

Postharvest rind disorders of 'Nadorcott' mandarin are affected by rootstock in addition to postharvest treatments

P.J.R. Cronjé

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Abstract

Postharvest physiological rind disorders, such as staining and pitting, affects all citrus cultivars and have a significantly negative impact on return on investment for producers. Fluctuations in rind water balance, as influenced by ambient conditions during handling may play a major part in inducing rind disorders. The aim of this research was to determine if the type of rootstock (known to influence water supply to fruit) and postharvest handling practices affect the incidence of pitting and staining in 'Nadorcott' mandarin (*Citrus reticulata* Blanco) rind. Fruit were harvested at optimum maturity from two adjacent commercial 'Nadorcott' mandarin orchards, grafted either on rough lemon or Carrizo citrange rootstocks in the Western Cape, South Africa. After harvest the fruit were either immediately waxed and kept at ambient conditions or first dehydrated for 4 days at 20°C prior to waxing, or dehydrated before being subjected to a high RH (>90%) prior to waxing and storage at ambient conditions. After 14 days the fruit were evaluated for incidence of rind disorders and loss of rind firmness. The results indicated a significantly higher susceptibility of fruit from rough lemon rootstocks compared to fruit from Carrizo citrange. The postharvest dehydration prior to wax application induced significantly higher levels of rind disorders compared to fruit that was waxed within 24 hours after harvest. The data concur with findings on different citrus rind disorders where a dramatic water loss, due to high vapor pressure deficit (VPD) resulted in an inadequate adjustment of the water status of the rind, leading to cellular collapse and tissue damage. It is hypothesized that rough lemon rootstocks result in a rind with less of an ability to prevent water loss and therefore a higher rind disorder development. In addition, postharvest handling practices could aggravate the incidence of rind disorders. Therefore known and implementable postharvest practices such as removal of field heat and reduction of fruit VPD would decrease citrus postharvest rind disorders.