

Effects of calcium oxide mixed with turmeric tuber, and packaging bags on crown rot disease of bananas, caused by *Colletotrichum musae*, for retail markets

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Abstract

Previous results showed that calcium oxide (CaO) mixed with turmeric tuber (*Curcuma longa*, Tu) was able to control crown rot disease of banana during storage at room temperature without any effect to banana quality. Here we demonstrate that the combined effect of CaO mixed with Tu (CaO+Tu), and packaging bags showed great potential for the control of crown rot disease caused by *Colletotrichum musae*, and the maintenance of quality of bananas for the retail market. Banana hands were harvested from the orchard and cut to obtain two fingers per hand as they are generally sold in retail markets. Each small hand was inoculated on the crowns with a spore suspension of *C. musae* and incubated for 4 h under high moisture before the crowns were treated (painted) with CaO+Tu. The treated hands were then packed in either Equilibrium Modified Atmosphere (EMA) bags or Ethylene Scavenger (ES) bags. Untreated banana hands were packed in commercialized Perforated Polyethylene (PPE) bags (controls). All banana hands in the packages were kept at 13°C for 15 days and then transferred for shelf life at 25°C for 2 (15+2) and 4 (15+4) days, respectively. The results showed that disease severity was significantly reduced by the combination of CaO+Tu and EMA or ES bags when compared with the PPE bag during storage at 13°C. EMA and ES bags significantly prevented weight loss and colour changes (Hue angle) of banana peel throughout storage life and shelf life, and also delayed senescence by retarding the accumulation of total sugar in pulp and chlorophyll degradation in peel. Gas concentration in banana packages was observed, and CO₂ concentrations in EMA or ES bags were significantly higher than in the PPE bag, whereas O₂ concentrations were lower than in the PPE bag. These results implied that CaO+Tu and EMA or ES bags were able to delay the disease severity and the senescence of bananas for retail markets.