Title Control of postharvest spoilage in soft fruit

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Abstract

Purpose of the review: The incidence of disease is a significant postharvest problem in soft fruit. This paper discusses traditional methods and emerging technologies used to control this problem.

Findings: Currently the most common approaches taken to reduce postharvest spoilage of soft fruit are based on controlling the rate of fruit ripening and pathogen growth using low temperature and modified atmosphere storage. Other strategies such as irradiation, short heat treatments, application of chemicals (calcium, 1-methylcyclopropene and nitric oxide), plant defence response elicitors, natural compounds and the use of antagonists have been evaluated. Physical methods such as heat treatments and irradiation are promising methods for extending soft fruit shelf-life. Biological control and treatments that could elicit the activation of fruit natural responses have also shown encouraging results and seem to be feasible especially where application of fungicides is restricted. However, there are still many aspects that should be understood before these are adopted on a commercial scale. The rapid advances in metabolic engineering of plants may open another field of research with possibilities for reducing fruit susceptibility. Rapid cooling and low temperature storage (0ºC, 90–95% relative humidity) are crucial for reducing soft fruit spoilage, but the best approach seems to require the use of several integrated preharvest and postharvest strategies.

Directions for future research: Although there are some emerging technologies that could be useful to complement the benefits of low temperature storage and modified atmospheres, we must evaluate their feasibility and consider their limitations on a commercial scale. Testing the effectiveness of new techniques in low temperature storage conditions must be carried out to find alternatives that could improve currently used methods. Further research is also needed to understand aspects of fruit-pathogen interaction by examining, for example, pathogen virulence factors and the regulation of natural fruit-defence strategies. This information would be extremely

useful in the selection of candidate genes for breeding, biotechnological approaches and to develop effective and consistent methods based on the activation of fruit natural defence.