

Title Epicuticular wax content and morphology as related to ethylene and storage performance of 'Navelate' orange fruit

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Abstract

The effect of ethylene ($2 \mu\text{L L}^{-1}$) on total and soft epicuticular wax content and wax morphology has been investigated in mature 'Navelate' (*Citrus sinensis*, L. Osbeck) oranges held under non-stressful environmental conditions (22 °C and constant high relative humidity (90–95% RH)). In addition, the objective of the study was to understand whether the ethylene-induced changes in epicuticular wax might participate in the beneficial effect of ethylene reducing non-chilling peel pitting, by modifying peel water, osmotic or turgor potential, or disease incidence caused by *Penicillium digitatum* (Pers.:Fr.) Sacc. Ethylene increased total and soft epicuticular wax content in 'Navelate' fruit and induced structural changes in surface wax that might be related to the formation of new waxes. Changes in epicuticular wax morphology, but not in its content, might be involved in the protective role of ethylene reducing non-chilling peel pitting, although the beneficial effect of the hormone is not related to water stress. Cell water and turgor potentials in freshly harvested fruit and fruit stored in air under non-stressful conditions suggest that water stress is not a limiting factor leading to the development of this physiological disorder. In addition, the results indicated that formation of new waxes in fruit treated with ethylene may partially cover stomata, cracks or areas lacking wax occurring in stored fruit and is likely to improve physical barriers to *P. digitatum* penetration.