

Potassium and nitrate retention in three different soil amended with oil palm empty fruit bunch biochar

ABSTRACT

The application of biochar produced from oil palm empty fruit bunch (EFB) as soil amendment to retain soil nutrients has the potential to improve agriculture production in tropical regions. A laboratory leaching study was conducted to determine the effects of different rates (0 t/ha, 10 t/ha, 20 t/ha, and 30 t/ha) of EFB biochar on potassium and nitrate retention in three different type of soil texture: clay, sandy clay loam, and sand. The sorption study showed that EFB biochar was able to sorp both potassium and nitrate (Q_{max} 0.53 mg g⁻¹ and 0.23 mg g⁻¹, respectively). However, the leaching study indicated that soil texture played a larger role in potassium and nitrate retention than biochar in condition with high soil water potential. The application of EFB biochar did not significantly affect the retention of potassium and nitrate for all three types of soil texture. The order of retention for potassium was sandy clay loam > sand > clay and clay > sandy clay loam \geq sand for nitrate. The results suggested that high soil water potential condition, interpores between soil-biochar particles played a larger role (and therefore nutrient retention) than biochar intrapores in water retention.

Keywords: Biochar; Soil amendment; Oil palm empty fruit bunch; Nutrient retention
