CLASSIFICATION AND SUITABILITY EVALUATION OF THE SOILS OF A TOPOSEQUENCE AT ODEDA, OGUN STATE FOR THE PRODUCTION OF RICE (*Oryza sativa*)

Ajiboye[1] G. A.; Alabi K. O.; Aiboni, V. U., Okeleye, K. A and Adesodun, J. K.
Department of Soil Science and Land Management,
College of Plant Science and Crop Production
University of Agriculture Abeokuta
P.M. B 2240, Abeokuta. Nigeria.

ABSTRACT

A detailed survey of the soils of a toposequence at Odeda, Ogun State was conducted to characterize, classify and assess the suitability of the soils for sustainable production of rice. The rigid grid method of survey was adopted for soil mapping while the linear parametric and square root models were used for assessing the suitability of the land for rice production. The result of the study showed that the soils of the three pedons were loamy sand to sandy clay loam texture, fine to coarse sub-angular blocky structure and loose to hard consistency. All the pedons had redoximorphic properties with varying quantities of iron-manganese concretion in the sub soils. Soil reaction ranged from strongly acid to neutral (pH of $5.3 - 6.8$) with low organic carbon (<1.6%) and available nitrogen. Apart from potassium contents which, were considered adequate for rice production, other exchangeable cations, available phosphorus and micro-nutrients were very low. Pedon 1 (upper slope) was classified as Typic Hapludalf (Lixisol; Cutanic, Hypereutric), pedon 2 (middle slope) as Plinthic Kandiudalf (Lixisol; Plinthic Hypereutric) and pedon 3 (lower slope) as Aeric Endoaquept (Cambisol; Endogleyic, Hypereutric). All the pedons had index of current productivity (IPc) ranging between 1.13 and 5.32 and were currently not suitable (N2) for both upland and lowland rice production as assessed by the linear and square root models. Potentially, using the linear model, the index of potential productivity (IPp) ranged between 37.8 and 76.50 for upland rice production and between 44.10 and 54.00 for low land production. Thus pedon 1 is highly suitable for upland rice but moderately suitable for low land rice production. Pedon 2 is moderately suitable (S2) for the production of upland rice but marginally suitable (S3) for lowland rice production. Pedon 3 is potentially marginally suitable (S3) for both upland and lowland rice by the linear model. The square root model gave higher values of IPp ranging between 47.62 and 80.60 with a trend similar to the results of the linear model for upland rice production. However, the square root model with an IPp ranging between 50.91 and 67.44 indicated that all the pedons are moderately suitable (S2) for lowland rice production. The limiting factors were mainly low levels of available macro- and micro-nutrients, low organic matter content and low cation exchange capacity.