

## Horticultural Crops Vital for Food and Nutritional Security

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Horticultural crops mainly comprise of fruit, vegetable, plantation, spice, etc. They are considered the vital sources of food and nutritional security. Before four decades, there used to be significant scarcity of fruits and vegetables in remote and rural India. These crops are now available in every nook and corner of the country. There has been increase in area of horticultural crops more than two times, except plantation crops (1.94 times) from 1991-92 to 2023-24. Production of fruits, vegetables, spices and plantation crops showed an increase of 294.6%, 254.0%, 557.1% and 135.6%, respectively during the period. There has been enhancement in average productivity of these crops also by more than 1.5 times, except plantation crops (1.21 times) during the period. As per the final estimates issued by the Ministry of Agriculture & Farmers Welfare for 2023-24, area of fruit, vegetable, plantation and spice crops were reported to be 7.1 million hectare (Mha), 11.2 Mha, 4.5 Mha and 5.0 Mha, respectively. The corresponding figures for production are 112.98 million MT, 207.21 million MT, 17.67 million MT and 12.48 million MT. Upto 2011-12, production of food grains used to be more compared to horticultural crops. Production of horticultural crops in 2023-24 was 354.7 million MT compared to 332.3 million MT of food grain. Share of different crops in total area of these crops works out to be around 40%, 25%, 18%, 16% and 1% for vegetables, fruits, spices, plantation crops and aromatic & medicinal plants, respectively during 2023-24.

Contribution of horticultural crops to India's agricultural GDP (outputs) account for around 33%, despite 21% of the cropped area. They are key to provide essential vitamins, minerals and antioxidants, thereby improving dietary diversity and nutrition among the population. They also play

a vital role in addressing the problems of unemployment and environmental footprints. The crops are also contributing in foreign exchange earning. Out of total export value of agricultural produce *i.e.* Rs. 4,09,844 crore, share of horticultural crops was about 22% during 2023-24.

Realizing the importance to give fillip to production of these crops, Government of India established/created Coconut Development Board in 1981; National Horticulture Board in 1984; Horticulture Mission for North East and Himalayan States earlier known as Technology Mission for Integrated Development of Horticulture in North Eastern States since 2001-02; National Horticulture Mission in 2005-06; and Central Institute of Horticulture, Nagaland in 2006. The Directorate of Cashewnut Development, Kochi was established in 1966 and Cocoa was included in 1997 in the Directorate to promote these crops. These schemes are under the Mission for Integrated Development of Horticulture launched in 2014-15.

The major interventions of the Mission are to supply quality planting materials through establishment of nurseries and tissue culture units; improvement in production, productivity through area expansion and rejuvenation programs; promotion of technology and dissemination; human resource development; creation of infrastructure for post-harvest management; and marketing in consonance with comparative advantages of each state/region and their diverse agro-climate conditions, etc. The impact of the Government efforts over the years substantiates the enormous growth in the sector.

The Hon'ble Finance Minister in her Budget Speech presented in the Parliament on 1 February 2025 stated that a comprehensive programme to promote production, efficient supplies, processing, and remunerative prices of fruits and vegetables for farmers will be launched in partnership with the states. Appropriate institutional mechanisms for implementation and participation of farmer producer organizations and cooperatives will be set up. She also announced establishment of a Makhana Board in the state of Bihar to improve production, processing, value addition, and marketing of makhana. The people engaged in these activities will be organized into FPOs.

Agriculture as a whole has been facing many challenges. To name a few, dwindling soil and water resources; decline in soil health due to decreasing level of organic matter/carbon in soil; imbalance in

**Horticultural crops play a key role in ensuring food and nutritional security to the teeming population. The growth in the sector has to be sustained by addressing the problems arising due to climate change and adopting need-based strategies.**

use of fertilisers; non-adoption of integrated nutrient management supply system creating mismatch in addition and removal of nutrients; multi-nutrient deficiencies; diminishing useful micro-organisms in soil; least emphasis on conservation agriculture; misuse of irrigation water; and last but not the least the serious problems of climate change.

The modern concept of smart urban farming makes use of modern indoor farming techniques (soilless hydroponics and aeroponics), vertical farming and controlled environment agriculture technology such as greenhouse/protected cultivation where all environmental factors can be managed. Value chain based marketing system is an important component of such farming. Youths and common citizens are taking interest to adopt it. It should be popularized more in urban areas for vegetables, floriculture, medicinal and aromatic plants. Farming of floriculture among the farmers is picking up in view of better returns to them.

Use of digital technologies such as thermal and infrared imaging; chlorophyll fluorescence imaging; internet of things-based sensors; artificial intelligence; machine learning; remote sensing; etc. enables early stress detection, optimize resource use, and enhance crop resilience. Improved management practices along with leveraging digital technologies and resilient crop varieties are necessary to address climate induced challenges in horticultural crops.

Perennial horticultural crops play an important role in carbon sequestration, storing 25 to 100 times more biomass C than conventional cropping systems, which makes them more effective in mitigating adverse effects of the climate change. Aberrant weather conditions and rise in temperature due to climate change threatens soil organic carbon stability underlining the need for adoption of sustainable practices such as mulching, cover cropping and efficient irrigation system. Use of micro-irrigation system (drip irrigation and sprinkler) is in vogue in horticultural crops. Area

under such system is on rise. It has reached to a level of more than 14 Mha in the country. Application of 100% water soluble fertilisers through such system improves water as well as fertiliser use efficiency to a great extent. Such practices need to be given more impetus by all concerned.

Use of fertilisers is crucial in boosting crop yields with better quality and their role in horticultural crops cannot be undermined. Contribution of horticultural crops in emissions of greenhouse gases with use of N fertilisers is less compared to cash and food grain crops. However, need is to promote balanced fertilisation on soil test basis along with integrated nutrient management system comprising of organic manures, city compost, bio-fertilisers, recycling of agri-wastes, green manuring, legumes as cover crops, etc. The practice allows plants to withstand extreme weather events like heat waves and droughts, thereby improving crop resilience to climate change. Site-specific nutrient management optimizes application of plant nutrients and minimize their losses. Conservation agriculture system based on minimal soil disturbance (no-till, minimum tillage) and permanent soil cover (mulch crop residue) combined with diversified rotations with legumes can mitigate negative effects of climate change. Cultivars tolerant to drought, heat, salinity/alkalinity and biotic and abiotic stresses needs to be developed. Towards this, proper utilization of genetic resources and breeding strategies is essential. Integrated pest management helps in judicious use of pesticides to minimize pest and disease outbreaks. Farmers need to be persuaded in this direction.

Post-harvest technology to minimize the losses and extend the shelf-life of horticultural crops needs to be emphasized by all concerned. Processing of the end products is an area of better returns to the farmers. Processing units at the village level need to be created with involvement of farmers. Creation of better cold storage facilities will go a long way in keeping quality of the perishable produce. Lastly, proper marketing set-up will also be desirable for better returns to the farmers.

The special issue of Indian Journal of Fertilisers is devoted to horticultural crops. There are 11 papers in the issue contributed by the experts in the field. It is hoped that the readers will find the issue useful. ■