

Title Influence of 1-MCP application timing on the ripening behaviour of 'Elstar' apples after storage

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Abstract

1-MCP (SmartFresh™) is becoming more and more important as a practical tool for use in apple storage because it helps maintain better fruit quality both during storage and shelf-life. However, the recommended time window for 1-MCP application following harvest is very limited. In 2005/2006 the influence of 1-MCP application time on the effectiveness of fruit ripening inhibition during both the storage and shelf-life periods was investigated. 'Elstar' apples from three harvest dates were treated with 1-MCP one week, two weeks and three weeks after harvest. Fruit samples were taken after 5 and 6.5 months regular atmosphere (RA) and controlled atmosphere (CA) storage and the CO₂-release, ethylene production, and firmness changes were monitored during a shelf-life period at 20°C. The results show significantly better firmness retention in all 1-MCP treated apples in comparison to untreated, but in most cases no statistical significance difference was observed between the different application times. The late 1-MCP applications at three weeks after harvest maintained good fruit firmness levels, for both harvest dates as well as for both storage periods in CA stored as well as in RA stored fruit. In contrast, the firmness decrease observed in untreated fruit during shelf-life was much more pronounced than in 1-MCP-treated fruit. The lower metabolic activity of 1-MCP apples was shown by significantly lower respiration rates and ethylene production in fruit from all harvests and application timings during the entire shelf life period. This effect was greater in RA than in CA stored apples. It can be concluded that 'Elstar' apples treated with 1-MCP up to three weeks after harvest can maintain adequate flesh firmness during shelf-life. However, other apple cultivars or other quality parameters such as colour changes or skin greasiness may respond differently to delays in the 1-MCP application timing.