

Title Effects of polyamines and salicylic acid on postharvest lemon quality
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Citation Program and Abstracts, 11th International Citrus Congress (ISC Congress), 26-20 October 2008, Wuhan, China. 333 pages.
Keyword lemon; salicylic acid

Abstract

Postharvest losses during storage and transportation of lemons significantly reduce net income. Inexpensive treatments to improve fruit quality and shelf life of stored lemons are needed. The efficacy of polyamines and salicylic acid compared to GA₃ combined with 2,4-D to maintain lemon fruit quality was quantified. Fruit from three orchards (1650 fruit/orchard) were treated by submerision in spermidine (100 mg·L⁻¹), spermine (100 mg·L⁻¹) or salicylic acid (400 mg·L⁻¹) for 2 or 6 mins. All fruit were waxed [Stay Fresh 705 with Imazilil[®] (IMZ), Freshguard 2000 ppm]. Control fruit were treated with wax + IMZ or wax + IMZ + GA₃ (50 ppm) + 2,4-D (225 ppm). After 8 weeks of storage (12 °C), percent juice, total soluble solids and total acidity of fruit treated with spermine and salicylic acid were equal to fruit treated with GA₃ + 2,4-D. Fruit treated with spermidine (6 mins), spermine (2 mins), salicylic acid (6 mins) or GA₃ + 2,4-D had equal weight loss over 8 weeks. All treatments had equally low decay during the 8 weeks. All fruit treated with spermidine, spermine or salicylic acid had les decay at week 10 than control fruit (wax +IMZ or wax + IMZ + GA₃ + 2,4-D). Retention of the button and delaying its change in color from green to straw to black is an important parameter of lemon postharvest fruit quality. All treatments were equally effective in button retention. Fruit treated with spermine for 2 mins or GA₃ + 2,4-D had equally low differences between the initial and final number of fruit with green, straw, or black buttons after 8 weeks of storage. Thus, with the exception that no treatment delayed color development of the peel as effectively as the treatment containing GA₃ + 2,4-D, fruit treated with spermine for 2 mins were equal in all quality parameters to fruit treated with GA₃ + 2,4-D. Spermine is inexpensive to use and could prove a cost-effective alternative to 2,4-D.