

Title Increased maturity enhances 1-MCP efficacy in maintaining quality of summer apples 'Sunrise' and 'Silken' stored at 0°C

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Abstract

'Sunrise' and 'Silken' are summer apples with excellent crispiness, juiciness and sweet-acid balance 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. To correspond with the common commercial handling at low temperature, fruit were treated with 250 nl L⁻¹ of 1-MCP for 16 hours at 0°C and were subsequently held for three weeks ('Sunrise') or four weeks ('Silken') in air at 0°C 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 than those left untreated. Fruit which was harvested two weeks after commercial harvest maturity and treated with 1-MCP were 32.6 N and 21.6 N firmer than controls harvested at commercial maturity in 'Sunrise' and 'Silken' apples, respectively. In regards to maturity, there was no significant effect of 1-MCP on early picked apples (at the commercial harvest maturity or 1 week before commercial maturity). Internal ethylene concentration (IEC) dramatically increased after removal from low temperature storage regardless of 1-MCP treatment. A one week delay of harvest (in relation to current commercial recommendations) and short term storage for these two cultivars was feasible at low temperature storage.