

Title Effect of preharvest calcium applications on postharvest quality, softening and cell wall degradation of two blueberry (*Vaccinium corymbosum*) varieties

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Abstract

Excessive softening is the main factor limiting blueberry storage. We evaluated the effect of preharvest calcium applications on ‘O’Neal’ and ‘Bluecrop’ blueberry quality during refrigerated storage. Blueberry plants were fertilized with CaSO_4 (0.06 kg m^{-2}). On the following season, fruit was harvested at commercial maturity (100% blue) and stored at 2°C for 23 d. During storage, we analyzed firmness, weight loss, surface color, anthocyanins, respiration rate, decay, acidity, pH and total sugars. In addition, changes in loosely and tightly bound pectins, hemicelluloses and calcium content were evaluated. Calcium-treated fruit for both varieties had less softening and weight loss than control fruit. Respiration rate increased during storage, but this increment was lower in calcium-treated blueberries. The fertilization treatment did not affect other quality attributes such as color, anthocyanins, acidity or sugars. Calcium treatments did not alter hemicellulose content but in some cases reduced solubilization of pectic polymers. At harvest a 10% increase in calcium content within the cell wall was found in both varieties. At the end of the storage period the differences were more marked, suggesting that the modest but significant increase in calcium in treated blueberries at harvest might have affected wall disassembly. Results showed that calcium sulphate fertilization was useful to delay postharvest softening and decrease weight loss of blueberry fruit harvested in the following season. The treatments might be useful for fruit intended for long distance shipping. Further work is needed to determine the efficacy of the treatments with a low soluble calcium source such as CaSO_4 as well as the effects of repeated applications to the soil.