

Title Postharvest conditioning of Satsuma mandarins for reduction of acidity and skin puffiness
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Abstract

Postharvest temperature and relative humidity (RH) treatments were tested for their capacity to increase the soluble solids content:titratable acidity ratio (SSC:TA ratio) and/or reduce skin puffiness of New Zealand grown 'Miho' Satsuma mandarin. Fruit of low SSC:TA (approximately 6.8:1) harvested in 2001 and 2002 were held at 18 or 30 °C at low (approximately 65%) or high (>95%) RH for 3 or 5 days, followed by 2 days at 10 °C (88–92% RH). In 2002, an additional treatment of high and low RH at 10 °C was examined. Treatments at 30 °C, irrespective of RH, resulted in increased SSC:TA ratios in the fruit as a result of a decrease in titratable acidity, largely a decrease in citric acid. There was little effect of temperature on SSC and the levels of individual sugars. There was no significant effect of RH on either TA or SSC. The altered metabolism was also seen in an elevated respiratory CO₂ output at 30 °C, but a decreased CO₂ output once these fruit were transferred to 10 °C, in comparison with fruit treated at lower temperatures.

At 30 °C, weight loss was up to 8.5% after 5 days under low RH, but <4% under high RH. Fruit with >4% weight loss tended to have an unacceptable level of dehydration of the skin. After 5 days at 30 °C and low RH, skin puffiness, quantified from magnetic resonance images taken before and after treatment, was reduced, although fruit tended to have soft skin that could be more prone to damage.

It is concluded that short high temperature treatments such as 3–5 days at 30 °C can significantly raise the SSC:TA ratio in Satsuma mandarin through a reduction in TA, and conducting these treatments under a RH >90% minimises the risk of excessive weight loss and softening of the skin.