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# Evaluation of ClO<sub>2</sub> Gas for Reducing Postharvest Diplodia Stem-end Rot on Grapefruit before Degreening

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Diplodia stem-end rot (SER) is an economically important postharvest citrus fruit decay in Florida that has been exacerbated by citrus HLB in the groves. Experiments were conducted to evaluate the effects of ClO<sub>2</sub> gas applied on grapefruit before degreening to reduce Diplodia SER. The ClO<sub>2</sub> gas was generated by mixing two dry reacting powder materials. Field-run grapefruit were placed in a sealed plastic box (42.5L) and ClO<sub>2</sub>-releasing materials applied 1) at 1, 1.5 and 2.0

g/kg fruit at 70-75°F for 8 hours, or 2) at a rate of 1g/kg fruit for 2, 4, or 8 hours. The fruit were then degreening with 5 ppm ethylene for 3 days and incubated at 75°F for up to 3 weeks to promote decay. The ClO<sub>2</sub>-releasing materials at 2, 1.5 or 1.0 g/kg fruit for 8 hours reduced Diplodia SER incidence by 87, 78, and 74%, respectively, compared to the control. ClO<sub>2</sub> treatment for 8, 4 or 2 hours at 1g/kg fruit reduced Diplodia SER incidence by 71, 43 and 36%, respectively, compared to controls

(0 h). Fruit absorbed about 93% of the ClO<sub>2</sub> gas after the 8-hour treatment. ClO<sub>2</sub> at 1g/kg fruit for 8 hours did not affect fruit weight loss, firmness, total soluble solid, or acid content. However, higher than 1g ClO<sub>2</sub>-releasing material/kg fruit and longer than 8 hours of exposure caused visible fruit injuries in some tests. Overall, ClO<sub>2</sub> gas has the potential to be included in a grapefruit postharvest decay control system to reduce Diplodia SER.

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