

Title The effect of potassium, calcium and magnesium foliar applications on postharvest rind breakdown of 'Nules Clementine' Mandarin

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Citation Program and Abstracts, 11th International Citrus Congress (ISC Congress), 26-20 October 2008, Wuhan, China. 333 pages.

Keyword orange; rind breakdown

Abstract

Rind breakdown (RB) is a postharvest physiological disorder of 'Nules Clementine' mandarin developing 5-10 weeks into storage, which has a negative economic impact on exports. The first visible symptom of rind breakdown is a darkening of an oil gland followed by the adjacent tissue, leading to tissue discolouration. This physiological collapse of the oil gland structure occurs randomly over the fruit surface resulting in the oil leaking into the subcutaneous flavedo tissue. During 2007 an experiment studying the effect of foliar nutrient applications on this postharvest condition was conducted. Foliar applications commenced after fruit set in October and were repeated at monthly intervals until April. The nutrient applications were chosen as high and low concentrations according to industry as high and low concentrations according to industry guidelines: potassium 2 and 6%, magnesium 2 and 6% and calcium 1 and 4%. Fruit were harvested from inner shaded and outer exposed bearing positions during 19-21 May, degreened, packed (including fungicides and wax) before being cold stored at 7.5°C. After 4, 6 and 8 weeks of storage RB incidence was scored. There after the flavedo was removed to determine the total mineral content of this fruit tissue. The incidence of RB followed the familiar pattern of inner shaded fruit having significantly higher occurrence than outer exposed fruit. The 6% magnesium treatment resulted in a significant reduction of RB on the inner shaded fruit. The same trend was evident on outer exposed fruit, but due to lower RB incidence the effect was not significant. These results indicate that the condition of the rind with respect to the mineral content, and especially magnesium, seems to play a vital role in determining the sensitivity of the rind towards RB. The exact role of magnesium, or other minerals, in limiting RB incidence is unclear and requires further research.