

**Title** Effect of 1-MCP on respiration and concentration of ATP/ADP in the fruit tissue of 'Jonagold' apple after storage

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#### **Abstract**

The effect of 1-MCP on the respiration and ATP/ADP concentrations in 'Jonagold' apple fruit tissue in combination with three harvest dates (optimal harvest date, 10 days before and 10 days after optimal) and various storage conditions was investigated. Immediately after harvest 'Jonagold' apples were cooled to 5°C and treated with 1-MCP for 24 hours. Subsequently, the apples were stored under refrigerated storage conditions in air (RA-storage) and in controlled atmosphere (CA-storage) for 34 weeks and sampled 4 times after 0, 8, 18, and 34 weeks of storage for respiration measurements and ATP/ADP assays. Respiration was measured during the shelf-life period of 10 days and ATP/ADP was assayed respectively at 0 days and 10 days of shelf-life. The effect of 1-MCP treatment could be seen in the day one measurements with a clear drop in respiration and reduction in ATP concentrations, while the untreated fruit showed an increase in ATP. There were considerable differences in the ATP and/or ADP concentrations as well as respiration between the 1-MCP treated and untreated 'Jonagold' apples during the 34 weeks storage. 1-MCP treated fruit from both RA-storage and from CA-storage, showed a decrease in respiration and ATP concentration during the 10 day shelf-life while the untreated fruit maintained higher ATP and ADP concentrations. The ratio of ATP to ADP in the 1-MCP treated fruit was higher than that found in untreated fruit showing that ATP accumulated in the 1-MCP treated fruit despite the lower respiration level, possibly because of lower ATP consumption.