

Application of Biocom-Phosphate Solubilizing Fungi and Coal Fly-Ash to Increase P-Availability of Peat Soil in Kalimantan

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ABSTRACT

The peatlands have the potential to support food security efforts. However, there is have constraints on soil fertility, especially the P nutrients availability. The biotechnology approach, the application of ameliorant (biochar-compost carrier medium (biocom)) enriched with phosphate solubilizing fungi (PSF) and coal fly ash (CFA), was expected to increase the P-availability in peat soils. The research aimed to study the application of biocom enriched with PSF and CFA to increase soil P-availability and plant P-uptake. The study was conducted using peat soil media with the formulation of CFA and biocom enriched with PSF and CFA as treatments. The treatment effect was observed through soil P available and plant P uptake of maize. The results showed PSF application was inconsistent in improving P available in peat soils in Kalimantan. In Central Kalimantan, Biocom + PSF was able to increase P available in peat soils by up to 406.18% (*A. oryzae*-Tb7) and 353.44% (*N. fischeri*-Tm8). However, in South Kalimantan P available in peat soil was only 8.04% (*A. oryzae*-Tb7) and 12.86% (*N. fischeri*-Tm8). The CFA+ (biocom+PSF) formulation increased P available in Central Kalimantan peat soils, but it was different from South Kalimantan peat soils. The application of biocom+PSF and CFA has not been able to increase the P uptake of maize plant in peatlands of South Kalimantan.

Keywords: Biochar, coal fly-ash, peat soil, phosphate solubilizing fungi