



Preliminary Study of Guinea Grass (*Megathyrsus maximus*) Biochar as a Phosphorus Source

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ABSTRACT

The *Megathyrsus maximus* commonly known as guinea grass is an invasive species in Sri Lanka that can be found throughout the island. Biochar has a wide range of potential applications as a soil amendment and as a fuel source. Biochar can adsorb different chemical components due to its porous structures, thus biochar can function as a fertilizer. Biochar is inherently having the ability to adsorb and release plant nutrients to ensure optimum availability of micronutrients to plants. The objective of this study was to develop a guinea grass biochar as a potential slow releasing phosphorus source to be used as a soil amendment. Guinea grass biochar was synthesised at different pyrolysis temperatures range from 200°C to 500°C under low oxygen environment. Phosphate releasing capacity of the biochar and air-dried guinea grass were studied spectrophotometrically. The phosphate releasing ability was studied by mixing 0.5g of biochar and 200 ml of distilled water for 24h at ambient conditions. The biochar yield was calculated as 92%, 48% 36% and 23.0% for 200°C, 300°C, 400°C and 500°C respectively. The highest phosphate release (66 ppm) was given by the biochar synthesised at 400°C and air-dried guinea grass, 200°C, 300°C, and 500°C samples were 17, 20, 41 and 34 ppm, respectively. The calculated standard P₂O₅ % of 400°C biochar was 1.97 %, parallel to vermicompost. The pH of biochar at 400°C was about 10. Finding of the present study demonstrated the potential use of guinea grass biochar as a phosphate source which can be use as soil amendment to enrich phosphorous level of soil and neutralize the acidity of soil. Further studies are recommended to fortify biochar with nitrogen, potassium, phosphorous *etc.* and analyse kinetics of nutrient adsorption/releasing.

Keywords: *Biochar, Fertilizer, Guinea grass, P₂O₅, Pyrolysis*