

Title Fruit temperature and ethylene modulate 1-MCP response in 'Bartlett' pears
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Abstract

1-Methylcyclopropene (1-MCP) has been shown to protect 'Bartlett' pears against temperature stress during postharvest handling, and control or reduce incidence of scald and internal breakdown after cold storage. We investigated several factors that can influence pear fruit response to 1-MCP, including temperature during 1-MCP treatment and during storage after 1-MCP application and exposure to ethylene during the 1-MCP treatment to determine factors that might lead to variability in ripening response observed in 1-MCP-treated 'Bartlett' pears. The effect of 1-MCP was significantly reduced when fruit were stored after 1-MCP treatment for 45 d at intermediate temperatures (10 or 5 compared with 0 °C). Ripening of fruit treated with 1-MCP at 0.3 µL/L for 12 versus 24 h at 20 °C was not significantly different, suggesting the 1-MCP response was saturated by a 12 h exposure at 20 °C. However, at 0 °C, treatment with 0.3 µL/L 1-MCP for 24 h was more effective in inhibiting ripening than a 12 h exposure, and 1-MCP treatment for 24 h at 0 °C was less effective than 24 h at 20 °C, suggesting the response takes longer to saturate at lower temperatures. The presence of as little as 0.3 µL/L ethylene during 1-MCP application significantly reduced the efficacy of 1-MCP in ripening inhibition. Ethylene concentration and fruit temperature during 1-MCP application, along with fruit temperature during storage after 1-MCP treatment appear to be important factors regulating 1-MCP efficacy in 'Bartlett' pears.