

Abstract:

Red Delicious producers in the USA are under increasing pressure to produce fruit with optimum “on-shelf” dessert quality following storage. In addition to traditional quality measures like firmness and soluble solids, we are studying the ripening-related events that affect flavor perception. Ester production is always closely linked to the onset of climacteric ripening, while prolonged low-oxygen storage is usually detrimental to volatile production. Experiments focused on optimum harvest time for maintaining sweetness, sourness and aroma generating capacity during CA storage. In multiple-harvest experiments with ‘Redchief Delicious’ apples, we investigated the relationship between the internal ethylene maturity indicator and flavor retention and regeneration after storage for different lengths of time. Using a cohort of untrained panelists, it was found that overall flavor perception and perceived fruit ripeness begins to increase at the onset of the climacteric. CA conditions reduce post-storage volatile production when compared to those stored in refrigerated air although not to a level below those displayed in “over-mature” fruit at harvest after 3 months in storage. As harvest maturity advanced, the time required to regenerate aroma volatiles to an “optimum” level after removal from CA storage decreased markedly. Apparently, there is a linear relationship between attainment of optimal eating quality and time out of storage. Firmness, soluble solids, and titratable acidity of fruit from all harvest dates remained at acceptable levels throughout the post-storage ripening period.