2021

April

Nursery and Field Evaluation of *Streptomyces nigrogriseolus* GanoSAl to Control Basal Stem Rot in Oil Palm Seedlings

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Basal stem rot (BSR) disease caused by Ganoderma *species is a threat to the oil palm industry. In our initial study, rhizosphere actinomycetes identified as* Streptomyces nigrogriseolus *GanoSAl* (Streptomyces *GanoSAl) possess competent biological control activity in the growth of* Ganoderma in vitro. *This study was carried out to evaluate whether* Streptomyces *GanoSAl formulated in the vermiculite-bio charcoal powder can reduce disease incidence caused by* G. boninense *PER71, and promote oil palm growth through nursery and field trial. Mixing of* Streptomyces *GanoSAl powder at* 10^8 *CFU (colony-forming unit) per gramme in soil resulted in the strain establishment in the applied soil and increased oil palm seedlings height with no observed adverse effect on seedlings growth. The seedlings treated with the powder formulation resulted in a reduced percentage of disease incidence (DL %) by 51.1 per cent and disease severity index (DSL %) by 35.0 per cent compared to untreated seedlings and seedlings inoculated with* G. boninense *PER71 alone (93.3% DI and 75.83 % DSL respectively). The field trial indicated that, after 36 months of planting, only 6.6 per cent of oil palm treated with the* Streptomyces *GanoSAl powder showed symptoms of BSR disease and death due to* Ganoderma *infection compared to the untreated oil palm at 75.0 per cent. These trials highlight the potential of the* Streptomyces *GanoSAl powder to reduce BSR disease in oil palm and promote oil palm growth.*

Keywords: Streptomyces, Ganoderma, *artificial inoculation, seedling baiting technique.*