

Effect of Cocoa Pod Ash and Poultry Manure on Soil Properties and Cocoyam Productivity of Nutrient-Depleted Tropical Alfisol

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Abstract : An experiment was carried out for three consecutive years at Owo, southwest Nigeria. The objective of the investigation was to determine the effect of Cocoa Pod Ash (CPA) and Poultry Manure (PM) applied solely and their combined form, as sources of fertilizers on soil properties, leaf nutrient composition, growth and yield of cocoyam. Three soil amendments: CPA, PM (sole forms), CPA and PM (mixture), were applied at 7.5 t ha⁻¹ with an inorganic fertilizer (NPK 15-15-15) at 400 kg ha⁻¹ as a reference and a natural soil fertility, NSF (control), arranged in a randomized complete block design with three replications. Results showed that soil amendments significantly increased ($p = 0.05$) corm and cormel weights and growth of cocoyam, soil and leaf N, P, K, Ca and Mg, soil pH and organic carbon (OC) concentrations compared with the NSF (control). The mixture of CPA+PM treatment increased corm and cormel weights, plant height and leaf area of cocoyam by 40, 39, 42, and 48%, respectively, compared with inorganic fertilizer (NPK) and 13, 12, 15 and 7%, respectively, compared with PM alone. Sole or mixed forms of soil amendments showed remarkable improvement in soil physical properties compared with NPK and the NSF (control). The mixture of CPA+PM applied at 7.5 t ha⁻¹ was the most effective treatment in improving cocoyam yield and growth parameters, soil and leaf nutrient composition.

Keywords : Cocoa pod ash, cocoyam, poultry manure, soil and leaf nutrient composition.

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