

Improving soil phosphorus availability following application of Egypt rock phosphate and chicken litter biochar

ABSTRACT

Biochar has high concentrations of organic carbon, high porosity and surface area, improvement in soil physical properties including soil structure and water holding capacity. Chicken litter biochar had been used to improve soil phosphorus (P) availability for maize production but limited information on optimum rates of biochar and Egypt Rock Phosphate (ERP) to increase P availability. This research determined the rate of biochar and Egypt Rock Phosphate (ERP) that could increase soil P retention and availability. A laboratory study on P retention by different rates of biochar was evaluated in a leaching study for 30 days where the leachates were collected at three-day interval. Selected soil chemical properties before and after incubation were determined using standard procedures. The total P, pH, K, Mg, total C and P, exchangeable P, and water-soluble P, of the soils with biochar significantly higher than recommended fertilization practice. Around 75% biochar of 10 t ha⁻¹ with 50% and 25% ERP of the existing recommendation showed significant retention and nutrients availability.

Keyword: Biochar; Egypt rock phosphate; Phosphorus availability