

Abstract:

The objective of this research was to determine the nature and extent of CO₂ injury in apples treated with 1-methylcyclopropene (1-MCP) and stored in controlled atmosphere (CA). 'McIntosh' apples were treated immediately after harvest with 0, 60, 300, or 600 nL·L⁻¹ of 1-MCP for 18 to 24 hours at ~20°C, and then placed in CA (3% O₂ + 2.5% CCO₂ for the first 30 days followed by 3% O₂ + 4.5% CO₂ thereafter) for 70 and 140 days at 3°C. 'Empire' apples with or without ReTain™ application (200 mL·L⁻¹, 4 weeks prior to harvest) were treated similarly with 1-MCP immediately after harvest and placed in CA (2.5% O₂ + 2.0% CO₂) for 120 and 240 days at 2°C. CO₂ injury was promoted in 'McIntosh' by 1-MCP treatment, with up to 39% of the treated apples having external symptoms compared to zero incidence in the non-treated fruit. 'Empire' apples treated with 1-MCP also exhibited greater CO₂ injury than those not treated, and the application of ReTain™ further promoted CO₂ injury.