

Title Effects of 1-methylcyclopene on fruit decay and quality in Chinese bayberry
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Abstract

1-Methylcyclopene (1-MCP) prevents ethylene action and extends postharvest life of many fruits and vegetables. It has been shown that treatment concentration and temperature are two important factors affecting the efficacy of 1-MCP. Considering the very short shelf life of Chinese bayberry fruit at ambient temperature, this work was carried out to investigate the effects of 1-MCP treatment at low and high temperatures on fruit decay and quality in this fruit. The fruit (cv. 'Wuwei') were harvested at ripe stage and exposed to 0.5, 1.0, and 5 $\mu\text{L/L}$ 1-MCP at 5°C for 12 h or at 20°C for 4 h. Following treatment, fruit were stored either at 0 °C for 12 days or at 20°C for 3 days. Treatment with 1-MCP at 5°C significantly reduced decay incidence during storage at both temperatures. The lowest concentration of 1-MCP was most effective in inhibiting fruit decay when stored at 0°C, having a decay index of 5% after 12 days of storage. In contrast, control fruit had a decay index of 15%. For fruit stored at 20°C after a treatment at 5 °C, 5 $\mu\text{L/L}$ 1-MCP was most effective in reducing fruit decay. The decay index of those treated fruit was 12% at 3 days, compared with 20% in control fruit. In complete contrast, 1-MCP treatment at 20 °C led to increased fruit decay at either 0 or 20 °C storage. Treatment with 1-MCP at both temperatures maintained higher total soluble solids (TSS) content during storage at 0°C, however, no significant differences were observed among any of the 1-MCP treatments. There was no significant effect of 1-MCP on TSS content when the fruit were stored at 20°C. Total titratable acidity content was not significantly influenced by 1-MCP treatment. These results suggest that low temperature for 1-MCP treatment has the potential to extend the postharvest life of Chinese bayberries by inhibiting fruit decay.