Integrated effect of fertilizers and biochar on soil fertility status and nutrient uptake of groundnut crop in sandy loam soil

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ABSTRACT

A field investigation was carried out during late *kharif*, 2024 at Agricultural College Farm, Bapatla to study the influence of biochar and fertilizers on groundnut (TAG 24 variety) cultivated in sandy loam soil. The experiment consisted of eight treatments involving combinations of the recommended dose of fertilizers (30: 40: 50 kg N: P2O5: K2O ha^{-1}) and gypsum was applied commonly for all treatments except control, with cotton stalk biochar applied at 2 and 4 t ha^{-1}. The study was designed using a Randomized Block Design (RBD) with three replications. Results showed that the combined application of 100% RDF + biochar @ 4 t ha^{-1} (T6) led to the highest values for dry matter production, yield components, and nutrient uptake. Though nutrient content (N, P, and K) in plant tissues were statistically non- significant, their uptake values were notably higher in integrated treatments. Improvement in crop performance was linked to biochar's superior water holding capacity (128.6 %), organic carbon (79.2%), and porosity (33.87%). Thus integrated nutrient management using biochar and fertilizers enhanced groundnut yield and soil health, providing a promising approach for sustainable cultivation in light-textured soils.

Keywords: *Biochar, Groundnut, Integrated nutrient management. Nutrient uptake, Soil properties and Yield*