OIL PALM YIELD LOSS ASSESSMENT TOOLS DUE TO *GANODERMA* BSR DISEASE

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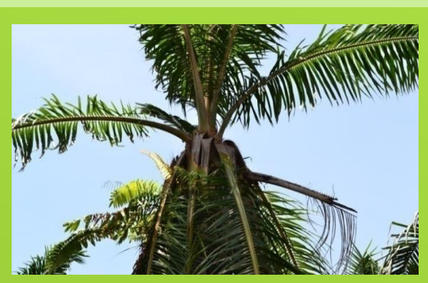
Oil palm (*Elaeis guineensis* Jacq.) is being attacked by a fatal disease which is called as *Ganoderma* Basal Stem Rot (BSR) disease. It is very crucial to the planters to estimate the yield loss due to the disease. But, currently there is no existing mathematical model that can be used for that purpose. Therefore, this empirical study was conducted to build a mathematical model (i.e. assessment tools) which can be used for yield loss estimation due to the disease. For the purpose of data collection, three commercial oil palm plots with different production phase (i.e. step ascent phase, plateau phase, and declining phase) were selected as the study sites. Model averaging approach using Bayesian solution was used in developing the mathematical model (i.e. also called as Bayesian Model Averaging, BMA). In conclusion, the yield loss model built in this study can potentially be used by the oil palm planters in helping them to estimate the yield loss as well as economic loss due to *Ganoderma* BSR disease if no treatment is applied.



R1 - Uninfected

R5 – Dead due to *Ganoderma* BSR

R2 - Mild

R3 - Medium

R4 - Severe

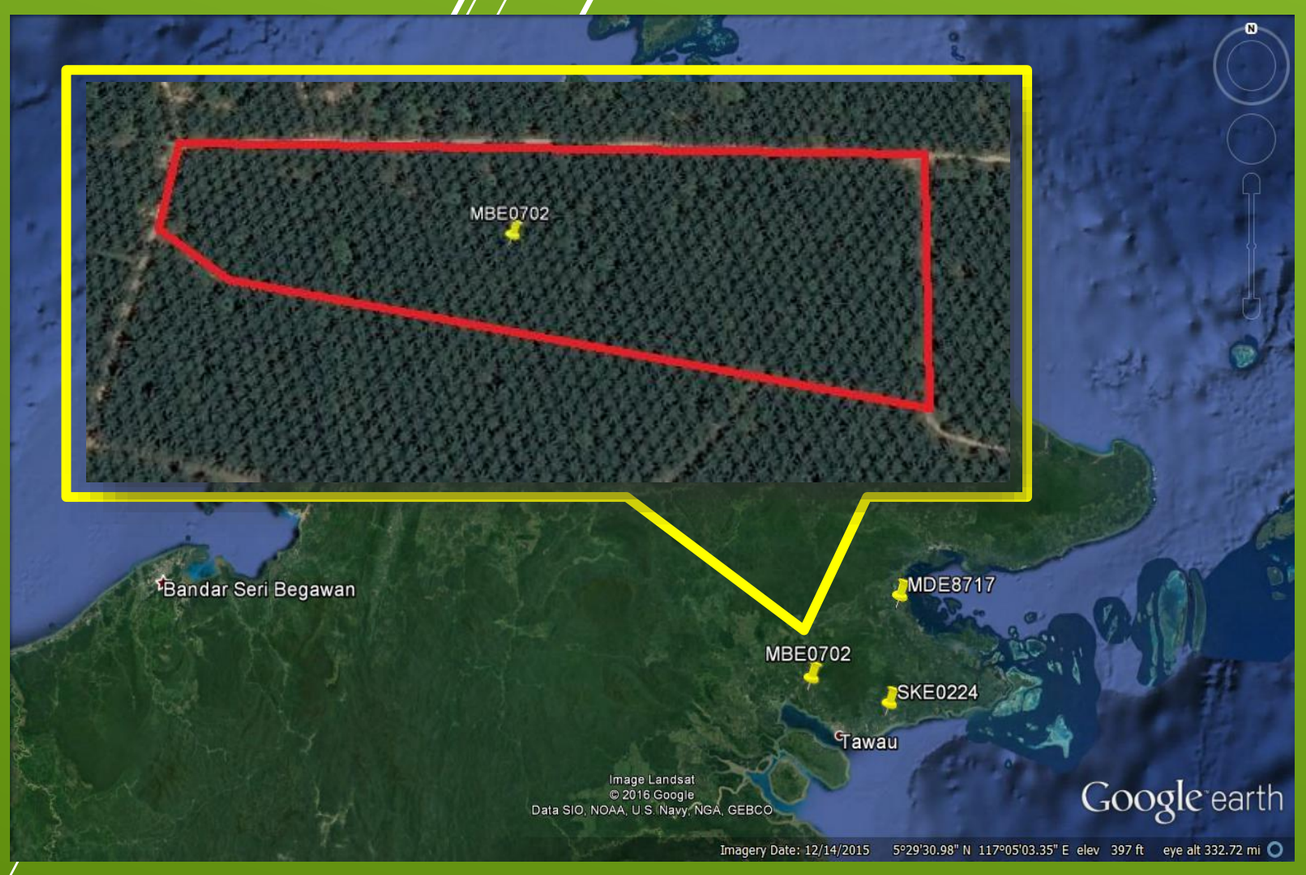
ASSESSMENT TOOLS

$$YLTBW = f\left(\begin{array}{l} R2, R3, R4, R5, AUDPC, NEIGHBOUR, PT, \\ AUDPC * NEIGHBOUR, AUDPC * PT \end{array}\right)$$

Palm ID	Severity at DS1	Severity at DS2	AUDPC	NEIGHBOUR	PT	YIELD LOSS
1	*Key in*	*Key in*	*Auto-calculated*	*Key in*	*Key in*	*Estimated by BMA*
2	*Key in*	*Key in*	*Auto-calculated*	*Key in*	*Key in*	*Estimated by BMA*
2	*Key in*	*Key in*	*Auto-calculated*	*Key in*	*Key in*	*Estimated by BMA*
3	*Key in*	*Key in*	*Auto-calculated*	*Key in*	*Key in*	*Estimated by BMA*
∞	*Key in*	*Key in*	*Auto-calculated*	*Key in*	*Key in*	*Estimated by BMA*

Calculate

Estimated total yield loss **0.00** MT per year



Requirements to used the tools:

1. Need to conduct disease census at least two times with the interval of six months (i.e. standard practice) in order to calculate the disease progress
2. Need to map the trees with the disease infection status in order to calculate the number of infected neighboring palms

PUBLICATION

- Two (2) articles published in indexed journals
  - Assis, K., Chong, K. P., Idris, A. S., & Ho, C. M. 2016. Economic Loss due to Ganoderma Disease in Oil Palm. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*, 10(2), 604-608.
  - Assis Kamu, Chong Khim Phin, Idris Abu Seman and Ho Chong Mun. 2015. Distribution of infected oil palms with Ganoderma basal stems root disease. *Journal of Scientific Research and Development*, 2(10): 49-55.
- Three (3) articles published in indexed proceedings

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MPOB

SAWIT KINABALU