Comparative multi-parameters approach to dissect texture subcomponents of highbush blueberry cultivars at harvest and postharvest

Lara Giongo, Matteo Ajelli, Marti Pottorff, Penelope Perkins-Veazie and Massimo Iorizzo

Abstract

Fruit texture and firmness are important cues of blueberry quality for the fresh market. These attributes contribute to consumer acceptance, resistance to bruising during harvesting and transportation, and shelf-life. Thus, fruit firmness and texture are major priorities for blueberry breeders, producers and distributors. In this study, the discriminative power of texture analysis was examined using penetration tests with different probes and double compression for texture profile analysis (TPA). Mechanical parameters taken from the force deformation curves used to dissect texture subcomponents in blueberries that are associated with specific tissue layers. Principal component analysis (PCA) allows to filter and identify mechanical parameters that significantly discern the most variation amongst 24 blueberry genotypes and showed that texture in this crop is multi-trait and cultivar-dependent. Texture analysis was used also on blueberries stored over six weeks to identify mechanical parameters that could be used as predictors for long shelf life. Additionally, the mechanical parameters were correlated with dynamometer data to determine the utility and accuracy of a simple handheld device to measure fruit firmness in blueberries. This study provides a framework for the identification and characterization of the subcomponents of texture in highbush blueberry.