

**UNIVERSITI TEKNOLOGI MARA**

**EVALUATION OF FLUBENDIAMIDE  
AND BACILLUS THURINGIENSIS  
(BTK) FOR CONTROLLING METISA  
PLANA AND ECONOMIC IMPACT  
OF SEVERE INFESTATION ON OIL  
PALM YIELD**

**CHE AHMAD HAFIZ BIN  
CHE MANAN**

**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 dissertation 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.

Name of Student : Che Ahmad Hafiz Bin Che Manan

Student I.D. No. : 2017305527

Programme : Master of Science (Crop Protection) – AT 734

Faculty : Plantation and Agrotechnology

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Signature of Student : .....

Date : September 2021

## ABSTRACT

In Malaysia, Bagworms, *Metisa plana* are one of the most serious and critical pests on oil palm. Most approaches were still not promising for planters to decide as the primary solution for bagworm control. Therefore, it is important to identify cost-effective pesticide with simultaneous good control efficiency alongside different treatment methods. This research aimed to evaluate the cost-effectiveness for two types of pesticide (*Bacillus thuringiensis* and Flubendiamide) and methods of spraying application also the impact of bagworm infestation on oil palm yield. The first treatment by Aircraft (aerial), application at 30 and 50 liters per hectare and second treatment by tractor-mounted sprayer (ground) spray at high and low pest population. Based on the first treatment with aerial spray via aircraft, Flubendiamide was effective ( $p < 0.05$ ) to control *M. plana*, whereas *Bacillus thuringiensis* (Btk) not effective ( $p > 0.05$ ) to control *M. plana* population below economic threshold level (ETL). Second treatment for ground spray via tractor-mounted sprayer with Flubendiamide was more effective ( $p < 0.05$ ) than Btk ( $p < 0.05$ ) at high infestation area. Whereas, in the low infestation area, both Flubendiamide and Btk were comparable ( $p < 0.05$ ) in controlling *M. plana* below ETL. By evaluating the actual yield loss due to the infestation (37%), the monitoring and treatments cost up at only 2.9% from the total loss suffered. To conclude, based on Benefit-Cost Ratio (BCR), Flubendiamide aerial and ground application is better cost-effective (1:59 & 1:37) than Btk (1:33 & 1:14) to control the *M. plana* below ETL thus avoiding greater yield loss suffered due to the continuous infestation.

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