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
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## Effects of Controlled Atmosphere Storage on Scald Development and Postharvest Physiology of Granny Smith Apples

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**Abstract:** The effects of different O<sub>2</sub> and CO<sub>2</sub> concentrations on the scald development and postharvest physiology of Granny Smith apples (*Malus domestica* Borkh.) were investigated. Apples were harvested at optimal harvest time and stored in 1% CO<sub>2</sub>/2% O<sub>2</sub>, 2% CO<sub>2</sub>/2% O<sub>2</sub>, 3% CO<sub>2</sub>/2% O<sub>2</sub> and 0% CO<sub>2</sub>/21% O<sub>2</sub> (control) at 0 °C and 90-92% relative humidity for 9 months. At certain intervals, samples were collected from each storage condition for physical and chemical analysis (e.g. weight loss, flesh firmness, amount of titratable acid, total soluble solids, skin color, scald development, respiration rate and decayed fruit). Respiration rates of the apples were measured at 20 °C. The percentage of scald was significantly lower in CA-stored apples than in those stored in a normal atmosphere. In tested CA conditions, 3% CO<sub>2</sub>/2% O<sub>2</sub> was more effective and scald incidence was retained at around 8% after 9 months of storage. There were small differences in scald incidence among the 1% CO<sub>2</sub>/2% O<sub>2</sub>, 2% CO<sub>2</sub>/2% O<sub>2</sub> and 3% CO<sub>2</sub>/2% O<sub>2</sub> concentrations. Apples subjected to CA-storage were firmer and had substantially higher levels of titratable acids and soluble solids than apples stored in a normal atmosphere. CA-storage delayed the loss of chlorophyll and yellowing of the skin and also prevented the incidence of decay. The respiration rate of CA-stored apples was lower than that of apples stored in a normal atmosphere at 20 °C. Flesh firmness, soluble solids, titratable acids, skin color and levels of decay were not different at the 3 tested CA concentration levels. Granny Smith apples were able to be stored for up to 9 months under 3% CO<sub>2</sub>/2% O<sub>2</sub> with minimal superficial scald incidence and quality loss.

**Key Words:** Apple, *Malus domestica*, Granny Smith, superficial scald, CA-storage, quality

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