Influence of early season boron spraying and postharvest calcium dip treatment on cell-wall degrading enzymes and fruit firmness in 'Starking Delicious' apple during storage

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Abstract

In this experiment, the effects of early season boron sprays (300 mgL⁻¹, two times at the stage of full bloom and petal fall) and postharvest calcium dip treatment (4% w/v) alone or combined were investigated on the cell wall composition and cell wall modifying enzymes and their contribution to fruit ripening and softening behavior of 'Starking Delicious' apple at harvest and after 6 months storage (0 \pm 1 °C and 95% RH) plus shelf life at room temperature. Ca alone and Ca plus B was effective in delaying fruit softening apparently owing to suppressed pectin solubilisation, pectate lyase (PL), β -galactosidase (β -Gal) and α -L-arabinofuranosidase (AFase) activities were negatively correlated to firmness, thus positively affecting fruit storability. B application did not affect fruit Ca content and the activity of cell wall modifying enzymes, but caused small changes in flesh firmness and ethylene production which was less efficient than Ca dip treatment.