

**UNIVERSITI TEKNOLOGI MARA**

**EVALUATION ON SELECTED  
CHEMICAL FUNGICIDES FOR  
CONTROLLING BACTERIAL  
HEART ROT DISEASE (*Dickeya zea*  
SYN *Erwinia chrysanthemi*) IN MD2  
PINEAPPLE VARIETY**

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**MSc**

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## AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.


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## ABSTRACT

Bacterial heart rot (BHR) disease in pineapple variety MD2 is caused by *Dickeya zeae* syn. *Erwinia chrysanthemi*. The present study aimed to screen the effectiveness of systemic chemical fungicides in different dosages for controlling the BHR pathogen *in vitro* and to evaluate the effectiveness of delivery techniques of the selected chemical fungicides to control BHR disease under rain shelter (*in vivo*) conditions. The disease pathogen was isolated from symptomatic pineapple leaves with the appearance of water-soaked and heart rot disease symptoms such as rotten basal tissues. Pathogenicity tests were carried out to fulfil the Koch's postulates. Evaluation on the effectiveness of fungicides in controlling the causal pathogen was conducted via *in vitro* study. From the result obtained, mancozeb and difenoconazole demonstrated the ability to control the pathogen at the lowest concentration of 250 mg a.i./L from the recommended rate. Subsequently, these results were tested on *in vivo* stages to find the effective method of fungicides application. The experiment was planned in a completely randomised design (CRD). Ten replications were assigned for each treatment. The treatments of present study were (i) Control (pathogen only), (ii) Difenoconazole + Pathogen, (iii) Mancozeb + Pathogen, and (iv) Benomyl + Pathogen. The two methods of application were dipping only and combination method with dipping and spraying. For the dipping method, the data were collected based on mean disease incidence (DI) (%) for 6-week assessment. While for combination (dipping and spraying) method, the data was collected based on mean disease severity (DS) (%) for 6-week assessment. For calculate the mean of DI (%) per week, total number of leaves could be pulled out from the plants was noted. While for DS (%), the total area of leaf demonstrating rotting symptoms of BHR disease was calculated for data of mean per week. The DI (%) and DS (%) analysed have significant differences among the means ( $P < 0.05$ ) for each of the treatments from week 1 until week 6. According to the results obtained, as expected, the highest heart rot infestation was found to be at the control treatment DI with 96.97%. While the best fungicides that reduce the infestation was difenoconazole with 7.65% (DS) by using combination method (dipping and spraying) application. However, these results need to be re-evaluated in the fields to re-confirm the best application method for these selected fungicides by using the combination method (dipping and spraying).

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