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Book reviews

The Avocado: Botany, Production and Uses

A.W. Whiley, B. Schaffer, B.N. Wolstenholme (Eds.),
CABI Publishing, Wallingford, Oxon, UK, ISBN
0-85199-357-5

This is a very comprehensive and detailed book on the avocado, edited by three experts and written by a range of specialists from diverse disciplines. The book has 14 chapters, starting with the history of the crop, the taxonomy and botany of the species, reproductive biology, genetics and breeding. The subsequent chapters discuss the various cultivars, the propagation techniques, effects of the environment (weather and soil conditions) on growth, and the effect of irrigation and mineral nutrition. One chapter is devoted to what is called biotechnology, defined as the use of methods such as in vitro culture, somatic embryogenesis, and transformation. The book also contains chapters on diseases caused by algae, fungi and bacteria, and on pests by insects and mites. The final chapter deals with postharvest biology and technology.

All chapters are well written and well illustrated. The volume also contains as many as 69 good colour photographs. There seems only little overlap between the chapters, and there are several cross-references to other chapters. This shows that the editors have done a nice job. The index is all right, but not very detailed. For example, postharvest is not an entry, although an entire chapter is devoted to the subject. The idea of 'tree storage' is mentioned a few times in the text, but also not found in the index.

Avocado fruit apparently originates from the Meso-Americas. The species *Persea americana* contains at

least seven subspecies, three of which are commercially important: var. *drymifolia* from the Mexican highlands; var. *guatemalensis* from the Guatemalan highlands, and var. *americana* from the pacific lowlands. Because of geographical isolation these subspecies did not cross-fertilise, though there are no sterility barriers if the plants grow in close proximity. The important cultivar Fuerte is a hybrid of the Mexican and Guatemalan subspecies, and Hass is predominantly Guatemalan in origin, with some Mexican influence.

Avocados have apparently been bred by local people for about 10,000 years, if the evidence is correctly interpreted. Archaeologists found that the seeds became larger in more recent strata, indicating breeding for larger fruit.

It is well known that avocado fruit of several cultivars show little softening when left on the tree after they reach acceptable commercial maturity. The fruit can thus be stored on the tree, for as much as 6 months (p. 224 and 247). If taken from the tree the fruit ripens rapidly. A tree factor is held responsible for this drastic difference, but the nature of this factor is still a mystery. Cultivars such as Hass and Fuerte show the tree factor, but the cultivars derived from the pacific lowland subspecies do not. Fruit of the latter cultivars thus ripen quickly when left on the tree (p. 224). We suggest that the difference between these two groups

may well be used to further investigate the nature of the tree factor.

The final chapter deals with postharvest technology and practice. The physiologist will not, in this chapter or elsewhere, find a detailed review on the biochemistry, physiology or molecular biology of ripening. The chapter rather focuses on practical aspects such as quality parameters, maturity indices, and effects of production on postharvest quality. Attention is given to harvesting, transport to the packing shed, sorting, packing and cooling, storage and long-distant transport. Processing of the fruit is also briefly treated. The chapter contains a detailed reference list.

In conclusion we recommend this outstanding volume to any postharvest biologist interested in avocado.

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Topics include the causal agents of postharvest diseases of fruits and vegetables, their sources and their ways of penetration into the host; factors that may accelerate the development of the pathogen in the host - and those that suppress them; a list of the main pathogens of fruits and vegetables, their hosts and the diseases elicited by them; and a detailed description of the major diseases of selected groups of fruits and solanaceous vegetable fruits. Attack mechanisms of pathogens and defense mechanisms of the host are examined as are treatments aimed at suppressing postharvest diseases. Postharvest diseases significantly reduce the shelf-life of harvested fruits/vegetables worldwide. *Bacillus* spp. are considered to be an eco-friendly and bio-safe alternative to traditional chemical fungicides/bactericides due to their intrinsic ability to induce native anti-stress pathways in plants. This review compiles information from multiple scientific databases (Scopus, ScienceDirect, GoogleScholar, ResearchGate, etc.) using the keywords "postharvest diseases", "Bacillus", "Bacillus subtilis", "biocontrol", "storage", "losses", and "fruits/vegetables".

Efficient Biotic Strategy to Control Postharvest Diseases of Fruits and Vegetables. *Plants* 2019, 8, 97. AMA Style. Knowledge about the various post-harvest causes of quality reduction in vegetables, fruits and potatoes lays the foundation for new strategies to maintain quality. The quality of fruit and vegetable products is determined by external, sensory and nutritional properties. To measure the impact of different storage and logistics scenarios, we quantify various quality indicators. Our dynamic control systems allow us to store fruit at a lower oxygen level, for example, and thus minimise quality losses and energy consumption while prolonging shelf life. Packaging can be even better suited to the specificities of a product. We help companies to extend shelf life and limit waste by providing advice on different types of packaging materials.