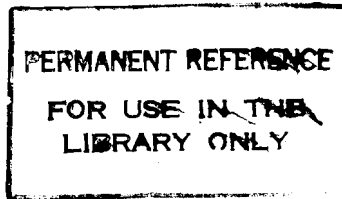


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**EFFECT OF PREHARVEST TREATMENTS WITH GIBBERELLIC
ACID AND BAGGING, ON QUALITY AND SHELF-LIFE OF
BANANA (CV. 'EMBUL')**



A THESIS PRESENTED BY

CHAMARI JEEVANTHI IKIRIWATTE

**To the Board of Study in Plant Sciences of the
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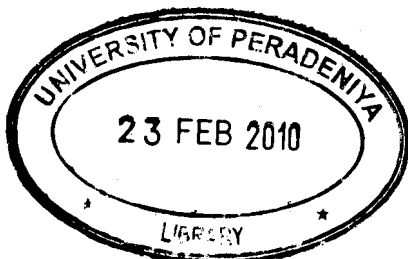
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BANANA (CV. 'EMBUL')**

Chamari Jeevanthi Ikiriwatte

Department of Botany

Faculty of Science

University of Peradeniya

Sri Lanka

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'Embul' banana (Mysore group, AAB) has a potential for export. Therefore, shelf life extension and appearance are important. It is reported that bagging increases fruit size and gibberellic acid (GA) improves shelf life of some fruits. Thus, preharvest bagging and GA sprays were tested on bunches in a monoculture plantation.

The suitable GA application time for desirable postharvest effects was determined. Bunches were sprayed (GA, 100 ppm) at five maturity stages [bunch emergence (M1), 2nd (M2), 4th (M3), 6th (M4) and 8th (M5) weeks after bunch emergence]. Four bunches (n=4) were investigated per maturity stage except in M2 (n=2) for circumstances beyond our control.

Effects on physicochemical parameters (fruit circumference, length, pulp diameter, peel thickness, firmness, pH, titratable acidity-TA and soluble solid content -SSC), ripening (visual, colorimetric and ethylene evolution), susceptibility to diseases (freckles, anthracnose, crown rot), peel anatomy and composition were assessed. GA sprayed at M1 resulted in thicker peels. Stomatal densities gradually increased with maturity stage of treatment. Early GA spray reduced freckling but increased anthracnose. Delayed ripening and increased size and weight of fruits were achieved when GA was sprayed at M1 or M4.

A combination of GA sprayed at M1 and bagging (combination) was carried out to overcome the drawbacks of individual treatments. Banana bunches were subjected to bagging (n=17), GA spray (100 ppm) (n=12), combination (n=15) and control (n=12). Combination, increased fruit circumference (14%), fruit length (10%), fruit weight (35%)

but decreased curviness (2%), weight loss during ripening (33%), SSC (3%) and firmness (7%). Fruits treated differently were equally preferred sensory evaluations. Colour development was delayed in the combination. Late climacteric rise was visible in both GA and combination.

The effect of GA on conidial germination and lesions of the pathogens, *Colletotrichum musae*, *Botryodiplodia theobromae* and *Fusarium* sp. were assessed *in vivo* (n= 4 bunches) and *in vitro* (n=3 bunches). All treatments reduced crown rot incidence. Anthracnose incidence increased significantly ($p=0.05$) when bagged but remained at the level of control in combination. Also, bagging reduced freckle disease.

The best results in terms of fruit size, shelf life, ideal fruit shape for packing and sensory qualities were achieved with the combination. Hence, after an economic evaluation, combined treatment can be recommended for field application.