



Organic Farming for Sustainable Agriculture

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Abstract

The most pressing concern in India since independence has been producing enough food to feed an expanding population. As a result, high-yielding types are used, along with irrigation water, fertilizers, and pesticides. This mix of high-yielding production techniques has helped the country generate a food surplus while also raising worries about soil health, pollution, pesticide toxicity, and agricultural production sustainability. As a result, scientists and policymakers are rethinking agricultural systems that rely heavily on biological inputs rather than chemical fertilizers and pesticides. Organic farming can provide high-quality food without compromising the health of the land or the environment; nevertheless, it is unclear if large-scale organic farming would be able to feed India's vast population. India produces certified organic items such as basmati rice, pulses, honey, tea, spices, coffee, oilseeds, fruits, cereals, herbal medicines, and their value-added products. In northern India, the development of these organic crops and products is examined in terms of sustainable agriculture.

Keywords: Organic farming, sustainable agriculture, high-quality food, environment.

Introduction

Organic farming is a type of farming that avoids or limits the use of synthetic fertilizers, pesticides, growth regulators, and feed additives in livestock. Organic farming's fundamental goals are environmental, social, and economic sustainability. Protecting the long-term fertility of soils by maintaining organic matter levels, fostering soil biological activity, careful mechanical intervention, nitrogen self-sufficiency through the use of legumes and biological nitrogen fixation, effective recycling of organic materials such as crop residues and livestock wastes, and disease and pest control relying primarily on crop rotations, natural predators, diversity, and organic manure are among the key characteristics.

To reduce the gap between NPK input and removal from the soil, a strong emphasis is placed on maintaining soil fertility by returning all wastes to it, primarily through compost. Many countries are



now required to utilize chemicals and fertilizers to boost farm production in order to meet their ever-increasing food demands as a result of rising population pressure. Long-term and excessive chemical use, on the other hand, has resulted in human and soil health risks, as well as environmental damage. As a result, farmers in industrialized countries are urged to convert their existing farms to organic farms.

The public's willingness to pay for high-priced organic produce is one of the most important variables influencing consumer demand for organic food. Organic product buyers are typically affluent, educated, and health-conscious individuals who are motivated by strong consumer demand, a high price premium, and environmental concerns. Organic farming is becoming more popular as a result of these hidden benefits. Government policies in Europe attempt to encourage the organic sector through subsidies, consumer education, research, education, and marketing support. India's agricultural techniques date back over 4000 years, and organic farming is very much a part of the country's culture.

Organic Sources of Plant Nutrients

Currently, most optimistic projections show that various organic sources can meet roughly 25-30 % of Indian agriculture's nutrient needs. The use of FYM to supplement the N in the soil increases crop productivity more than the use of traditional N fertilizers. Because estimates of NPK availability from organic sources are based on total nutrient content, their efficiency in meeting crop nutrient requirements is not as certain as it is with mineral fertilizers. However, combining chemical fertilizers with various organic sources can sustain higher crop productivity, improve soil quality, and productivity over time.

These organic sources not only provide N, P, and K, but also convert inaccessible sources of elemental nitrogen, bound phosphates, micronutrients, and degraded plant wastes into a form that the plants can absorb. Organic sources supported the growth and activity of mycorrhizae and other beneficial organisms in the soil, as well as helping to alleviate the rising incidence of secondary and micronutrient insufficiency and allowing for high crop yield and soil health. Several researchers from around the world have demonstrated the benefits of FYM application on soil characteristics and crop productivity. Farmers commonly use collected crop straws as animal feed or bedding. Straw is commonly used as bedding to retain urine and promote nitrogen cycling. Every day, the farmer collects wet straw and manure from the animal shelters and stores or composts it on his property. Depending on the farmer's



socioeconomic circumstances, composted manure is applied immediately or stored until the next crop season.

Principles of Organic Farming

To ensure the success of organic farming, three key rules must be followed.

1. The first is the interdependency principle. The farm is considered as an ecosystem in organic farming, with the understanding that a change to one aspect of the system might disrupt the farm's interrelationships.
2. The second organic agricultural principle is diversity. Crop rotation is utilized in organic farming to keep the habitat as natural as possible.
3. Recycling is the third organic agricultural principle. Plant and animal leftovers are recycled in organic farming to promote nutrient self-sufficiency on their own farm.

Objective of Organic Farming

1. To produce food that is healthy, nutritious, and of high quality.
2. Microorganisms, soil flora and fauna, plants, and animals are all part of biological cycles that must be encouraged and improved.
3. Soil fertility must be maintained and improved over time.
4. To aid in the conservation of soil and water
5. To reduce all types of pollution that may be caused by agricultural activities.
6. To maximize the usage of farm resources.
7. Traditional and indigenous farming knowledge, seeds, and varieties must be preserved and enhanced.
8. To take into account the social and environmental consequences of the farming system

Favorable Effects of Organic Farming on Environment and Human Health

Organic farming is, on the whole, far better for the environment than conventional agriculture. Energy consumption is one of today's most pressing environmental issues, and organic farming consumes significantly less energy than conventional farming. In reality, the organic agricultural system has seven percent higher energy efficiency than conventional farming. Organic farming also benefits the environment by using significantly less fertilizer and avoiding synthetic fertilizers, which are



hazardous to the soil, water, animals, and people. Due to the lack of soluble fertilizers, the nitrate content of organic fields is substantially lower than on conventional farms.

Too much nitrogen can destabilize the soil ecology and cause algal blooms in the water, suffocating other aquatic life. Organic fields also support biodiversity, which includes a wide range of animal and plant species that are critical to the survival of all species on the planet. Organic farming emits far less CO₂ than conventional farming. Carbon dioxide is the most significant greenhouse gas responsible for global warming. Salicylic acid levels in organic vegetables were six times higher than in non-organic vegetables. Salicylic acid is used to treat artery hardening as well as bowel cancer.

Conclusion

Organic farming is built on a mutually beneficial relationship between soil, minerals, water, plants, microorganisms, insects, animals, and people. It successfully reconciles food production and environmental conservation by creating productive landscapes. To improve natural resource processes while respecting ecological carrying capabilities, organic management relies on local human resources and expertise. Ecosystem resilience is strengthened, food security is increased, and additional earnings are generated by lowering reliance on off-farm inputs and producing more balanced nutrient and energy flows. Organic farming contributes to all sustainable agriculture and rural development goals by helping to preserve soil fertility, increase crop yield, and enhance farmer socio-economic situations. Organic farming can provide high-quality food without compromising the health of the soil or the environment. There is a need to find acceptable crops/products for organic cultivation that meet international market demands on a regional basis. Because of its promises to ensure food and nutritional security, the area as a whole cannot afford to go organic at the same time. This will provide a lot of job opportunities and bring prosperity and peace to the region.