Preface

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The 2nd International Conference on Recent Advances in Horticulture Research (ICRAHOR-2024) was held at Amity Institute of Horticulture Studies Research, Amity University Uttar Pradesh, Noida, from February 15-16, 2024. The conference focused on the relationship between people, plants, and quality of life, with five main topics: technological advances in horticulture, AI's role in the sector, post-harvest management, and urban and backyard farming. The conference aimed to share experiences and perspectives from various fields of horticulture, highlighting the interdisciplinary input from various fields. The conference also sought to provide researchers and students with up-to-date information on technological trends, molecular approaches, nanotechnology, organic agriculture, sustainability, and hi-tech horticulture, as well as cutting-edge ideas in big data, robotics, and vertical farming.

Agriculture is crucial for human progress and sustainable development, but it contributes to 34% of greenhouse gas emissions and 70% of freshwater withdrawals, causing biodiversity loss. The Food and Agricultural Organization estimates that agricultural production must quadruple by 2050 to feed a global population of 9.7 billion people. The horticulture sector can improve food production through technological interventions, such as high-tech greenhouse horticulture technology and machine learning. As population growth, climate change, and resource constraints increase, horticultural research must adapt to meet future challenges, including increasing crop productivity, improving nutritional content, fostering economic growth, and mitigating climate change impacts. Developing improved crop varieties, innovative cultivation techniques, and biofortified crops can improve crop productivity, combat malnutrition, and promote public health.

Innovations such as integrated nutrient management, sustainable agriculture, climate-resilient technology, and nano-emulsions have the potential to completely change the horticulture industry. The conference gave attendees a forum to talk about developments and trends in horticulture, ensuring that the industry grows and continues to support global food security. Because it provides ecological services like soil conservation, carbon sequestration, climate change mitigation, and productivity preservation, horticulture is essential to the global productivity system. However, the rising demand for food worldwide and the uptake of contemporary technology have resulted in greater resource use and ecological impacts. Agroecosystems and food production systems urgently need to be managed in order to address the problems of food scarcity, security concerns, and overproduction beyond the ecosystem's biocapacity.

The conference proceedings covered methods for handling ecological footprints and sustainability in gardening, looking at important components such the footprints of energy, fruits, vegetables, nutrients, water, land, and animals. In addition, it discusses planning, policy creation, and mitigation measures for ecological footprints that are grounded in research and development initiatives. Planet-friendly agriculture is becoming more and more popular around the world as a means of enhancing human well-being and safeguarding life-supporting systems. It requires that food production be done within planetary bounds. The goal of agroecologists is to reduce the carbon footprint of the environment while developing sustainable food systems for the world's growing population. For horticultural systems to be sustainable, agricultural
sustainability is essential, and scientists are worried about changing environmental conditions, availability of quality water, and soil degradation going back to ancient times.