

### Abstract

'Sunrise' and 'Silken' are summer apples with excellent crispness, juiciness, and sweetness, but unfortunately have inherently poor storage potential and a very narrow picking window. Apples for this test were picked up to 5 times at weekly intervals spanning across different stages of the fruit ripening period. Two temperature regimes set up for 1-MCP treatment were: fumigation at 22°C and storage at 0°C (22-0°C), fumigation at 0°C and storage at 0°C (0-0°C). The treated fruit were subsequently held for three weeks in air and then were held an additional seven days at 22°C to simulate shelf handling. 1-MCP treated apples with an increased maturity (starch index >3 on a 0-9 scale) maintained significantly better firmness and titratable acidity levels than those untreated. The treatment resulted in a 39N and 27N advantage in flesh firmness for 'Sunrise' and 'Silken', respectively. A 50% advantage in titration acidity retention and a retarded ground color change was found for both cultivars. A 1-MCP concentration of 250 nl L<sup>-1</sup> was sufficient for maximal response in inhibiting ripening when it was applied at the 22-0°C regime, however 1000 nl L<sup>-1</sup> was minimum required when it was applied at 0-0°C regime. In regards to maturity, there was no significant effect of 1-MCP on early picked apples (starch index <2.4 on a 0-9 scale) even at the 22-0°C. Internal ethylene concentration (ICE) dramatically increased after removal from low temperature storage regardless 1-MCP treatment concentration in early picking fruit. The results suggested that 'Sunrise' and 'Silken' apples should be treated at ambient temperature with 1-MCP and at an advanced maturity to ensure maximal benefit when they are stored at 0°C.