

EFFECTS OF BIOCHAR BASED NUTRIENT PELLETS ON SOIL FERTILITY AND GROWTH OF MAIZE PLANTS

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Biochar is a source to improve soil organic matter, and pellets derived from biochar also offer similar advantages. This study aimed to investigate the impact of biochar pellet application on soil nutrient levels, growth and biomass production of maize. A field study was conducted at Grain Legumes and Oil Crop Research and Development Centre, *Agunukolapelessa*. There were seven treatments replicated three times in Randomized Complete Block Design as T₁: no fertilizer (control), T₂: Department of Agriculture (DOA) recommendation, T₃: DOA recommendation with organic matter 10 t ha⁻¹, T₄: DOA recommendation with biochar (100 kg ha⁻¹) pellets, T₅: 75% DOA recommendation with biochar (100 kg ha⁻¹) and compost pellets, T₆: 50% DOA recommendation with biochar (100 kg ha⁻¹) and compost pellets, T₇: 50% DOA recommendation with biochar (100 kg ha⁻¹) and Vermicompost pellets. Soil pH, EC, available P, exchangeable K, and organic matter of soil were determined at the initial and flowering stages. Data were analysed using the ANOVA procedure and mean separation was performed by Least Significant Difference test using RStudio. According to the results, pH, available P, and exchangeable K of soil were found to be significantly different ($p < 0.05$) among the treatments. The highest available P was recorded in T₂ and T₅ and the highest exchangeable K was recorded in T₂. The highest pH was recorded in T₁. The EC and organic matter of soil were not significantly different ($p \geq 0.05$) among the treatments. The maximum plant height at the flowering stage, (198±3.4 cm) was recorded in T₃ while the highest aboveground biomass (908±139 g m⁻²) and the highest root dry weight (22.3±4.5 g) were obtained in T₄. The biomass obtained from combination of biochar and inorganic fertilizer was significantly higher than that from the sole application of inorganic fertilizers. Therefore, biochar pellets could be a better option to replace sole application of inorganic fertilizers.

Keywords: Chemical properties, Plant nutrient, Vermicompost pellets