Title Effects of delays in cooling on blueberry quality outcomes

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Abstract

Rapid cooling of fresh produce after harvest is widely accepted as an important process in maintaining product quality. However, in the industrial context, rapid cooling can be inhibited by the requirement to initially aggregate and transport produce, and later by the throughput capacity of either the cooling or packing line facilities. In order to achieve rapid cooling after harvesting blueberries fruits are cooled to an intermediary temperature of 10°C. After packing, the fruits were later cooled to the optimal storage temperature of 0 0c. While these activities are conducted as fast as possible, it is not known whether delays that interrupt this operation result in reduced product quality when the product reaches the marketplace. In order to address this question a delayed cooling experiment was conducted in which rabbiteye blueberries *(Vaccinium ashei* Reade, cv. Maru) were subjected to extended periods of time at 20°C (to simulate delays before cooling) and 10 °C (to simulate delays before final chilling). A full matrix of2 delay times at 20°C and 3 delay times at 10 °C was investigated. The firmness and weight loss was measured weekly during a subsequent 3 week period at O°c. The results indicated that minimal differences in firmness or weight loss are observed when comparing a 6 h delay to a 2 h delay at 20°C, while a 20 h delay at 10°C resulted in significantly softer fruit than those delayed for 4 or 8 h at 10°C. In addition, the firmness losses observed were found to correlate to the cumulative weight loss from the fruit. The results indicate that delays of up to 6 hat 20°C and 8 hat 10 °C do not result in significantly reduced fruit quality 3 weeks later in comparison to the most rapid practicable cooling times (2 h at 20°C, 4 h at 10°C).