Title Complementary physical and chemical treatments as an alternative to fungicide use to control postharvest decay incidence and fruit quality of Montenegrina tangerines

Author Cândida Raquel Scherrer Montero, Rose Beatriz Antes, Ligia Loss Schwarz, Liege Cunha dos Santos, Rinaldo Pires dos Santos and Renar João Bender

Citation Crop Protection, Volume 29, Issue 10, October 2010, Pages 1076-1083

Keywords *Citrus deliciosa*; Scanning electron microscopy; Thermotherapy; Alternative treatments

Abstract

Heat treatments affect the germination and development of pathogens and enhance the ability of fruits to resist infection after harvest. In the present work, the effects of heat, in combination with other alternative decay control methods, were studied on 'Montenegrina' tangerines along with the effects on the cuticular surface of the fruit. Different treatment combinations using hot water (60 °C), brushing, and immersion in chloride dioxide, imazalil, sodium bicarbonate, and hand-applied carnauba wax were used. The tangerines were then put in cold storage for 20 days at 5 °C and retrieved to ambient conditions for 7 more days. Fruit samples were analyzed for total soluble solids, titratable acidity, epidermal color, weight loss, and decay incidence; an analysis of fruit surface was done through scanning electron microscopy. Heat treatments significantly reduced the number of tangerines with decay symptoms and enhanced the efficacy of the tested products. Carnauba wax significantly increased the number of rotten fruits, exerting a protective effect on the fungi by covering their structure. Sodium bicarbonate in combination with heat exerted a good control on decay incidence. The heat treatments partially removed the hyphae and spores of pathogens on the surface and also melted the cuticular waxes that cover stomata and cracks, reducing possible entry points for pathogens.