Title Contrasting the structure and morphology of the radial and diffuse flesh browning disorders and CO_2 injury of 'Cripps Pink' apples

Author Hannah J. James , and Jenny J. Jobling

Citation Postharvest Biology and Technology, Volume 53, Issues 1-2, July-August 2009, Pages 36-42

Keywords Apple; Chilling injury; Carbon dioxide injury; Storage; *Malus* × *domestica*; Flesh browning; Cripps Pink; Pink Lady; Mineral content; Density

Abstract

Flesh browning of 'Cripps Pink' apples has been categorised into three separate disorders based on visual symptoms and cell morphology. Radial flesh browning (RFB) was identified by browning of the vascular tissue, in contrast diffuse flesh browning (DFB) was identified as browning of the cortex tissue. Carbon dioxide injury of 'Cripps Pink' apples was identified by the formation of pits and cavities in the flesh of the fruit. The area of affected tissue within the fruit had a different distribution for the RFB and DFB disorders. The area of tissue affected by RFB was highest at the stem end of the fruit decreasing towards the calyx end. In contrast the area of tissue affected by DFB was highest at the stem and calyx ends of the fruit and lowest in the middle section. Examination by scanning electron microscope (SEM) revealed that RFB and DFB were structurally different. The RFB disorder was associated with fractured cell walls whereas the DFB disorder was associated with the collapse of cells. Analysis of mineral nutrition and fruit density showed inconsistent relationships to the development of RFB and DFB of 'Cripps Pink' apples.