Abstract:

The effect of two controlled atmosphere (CA) storage regimes and twelve CA storage periods following an initial low oxygen stress (ILOS) treatment on the development of superficial scald on 'Topred' and 'Granny Smith' apples was evaluated during two successive seasons. Apples harvested at pre-optimum and optimum maturity stages were stored for 7 days under simulated commercial conditions. Subsequently, fruit were exposed to ILOS conditions and then stored for 20 w and 12 w respectively at -0.5 °C in atmospheres containing 1.5% O_2/1.5% CO_2 or 1.5% O_2/3.0% CO2 (Topred) and 1.5% O2/1.0% CO_2 or 1.5% O_2/3.0% CO_2 (Granny Smith). The trial was repeated with fruit not exposed to a low O2 concentration and stored at regular atmosphere conditions at -0.5°C. Samples were evaluated at 2-week intervals. ILOS, without diphenylamine (DPA) treatment, followed immediately by CA storage, inhibited the development of superficial scald significantly on both cultivars after a CA storage period of between 8 w and 12 w for fruit picked at pre-optimum maturity and 2 w and 6 w for fruit picked at optimum maturity. CA storage regimes did not differ significantly in their effect on superficial scald development. Storage periods of longer than 14 w (Topred) and 16 w (Granny Smith) (pre-optimum maturity) and 6 w (Topred and Granny Smith) (optimum maturity) inhibited the development of superficial scald completely.