

Title Heat treatment and harvest date interact in their effect on superficial scald of 'Granny Smith' apple
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Abstract

A study was made of the effect of hot water dips (HWD) at temperatures of 42, 44, 46 and 48 °C (HWD 42 °C, HWD 44 °C, HWD 46 °C and HWD 48 °C, respectively) for 3 min on development of superficial scald and the concentration of α -farnesene and conjugated trienols (CT), CT₂₅₉, CT₂₆₉, CT₂₈₁, as well as OD₂₀₀ on Granny Smith apple fruits harvested on three dates and stored 125 days in air at 2 °C. HWD 48 °C efficiently decreased surface scald in the second and third harvest. α -Farnesene and CT were measured spectrophotometrically and by HPLC. No clear relationship of OD₂₀₀ and scald development was observed. Correlation of scald index and OD₂₀₀ at the end of storage was negative for the second harvest date. There was no significant correlation between the scald index and CT₂₅₉. Scald index was positively correlated with CT₂₆₉ after 80 days for the second and third harvest and at the end of storage for the second harvest. CT₂₈₁ was spectrophotometrically detectable only at the end of the storage, for the third harvest date, in control, HWD 42 °C, and HWD 44 °C. HWD 42 °C had significantly higher CT₂₈₁ compared to HWD 44 °C and control. HPLC analysis of control samples revealed presence of CT₂₈₁ in all three harvest dates, and presence of at least two components, as was the case of CT₂₅₉ and CT₂₆₉. The ratio of these two components was different for all three CT species. Fruit maturity was an important factor determining the response of fruit to heat and occurrence of superficial scald. The results indicate that a successful treatment using HWD to control superficial scald may be obtained after further research and that there are still some questions on the role of different CT's in scald biochemistry that should be addressed in future research.