Review Article

A REVIEW ON ORGANIC FARMING IN INDIA

Abstract:

Organic horticulture is a dynamic and sustainable approach to cultivating plants that prioritizes environmental health, biodiversity, and human well-being. This combination of high-yielding production technology has helped the country develop a food surplus as well as contributing to concerns of soil health, environmental pollution, pesticide toxicity, and sustainability of agricultural production. Alternatives for managing pests and diseases in organic farming mostly focus on preventive methods as opposed to curative therapies, which are founded on ecologically safer management techniques. The priority has been placed on maintaining the ecosystem's health, allowing plants to become resistant to insect pests and illnesses.

Keyword:-organic farming, type, method, Principle,Prospectus.

Introduction:

Organic horticulture, a subset of sustainable farming, embodies a comprehensive and environmentally conscious approach to cultivating a diverse range of crops, spanning fruits, vegetables, herbs, and ornamental plants. In response to growing apprehensions about the ecological and health repercussions of conventional agriculture, organic horticulture has emerged as a viable alternative. This introductory section underscores the significance of organic horticulture in addressing global challenges, including soil degradation, water pollution, biodiversity loss, and the excessive use of synthetic chemicals in farming. Agriculture has long served as the backbone of India's sustenance, with a substantial portion of the population and labor force relying on it. While the Green Revolution ushered in advancements in agricultural technology, meeting the escalating demands of a growing global population, it also raised concerns about the environmental and health implications of chemical-intensive practices (Chandrashekar, 2010). Consumers are increasingly prioritizing ecologically safe, chemical-free, and nutritious foods, prompting a shift toward organic practices (Chander et al., 2011). The origins of the organic movement in India can be traced

back to the work of Howard (1940), who laid the groundwork for the principles embraced by subsequent activists. Organic farming, at its core, shuns or minimizes the use of synthetic fertilizers, pesticides, growth regulators, and livestock feed additives, with sustainability objectives encompassing environmental, social, and economic dimensions (E. A. Stockdale et al., 2001). Diverging from conventional farming, organic farming relies on compost, manure, green manure, and bone meal instead of synthetic fertilizers and pesticides (Binta et al., 2015). This system harnesses organic wastes, fostering soil health and vitality. Microbes are harnessed as bio-fertilizers, enhancing production without environmental pollution (Bagchi et al., 2015). Organic farming champions eco-friendly agricultural practices, eschewing synthetic inputs and predominantly utilizing organic wastes to cultivate crops.

Need of organic farming:-

As the global population continues to rise, the imperative is not merely to stabilize agricultural production but to augment it sustainably. Scientists recognize that the 'Green Revolution,' characterized by intensive input use, has plateaued, yielding diminishing returns. The need for a paradigm shift is evident, considering the escalating demand for food. Maintaining a natural balance becomes paramount for the preservation of life and property [33,34]. In the current era, with agrochemicals derived from non-renewable fossil fuels, sustainability is at risk. The overreliance on these chemicals not only depletes finite resources but also poses economic challenges, with potential future heavy costs on foreign exchange reserves (TNAU). It is crucial to reassess our agricultural practices and transition towards more relevant, sustainable alternatives. Embracing methods that align with ecological balance and reduce dependence on non-renewable resources becomes imperative for the long-term resilience of agriculture. This necessitates a holistic approach that considers the environmental impact, economic sustainability, and the well-being of future generations. By fostering agricultural practices that are in harmony with nature and mindful of resource availability, we can pave the way for a more sustainable and resilient agricultural future.

Types of Organic Farming:-

Organic farming is broadly of two types, namely pure organic farming, and integrated organic farming. Let us see briefly about these two types:

Pure Organic Farming: In this type, use of all unnatural chemicals and fertilisers are completely reduced. The farmers fulfill their fertiliser and pesticides need from natural sources **(Siddique*et al.*, 2014).**

Integrated Organic Farming: In this type, an integrated approach is adopted for pest and nutrient management. The objective is to meet economy demands as well as ecological standards **(Baker *et al.*, 2020).**

Methods of Organic Farming:-

Following are different methods of organic farming however all these methods are required to be followed simultaneously during the process of such farming:

1. Management of Soil: The core of organic farming lies in effective soil management. Following a crop harvest, the soil typically undergoes nutrient depletion, leading to diminished fertility. Soil management involves the replenishment of essential nutrients, a crucial process in organic farming. In this approach, the revitalization of soil fertility occurs naturally, utilizing methods that align with organic principles. A key strategy in organic soil management involves the utilization of animal waste to recharge the soil with essential nutrients. This natural process leverages the bacteria present in animal waste to enhance soil fertility, offering a sustainable alternative to synthetic fertilizers (Gershuny et al., 1999). By incorporating organic matter derived from animal waste, organic farmers aim to foster a healthy and nutrient-rich soil environment. This practice not only rejuvenates the soil but also aligns with the principles of organic farming, promoting ecological balance and sustainability in agricultural systems.

2. Management of Weeds: "Organic farming focuses on eradicating the weeds from the soil during the crop production. Weeds are unwanted plants that grow in the agriculture fields simultaneously with the crops and they suck most of the nutrients present in the soil. As a result the production of the crops gets affected. To get rid of weeds the farmers follow the below mentioned techniques"**(Liebman *et al.*, 2009).**

Mulching and Cutting or Mowing: "Mulching is a process in which the farmers use plant residue or plastic films on the surface of the soil which blocks the growth of the weed while cutting or mowing helps in removal of the growth of the weeds in the farms"**(Chalker-Scott, L. 2007).**

3. Crop diversity: Crop diversity stands as a fundamental practice in organic farming, and two distinct approaches are commonly employed: Monoculture and Polyculture. In monoculture organic farming, farmers cultivate a single crop at a time. Conversely, the polyculture method involves the simultaneous cultivation of various crops in a single field,

resulting in increased production diversity. This approach not only allows for a more varied harvest but also harnesses the synergistic benefits arising from the coexistence of different crops within the same space. Polyculture in organic farming plays a pivotal role in enhancing soil fertility by promoting the proliferation of microorganisms. This diverse planting strategy creates a more balanced and resilient ecosystem within the soil, contributing to overall soil health and productivity (Peigné et al., 2016). By fostering a symbiotic relationship among different crops and the soil microbiome, polyculture exemplifies a sustainable and ecologically sound practice in organic farming, emphasizing the interconnectedness of diverse plant species in creating a thriving agricultural environment.

4. Controlling the harmful organisms: "Organic farming lays much emphasis on controlling the harmful organisms present in the agricultural farms which negatively impact the crop production capacity of the fields"**(Gomiero*et al.*, 2011).**For this purpose the farmers use pesticides and herbicides, however in organic farming only natural pesticides are used.

5. Use of green manure: "In organic farming, the farmers use the dying, or uprooted plants as green manure"**(Toungos*et al.*, 2019).** These plants are turned into the soil through tilling to decay further and form nutrient for the soil to increase its fertility.

6. Use of compost: "The farmers prepare compost by digging a pit and filling in it green waste and water to decay. Later this compost which is highly rich in nutrients for crops is used as fertilizer in the farms to increase the soil fertility"**(Singh *et al.*, 2018).**

7. Cover crop:"Fast-growing crop, such as rye, buckwheat, cowpea, or vetch, planted to prevent soil erosion, increase nutrients in the soil, and provide organic matter"**(Islam*et al.*, 2021)**. Cover crops are grown either in the season during which cash crops are not grown or between the rows of some crops (e.g., fruit trees). *See also* green manure.

Principle of organic farming:-

1. Principle health: - "Organic agriculture must contributed to the health and well being of soil, plants, animals and human in earth"**(Howard, A. 2006).**

2. The principle of ecological balance:- We must model organic farming on living ecological system. Moreover, the methods of organic farming must fit the ecological balance and cycle **(Luttikholt, L. W. 2007).**

3. Principle of fairness: - Organic farming provides a good quality of life and helps in reducing soil infertility **(Rani *et al.*, 2019).**

4. Principle of care: - We should practice organic agriculture in a careful and responsible way to help the present and future generation and the environment **(Gomiero *et al.*, 2011).**

Prospectus of organic farming:-

1) **High nutrition values**

   "Organic food products contain very high nutrition content because they do not contain modified ingredients compare to the conventional agricultural food products"**(Yiridoe*et al.*, 2006).**Another factor that makes them highly nutrition is that they are given time to develop and are provided with the best natural condition of growth.

2) **Better taste**

   "Apart from nutrition, the mineral and the sugar structures in organic foods are tasty because the crops are given more time to develop and mature. The use of natural and environ mentally friendly agricultural production techniques is reveled to be the reason for the better taste in organic food products"**(Magkos*et al.*, 2003).** It is commonly reported that the taste of organic vegetables and fruits are of higher quality compared to those that are conventionally grown.

3) **Improved human health**

   Organic produce stands out as the safest option for human consumption when compared to other available food products. These organic items boast elevated nutritional content, lower levels of chemicals, and are free from modified ingredients (Mie et al., 2017). Furthermore, stringent regulations within organic standards are in place to guarantee that all products labeled as organic adhere to authentic organic practices throughout their production and processing. These regulations ensure the exclusion of synthetic chemical components and genetically modified production technologies, reinforcing the commitment to organic integrity. By choosing organic products, consumers not only enjoy the benefits of increased nutritional value but also gain assurance regarding the purity and authenticity of the food they consume, aligning with their preferences for healthier and sustainably produced options.

4) **Environmental sustainability**

   Every nation aspires to achieve significant strides in environmental sustainability. One avenue towards this goal is the adoption of organic farming practices. Extensive research

indicates that organic farming serves as a noteworthy mechanism for promoting ecological harmony, biodiversity, and sustainable biological cycles. The core objectives of organic farming, including soil management and conservation, fostering nutrient cycles, maintaining ecological balance, and preserving biodiversity, contribute significantly to environmental sustainability (Rogers, H. 2010). The dream of attaining substantial environmental sustainability gains globally can find realization through the widespread adoption of organic farming methods. These practices not only align with ecological principles but also offer tangible benefits in terms of maintaining soil health, supporting nutrient cycles, and preserving the delicate balance of ecosystems. By prioritizing these organic farming objectives, nations can make strides toward realizing a more environmentally sustainable future.

5) **Food security**

"The demand against the supply of food has always been disproportionate due to the effects of climate change and poor farming practices that cause poor crop produce. Various people around the globe are facing starvation and lack enough food supply as there is a general shortage of safe and nutritious food to satisfy food preferences and dietary needs for a healthy and active life"**(Devereux *et al.*, 2004).**

Advantages of Organic Farming

1. **Regenerating the degraded soil**: Organic farming is the best way to prevent environmental pollution as well as degradation of soil **(Osman, K. T. 2014).** In some areas of the world where the soil has been degraded due to excessive use of chemical fertilizers, organic farming is helping in regenerating the soil by recharging it with necessary nutrients.
2. **Maintaining the optimal condition of soil**: "Since only Organic manures are used in organic farming it helps in maintaining the optimal condition of soil to gain higher production of good quality of crops"**(Watson *et al.*, 2002).**
3. **No need to purchase chemical manures: "**The farmers use only natural and organic manures in organic farming so the farmers are not required to purchase any chemical manures which reduces the expenses of the farmers considerably"**(Wang *et al.*, 2018).**

4. **Improves soil quality: "**Organic farming helps the soil regain its fertility power, since this kind of farming supplies various necessary nutrients in the soil and moreover it helps the soil in retaining its nutrients"**(Reeve *et al.*, 2016).**

Disadvantages of Organic Farming

1. **Higher production costs: "**For organic farming the farmers require more manpower to maintain various works associated with it which increases the crop production costs"**(Casado *et al.*, 2009).**
2. **Crops yield become more expansive: "**Since the farmers do not get much yield from their farms through organic farming in comparison to the conventional farming their produce becomes more expansive"**(Jouzi*et al.*, 2017).**

Conclusion

Taking a long-term perspective, the imperative for embracing organic farming becomes evident as a crucial measure to sustain life on Mother Earth. Organic farming serves as a necessity in replenishing soil fertility through natural means, ensuring the production of wholesome and healthy food for the global population. Despite potential challenges such as lower crop yields impacting farmers, the indispensability of organic farming arises from its role in fostering a natural way of life while maintaining ecological and environmental equilibrium for future generations. Given the current scenario, where agricultural soils are experiencing deterioration due to the excessive use of chemical fertilizers, organic farming emerges as the optimal solution. It stands as the most effective means to recharge Mother Earth with essential natural nutrients, paving the way for a healthier life for the human population. The transition to organic farming represents a conscientious commitment to preserving the Earth's vitality, offering sustainable solutions that prioritize both human well-being and the long-term health of our planet. As we look toward the future, organic farming stands as an indispensable pathway to harmonize agricultural practices with the intricate balance of nature, fostering a resilient and flourishing ecosystem for generations to come.

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