

Title The effect of 1-MCP on the development of physiological storage disorders in horticultural crops

Author Watkins, Christopher B.

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Abstract

Purpose of review: To review the extent to which 1-methylcyclopropene (1-MCP), an inhibitor of ethylene perception, has led to increased understanding of the role of ethylene in the development of physiological disorders in harvested horticultural crops.

Main findings: The effects of 1-MCP on physiological storage disorders can be separated into several categories; those that are related directly to ethylene exposure, senescence and ripening, chilling and low temperatures during storage, and with oxygen and carbon dioxide levels in the storage atmosphere. The effects of 1-MCP on physiological disorders are beneficial and detrimental depending on the specific product that is under investigation. The majority of studies in the literature present data on physiological disorders as part of overall descriptions of product responses to 1-MCP, and insight into its specific role in disorder development is often lacking. However, 1-MCP has been, and will increasingly be, a valuable research tool for understanding the etiology of disorder development. The results highlight the complex nature of ripening and senescence processes. Understanding the interactions between these processes and disorder development will be critical for commercialisation of 1-MCP-based technologies for horticultural products.

Directions for further research: 1-MCP is a new experimental tool for researchers and the potential of the compound help to provide a better understanding of the role of ethylene on physiological disorders has yet to be fully exploited. Dissecting the relationships of disorder development with ripening and senescence processes will continue. In addition, the effects of cultivar and especially those of preharvest factors in relation to 1-MCP and physiological disorders are largely under-researched and further research is needed.