EFFECT OF GIBBERELLIC ACID AND BAGGING ON DISEASE DEVELOPMENT OF 'EMBUL' BANANAS

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In an attempt to improve postharvest attributes of 'Embul' bananas including shelf-life, the effects of four individual pre-harvest treatments on banana pathogens, *Colletotrichum musae, Botryodiplodia theobromae* and *Fusarium* sp. were determined. The treatments were spraying 100 ppm gibberellic acid (GA), bagging and combination of GA and bagging. Spraying water and untreated one served as controls. Harvested, differently treated bananas (15 fruits X 3 replications) were inoculated with *C. musae* conidial suspensions (20 µl of 10^4-10^5 CFU/ml), onto intact tissue of middle (half way between stem and style) of fruits. Lesion diameters were measured, daily. In another experiment conidial suspensions (10^4-10^5 CFU/ml) of each pathogen (20 µl) was inoculated separately onto freshly cut stem end tissues of individual bananas (15 fruits x 3 replicates per pathogen). Lesion lengths from stem end to longest end of the lesion were measured daily. Additionally, spore germination assay was done by placing conidial suspensions (10^4 - 10^5 CFU/ml) at 0, 50, 100 and 150 ppm GA solutions in 5% sucrose or potato dextrose broth (20 µl) were placed on glass slides separately, and incubated at 27-29 ^{0}C. Germinated conidial counts (n=100 per site) were taken (9 sites per treatments) in 4-hr intervals. In another experiment, a pathogen at a time was inoculated (5 mm diameter disk) to freshly prepared plates of Sabouraud's agar, supplemented with GA of different concentrations separately (0, 50, 100, 150 ppm). The diameters of the advancing fungal colonies were measured at every 8-hr interval (6 replications).

Previously we showed that bagging resulted in larger aesthetically appealing bananas. However, confirming already reported field observations, in this study bagged bananas showed significantly higher anthracnose lesion development than untreated control and water treatment ($p = 0.05$). In field observations, bagging resulted in a reduction of crown rot severity. However, in the present study, bananas from bagged bunches, when inoculated on stem tissues, showed significantly higher susceptibility to pathogens associated with crown rot. From the results of inoculation studies, bananas that were bagged had increased susceptibility to pathogens, but in field experiments exposure to inoculum was reduced by bagging. Therefore reduced crown rot development in field experiments would have been due to exposure to a lower inoculum level than due to decreased susceptibility of bananas. *In vitro* germination of *C. musae* reduced with increasing GA concentration, but GA did not affect those of *B. theobromae* and *Fusarium* sp. ($p=0.05$). GA (50 ppm) reduced the linear growth of fungal mycelium of *C. musae* and *Fusarium* sp. whereas germination of *C. musae* was reduced with increasing GA concentration. However, anthracnose development was not affected in field studies, to the same degree by GA treatment. There is evidence that some degree of suppression of *C. musae* occurs when GA is applied. Although bagging enhances the disease susceptibility towards anthracnose and crown rot, combining with GA appears to reduce susceptibility of bananas to all three pathogens.

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