NEW ERA AGRICULTURE MAGAZINE

Organic farming in agriculture

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Introduction

For over ten years, sustainable development has captivated the interest and attention of people worldwide. Achieving sustainable development requires sustainable agriculture. As stated According to FAO, the Food and Agriculture Organization, sustainable Agriculture is the effective use of resources to agriculture to meet evolving human demands while preserving or improving environmental quality and preserving natural resources." Sustainable agriculture is defined in a variety of ways. emphasis on preserving the rate of growth in agriculture, which can satisfy every living thing's need for food without depleting the fundamental materials.

The production method known as "organic farming" minimizes the use of pesticides, fertilizers made artificially, growth regulators, genetically modified organisms, and additives in animal feed. To maintain soil productivity and tilth to supply plant nutrients and control insect, weed, and other pests, organic farming systems, to the greatest extent possible, rely on crop rotations, the use of crop residues, animal manures, legumes, green manures, off-farm organic wastes, biofertilizers, mechanical cultivation, mineral-bearing rocks, and aspects of biological control.

It is therefore crucial to practice organic farming, which is a comprehensive production management approach that supports and improves the health of the agro-ecosystem, including biodiversity, biological cycles, and soil biological activity. Numerous studies have demonstrated that yields from organic farming can surpass those from conventional farming. Notable variations were also observed in soil health indicators, which were higher in the organic farms and included nitrogen mineralization potential, microbial abundance, and microbial diversity. Additionally, organic farms' improved soil health led to a significant decrease in the prevalence of pests and diseases. The focus on integrated farming systems on a small scale has promise for reviving rural economies.

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Advantages of organic farming

1. By lowering pollution, it contributes to maintaining the health of the environment.
2. By lowering the amount of residues in the product, it lessens the health risks to humans and animals.
3. It aids in maintaining a sustainable level of agricultural output.
4. In addition to lowering agricultural production costs, it also enhances soil health.
5. It guarantees the best possible use of natural resources for immediate gain and contributes to their preservation for future generations.
6. It not only lowers the chance of crop failure but also saves energy for both machines and animals.
7. It enhances the physical characteristics of the soil, reducing erosion and improving water-holding capacity as well as granulation, good tilth, good aeration, and easy root penetration.
8. It enhances the chemical characteristics of the soil, including nutrient availability and retention, and decreases nutrient

Nutrient management in organic farming

Building healthy soil that is rich in organic matter and has all the nutrients required by the plants is a continuous task in organic farming. To increase soil fertility, a variety of techniques can be applied, such as green manuring, adding manures and biofertilizers, etc. In addition to providing the soil with various nutrients, these organic sources also aid in weed control and boost soil organic matter, which provides food for soil microbes. High organic matter soil stores water better, resists soil erosion, and requires less irrigation. It is also possible to add some naturally occurring minerals that the plants require for growth and to enhance the consistency of the soil. The pH balance of the soil is adjusted by adding soil additives, such as lime. But the least amount of heavy metals should be present in water and soil amendment. Recycled byproducts from other industries that would otherwise go to waste make up the majority of the organic fertilizers used. Compost is also made by farmers from mushroom compost and animal dung. In order to kill undesirable bacteria and weed seeds, compost must be heated and aged for at least two months, reaching and maintaining an internal temperature of 130°–140°F. Only then can it be applied to the fields. Depending on availability and crop suitability, a variety of organic fertilizers, amendments, and bacterial and fungal biofertilizers can be used in organic farming. The following lists the various organic inputs that are available:

Organic matter

High application rates are required to meet crop nutrient requirements because

commonly available and applied materials like farm yard manure (FYM), vermicompost, etc., generally have low nutrient contents. Unfortunately, the availability of organic manures in many developing nations, including India, is insufficient to meet crop requirements. This is partially because of the country's extensive use of cattle dung in the production of energy. Using green manuring techniques such as cowpea, green gram, and sesbania can significantly increase the amount of organic matter in the soil.

Biofertilizer

Contribution of biological fixation of nitrogen on surface of earth is the highest (67.3%) among all the sources of N fixation. Following bacterial and fungal biofertilizers can be used as a component of organic farming in different crops.

Weed management in organic farming

Chemical herbicides cannot be used in organic farming. Therefore, weeding can only be done by hand. To control weeds, various cultural practices such as tillage, flooding, and mulching can be employed. Additionally, the loss caused by weeds can be managed using the biological (pathogen) method. A cover crop can be planted on fallow land to improve soil quality and reduce weed growth. Whenever possible, use drip irrigation to limit the amount of water that reaches the plant line, thus inhibiting the growth of weeds.

Pest management in organic farming

In organic farming, the where and when of pest presence is predicted in advance, and planting schedules and locations are modified appropriately to minimize major pest issues. Increasing the number of beneficial insects—whose larvae eat the eggs of pests—is the primary method of battling harmful pests. Establishing borders (host crops) around fields planted with combinations of flowering plants that the beneficial insects especially enjoy is essential to establishing a population of beneficial insects. After that, beneficial insects are periodically released into the fields, where the host crops act as their base of operations and gradually draw in more beneficial insects.

Disease management in organic farming

Plant diseases are a major factor in crop yield and quality reductions in low-input and organic production systems. Crop resistance to specific diseases can be increased by applying crop rotation and providing crops with a balanced supply of macro- and micronutrients. Thus, healthy soil that is teeming with beneficial organisms is one of the main benefits of organic farming. These beneficial bacteria, fungi, and microbes control the bad bacteria and fungi that cause illness.

Constrants of organic farming in india

1. The biggest issue facing organic farmers is marketing their produce.

2. The biggest obstacle to selling organic products is consumer and buyer ignorance.
3. Furthermore, only the wealthy and foreigners can afford the high cost of organic products. Before making a purchase, consumers should confirm that the produce is certified organic.
4. Growers of organic produce are unable to afford the cost of obtaining an organic certification.
5. Absence of organic sales units.
6. With the exception of Germany and Austria, where 2-3% of their total agricultural area is used for organic production, the majority of the world's countries still have relatively small organic markets, making up less than half of the agricultural sector overall.
7. Many companies in India cultivate and export organic fruits, vegetables, tea, spices, and plantation crops to other nations. Small and marginal farmers are a hard lot; farmers connected to large exporters typically don't have to worry about the sale of their goods or certification.
8. In India, a number of organizations and movements are working together to advance organic farming and change laws that support ecological agriculture. The Director General of Foreign Trade announced in June 2001 that an agricultural product could only be exported as organic if it was produced, processed, and packaged under a valid organic certificate issued by a certifying agency that was properly accredited by the Coffee Board, Spice Board, or APEDA.

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