

Title Postharvest characteristics of navel oranges following high humidity and low temperature storage and transport

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Abstract

Fruit moisture loss and the onset of rind disorders in citrus can occur during refrigerated storage and transport, leading to significant economic costs to horticultural industries. High relative humidity (RH) storage obtained by using a modified atmosphere packaging liner in a carton and described as Moisture Control Technology (MCT) was investigated for its effect on navel orange fruit quality in static cold-storage and under commercial export conditions. In static cold-storage, 'Lanes Late' navel orange (*Citrus sinensis* L. Osbeck) stored with and without MCT for 55 days at ≤ 5 °C and 21 days at 21 °C lost 3% and 13%, respectively, of their initial weight. Fruit from the MCT treatment were $\geq 32\%$ firmer and had less chilling injury (1% versus 7%) compared with those without MCT. In the export study, 'Washington' navel orange fruit were packed in cartons with and without MCT and sent in a sea shipment consignment (holding conditions: 3 °C, RH 90%) from Adelaide, Australia to San Diego, USA where they were off-loaded into cold storage (5.5 °C, RH 89%). After 3 weeks of cold-storage, fruit with MCT had 83% less moisture loss than those without MCT. Compression damage occurred on fruit without MCT, particularly in the bottom two pallet layers. MCT reduced the incidence of chilling injury by 42% and albedo breakdown by 54% compared with fruit in unlined cartons. Overall, fruit quality was highest in both trials with the use of MCT. Despite the high humidity conditions inside the MCT cartons ($\geq 98\%$), no mould was detected on fruit at out-turn. This was probably due to the industry standard pre-treatment of fruit with a fungicide dip during pre-pack processing and to the properties of the MCT liner itself.