

Abstract:

The logistics of the current Australian and Californian recommendations to harvest avocado below 30 °C and remove field heat within 6 hours of harvest are increasingly being challenged as the Western Australian industry expands. Despite this, there has been little feedback of quality sacrifice in the market as a result. Through factorial experiments, we harvested both shaded and sun-exposed 'Hass' avocado over an ambient air temperature range of 27-34 °C, subjected to a 2, 6 or 24 h pre-cooling delay and a 14 or 28 day cool-storage, before ripening and quality assessment. We found significant temperature correlations to softening, vascular browning, body rots and, when a temperature-by-delay interaction was considered, skin colour. The relationships of temperature to softening and body rot were quadratic: softening increased significantly up to an ambient temperature of about 30 °C but did not change significantly thereafter; body rots did not change significantly up to 30 °C but declined significantly thereafter. The interaction effect of temperature-by-delay on colour was also quadratic when fruit were subjected to a 24 h pre-cooling delay. Fruit colour increased significantly up to about 30 °C but did not change significantly thereafter. The relationship of temperature to vascular browning was negatively linear; showing a significant decline over the range of 27-34 °C. There was no significant main effect of sun-exposure, although there were significant interactions; showing that postharvest behaviour varied between shaded and sun-exposed fruit. However, the average elevation of 6 °C above shaded fruit temperatures was not as large as reported by previous studies and was thus interpreted with caution. In light of the results, experiments have been designed to further explore the main effects and interactions of temperature, sunlight, and postharvest handling on avocado quality and physiology.