

Title CA affects juiciness in peaches due to an earlier post-storage ethylene production
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Abstract

The long-term storage of peaches at low temperatures, instead of maintaining the postharvest quality, can lead to the development of chilling injury symptoms such as mealiness (woolliness). In addition to the genotype influence, the development of mealiness has been demonstrated to be temperature- and storage time-dependent. In this work we aimed to raise additional information about the effect of storage conditions and ethylene on the ability of peaches to develop mealiness during shelf life. Therefore, white-fleshed, melting ‘Chiripá’ peaches were treated with 900 $\eta\text{l L}^{-1}$ 1-methylcyclopropene (1-MCP) for 24 h at -0.5°C before cold storage (-0.5°C , 95% RH) either without additional treatment or with additional ethylene ($20 \mu\text{l L}^{-1}$) treatment during the first 24 h of post-storage ripening. Some fruit were also stored in controlled atmosphere (CA) 2.0 kPa O₂ + 8.0 kPa CO₂ without 1-MCP treatment. Fruit were stored during 40 days and ripened for 6 days at 20°C . The ethylene production increased slowly in 1-MCP-treated fruit during post-storage ripening, whereas it increased quickly and reached a peak value at the 2nd day in CA-stored fruit. CA strongly stimulated the activity of ACC oxidase after removal from storage but this activity was only slightly increased in 1-MCP-treated fruits even after exposing them to ethylene during 24 h. Flesh juiciness decreased markedly in CA-stored fruit until 2 days of shelf-life, but quickly increased afterward almost recovering the values determined at harvest. 1-MCP treatment lead to faster reduction of free juice contents and likely to increased incidence of mealiness. Our data, therefore, suggest that the positive effect CA has on mealiness reduction is at least in part due to the maintenance of a normal pattern of ethylene production after storage.