



## Production of Organic Fruits: Trends, Prospects and Challenges

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### Abstract

Organic farming is progressively gaining importance all over the world. Organic food is becoming more and more in demand as a result of growing environmental and health concerns in agriculture, making it an attractive source of rural income. Although there are indications suggesting a rise in consumer demand for organic goods, crop production sustainability has been the primary force behind agricultural growth. Globally, the organic agricultural sector is expanding substantially. The International Federation of Organic Agriculture Movements (IFOAM), a global organisation for network of organic stakeholders, founded in 1972, framed the rules that many governments across the globe use to regulate and enforce the legality of organic agricultural practises.

**Keywords:** India, Organic fruit, Quality, Sustainable

### Introduction

Food and Agriculture Organization (FAO), defined organic farming as a holistic production management system that promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. Organic farming is practiced in 187 countries, and approximately 3.1 million growers adopted organic technologies to grow 72.3 million ha of the agricultural area. The organic area of agricultural crops is presented in figure 1. 2019 witnessed a global increase in spending on organic foods of approximately 106 billion Euros (Anonymous, 2020a). Around 2,37,000 ha or 0.9% of the world's tropical and subtropical fruit land, and more than 3,08,000 ha or 2.6% of the world's temperate fruit area, were managed organically in 2019. In the world, among the temperate fruits, apples, followed by apricots and plums, occupy the topmost position; while in tropical and subtropical fruits, bananas, followed by dates, and mangoes occupy the topmost positions. China, the Dominican Republic and Turkey are the top three countries in the world. In India, organic farming is still in its infancy. Over 2.30 million ha of farmland were being cultivated organically as of March 2019. This amounts to 2% of India's total net sown area of 140.1 million ha. Since

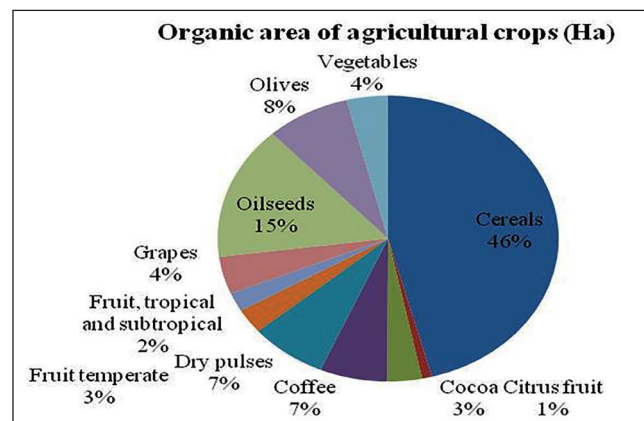


Figure 1: The share of various agricultural crops in organic farming

a sizable percentage of this business is concentrated in just a few states, several of them have made the effort to expand the scope of organic cultivation. In India, Madhya Pradesh holds the first position with 0.76 million ha of area used for organic farming or more than 27% of all organic agricultural areas in India. The top three states for organic farming are Madhya Pradesh, Rajasthan and Maharashtra, and they

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occupy over half of the country’s organic area. Almost 80% of the land under organic farming is in the top 10 states. In this manuscript, we have reported the major organic fruit growing countries, major organic fruits grown around the world and in India, the nutritional benefits of organic fruits, organic nutrient management, organic inputs for pest and disease management, the organic certification process and exports of organic fruits.

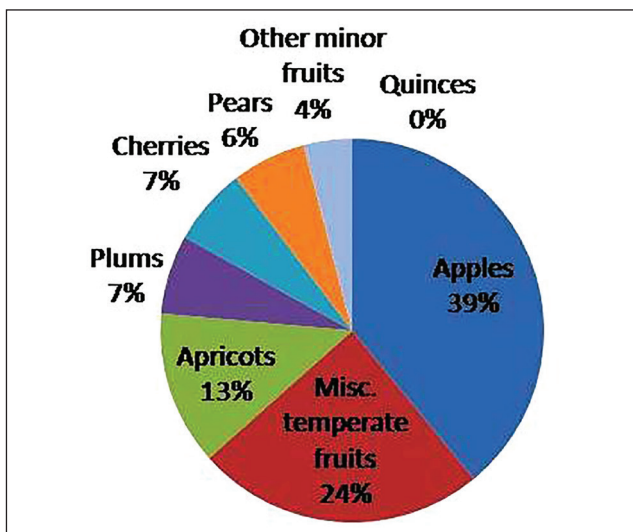
**Countries Growing Organic Fruit**

Worldwide, 187 countries practice organic farming which is 72.3 million ha of area and managed by 3.1 million farmers. Australia (35.69 million ha) followed by Argentina (3.63 million ha) and Spain (2.35 million ha) has the highest amount of organic agricultural area. Nearly 106 billion Euros were invested on organic products worldwide in 2019. Figure

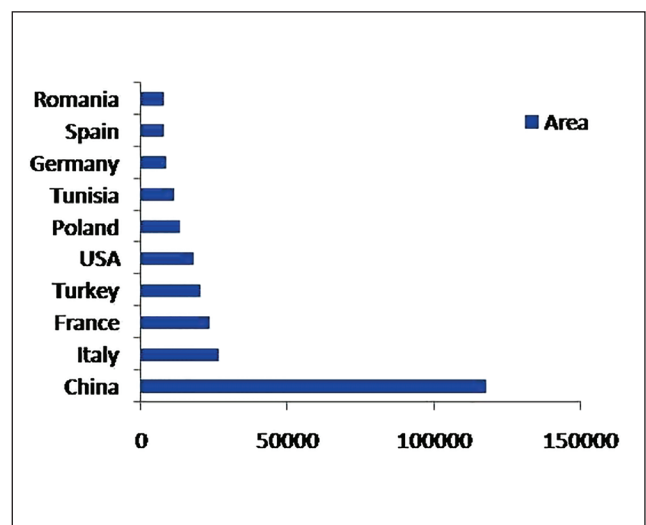
2 presents the top countries growing organic temperate, tropical, and subtropical fruit crops with their percentage share of various fruit crops. The amount of organic area expanded by 1.1 million ha, while organic retail businesses are kept rising, according to the most recent FiBL report on organic agriculture globally (Anonymous, 2023).

**Organic Fruits in India**

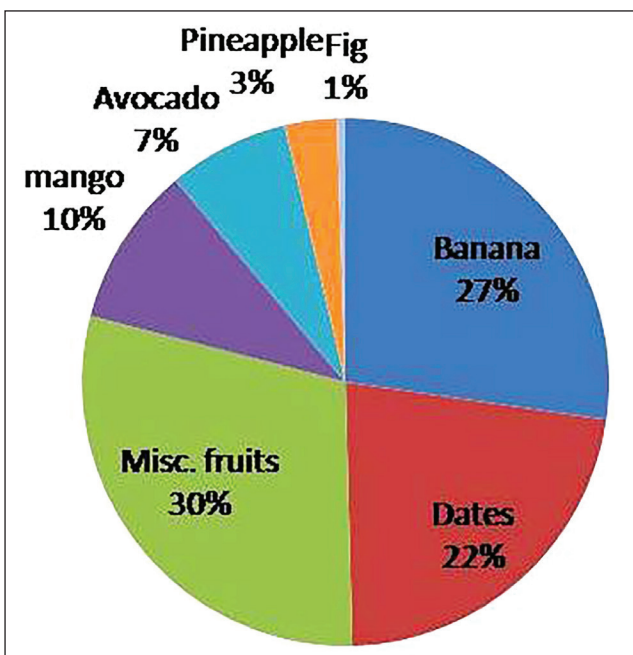
According to the FiBL study from 2021, India holds a unique situation among the 187 countries that practise organic farming. India is home to 30% of all organic producers globally with 2.30 million acres (Anonymous, 2023). In India, there are 27,59,660 organic growers (11,60,650 PGS and 15,99,010 India Organic), 1703 processors and 745 traders. The quantity of area utilised for organic agriculture throughout the country has grown significantly in recent



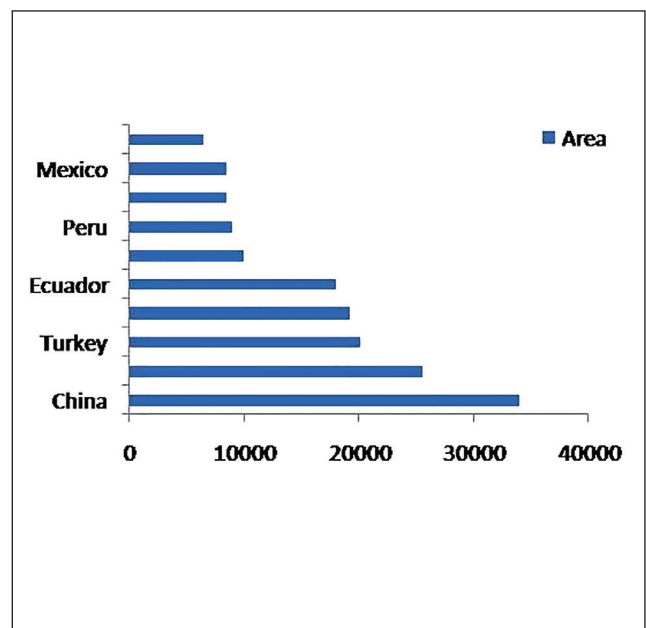
a) Percent area share of temperate fruits



b) Area-wise (ha) top countries of temperate fruits



c) Percent area share of tropical and sub-tropical fruits



d) Area-wise (ha) top countries of tropical and sub-tropical fruits

Figure 2: Top countries growing organic temperate, tropical and sub tropical fruit crops with percentage share of various fruit crops

years. Farmers all throughout India have been drawn to organic farming in recent years, and many have tried their hand at growing crops like bananas, papayas, pineapples, sapotas, cashew nuts, coconuts, mangoes and passion fruits with great success. Policies and initiatives promoting organic farming have been pushed in several Indian states. The states of Sikkim and Uttarakhand set organic as one of their primary targets. The state of Sikkim has been declared organic since 2003 and Sikkim became the world's first 100% organic state in 2018. These areas hardly receive any kind of external synthetic input; these areas are by default organic. Therefore, there is a huge possibility of converting these areas into organically certified fruit growing areas in the future. Farmers of North-eastern Hill region of India uses by default organic inputs due to unavailability of inorganic inputs. Most of the farmers have small holding size and shifting cultivation is followed due to high slope in these regions. These are the fundamental advantages that organic horticulture has in this area.

### Nutritional Benefits of Organic Fruits

In the literature it has no reports of controlled intervention studies involving human subjects. More high-quality research is currently required to support consumer opinions on the potential health benefits of eating organic food. But there are compiled reports on the advantages of organic foods, like organic food is better for animal reproduction, contains more nutrients than conventional food, has a better taste, is cleaner than inorganic food, protects the immune system, prevents antibiotic resistance, has a greater antioxidant value, decreases antibiotic exposure, and many more (Gopalakrishnan, 2019). Notwithstanding the fact that the health advantages of organic foods are debatable, organic fruits and vegetables contain larger quantities of vitamin C and phenolics than conventional ones, as well as lower levels of nitrate content and pesticide residue. There is little doubt that organic products have fewer and fewer pesticides than conventional fruits and vegetables, but it is still unknown what the long-term health effects of pesticide consumption will be, in addition to the medicinal significance of organic food having fewer pesticide levels.

### Organic Nutrients for Fruit Crops

The development and upkeep of soil fertility - the capacity of the soil to give moisture and nutrients for plant growth and reproduction - is the primary problem in controlling tree nutrition in line with organic farming principles. Cover crops can enhance soil organic matter (OM), trap nutrients, reduce leaching of  $\text{NO}_3\text{-N}$  and other nutrients, prevent soil erosion and runoff of nutrients, improve soil structure and aeration, and lessen nematode infestations. Mulching has far less of an effect on soil organic matter (OM) than other techniques, but it can have a big influence on tree nutrition due to the release of nutrients. A variety of materials referred to by many names, including amendments, manure, bio-solids, organic by-products and organic fertilizers, can be utilised for this purpose. Intentionally utilised as a soil conditioner for agronomical objectives, biochar is a highly porous and resistant carbon rich residue produced by the thermal breakdown of organic materials (such as wood, agro-industrial wastes, energy crops, manure and MSW).

One of the earliest methods for stabilizing organic waste and biologically fertilizing the soil is composting. By fixing atmospheric nitrogen both with and without the assistance of plant roots, biofertilizers play a crucial role in enhancing soil fertility. *Azotobacter*, *Azospirillum* and Arbuscular Mycorrhizal Fungi (AMF) are the most widely used biofertilizers in fruit crops. Vermicompost is the end product of the decomposition of materials such as biodegradable waste, bedding material, and vermicast by earthworms. It is a very simple and environmentally friendly technology that utilises waste products (usually straw, cowdung) and converts them into vermicompost. Vermicompost consists of C, H and O and nutrients such as Ca, Mg, K, S,  $\text{NO}_3$ ,  $\text{PO}_4$  and micronutrients, which have comparable impacts on plant growth and yield as inorganic manure. By combining rock phosphate at 5%  $\text{P}_2\text{O}_5$  with the composting material, phospho-compost or P-enriched compost, may be produced. More nutrients are found in sheep and goat droppings than in compost or farmyard manure. The manure typically has 3% N, 1%  $\text{P}_2\text{O}_5$  and 2%  $\text{K}_2\text{O}$  content. The term "*Integrated Organic Nutrient Management*" refers to the optimisation of the benefits from all potential sources of organic and biological components, aside from inorganic, in a coordinated manner in order to maintain the soil fertility and plant nutrient supply at an optimal level for maintaining the desired productivity. The right mixture of inorganic fertilizers, FYM, crop residue,  $\text{N}_2$ -fixing plants, such as pulses like mung, arhar, rice bean and black gram, and oilseeds like soybean, and biofertilizers appropriate to the local system.

### Organic Inputs for Disease and Pest Management

Due to a direct reduction of 30-100% in output, pests and diseases inflict enormous financial losses on fruit cultivators. Chemical pesticides have been used to manage insect pests and fungus infections for a very long time. Consumers face health risks as a result of harmful residues left behind by pesticide usage on fruit crops that are grown for human consumption. Their ongoing usage is harming the ecosystem by causing the emergence of new pests, the revival of old insects, and health risks for employees and agricultural workers owing to improper or ignorant handling and application, as well as pesticide poisoning. Soil management practises like the incorporation of organic mulches, conservation tillage, and removal of weeds are used to minimise insect occurrence. Field management practises are also used to reduce pest incidence. For example, the selection of the proper crop or production site, determining the scope, season, and the severity of a particular pest or disease problem in a specific site, proper training and pruning operations, constant monitoring for pests and diseases, the use of local varieties, and maintaining soil nutritional health are some of the remedies. Effective physical approaches to managing insect populations include the use of light, sticky and pheromone traps and fruit bagging. Botanicals like mineral oils, pyrethrum, neem, plant oils, nimbecidin or azadirachtin and concoctions brewed from wild plants are employed to manage pests and diseases.

### Organic Certification

In order to create organic goods, an agricultural system that

prioritizes ethical behaviour and the social obligation above the use of inorganic inputs is practiced. The National Plan for Organic Production (NPOP) is carried out by the APEDA, under the Ministry of Commerce and Industry, Government of India. The approach comprises organic production standards, organic agriculture promotion, marketing, and certification by certification bodies. The NPOP production and accreditation criteria have been acknowledged by the European Commission and Switzerland for unprocessed plant products. These acknowledgements will allow importing countries to recognise Indian organic goods that have received the required certification from India's recognised certifying bodies. Moreover, APEDA is in the middle of negotiations with countries including Australia, South Korea, Taiwan, Canada, and Japan (Anonymous, 2020b).

### Organic Fruit Exports

The entire area undergoing the organic certification process as of March 31, 2022, as recorded with the National Programme for Organic Agriculture is 91,19,865.91 ha (2021-22). There are 47,26,714.74 ha of cultivable land and an additional 43,93,151.17 ha for gathering wild produce. India's horticulture exports increased from 2.8 million to 3.19 billion US dollars between 2010 and 2020. The primary export destinations for these horticultural goods have been the United Arab Emirates, the Netherlands, and Saudi Arabia. The strong horticulture trend in India has tremendously profited from the increase in global prices. Several government initiatives also aided horticultural exports. India's exports of fresh grapes increased from US\$ 102.5 million in 2019 to US\$ 307.9 million in 2020, to put things in perspective. Moreover, India's exports of potatoes increased from \$0.64 million in 2019-20 to \$11.36 million in 2020-21 (Anonymous, 2021). Mangoes are mostly produced in India; however, due to high domestic demand, less mango and its products are exported. In contrast to mango pulp, which is predominantly exported to the EU, fresh mangoes from India are mostly sent to the Gulf countries and a few European nations, particularly the UK. Trade pacts have recently been signed with the US, China and Australia.

### Future Challenges

Although the increased demand for organic fruit suggests that there may be possibilities in the future, there will also be difficulties. The variety of new insect pests is constantly expanding. The menace of new pests and diseases will be

alarming in the future, and there continues to be a significant risk factor for tree loss and damage. It will take more work to create fruit varieties that address regional concerns with organic agriculture in order to reduce reliance on inputs. The process of organic fruit production is expensive and lengthy, but it is currently taking place in a number of countries. Effective weed control methods are urgently needed because relying solely on tillage can have a detrimental influence on soil conditions, and organic pesticides have not yet proven to be effective. A progressive pattern of growth brought on by the customary three-year conversion time for new organic fruit land might exacerbate price volatility for producers.

### Conclusion

There is an ever increasing demand for organic fruits and vegetables on the market. An increase in retail sales has been recorded in western countries over the last two decades. Moreover, there was also an increase of 53% in organic fruit growing areas worldwide. Some major organic fruit growing areas are in the conversion phase, for which the produce has not arrived on the market yet, so there is a good possibility of a further increase in the organic fruit area in the near future. Novel discoveries in biological control, organic nutrient management, improved production practises, etc. will boost organic fruit growers' overall expansion in the area. More innovation and trade will result from the international harmonisation of organic standards. The supply and demand curve, innovative technologies, prices, new pests, and consumer perception will determine the future of organic fruit farming.

### References

- Anonymous, 2020a. FAOSTAT. Available at: <https://www.fao.org/faostat/en/#home>. Accessed on: 6<sup>th</sup> May, 2023.
- Anonymous, 2020b. APEDA. Organic Products. Agricultural and Processed Food Products Export Development Authority, Government of India. Available at: [www.apeda.gov.in](http://www.apeda.gov.in). Accessed on: 6<sup>th</sup> May, 2023.
- Anonymous, 2021. India Brand Equity Foundation. Available at: <https://www.ibef.org/>. Accessed on: 6<sup>th</sup> May, 2023.
- Anonymous, 2023. FiBL. Available at: <https://www.fibl.org/en/>. Accessed on: 6<sup>th</sup> May, 2023.
- Gopalakrishnan, R., 2019. Advantages and nutritional value of organic food on human health. *International Journal of Trend in Scientific Research and Development* 3(4), 242-245. DOI: <https://doi.org/10.31142/ijtsrd23661>.