

Title Responses of 'd'Anjou' pear (*Pyrus communis* L.) fruit to storage at low oxygen setpoints determined by monitoring fruit chlorophyll fluorescence

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Abstract

'd'Anjou' pears, which are susceptible to superficial scald (scald), were stored in air or controlled atmospheres containing 1.5 kPa O₂ or a minimal partial pressure determined using real-time monitoring of fruit chlorophyll fluorescence. In two experiments, the low O₂ setpoints were 0.4 and 0.5 kPa. During experiment 1, pears stored continuously at the low O₂ setpoint did not develop scald while scald developed on fruit stored in air, 1.5 kPa O₂, or 0.5 kPa O₂ for 6 months then 2 months at 1.5 kPa O₂. Fruit from 2 of 3 lots stored in 0.5 kPa O₂ during year one of the two year study developed peel black speck, a disorder previously reported on d'Anjou fruit stored in pO₂ of 1 kPa or below. All CA environments slowed peel color change with the low pO₂ having a larger effect on color after longer storage durations. Fruit softening was also reduced by the low pO₂ compared with fruit stored in air or 1.5 kPa O₂. Fruit stored in 0.4 kPa O₂ with 0.1 kPa CO₂ in experiment 2 did not soften to a commercially acceptable value during the shelf life period after removal from storage. The results indicate low O₂ partial pressure set points established by monitoring fruit chlorophyll fluorescence can prevent 'd'Anjou' scald but may result in black speck development as well as insufficient softening during a typical shelf-life period.