

Assessment of Properties and Agricultural Potentials of Some Hydromorphic Soils in Katcha Local Government Area of Niger State, Nigeria

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Abstract

Seasonal deposition of fluvial materials and high soil moisture makes floodplains a unique ecosystem for all season production. Soil properties of three hydromorphic sites, Gbakogi, Katcha and Kashe, along the banks of river Niger and its tributary, Gbako River, in Katcha Local Government Area of Niger State of Nigeria were assessed. In all sites, sand dominated the mineral fraction and its contents ranged from 578 - 658, 413 - 473 and 432 - 453 g kg⁻¹ respectively for Gbakogi, Katcha and Kashe. In the same order, silt was 90 - 180, 173 - 353 and 133 - 173 g kg⁻¹ and clay was 242 - 249, 334 - 354 and 294 - 414 g kg⁻¹. Soil reaction for the surface soils was moderate to slightly acid (pH ≤ 6.4). Available phosphorus (P) was higher at the surface than subsurface horizons except in Kashe. The P values for surface horizons were 35, 26 and 12 mg kg⁻¹ and were rated high in Gbakogi and Katcha and low in Kashe. Total nitrogen (N) was 0.07, 0.28 and 0.14 g kg⁻¹ and was rated low in Gbakogi, high in Katcha and medium in Kashe. Organic carbon (C) was low irrespective of soil depth in all the sites and the values were ≤ 1.53 g kg⁻¹. Exchangeable bases and effective cation exchange capacity (ECEC) were rated high in all the soils. Percentage base saturation was rated medium to high. On the basis of soil attributes measured, all the sites have good potentials for sustainable arable agriculture.

Keywords: floodplains; hydromorphic soils, arable agriculture

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