MANAGEMENT OF MANGO POSTHARVEST DISEASES USING PLANT ACTIVATORS

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INTRODUCTION
The main postharvest diseases of mango in Australia are anthracnose caused by Glomerella cingulata (Stoneman) (anamorph: Colletotrichum gloeosporioides (Penz.) and stem-end rots caused by Fusarium parva (Botryosphaeria spp. and Lasiodiplodia theobromae). Effective control of these diseases has relied primarily on the use of pre- and post-harvest synthetic fungicides (1). There are continuous concerns on the use of these fungicides because of environmental as well as residue issues. Recently there has been a shift towards the use of softer options, such as plant activators. These stimulate the natural defence mechanisms of host plants making it possible to control disease with less fungicide use.

The objective of this study was to evaluate the efficacy of selected activators in suppressing mango postharvest diseases, especially anthracnose and stem-end rots (SER), for incorporation into an integrated program for disease management.

MATERIALS AND METHODS

Treatments
The following plant activators were evaluated: Kasil® (a formulation of liquid silicon), Mangocote® (kaolin-based product), and Bion® (acibenzolar-S-methyl). The efficacy of these activators was compared to that of a standard fungicide program for postharvest diseases of mangoes in north Queensland.

Field trial design
Treatments were applied to 15-year old trees of the mango cultivar, R2E2, at Ayr Research Station, of the Queensland Department of Primary Industries and Fisheries. Four blocks of five trees were arranged in randomised block design. Standard mango industry practices for irrigation, fertilization and insect pest control were implemented. Four applications of each activator were made between full bloom to just a few days before fruit harvest, at the following application rates and schedules: Bion® (2 g/10 L); Kasil® drench (20 mL/10 L); Mangocote® (300 g/10 L); Standard fungicide - (Mancozeb, Amistar, Mancozeb then Amistar). The four treatments were compared to an untreated control.

Disease assessment
At harvest, 35 fruits were randomly picked from each treatment tree from which 25 uniform fruits were selected, de-sapped, washed and then placed in boxes and stored in a cool room at ~20-22°C. Fruits were assessed for incidence and severity of post harvest anthracnose and SER after 14 days of incubation.

RESULTS
All treatments reduced the incidence of post harvest rots when compared with the untreated control (Figure 1). There were no differences among treatments for disease severity. Bion®, the standard fungicide program and Kasil® were equally effective in reducing the incidence of anthracnose when compared with the untreated control. Only Bion® and the standard fungicide program, however, suppressed SER significantly (Figure 1).

Figure 1. Effect of plant activators on post-harvest diseases of mango fruit.
Treatments with the same letter are not significantly different at P=0.05.

DISCUSSION
The suppression of post harvest mango rots by the plant activators Bion®, Kasil® and Mangocote® illustrates the potential for their incorporation into a holistic disease management program. Bion® appeared to be the most effective plant activator because the incidence of both anthracnose and SER were equivalent to the standard fungicide program. These positive results clearly indicate options for cutting back on the amount of fungicides needed to manage these diseases.

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REFERENCES