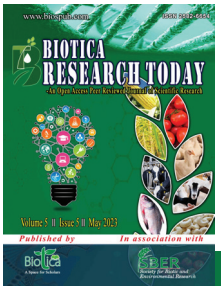
Bio. Res. Today 2023, 5(5):382-384



Biotica Research Today

e-ISSN: 2582-6654

May, 2023

Article ID: RT1316 **Popular Article**

Natural Farming in India: Prospects and Constraints

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Open Access

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Conflict of interests: The author has declared that no conflict of interest exists.

How to cite this article?

Patra *et al*., 2023. Natural Farming in India: Prospects and Constraints. *Biotica Research Today* 5(5), 382-384.

Abstract

Natural farming (NF) is an agricultural technique that relies on natural processes to enhance soil fertility and crop production without the use of chemicals or genetically modified organisms. It is a form of traditional farming that is becoming increasingly popular due to its emphasis on sustainability. Natural farming techniques include the use of composting, crop rotation, intercropping, and other natural methods to promote healthy soil and increase yields. Natural farming also encourages biodiversity and the use of local resources to reduce the reliance on external inputs. Despite its benefits, natural farming can be difficult to implement due to its reliance on traditional methods and lack of access to modern technologies. Nonetheless, it has the potential to become a viable alternative to conventional agriculture in many parts of the world. Natural farming might be a feasible option to food insecurity and poverty in the future, while simultaneously lessening the consequences of climate change.

Keywords: Agroecology, Composting, Mulching, Soil health

Introduction

Natural farming (NF) is a form of agricultural production that relies on traditional methods and natural processes to produce crops and livestock. It is based on the principles of sustainability, conservation, and respect for the land and its resources. Natural farming strives to create a more sustainable, ecological and self-sufficient system of agriculture that is in harmony with the environment and that is beneficial to both the farmer and the consumer (Biswas, 2020). Natural farming is based on the idea that the land should be managed in a way that mimics nature. This means using traditional farming methods such as crop rotation, intercropping, and companion planting to make the most of the resources available. Natural farming does not use chemical fertilizers, pesticides, or herbicides, but instead relies on natural fertilizers such as compost and animal manure. It also emphasizes the use of cover crops to preserve soil fertility and natural pest management strategies for pest and disease control. Natural farming is also based on the concept of "agroecology". This is the study of how natural processes and cycles can be used to develop sustainable agriculture systems. Agroecology focuses on how the relationships between plants, animals, and the environment can be managed in a way that is beneficial to both. The principles of natural farming involve utilizing traditional farming methods and natural processes to produce crops and livestock in a sustainable and ecological way. This means relying on the natural cycles of the land and the environment, while avoiding the use of chemical fertilizers, pesticides, and herbicides (Khadse and Rosset, 2019). Crop rotation is one of the key principles of natural farming. This involves alternating crops in a field over time and can help prevent soil-borne diseases and pests. It also aids in the preservation of soil fertility and the prevention of nutrient loss. Intercropping is another method commonly used in natural farming. This involves planting two or more different crops in the same area and can help to reduce weeds, pests, and diseases, as well as increase yields. Companion planting is also important in natural farming. This involves planting different crops together in order to benefit from their interactions (Khadse *et al.*, 2018). For example, planting garlic and onions near cabbage can help to repel pests and diseases from the cabbage. Natural farming also emphasizes the use of compost and animal manure to provide essential nutrients to the soil.

Principles of Natural Farming

• *Rely on natural processes to restore and maintain soil fertility:* Natural farming emphasizes the use of natural processes to maintain and restore soil fertility, such as crop

Article History

RECEIVED on 10th May 2023 RECEIVED in revised form 21st May 2023 ACCEPTED in final form 22nd May 2023

rotation, green manures, composting, and the use of natural predators to control pests.

• *Reduce or eliminate the usage of chemicals:* Natural farming aims to reduce or eliminate the use of synthetic fertilizers, pesticides, and herbicides.

• *Emphasize diversity and ecological balance:* Natural farming emphasizes the importance of maintaining ecological balance by planting a wide variety of crops and using methods such as crop rotation and companion planting to maintain soil fertility and reduce pest problems.

• *Use of biological controls:* Natural farming encourages the use of biological controls, such as beneficial insects, predatory nematodes, and fungi to control pests instead of relying on chemical pesticides.

• *Promote the use of local resources:* Natural farming encourages the use of local resources such as local soils, compost, seed, and farmers' knowledge to increase self-sufficiency and reduce the need for imported inputs.

• *Utilize perennials:* Natural farming encourages the use of perennials such as trees, shrubs, and cover crops to reduce labor and inputs, and to increase the diversity of the farming system.

• *Incorporate livestock:* Natural farming encourages the use of animals such as chickens, goats, and sheep as a source of fertilizer, pest control, and forage for livestock.

• *Grow native species:* Natural farming encourages the use of native species of plants and animals that are adapted to local conditions and will thrive in the local environment.

Components of Natural Farming

The components of natural farming have been depicted in figure 1 and presented below.

• *On farm nutrient cycling:* It involves the decomposition of organic materials such as animal manure, vegetable scraps, and other organic matter into a nutrient-rich soil amendment such as jeevamrit, beejamrit and ghanjivamrit (Table 1). Composting improves soil structure, increases soil fertility, and helps to retain moisture.

Table 1: Nutrient content in natural farming inputs

Name of input	N (%)	P (%)	K (%)
Jeevamrit	0.41	0.003	0.30
Beejamrit	0.33	0.002	0.41
Ghanjivamrit	0.55	0.04	1.03

• *Mulching:* Mulching is the practice of covering soil with a layer of organic material like as straw, hay or wood chips. This helps to keep the soil moist, reduce erosion, and protect plants from extreme temperatures.

• *Crop Rotation:* Crop rotation is the technique of rotating different kinds of crops cultivated in a given region over time.

• *Green manuring:* The practice to bring in leguminous crops into the soil is known as green manuring. These crops are high in nitrogen and help to improve soil fertility.

• *Pest management*: Natural pest management involves the use of natural predators. Some pesticide formulations are also used *i.e.*, neemashtra, agniashtra and brahmashtra.

• *Cover cropping:* Cover cropping is the practice of planting cover crops between rows of crops to help protect the soil, reduce erosion, and improve soil fertility.

• *Minimal tillage:* Minimal tillage is the practice of using as little mechanical disturbance as possible when preparing the soil for planting. This helps to reduce soil compaction and preserve soil structure.

• *Crop diversity:* Crop diversity refers to the strategy of cultivating different crops in the same place. This helps to reduce pest and disease pressure and improve soil fertility.

Figure 1: Components of natural farming

Benefits of Natural Farming

• *Increased soil fertility:* Natural farming practices help to improve soil fertility by focusing on soil building, which in turn helps to promote healthy and productive yields.

• *Improved soil quality:* Natural farming practices help to improve soil quality by avoiding the use of synthetic fertilizers and pesticides, which can damage the soil's structure and reduce its ability to absorb water and nutrients.

• *Increased carbon sequestration:* Natural farming practices help to increase carbon sequestration by encouraging the use of cover crops, which help to store carbon in the soil and reduce greenhouse gas emissions.

• *Improved water retention:* Natural farming practices help to improve water retention by reducing runoff and erosion, which can lead to flooding and water pollution.

• *Improved biodiversity:* Natural farming practices help to promote biodiversity by encouraging the use of native plants and animals, which helps to create a balanced and healthy ecosystem.

• *Improved food quality:* Natural farming practices contribute to improved food quality by eliminating the application of

synthetic fertilizers and pesticides, which have hazardous to human health.

• *Improved local economies:* Natural farming practices help to improve local economies by creating employment opportunities and reducing the cost of food production.

• *Reduced use of energy:* Natural farming practices reduce energy use by eliminating the need for fuel-intensive machinery such as tractors and combines and instead relying on manual labor.

Challenges in Adoption of Natural Farming

• *Loss of yield:* Natural farming may result in lower yields than traditional farming and this can be a disincentive for farmers (Khurana and Kumar, 2020).

• *Pest and disease control:* Natural farming relies on natural pest and disease control methods which can be difficult to implement and may not be as effective as chemical pesticides and fungicides.

• *Weather:* Natural farming is vulnerable to weather and climate changes, which can have a negative impact on yields.

• *Cost:* Natural farming requires more labor and resources at the beginning than traditional farming, which can be costly for farmers to implement.

• *Lack of awareness:* One of the biggest challenges in the adoption of natural farming is the lack of awareness about its benefits. Many people are unaware of the advantages of natural farming and how it can help to improve the environment and their own health.

• *Lack of access to resources:* Natural farming requires access to land and resources that may not be available in some areas.

• *Lack of support:* Natural farming is not widely supported by governments or other organizations and there is a lack of incentives for farmers to switch to natural farming.

• *Access to markets:* Natural farming can be difficult to access markets for selling their produces due to the lack of infrastructure and the fact that many consumers are unfamiliar with natural farming.

• *Knowledge and skills:* Natural farming requires a certain level of knowledge and skills in order to be successful.

• *Lack of research:* There is limited research into natural farming methods, which can make it difficult for farmers to access the latest information and techniques.

Conclusion

Natural Farming has become increasingly popular in recent years as a sustainable and holistic agricultural approach that works in harmony with nature instead of against it. It is based on the principles of organic farming, but takes a more holistic and spiritual approach that emphasizes the connection between soil, plants, and animals. Natural Farming uses natural processes such as composting, crop rotation, and bio-diversity to restore soil fertility and improve crop yields without relying on chemical fertilizers or pesticides. Natural Farming has many advantages over traditional farming practices, including improved environmental sustainability and a decrease in the amount of resources used to produce food. It also encourages practices that promote animal welfare, as well as economic and social sustainability. Additionally, Natural Farming can be implemented in any agricultural setting, making it an accessible option for farmers of all sizes. Despite its many benefits, Natural Farming is not without its challenges. Additionally, the lack of access to appropriate technologies and infrastructure can make it difficult for farmers to adopt Natural Farming techniques. Furthermore, the lack of understanding of Natural Farming techniques among farmers and consumers may lead to a lack of support for the approach.

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