

Abstract

Susceptibility of Satsuma mandarin fruit (*Citrus unshiu* Matc) to chilling injury development limits its fresh marketability. In this study, the effect of Satsuma mandarin was investigated. The treatments applied were, 45°C, 47°C, 50°C, 52.5°C and 55°C for 2 and 5 min. After treatment, the fruit were stored at 2°C for 8 weeks. The parameters, including chilling injury index(CI), heat damage index(HI), Total Acidity, Brix, Maturity Index, Respiration rate, ethylene production ethanol and Acetaldehyde concentration were evaluated from fruits after 4 and 8 weeks stored at 2°C. The major reduction of chilling index development was found at 50°C and 47.5°C for 2 min, under these treatment, CI developments was 1.43 and 1.58 respective for these treatments as compared with control(20.1) after 8 weeks. Higher dipping temperatures, for example 52.5 and 55°C, showed lower CI development but also showed the highest heat damage symptoms. The number of fruits affected increased temperature increased. Respiration rate and ethylene production was also affected by dip treatments. After 8 weeks storage at 2°C, the minimum value was achieved with 50°C for 2 min. this dipping treatment also increased Brix and decreased total acidity resulting in improved flavour (Brix:acid ratio) compared to untreated fruit and fruit receiving other heat treatments. The lowest ethanol and acetaldehyde concentrations were found in 52.5 and 50°C for 2 min. Overall, the 50°C treatment offered reduced chilling injury with minimum impact on external Quality attributes compared to the control after 8 weeks of storage. This preliminary study has indicated that there are good prospects for using heat treatments to control chilling injury and extend the storage window for NZ Satsuma mandarins. We have used early season fruit in this study, and further work is needed to refine treatments and assess the suitability of these protocols for extending the storage life of mid and late season fruit.