Abstract:

Apple (*Malus domestica* Borkh, Pink Lady™) fruit were harvested from one Californian orchard in 2002 and 2003 at two and three different maturity stages, respectively. Fruit were immediately stored at 0.5ºC in air or in controlled atmosphere (CA), 1, 3 and 5% CO_2 in combination with 1.5, 3 and 21% O_2 in 2002 and 1 and 3% CO_2 with 2% O2 in 2003. Additional treatments in 2003 included 1ppm of 1-methylcyclopropane (1-MCP) for 24 h, 2200 ppm of diphenylamine (DPA) for 5 min and delayed CA storage at 0.5°C for two or four weeks. The area of flesh browning (FB) was determined after storage in CA or air and 5 days at 20ºC. IB was not seen in fruit stored in air. It appeared in fruit after two months storage in CA, and the incidence did not increase after longer storage times. There was no significant effect of maturity at harvest on the incidence of FB; however, FB increased with increasing CO_2 concentrations and decreasing O_2 concentrations in storage. 1-MCP and 2 and 4 weeks delayed CA did not significantly inhibit the incidence of FB while DPA inhibited it completely. When comparing similar storage atmospheres for both seasons, the FB incidence was significantly different, being much higher in 2002. A mineral analysis of the apple flesh showed differences among the two seasons. Concentrations of NH_4, B, Zn, Ca, and Mg were significantly higher and Fe was significantly lower in 2003 corresponding with a lower incidence of FB.