SEASONAL DYNAMICS OF SOIL ORGANIC MATTER AND TOTAL NITROGEN IN SOILS UNDER DIFFERENT LAND USES IN OWERRI, SOUTHEASTERN NIGERIA.


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ABSTRACT:
The study investigated seasonal dynamics of soil organic matter and total nitrogen in soils affected by different land use types in Owerri, Southeastern Nigeria. A total of 72 soil samples were randomly collected at two monthly intervals in the dry season (October/November, December/January and February/March) and rainy season (April/May, June/July and August/September) at 0-20 cm depth in all the studied land uses, namely soils under continuous cassava cultivation (CCS), pineapple orchard soil (POS), bush fallow (FS) and bare fallow (BF). Collected soil samples were air dried, passed through 2mm sieve and were analysed using standard methods. The experiment was factorially arranged in randomized complete block design (RCBD), with three factors namely, season, month and landuse. The treatments were replicated three times. Generated soil data were analysed using analysis of variance (ANOVA) and significant means were separated using least significant difference (LSD) at 5% probability. Results showed that soil organic matter and total nitrogen were significantly higher (P<0.05) in the dry season especially between January and April compared to the rainy season where the least was found around June/July in all the studied land uses, although in all cases, their variability was minimal, ranging from 30.49% in (CCS) to 47.68% in bare fallow. Significant positive correlation (P<0.05) was found between soil organic matter (SOM) and total nitrogen ($r^2$ = 0.966 CCS; 0.935 FS, 0.626 POS, and 0.796 BF), and negative correlation with CN ratio ($r^2$ =0.917 CCS; 0.729 FS, 0.3 POS; 0.347 BF), respectively, bulk density ($r^2$ = 0.63) only in FS. Similarly significant negative correlations (P< 0.05) were also found between TN and CN ratio ($r^2$ =0.865 CCS, 0.716 FS, 0.796 POS and 0.328 BF).

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