

#### Abstract:

The postharvest softening curve of the early season, rapid softening apple cultivar 'Cox's Orange Pippin' was triphasic in controlled atmosphere (CA; 2% O<sub>2</sub>:1.8% CO<sub>2</sub> at 3 °C) and air. However, CA stored fruit had a more prolonged initial slow softening phase and a slower rapid softening phase than air stored fruit. Internal ethylene concentration (IEC) increased in both air and CA fruit at 3°C, but the time necessary to exceed an IEC of 1.5 μl.l<sup>-1</sup> was greater, and maximum IEC attained was 50% less, in CA compared with air stored fruit. Onset of the rapid softening phase in both air and CA fruit was associated with a rapid increase in IEC. Thus IEC, or tissue sensitivity to ethylene, may determine the shape of the softening curve in apples regardless of atmosphere. Quantification of the affect of CA applied during storage at different levels and at different times should allow prediction of postharvest firmness after various times in air or CA.