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Collaboration intercropping, PGPM fertilisation, and Cascara-compost on optimising productivity of sub-optimal land in the tropics

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Abstract

Designing model cultivation system for sub-optimal land in the tropics to optimise productivity is a challenge due to limitations in soil physico-biochemical properties. The objective of this research is to obtain cropping system model in the sub-optimal land to optimise productivity through collaboration of intercropping, Plant Growth Promoting Organisms (PGPM) fertilisation, and application of Cascara-compost. The experiment was conducted in the field 2 m × 2 m plots using split-plot experimental design. The treatment were arranged with PGPM as the main plots and Cascara-compost as sub-plots with three replications, and it applied to the intercropping of sweet corn and peanuts. The treatments PGPM was consisted of 3 levels dosage as p0 = control, p1 = 49 mL/L water/plot, and p2= 67 mLL^{-1} water/plot. The kaskara-compost was applied as k0= control, k1=2.4 kg plot^{-1}, and k2=3.6 kg plot^{-1}. Statistical analysis of significant difference the experiment using ANOVA and the effect of different treatment analysed by Duncan's multiple range test. The result showed that collaboration of the treatment PGPM 67 mLL^{-1} water/plot and Cascara-compost 3.6 kg plot^{-1} have shown the significant result in vegetative stage at the 7th weeks after planting (WAP). The plant height of corn and peanut was 99.44 cm and 61.18 cm, cob diameter and number of pods/plant was 5.36 cm and 19.97 pieces. Analysis result in the generative stage has shown in the production as 14.68 ton ha^{-1} and 2.03 ton ha^{-1}. This study confirmed the potential model cultivation system that collaboration of PGPM and Cascara-compost could be used in optimising productivity of sub-optimal land in the tropics.

Keywords: Intercropping, Cascara-compost, peanut, plant growth promoting microorganisms (PGPM), sweet corn

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