

## Antagonistic efficacy of *Trichoderma harzianum* and *Bacillus cereus* against *Ganoderma* disease of oil palm via dip, place and drench (DPD) artificial inoculation technique

### ABSTRACT

Sustainability of the oil palm industry is crucial to ensure Malaysia's gross domestic product (GDP) by the agricultural sector. It is crucial to discover a sustainable and eco-friendly remedy for the most devastating *Ganoderma* disease of oil palm. The effects of pre-inoculation of oil palm seedlings with either *Trichoderma harzianum* and/or *Bacillus cereus* on their vegetative growth and the suppression of *Ganoderma boninense* were investigated. The dip, place and drench (DPD) artificial inoculation method was used to assure disease development. Disease severity was assessed based on the root symptoms (DS), disease incidence (DI) and disease reduction (DR). Application of a mixture of *T. harzianum* and *B. cereus* had the highest contribution to the vegetative growth of oil palm seedlings. However, single application of *B. cereus* was found to be the most effective treatment in suppressing *Ganoderma* disease of oil palm with a disease reduction of 94.75% followed by single applications of *T. harzianum* (78.98%) and mixture of both *T. harzianum* and *B. cereus* (68.49%).

**Keyword:** Dip, place and drench (DPD); *Bacillus cereus*; *Trichoderma harzianum*; Biocontrol