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Foreword

This special issue of *Advances in Horticultural Science* offers a timely reflection on the evolving landscape of postharvest research. As horticultural products continue to gain recognition for their nutritional, economic, and environmental value, the urgency of preserving their quality after harvest is more pronounced than ever. The contributions gathered here explore a broad range of strategies, from physiological responses to precision monitoring, that aim to reduce postharvest losses while enhancing the resilience and marketability of fresh produce.

One of the recurring themes in this volume is the need to balance technological innovation with ecological responsibility. Several studies investigate treatments such as melatonin, osmoprotectants, and natural antioxidants to mitigate stress and maintain visual and nutritional attributes during storage. These approaches show that harnessing the plant's own metabolic responses—rather than relying solely on synthetic chemicals, can be both effective and sustainable. Yet they also invite further questions: To what extent can we generalize these strategies across crops? How do we evaluate trade-offs between immediate efficacy and long-term environmental impact?

The issue also gives space to emerging analytical techniques like Time-Resolved Reflectance Spectroscopy and Aquaphotomics, which promise to revolutionize how we assess quality, moving from destructive sampling to real-time, non-invasive diagnostics. These technologies are still in refinement, but their integration into postharvest workflows could shift the paradigm toward more data-informed, dynamic quality control systems.

Waste valorization appears as another key topic, particularly in studies exploring the use of seaweed extracts or ozonated wastewater for disease control. These examples reflect a growing awareness that postharvest innovation does not end at the commodity itself, but extends to the reuse of waste streams and the management of by-products. In this sense, postharvest horticulture is no longer a "final stage" in the production chain, but an active site for sustainability interventions.

Importantly, several contributions also link pre- and post-harvest dimensions—for instance, showing how growing systems (soil vs. soilless) affect shelf-life and nutritional retention. This integration supports a more holistic understanding of quality as something that must be designed from the beginning, not merely maintained at the end.

Altogether, the research presented here underscores the interdisciplinary and increasingly strategic nature of postharvest science. It is a field that not only addresses spoilage and logistics but now engages directly with themes such as climate resilience, consumer health, and resource circularity. We hope this issue will inspire further discussion, innovation, and collaboration among scientists, practitioners, and policymakers committed to shaping a more efficient and sustainable horticultural future.

We thank the authors for their thoughtful contributions and the readers for joining this ongoing dialogue.