

Abstract

Internal browning disorders of apple have a significant commercial impact because affected fruit may not be discovered until eaten by consumers. We evaluated the effects of delaying establishment of controlled atmospheres (CA) and of different CA on incidence of internal browning in the new cultivar Sciros, as these postharvest factors have been found to influence occurrence of internal browning in other cultivars such as 'Braeburn' and 'Fuji'. Fruit from five orchards were harvested, forced-air cooled and stored in air (0.5°C) or placed in CA of 2%O₂: 2%CO₂, 1.5%O₂: 1.5%CO₂ or 3%O₂: 1%CO₂, following delays of 0, 1, 2 and 3 weeks after harvest. The occurrence of internal browning was assessed after 80 days storage. Fruit stored in CA treatments had 12% incidence of internal browning compared with 1% when stored in air. Fruit stored in CA had similar incidence of internal browning to that in air (1%) when application of CA was delayed for 3 weeks. When delay was reduced to two weeks, incidence of internal browning was higher than in air, but similar (4%) for storage in 3%O₂:1%CO₂ and 1.5%O₂:1.5%CO₂. It increased to 12% in 2%O₂:2%CO₂. After one weeks delay, the incidence of internal browning was greater still and increased with increasing CO₂ atmosphere concentration. The delay in applying CA had a more dramatic impact on incidence than atmosphere, which became less important with longer delays in air after harvest. The risk of CA-induced internal browning in 'Sciros' apples by CA can best be minimized by delaying application of the CA for three weeks.