

Title Integrated controls of crown rot disease on Banana cv. Kuai Horn Thong

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Abstract

Collectotrichum musae, *Lasiodiplodia theobromae* and *Fusarium* spp. are the causal agents of banana crown rot disease that is a major problem for domestic and export markets. Combined effects of heated potassium sorbate (PS) with modified atmosphere packaging on the control of crown rot disease were investigated. Bananas cv. Kuai Horn Thong were harvested from Good Agricultural Practices (GAP) orchards. Banana crowns were then inoculated with the mixture of three spore suspensions of those pathogens for 6 h before the banana hands were immersed in hot water (HW) at 45°C for 20 min or in a heated solution of 0.5% (w/v) PS at 45°C for 20 min. All treated banana hands were packed into perforated polyethylene (PPE) bags or active packaging (AP, M4 film) bags. Banana hands treated with 500 ppm carbendazim (fungicide) for 20 min and then packed in PPE bags were used as the controls. All treated banana hands were stored in a cold room at 13°C for 28 days and then transferred to ambient temperature of 25±2°C for 3 days to simulate storage life and shelflife respectively. Disease severity and quality of bananas were determined. The heated PS solution treatment delayed the severity of crown rot disease, as did the carbendazim treatment, up to 21 days at 13°C only, whereas banana hands treated with HW prior to packing in PPE or AP bags showed the highest disease severity throughout storage and shelf life. Retarding disease severity using heated PS treated- and carbendazim-treated bananas was related to the increase in chitinase activity, while the activities of peroxidase (POD) and polyphenol oxidase (PPO) were not significantly different to other treatments. AP bags had the ability to delay banana ripening by maintaining flesh firmness and delaying the change in peel colour, and the increase in total soluble solids content. This was particularly so in the heated PS solution treatment that showed the greatest effect in delaying banana ripening.