

**Title** Possible prediction of physiological storage disorders in 'Braeburn' apples comparing fruit of different orchards

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### **Abstract**

'Braeburn' apples frequently show physiological disorders during controlled atmosphere storage. Often apples from different orchards or sites can vary considerably in their sensitivity. The aim of this research was to develop strategies to predict the occurrence of internal physiological disorders in 'Braeburn' apples. Furthermore, possible reasons for differences in disorder sensitivity were investigated or were subject of investigations. Fruit from seven orchards were harvested at two picking dates. Subsamples were exposed to stress treatment with high CO<sub>2</sub> concentrations (5 and 10 kPa CO<sub>2</sub> for 24 h) and the chlorophyll fluorescence measured before and after treatment. Thereafter fruit were stored at 1.5°C under CA conditions (1 kPa O<sub>2</sub> and 0.5 kPa CO<sub>2</sub>) using either a rapid or delayed establishment of CA conditions (delay of 10 and 24 days). Fruit were removed from storage after two, four, and six months storage and the browning disorder incidence related to the initial fluorescence readings. We observed that delayed CA reduced the occurrence of internal browning disorders in the apples. In some cases a positive relationship between the chlorophyll-fluorescence measurements with the simulation of CO<sub>2</sub> stress at-harvest and the browning disorder incidence during storage was found. Furthermore, it was observed that late harvested fruit showed a lower incidence of BBD than the early harvested fruit with rapid CA establishment. In addition a strong correlation between the disorder incidence and respiration as well as ethylene production at harvest was evident. It was observed, that mineral content (K, P) and K/Ca ratio showed a positive correlation with browning storage disorders.