

Title Manipulating the ripening of imported avocado 'Hass' fruit during cold storage using e+[®] Ethylene Remover or 1-methylcyclopropene (1-MCP)

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Abstract

Increased ethylene production is associated with development of quality characteristics of climacteric fruit and also with loss of storage potential. The removal of ethylene and/or inhibition of the effect of ethylene in stored environments is fundamental to maintaining postharvest quality of climacteric produce. A wide range of approaches has been used to minimise the effect of ethylene on fruit. A former study by Terry et al. (2007) demonstrated that a newly developed palladium (Pd)-promoted material was capable of removing ethylene at cool temperatures to sub-physiologically active levels. Whilst 1-methylcyclopropene (1-MCP) acts by blocking the action of ethylene, the Pd-promoted scavenger rapidly removes ethylene from an environment. Hence, the aim of this study was to compare the efficacy of 1-MCP vs. Pd-promoted material (e+[®] Ethylene Remover) to extend storage life and maintain postharvest quality of avocado (*Persea americana* Mill.) 'Hass' fruit during 26 d storage at 5°C. The e+[®] Ethylene Remover effectively removed both exogenously administered and endogenously produced (i.e., fruit-derived) ethylene to sub-physiologically active levels within 24h. Accordingly, a delay in ethylene-induced softening and colour development was observed but e+[®] Ethylene Remover did not completely disrupt subsequent ripening. Inhibition of ethylene-induced ripening was also observed for 1-MCP, despite the presence of ethylene within storage atmosphere being well above physiologically active levels. There was no main treatment effect on the fatty acid composition of mesocarp lipids. Sugars content measured in response to treatments is discussed. This study suggests that e+[®] Ethylene Remover has the potential to be used commercially and possibly to overcome problems associated with disruption of normal ripening, which are often observed when using 1-MCP.