

Effects of Tillage and Poultry Manure on Soil Properties and Yam Performance on Alfisol in Southwest Nigeria

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Abstract : The main effects of tillage, poultry manure and interaction effects of tillage-poultry manure combinations on soil characteristics and yam yield were investigated in a factorial experiment involving four tillage techniques namely (ploughing (p), ploughing plus harrowing (PH), manual ridging (MR), manual heaping (MH) and poultry manure at two levels 0 t ha⁻¹ and 10 t ha⁻¹ arranged in split-plot design. Data obtained were subjected to analysis of variance using Statistical Analysis System (SAS) Institute Package. Soil moisture content, bulk density and total porosity were significantly ($p>0.05$) influenced by soil tillage techniques. Manually heaped and ridged plots had the lowest soil bulk density, moisture content and highest total porosity. The soil total N, exchangeable Mg, k, base saturation and CEC were better enhanced in manually tilled plots. Soil nutrients status declined at the end of the second cropping for all the tillage techniques in the order PH>P>MH>MR. Yam tuber yields were better enhanced in manually tilled plots than mechanically tilled plots. Poultry manure application reduced soil bulk density, temperature, increased total porosity and soil moisture content. It also improved soil organic matter, total N, available P, exchangeable Mg, Ca, K and lowered exchange acidity. It also increased yam tuber yield significantly. Tillage techniques plots amended with poultry manure enhanced yam tuber yield relative to tillage techniques plots without poultry manure application. It is concluded that yam production on alfisol in Southwest Nigeria requires loose soil structure for tuber development and that the use of poultry manure in combination with tillage is recommended as it will ensure stability of soil structure, improve soil organic matter status, nutrient availability and high yam tuber yield. Also, it will help to reduce the possible deleterious effects of tillage on soil properties and yam performance.

Keywords : ploughing, poultry manure, yam, yield

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