

Title Effect of delay between harvest and exposure to 1-MCP on post storage flesh firmness of three apple cultivars

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Abstract

The effects of delay between harvest and exposure to 1-MCP (SmartFresh, AgroFresh Inc.) was investigated for the apple (*domestica* × *Malus* Borkh) cultivars ‘Gala’, ‘Golden Delicious’ and ‘Law Rome’. Each cultivar was harvested at two stages of fruit maturity, based on Cornell starch index values of approximately 4 at the first harvest date and between 5 and 6 at the second harvest date. Harvest fruit maturity and delay between harvest and treatment were within recommended guidelines for commercial use of postharvest 1-MCP on these cultivars. Fruit were held at 0°C immediately after harvest and either not treated or exposed to 1 µl·L⁻¹ 1-MCP for 24 h from zero to seven days after harvest. The efficacy of postharvest 1-MCP treatments was determined by measuring flesh firmness after 40, 80, 120 or 160 days storage in regular atmosphere at 0°C followed by seven days at 20°C. Delaying 1-MCP treatment of ‘Gala’ for seven days after harvest did not influence flesh firmness after storage compared to treating fruit sooner after harvest. Delaying postharvest 1-MCP treatment from one to seven days after harvest reduced its efficacy on ‘Golden Delicious’ and ‘Law Rome’ by approximately 25 and 45%, respectively, when fruit were stored for 40 days after harvest. Although current guidelines for SmartFresh treatment require most apple cultivars to be treated within three to ten days after harvest these data indicate that delaying 1-MCP treatment for seven days after harvest may significantly reduce its efficacy in some apple cultivars.