

**Title** Preharvest soybean oil and postharvest 1-methylcyclopropene (1-MCP) application to 'Golden Delicious' apples affects volatile aroma production after controlled atmosphere storage

**Author** I. Müller, D.S. Mattinson and J.K. Fellman

**Citation** ISHS Acta Horticulturae 857:281-288. 2010.

**Keyword** *Malus × domestica*; horticultural oil; fruit quality; flavour regeneration

### Abstract

To study the effect of growing season applied soybean oil on pre- and post-storage volatile aroma regeneration capacities and fatty acid metabolism of apples, one single treatment (21 days before harvest) of soybean oil emulsion (1% food grade oil, 0.1% Latron) was administered to 'Golden Delicious' apple trees. Apples were harvested at commercial maturity. At the time of storage a second treatment was applied to either control or soybean oil treated pre-climacteric fruit, consisting of  $0.70 \mu\text{L}^{-1}$  1-methylcyclopropene (1-MCP). The fruit were then stored for up to 140 days at  $0.5^{\circ}\text{C}$  under 1%  $\text{O}_2$  and 0.2%  $\text{CO}_2$  controlled atmosphere (CA) storage conditions and analyzed after holding at  $22^{\circ}\text{C}$  for 0, 3, 7, 11 and 15 days. No significant effects due to soybean oil treatment were noted for fatty acid distribution. 1-MCP treated fruit lost linolenic acid (C18:3) at a slower rate and linoleic acid (C18:2) did not increase as fast compared to untreated fruit stored under CA conditions. Soybean oil application significantly increased the mean volatile and aldehyde emission, as well as hexanal and 2-hexenal levels of fruit directly after CA storage (day 0). No significant treatment effects were observed for mean alcohol concentrations of fruit after storage and/or at-harvest shelf-life period. Soybean oil application did improve regeneration capacities of straight chain esters and significantly increased the emission of the branched chain ester 2-methyl-butyl acetate compared to untreated fruit.