



### Third Article

<b>Article title</b>	<b>Potassium Spraying Preharvest and Nanocoating Postharvest Improve the Quality and Extend the Storage Period for Acid Lime (<i>Citrus aurantifolia</i> Swingle) Fruits.</b>
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#### **Abstract**

Citrus fruits are one of the most abundant crops globally in more than 140 countries throughout the world. Acid lime (*Citrus aurantifolia* swingle) is one of the citrus fruits which popularly has rich nutritional and therapeutic features. The storage period is the important factor that affects the economic and quality properties of this fruit. This study aims to demonstrate the enhancing effect of preharvest spraying with potassium, in addition to the postharvest dipping of fruits in some edible coatings, on the quality and storability of acid lime fruits. Preharvest spraying with organic and mineral forms of potassium, namely, potassium thiosulfate 1.75 g/L (S) and potassium tartrate 2 g/L (T), were carried out at three different times, in May, June, and July. On the other hand, postharvest treatments were carried out via dipping fruits in different types of biopolymers (carboxymethyl cellulose (E2) and gum arabic (E3)) and carboxymethyl cellulose/gum arabic composite (E4) as well as nanocoating formulation based on both biopolymers and doped zinc oxide nanoparticles (ZnONPs) (E1), which were prepared via acid lime peel waste extract. Herein, the physiochemical and morphological characterizations confirmed that the nanocoating was prepared at the nanoscale and doped with green synthesis ZnONPs, with recorded sizes of around 80 and 20 nm, respectively. Preharvest spraying with potassium tartrate enhanced fruit traits followed by potassium thiosulfate, compared to control. For postharvest treatments, E1 improved fruit quality, followed by E2, E4, and E3, respectively. The integration between pre- and postharvest treatments showed a clear superiority of TE2, followed by TE4, SE1, and SE2, respectively