

Foreword

FOREWORD Special Issue 2015 POSTHARVEST

In this special issue of *Advances in Horticultural Science* are collected a set of studies exploring key technological interventions in the postharvest management of fresh horticultural products. The contributions exemplify a broader and increasingly urgent shift in the field: from merely preserving appearance or extending shelf life to actively engaging with questions of ecological safety, consumer acceptance, and metabolic balance.

Among the themes explored, ozone treatment emerges as a particularly promising strategy for microbial control in minimally processed produce. Its strong antimicrobial action, combined with the absence of chemical residues, positions ozone as an appealing alternative to chlorine-based disinfectants, especially in leafy vegetables like iceberg lettuce. However, the broader adoption of ozone in commercial practice still faces challenges. How do we define optimal doses that balance efficacy and safety across different products and storage conditions? How do we integrate ozone into existing packaging and logistics systems without undermining energy or water efficiency?

The second major axis of this issue concerns edible coatings as active packaging tools, applied not merely for aesthetic purposes but as dynamic interfaces between the product and its storage environment. Coatings based on cellulose or synthetic polymers were evaluated for their ability to retain moisture, slow oxidative changes, and preserve aroma in winter melon fruits. Interestingly, while coatings improved visual quality and reduced dehydration, they also revealed a physiological cost: impaired gas exchange led to a shift toward fermentative metabolism, causing sensory degradation. This underscores a recurring dilemma in postharvest science: efforts to “seal in” freshness may inadvertently disrupt the metabolic rhythms of the product itself.

What these studies reveal is the inherent complexity of fresh produce as a living system. Postharvest technologies must not only act on the surface but must also respect the internal physiological dynamics of fruits and vegetables. This calls for a more integrative mindset, one that bridges physical treatments, biochemical understanding, and practical feasibility.

Moreover, postharvest innovation must be aligned with principles of resource efficiency and ecological responsibility. Both ozone and edible coatings, in their best formulations, have the potential to reduce water usage, packaging waste, and chemical inputs. Yet real-world application depends on systemic thinking: how do these technologies scale? How do they interface with consumer expectations and regulatory frameworks?

This issue prompts reflection on the multi-layered role of postharvest science today. It is not simply about prolonging product life, but about reimagining how we handle living materials in ways that are technologically sound, economically viable, and ecologically attuned.

We believe that this volume will stimulate deeper exploration and discussion on food quality, safety, and sustainability.

