Preface

Maintaining the postharvest quality of fresh produce has long been a challenging task. In the past, several chemicals were used for postharvest treatment of fresh produce. These chemicals have been phased out, however, and replaced due to factors such as advances in technology a rise in health consciousness among consumers, and new environmental concerns. The safety and efficacy of postharvest treatments depends on the use of novel preservation technologies. The existing food laws have brought about several desirable changes in the logistics of postharvest handling and the value chain of fruits, vegetables, and other fresh produce. Synthetic pre- and post-storage treatment agents/molecules have been replaced by eco-friendly products. In the last couple of years, environmental and consumer friendly postharvest treatments have gained popularity across the globe.

The book “Postharvest Management Approaches for Maintaining Quality of Fresh Produce” is comprised of 12 chapters written by eminent experts of the developing and developed world. The book presents existing and novel management systems that are in use or have the potential to be used to maintain the postharvest quality of fresh produce in terms of microbiological safety, nutrition, and sensory quality.

Gaseous composition plays a vital role in the biochemical and physiological responses of fruits and vegetables, which in turn affect the postharvest quality. Chapter 1 discusses the importance of the changes in the respiration rate and its influence on the physiological and biochemical process, as well as its effect on the nutritional value and sensorial properties of fruits and vegetables. The endogenous signaling molecules play important roles in regulating/enhancing postharvest defense responses. These molecules delay the ripening process by inhibiting ethylene/CO₂ production and microbial infection, and maintain postharvest quality. Chapters 2–6 focus on the recent advances in exploring the roles of nitric oxide, hydrogen sulfide, salicylic acid, polyamines, and methyl jasmonate in regulating fruit senescence and microbial infection.

The antimicrobial power of plants and herb extracts has been recognized for centuries. In this volume, Chap. 7 includes a discussion of the use of essential oils as potential inhibitors of the quorum sensing mechanism, capable of controlling
bacterial spoilage and pathogenesis in food-related microorganisms. Endogenous plant growth regulators (PGR) are important regulators of many functions in plant development and physiology. Chapter 8 describes the major classes of PGR, including their nature, physiological functions, and horticultural practices. The chapter also covers their role in maintaining postharvest sensorial and nutritional quality and ripening or senescence processes. Chapter 9 discusses carbohydrates, focusing on their biological activity, in particular their antibacterial and antifungal activity, or their prebiotic effectiveness on postharvest quality preservation of fresh perishables. Chapter 10 explains the principle operation of each active packaging system and its effect on fresh produce quality and safety.

As an effective disinfectant, ozone can be employed in cold storage, washing systems, or process water sterilization. Chapter 11 discusses the generation, formation, properties, biocidal action, and phytotoxicity of ozone along with its mechanism of microbial inactivation. A chlorine-based solution has been one of the commonly used disinfectants for fresh produce, owing to its very potent oxidizing properties and cost-effectiveness. Chapter 12 discusses the characteristics and generation of ClO₂, the basis of its antimicrobial action, and its antimicrobial effects on the safety and quality of produce.

The editors are confident that this book will prove a standard reference work for the industries and researchers involved in postharvest management of fresh commodities. The editors would appreciate receiving new information and comments to assist in the future development of the next edition.

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Postharvest Management Approaches for Maintaining Quality of Fresh Produce
2016, XIV, 222 p. 40 illus., 8 illus. in color., Hardcover
ISBN: 978-3-319-23581-3