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Utilization of selected beneficial bacteria incorporated with carrier materials on growth response of (*Theobroma cacao* L.) cocoa seedlings

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Statement of the Problem: Cocoa industry in Malaysia has undergone challenging phase recently. The planting industry has started to decline since 1990's due to the outbreak of disease and relatively high cost of fertilizer. Hence, there is a potential value by emerging the technologies of potential bacteria with selected carrier materials such as Cocoa Pod Husk (CPH) and Rice Husk Charcoal (RHC) as biofertilizer. The purpose of this study is to evaluate the potential value of selected bacteria incorporation with selected carrier materials on growth response on cocoa seedlings.

Methodology: This study has been conducted in nursery at Cocoa Research and Development Centre, Malaysian Cocoa Board, Pahang. Four treatments with three replications were arranged in this study. Physical growth of cocoa seedlings was recorded biweekly; fresh and dry weight of plant parts were recorded at the end of the study.

Findings: Based on data recorded, the application of beneficial bacteria in the carrier materials significantly influenced the plant height and plant girth of cocoa seedlings. Cocoa seedlings grown on soils treated with 30 gm of CPH and RHC in addition of 1.2% of beneficial bacteria were higher in plant height and plant girth whereas, applications of 45 gm of CPH and RHC in addition of 1.2% of beneficial bacteria in the carrier materials were significantly affected the fresh and dry weight of plant parts.

Conclusion: The application of 1.2% of beneficial bacteria with 30 gm of CPH and RHC influences the cocoa seedlings growth rate by 56.05% and 73.15% where, applications of 1.2% of beneficial bacteria with 45 gm of CPH and RHC increase leaves, stem, root weight by 38.66%, 75.35% and 50.40%, respectively as compared with normal NPK applications. This result indicated that bacteria incorporated with selected carrier material improve cocoa seedling growth and biomass.

Biography

Nurfadzilah Madian has her expertise in microbiology and soil ecology of cocoa crops. She has joined Malaysian Cocoa Board and has been working for 10 years since November 2008. She has received BSc in Plantation Technology and Management, University Technology MARA, Malaysia and presently pursuing Master of Science of Agriculture Technology in University Putra Malaysia, Malaysia.

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