

Storage performance of two ‘Pink Lady®’ clones differs, but 1-MCP treatment is beneficial, regardless of maturity at harvest

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Abstract

Determining optimal apple harvest time is important for effective postharvest treatments and also for maintenance of quality along the supply chain. A non-destructive instrument, the DA meter, was used to measure changes in absorbance near the upper chlorophyll-*a* absorption peak and to segregate commercially harvested fruit into two ripeness levels. DA meter readings were made at harvest and following cold (regular air) storage removals for two ‘Pink Lady®’ clones, ‘Cripps Pink’ and ‘Rosy Glow’. In addition, the destructive maturity and/or quality indicators of starch pattern index, fruit firmness, and soluble solids were determined and ethylene and CO₂ production were monitored at harvest and at each removal, i.e. every 1.5 months for 7.5 months, and during a 14 d simulated shelf life per removal. The DA meter readings were a reliable non-destructive technology for determining ripeness levels throughout storage. Ethylene production patterns were similar up to 4.5 months of cold storage for the two cultivars, ‘Cripps Pink’ and ‘Rosy Glow’, but the rate was approximately double in ‘Rosy Glow’. Treatment with 1-methylcyclopropene (1-MCP) was effective at inhibiting ethylene evolution during cold storage and simulated shelf life, regardless of harvest maturity in both cultivars. However, this benefit only lasted until 4.5 months of cold storage for ‘Rosy Glow’, when ethylene production increased markedly after 7 d of simulated shelf life. The storage disorders, superficial scald and internal browning were more evident in ‘Rosy Glow’ fruit than in ‘Cripps Pink’, particularly after 6 months of cold storage. It is recommended that ‘Cripps Pink’ and its clone, ‘Rosy Glow’, be kept separately in storage and that ‘Rosy Glow’ not be stored for as long as ‘Cripps Pink’. Alternatively, the efficacy of additional 1-MCP treatments after 4 months of cold storage could be explored in ‘Rosy Glow’ to maintain reduced ethylene production during longer storage.