

Abstract

'Mor' is a new mandarin variety, originated from a seedless progeny of 'Murcott'. It has a rich and aromatic taste but, like its 'Murcott' parent, it suffers from the development of off-flavors, and these are often enhanced by coating the fruit with waxes, which restrict gas exchange and lead to the development of anaerobic conditions in the internal atmosphere of the fruit. In order to reduce the development of anaerobic conditions and thus also to reduce the emission of off-flavor volatiles, we evaluated the effects on these processes of varying the contents of total solids (5, 9, 13, or 18%) and of shellac (regular amount, half-amount, or none) in 'Tag' wax (Safepack Products Ltd., Israel), a commercial polyethylene-based wax used for coating mandarins in Israel. It was found that all wax formulations reduced water loss sufficiently, but it was necessary to include at least 13% of total solids and half the regular amount of shellac to impart the desired gloss and shine, comparable with that obtained with the commercial 'Tag' wax. However, serial dilutions of the total solids and of the shellac content in the wax formulation gradually reduced the decrease in O₂ and increase in CO₂ concentrations in the internal atmosphere of the fruit, and the accumulation of ethanol and off-flavors. Therefore, in light of these data, we developed a new, modified 'Tag' wax formulation, containing only 13% solids and a half-amount of shellac, and compared its effects on fruit taste and quality with those of the commercial 'Tag' wax. We found that application of the modified 'Tag' wax significantly reduced the build up of anaerobic conditions and accumulation of ethanol, and correspondingly improved fruit taste and reduced the detection of off-flavors, as compared with fruit coated with the commercial 'Tag' wax, while causing negligible effects on other fruit quality parameters, such as weight loss, gloss, and storage performance.