Title Current perspectives on the use of 1-methylcyclopropene in tree fruit crops: an international survey

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Abstract

Purpose of the review: Although the majority of 1-methylcyclopropene (1-MCP) research and development has been on apple, an increasingly significant body of work is accumulating for a wide variety of fruit species. The objective of this paper is to create a snapshot of the current state-of-the-art, provide an estimate of the potential benefits for the use of 1-MCP in tree fruit crops where development is still in progress, and evaluate factors that can influence successful application. Importantly, this review summarises the perspectives of an international panel of recognised experts on the potential benefits of 1-MCP on a crop-by-crop basis.

Main findings: The use of 1-MCP for improving the storability and quality of horticultural products is truly global. Currently, 27 countries use 1-MCP as the formulation SmartFresh™ on 25 different commodities, 18 of which are tree fruits. The survey indicates that postharvest experts anticipate "good, very good or excellent potential benefit" for 15 of the current 18 registrations, with apple and persimmon ranking highest. Little or no potential for benefit is envisioned for most of the fruit crops for which no registrations currently exist. Achieving consistent results, especially among those commodities not as well suited to 1-MCP use as apple fruit, will be a function of cultivar choice, preharvest factors, fruit maturity, treatment conditions, pathology, and interaction of 1-MCP and the postharvest environment. The findings illustrate that many aspects of the influence of 1-MCP on various commodities remain to be clarified before 1-MCP is fully adopted on a commercial scale.

Directions for future research: There is no doubt that the commercial impact of 1-MCP will increase as further research is carried out. Nevertheless, ample investigation is needed to determine the influence of preharvest factors and harvest conditions on fruit response to 1-MCP, as well as its influence in any disease-control program. 1-MCP sprayable formulations applied during the growing season have potential as an orchard management tool to ameliorate preharvest problems (eg, abscission) in addition to improving postharvest fruit quality. Testing the effectiveness of 1-MCP on new crops as a complement to low temperature storage and modified

atmospheres must be carried out to evaluate the feasibility and limitations of these technologies on a commercial scale. The influence of 1-MCP on consumer acceptance does not seem to be a problem for apples, but could represent a stumbling block for other tree fruit crops and merits further research.