Abstract

Oranges, bell peppers and apples were treated with different coatings, and measurements were made of gas permeance through the peel. Shellac and wood resin coatings reduced ethane permeance of orange and apple peels by approximately 95% from the values for non-coated peel, and carnauba wax coatings gave about 85% reduction. The experimental procedure enabled us to make multiple measurements on the individual fruit CO_2 and ethylene production, internal gas concentrations and permeance. These measurements showed that some individual fruit were atypical in terms of CO_2 and ethylene production or permeance. Application of coatings resulted in some fruit having markedly high values of internal CO_2 and low O_2. High-barrier coatings not only caused large decreases in internal O_2 and increases in CO_2; but these also resulted in much larger variation in internal gas concentrations in different individual fruit with the same coating, much larger than the variation between different individual non-coated fruit. Because fruit quality is much dependent on internal gas concentrations, this means that high-barrier coatings result in fruit with higher variation in product quality.