Local practices for production of rice husk biochar and coconut shell biochar: production methods, product characteristics, nutrient and field water holding capacity

ABSTRACT

Application of biochar is widely reported to enhance soil quality and decrease leaching of nutrients. In this study, biochar from rice husk and coconut shells were used to determine physico-chemical characteristics, ability on nutrients and water holding capacity in soil. These biochars were produced using conventional processes of rotary husk (for rice husk) and kiln-drum furnaces (for coconut shells). It was found that coconut shell biochar (CSB) was very effective in retaining nitrogen compared to rice husk biochar (RHB). Leaching analysis over 19 days (100 ml each day) has identified 15 g/kg of CSB in Bungor series soil to consistently maintain a leaching rate of nitrogen at below 5 mg/litre as compared to other samples. Meanwhile, RHB was very effective in retaining water compared to CSB with highest water retention at 31.2%. Overall results indicate that conventionally made biochar has great potential to reduce nutrient leaching and improve water holding capacity in soil. CSB is more effective in reducing nutrient leaching, particularly nitrogen while RHB was most effective in increasing field water holding capacity. Further research is required to study its effectiveness on nutrient plant uptake.

Keyword: Biochar; Nutrient leaching; Nitrogen; Potassium; Field water holding capacity