

of Nigeria

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Abstract

This research was carried out at the College of Agriculture Lafia Research field in 2010 cropping season. The objective of this study was to investigate effects of long term cultivation on soil properties. Surface soil samples (0-15cm) were collected from three sites in each of the five land use types including: cassava, legume, maize, oil palm plantation and secondary forest. The samples were subjected to physical and chemical analyses to access the extent of change in soil quality. According to the results of statistical analysis, bulk density (BD), mean weight diameter (MWD), water stable aggregates (WSA), soil organic matter content (SOM), total nitrogen (TN), total porosity (TP), pH and available phosphorus (P) were significantly affected by land use types. Differences in bulk density (1.65-1.81 g/cm³) among the land use types were highly significant ($p < 0.05$) due to pore disruption by cultivation and percent sand resulting in decreased total porosity. The mean weight diameter and water stable aggregates were better in secondary forest compared to other land use types. Soil organic matter content and total nitrogen were generally very low, but were significantly different ($p < 0.05$). Available phosphorus and CEC were high for all the land use types. The pH in all the land use types was slightly acidic with mean of 6.38. The results of study suggest that the continuous cultivation of the land has degraded the soil properties and there is therefore, the need to adopt appropriate management practices to achieve high soil quality and sustainable productivity.

Keywords: Southern Guinea, Savanna