

Title Effects of postharvest potassium silicate application on phenolics and other anti-oxidant systems aligned to avocado fruit quality

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Abstract

The efficacy of silicon (Si) to increase the pool of phenols in avocado mesocarp and, thereby, improve postharvest avocado fruit quality, was determined. The effect of postharvest Si application on the concentrations of the two major free and membrane-bound phenols in avocado fruit tissue, catechin and epicatechin, was analysed using HPLC. The expression and activity of catalase, the major enzyme with anti-oxidant activity, were also determined. Postharvest potassium silicate (KSil) applications had no effect on respiration rate; in contrast, fruit firmness, weight loss, mesocarp electrical conductivity (EC), total phenolics concentration, lipid peroxidation as well as polyphenol oxidase and catalase activity responded positively to the KSil treatments. Silicon might function as a major elicitor increasing free polyphenol concentrations. As phenolics participate in the induction/repression of genes as well as the activation/deactivation of enzymes of key metabolic pathways, their application might be an important tool to increase the fruit's ability to better withstand stressful environmental impacts. Therefore, Si applications could be used to increase the pool of free phenols in the mesocarp, thereby increasing fruit quality.