

Title Control of postharvest decay by the integration of pre- and postharvest application of nonchemical compounds

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Abstract

Traditionally, chemical fungicides have been used to preserve the quality of fruit and vegetables over extended periods of storage or transportation. However, increased global concern about pesticide residues and the reduced efficacy of chemicals due to pathogen resistant strains, have forced producers to evaluate safer alternatives for controlling postharvest diseases in the context of sustainable agriculture. Several means, such as natural compounds of animal and plant origin, organic and inorganic salts, antagonistic microorganisms, and physical means, represent the approaches recently evaluated to ensure fruit quality and safety.

Unfortunately, under commercial conditions these means as standalone treatments rarely yield satisfactory control levels. Lack of a high activity, low persistence, a narrow spectrum of activity, and a failure to control previously established infections can be considered the main limiting factors. Thus, it is generally accepted that a combination of various methods is necessary to improve the efficacy of these alternatives. In this regard, the use of alternative control practices involves the use of both pre- and postharvest strategies that have the potential to reduce latent, quiescent, and incipient infections; pathogen inoculum in the environment; and increase innate resistance in fruit. It has been shown that integrated approaches involving applications of microbial antagonists or other non-chemical means both before and after harvest can provide rates of disease control comparable to or better than synthetic fungicides, due to additive or synergic effects.