the compost pile to provide oxygen to the microorganisms responsible for breaking down the waste. This helps prevent unpleasant odors and accelerates decomposition.

Maintaining the proper moisture level is crucial. Keep your compost pile adequately moist, similar to a damp sponge. If it becomes too dry, decomposition will slow down, but if it's too wet, it may become smelly and anaerobic.



POULTRY WASTE

Poultry waste can be a valuable asset in organic farming when employed judiciously. Poultry waste, comprising manure and bedding materials like straw or wood shavings, carries essential nutrients that can enrich soil

fertility and stimulate plant growth. To harness its benefits, it should undergo composting prior to application, reducing pathogens and odor while stabilizing nutrient content.

The timing of its application, often in the fall for winter decomposition, is crucial to ensure nutrient availability for subsequent crops and minimize runoff risks during heavy rainfall. Adherence to local regulations regarding application rates and environmental safeguards is paramount. Regular soil testing is advisable to tailor poultry waste application to specific crop needs and avoid nutrient overload.

Practicing crop rotation, diversifying crops, and ensuring disease-free waste further enhances its utility in organic farming, promoting sustainable and healthy crop production when integrated into a comprehensive organic farming approach.

Poultry waste, rich in nitrogen, phosphorus, and potassium, stands as a valuable source of nutrients. However, its nutrient concentration mandates careful use to avoid over-fertilization, which could harm both plants and the environment. Its integration into organic farming necessitates a holistic approach, combining practices like crop rotation, cover cropping, and natural pest management. Choosing the right crops for poultry

waste application is also pivotal some, such as leafy greens, benefit from the high nitrogen content, while others, like root crops, may require lower nitrogen levels to prevent excessive top growth.

Moreover, maintaining proper hygiene and disease management in poultry facilities can mitigate the risk of contamination in poultry waste. When thoughtfully managed and integrated into a broader organic farming strategy, poultry waste can significantly enhance soil health, fertility, and overall sustainability while promoting the production of healthy and nutritious crops.





SEEDS

1. Pea Seeds:

Scientific Name: *Pisum sativum*

Description: Peas are a cool-season vegetable and are typically grown for their edible green pods or seeds. The seeds are round or oval and come in various colors, including green, yellow, and purple, depending on the variety.

Planting: Pea seeds are usually sown directly in the garden in early spring or late summer for a fall crop. They prefer well-drained soil and full sun to partial shade.

Germination Time: Pea seeds typically germinate in 7-14 days under suitable conditions.

Growth: Pea plants grow as vines and require some form of support, such as trellises or stakes, to climb. They produce sweet, tender pods that can be harvested when young for fresh eating or allowed to mature for dried peas.

2. Brinjal (Eggplant) Seeds:

Scientific Name: *Solanum melongena*

Description: Brinjal is a warm-season vegetable known for its glossy, often purple, elongated or round fruits. These fruits are typically used in various culinary dishes around the world.

Planting: Brinjal seeds are usually started indoors 6-8 weeks before the last frost date in your area. Once the weather warms up, you can transplant the seedlings into the garden. They thrive in well-drained soil and full sun.

Germination Time: Brinjal seeds typically germinate in 5-10 days under suitable conditions.

Growth: Brinjal plants grow as bushy or sprawling shrubs. The fruits come in various shapes and colors, including purple, black, white, and green. They are

harvested when mature and can be used in a wide range of dishes, from stir-fries to curries.

3. Spinach Seeds:

Scientific Name: *Spinacia oleracea*

Description: Spinach is a cool-season leafy green vegetable known for its tender, dark green leaves. It's rich in vitamins and minerals, making it a popular choice for salads and cooking.

Planting: Spinach seeds can be sown directly in the garden as early as 2-4 weeks before the last frost date in the spring or in late summer for a fall crop. They prefer well-drained, fertile soil and can tolerate partial shade.

Germination Time: Spinach seeds typically germinate in 7-14 days under suitable conditions.

Growth: Spinach forms rosettes of leaves that can be harvested as baby spinach or allowed to mature for larger leaves. It's a fast-growing plant that can be harvested multiple times during the growing season.

LAND PREPARATION

Ensure that the soil is not too dry. If it is too dry, it will be brittle or hard to touch. Water the ground well.

Ensure the soil is not too wet. Obvious signs include

instances in which the ground is muddy. Remove weeds and debris.

Remove the top layer of soil from your row or bed one shovel head deep. Loosen soil that lies beneath your excavated area with a shovel, pick or fork. Refill with soil that was already excavated. Avoid stepping on or compacting your newly loosened soil.

- ✓ Liming – Soil PH is important for the growth of plants. Plants absorb major nutrient in the range of PH 6-7. When Kerala is considered, most soils are acidic in nature. In order to increase PH – added 15 – 20 gram lime per grow bag.
- ✓ Basal Manuring – Basal fertilization is also known as pre-planting fertilization, has the main purpose to increase soils biological fertility and concentration of mineral elements, providing big quantities of lacking nutrients. Basal manure was prepared out of bone meal and neem cake. I also added coir fibre and dry leaves.
- ✓ Grow bag fitting – I used grow bags and old plastic bags. I placed some coir fibre and dry leaves at the basal part of the grow bag for effective drainage of water. Then I filled $\frac{3}{4}$ of the grow bag with potting mixture that I had already prepared. Mixed a little neem cake and bone meal about half way through.

We have to tap the grow bag while filling to ensure that there are no empty spaces and the grow bag can stand rigidly. The grow bag is now ready.

- ✓ Seeding and planting – Store seeds in a cool, dry place until you are ready to sow them. The seeds were soaked in water for 2-3 hours prior to planting. After planting water was sprayed into it for better growth

AGRICULTURAL IMPLEMENTS

- ✓ Garden hand gloves
- ✓ Trowel
- ✓ Hoe
- ✓ Sprayer
- ✓ Water can
- ✓ Scissors
- ✓ Bucket
- ✓ Knife
- ✓ Hand rake
- ✓ Garden spade

✓ Grow bags

✓ Used plastic Sacks

✓ Plastic mug

PLANTING DETAILS

Excellent soil filled with nutrients is one of the major key to a successful organic garden. Well, draining soil encourages your plants to produce strong roots systems. The selected soil is mixed with calcium carbonate, bone meal, neem cake, dry leaves. Then the potting mixture is filled into grow bags.

- Spinach: I loosened the fertilized soil by digging down deep in the grow bag. Later I sowed the spinach seeds by simply scattering the seeds. Then I covered the seed lightly with soil, firmed it and watered well. I kept the soil moist until germination
- Cow Peas: I soaked the seeds overnight and directly sowed in a warm, sunny location. I planted the seeds 2 inches deep with the eye of the seed facing down.
- Chilli: I placed the chilli seeds between 12 damp paper towels and sealed them in a plastic bag and set them in a warm area for 2-5 days. Spread the seeds in the grow bag on top about 2 inches(5cm) apart. Then, I lightly covered them with soil. After that, I misted the

seeds with water and cover the grow bag with plastic wrap. Later, I set it back in a warm area and watched as they sprouted in about 2 weeks .

MANURES

Manure is an Organic matter derived from solid animal waste, such as that of cows, chickens etc. It's a valuable resource in gardening and agriculture due to its nutrient-rich composition. Manure contains essential elements like nitrogen, phosphorus, and potassium, along with other micronutrients, which promote plant growth. It serves as a natural fertilizer, enhancing soil fertility and supplying plants with the nourishment they need to thrive. Beyond nutrients, manure also improves soil structure, encouraging better water retention, drainage, and microbial activity. To ensure its effectiveness and avoid potential issues, manure is often composted before use, breaking down any harmful pathogens or weed seeds. This versatile substance can be incorporated into the soil, applied as a top dressing, or used as a mulch, benefiting a wide range of crops and gardens while promoting sustainable agricultural practices. Manures can be grouped as:

✓ Green manure- Green manure refers to cover crops or plants

that are intentionally grown and then incorporated into the soil to improve its fertility and structure. These plants are often grown during fallow periods or in between main crops. When the green manure is tilled into the soil, it adds organic matter, improves soil structure, and releases nutrients as it decomposes.

✓ Farmyard manure (FYM) - FYM is an organic fertilizer produced

from a mixture of animal dung, urine, bedding materials, and

other organic waste found on farms. As this mixture decomposes naturally, it becomes a nutrient-rich substance

that provides essential elements such as nitrogen, phosphorus, and potassium to plants. FYM enhances soil structure, moisture retention, and microbial activity, promoting healthy plant growth. It can be applied by mixing it into the soil before planting, spreading it on the soil surface, or composting it to improve its quality. FYM is a time-tested agricultural practice that enriches soil fertility, supports sustainable farming, and contributes to overall soil health.

✓ Compost manure - Compost manure is a nutrient-rich and well-decomposed organic material created through the controlled decomposition of various organic

waste materials, such as kitchen scraps, yard trimmings, leaves, and plant residues. Through a natural process called composting, these materials break down into a dark, crumbly substance that is a valuable addition to soil. Compost manure is teeming with beneficial microorganisms that aid in nutrient cycling, and it offers numerous benefits to gardening and agriculture. It improves soil structure, enhances water retention, encourages microbial activity, and gradually releases nutrients essential for plant growth. Compost manure can be applied as a soil amendment, mixed into planting beds, used as a top dressing, or incorporated into potting mixes. Its environmentally friendly nature and ability to recycle organic waste make compost manure an essential component of sustainable farming and gardening practices.

Manures used:

- ✓ Dry leaves – It feeds earthworms and beneficial microbes. They help sandy soil to retain moisture. I used dry leaves in basal application and top application of all plants.
- ✓ Cow dung – It is an organic manure which is highly rich in organic matter which helps the soil aeration and breakup of compacted soils.

✓ Bone meal – It is a mixture of finely and coarsely ground animal's bones and more. It is rich in phosphorus and calcium.

✓ Chicken manure - Chicken manure is the waste produced by domesticated chickens, commonly used as a fertilizer in agriculture and gardening. It is a rich source of nutrients due to the high protein content of chicken diets. Chicken manure consists of a mixture of feces, urine, bedding materials (like straw or wood shavings), and feathers.

✓ Neem cake - Neem cake is a natural and organic fertilizer produced from the leftover residue of neem seeds. After extracting oil from neem seeds, the solid material that remains is crushed to create neem cake. This cake is a valuable agricultural product due to its multifaceted benefits. It contains essential nutrients like nitrogen, phosphorus, and trace elements, acting as a slow-release fertilizer that enriches soil and promotes plant growth. Beyond its nutrient content, neem cake also serves as a natural pest repellent and soil conditioner. It deters pests and soil-borne pathogens, enhances soil structure, and encourages beneficial microbial activity. Neem cake's dual role in nourishing plants and protecting them from pests makes it a popular choice sustainable farming and gardening practices

OBSERVATION TABLE

Growth Stage	Peas	Brinjal (Eggplant)	Spinach
Germination	7-14 days	5-10 days	7-14 days
Seedling stage	2-4 weeks	4-8 weeks	2-4 weeks
Fruit/Pod Formation	Pods form, peas develop	Fruits (eggplants) develop	Leaves continue to grow
Harvesting	Harvest when pods are tender	Harvest when eggplants are mature	Harvest leaves as needed



MOOC ORGANIC
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REPORT-2

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Head of Department :

Mentor

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DATE OF SUBMISSION :

SEMESTER : SIXTH SEMESTER

BENEFITS OF COMPOSTING:

- ✓ Waste Reduction
- ✓ Soil Enrichment
- ✓ Reduced Need for Synthetic Fertilizers
- ✓ Soil Erosion Prevention
- ✓ Improved Plant Growth
- ✓ Reduction in Pesticide and Herbicide Use
- ✓ Carbon Sequestration
- ✓ Cost Savings
- ✓ Sustainable Agriculture
- ✓ Reduces Methane Emissions

1. Vermicomposting:

- Description: Vermicomposting is a composting method that uses earthworms (typically red wigglers or *Eisenia fetida*) to break down organic matter into nutrient-rich compost. The worms consume kitchen scraps, yard waste, and other organic materials, digesting them and transforming them into vermicompost, which is a highly fertile and nutrient-rich soil amendment.

- Suitable Materials: Kitchen scraps (fruit and vegetable peelings, coffee grounds, etc.), paper products, yard waste, and small amounts of cardboard.
- Process: Worms are placed in a specially designed vermicomposting bin with bedding material, and organic waste is added regularly. The worms and microorganisms in the bin break down the organic matter, creating vermicompost over time.
- Benefits: Vermicompost is an excellent organic fertilizer and soil conditioner. It improves soil structure, enhances plant growth, and increases nutrient availability to plants.

2. Kitchen Waste Composting:

- Description: Kitchen waste composting, as the name suggests, focuses on composting organic waste generated in the kitchen. This method is convenient for households and helps reduce the amount of kitchen waste that goes to landfills.
- Suitable Materials: Fruit and vegetable scraps, coffee grounds, tea bags, eggshells, and other kitchen organic waste.
- Process: Kitchen waste is collected in a compost bin or container in the kitchen and then transferred to an outdoor compost pile or composting system. The waste is mixed with other compostable materials, such as yard waste, to create a balanced compost mixture.

- Benefits: Kitchen waste composting reduces landfill waste, promotes sustainability, and produces nutrient-rich compost that can be used to enrich garden soil.

3. Poultry Waste Composting:

- Description: Poultry waste composting is a method used to manage and convert the organic waste generated in poultry farming, such as chicken manure and bedding material, into valuable compost.
- Suitable Materials: Chicken manure, straw or wood shavings (used as bedding material), and other organic waste from poultry operations.
- Process: Poultry waste is collected and mixed with carbon-rich bedding material (e.g., straw) to create a balanced carbon-to-nitrogen ratio. The compost pile is regularly turned and managed to ensure proper decomposition.
- Benefits: Poultry waste composting reduces odors, pathogens, and the risk of water pollution associated with raw poultry manure. The resulting compost can be used to improve soil fertility and structure in agricultural or gardening applications.



COST BENEFIT ANALYSIS

A Cost Benefit Analysis (CBA) is a process that is used to estimate the costs and benefits of decision in order to find the most cost effective alternative.

EXPENDITURE

Grow bag = $5 * 12 = 60$

Organic fertilizer = 160

Biopesticides = 120 Seeds

= $20 * 2 = 40$

Total Expenditure = $60 + 160 + 120 + 40 = 380$

INCOME

COWPEA = $85 * 3 = 255$

GREEN CHILI = $60 * 4 = 240$

Total income = $255 + 240 = 495$

Profit = $495 - 380 = 115$

CONCLUSION

In conclusion, organic farming is a holistic and sustainable approach to agriculture that prioritizes environmental health, biodiversity, and the well-being of both farmers and consumers. It relies on natural processes, eschews synthetic chemicals and genetically modified organisms, and encourages responsible soil and resource management.

Organic farming fosters soil fertility through practices such as composting, crop rotation, and cover cropping, which, in turn, yields healthier and more nutritious crops. Moreover, by minimizing the use of chemical pesticides and fertilizers, it reduces the ecological footprint of agriculture and safeguards the long-term viability of the land.



Organic farming also supports biodiversity by creating habitat-rich environments that encourage beneficial insects and other wildlife, thereby promoting natural pest control. It champions ethical treatment of animals, with stringent guidelines for their care and humane treatment. Furthermore, consumers benefit from organic farming by having access to food that is free from synthetic additives and pesticide residues, contributing to better health outcomes.