



Research Article

Assessment of organic and inorganic soil amendments on fertility status of an acid alfisol and performance of cocoyam (*Zanthosoma sagittifolium*)

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ABSTRACT : The non – sustainability of the practice of soil fertility maintenance through bush fallow, due to increasing population pressure and demand for land for agricultural and other human activities, as well as the problem of soil fertility depletion, occasioned by continuous cultivation, have necessitated growing search for alternative soil fertility maintenance options, with a view to solving the current problem of acute shortage of food supply that grips Nigeria. To this end, a two – year field experiment was conducted in 2010 and 2011 cropping seasons, at the Teaching and Research Farm of the Ekiti State University, Ado – Ekiti, Ekiti State, Nigeria, to evaluate the influence of *Gliricidia sepium* residues, NPK (15 – 15 – 15) fertilizer, and their combination on the chemical properties of an acid Alfisol, growth and yield of cocoyam (*Zanthosoma sagittifolium*). The experiment was laid out in a randomized complete block design with three replicates. The soil amendments included: *Gliricidia sepium* residues (GSR); NPK fertilizer; GSR + NPK; and no fertilizer (NF), which served as the control treatment. The results obtained indicated existence of significant ($P = 0.05$) differences among the soil amendments as regards their effects on soil chemical properties, growth, yield and yield components of cocoyam. At the end of 2010 cropping season, application of the fertilizer treatments resulted in significant ($P = 0.05$) increases in soil organic carbon (SOC) from 0.63 g kg⁻¹ for NF to 1.04, 1.40, and 1.32 g kg⁻¹ for sole NPK, sole GSR and GSR + NPK, respectively. Similarly, at the end of 2011 cropping season, fertilizer treatments significantly increased SOC from 0.43 g kg⁻¹ for NF to 0.88, 1.51 and 1.40 g kg⁻¹ for the respective sole NPK, sole GSR and GSR + NPK. At the end of 2010 cropping season, soil amendments significantly increased total N from 0.20 g kg⁻¹ for NF to 0.44, 0.57 and 0.66 g kg⁻¹ for the respective sole NPK, sole GSR and GSR + NPK. Similarly, at the end of 2011 cropping season, addition of the soil amendments resulted in significant increases in total N from 0.08 g kg⁻¹ for NF to 0.36, 0.64 and 0.71 g kg⁻¹ for sole NPK, sole GSR and GSR + NPK, respectively. Combining the mean values of cocoyam cormel yield data over the two years of experimentation, soil amendments significantly increased cocoyam cormel yield from 4.26 t ha⁻¹ for NF to 8.05, 7.23 and 8.85 t ha⁻¹ for sole GSR, sole NPK and GSR + NPK, respectively.

KEY WORDS : Acid, Alfisol, Amendments, Cocoyam, Fertility, Inorganic, Organic

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