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## Evaluation of Sawah Rice Management System in an Inland Valley in Southeastern Nigeria. II: Changes in Soil Physical Properties

PDF (Size: 313KB) PP. 609-618 DOI : 10.4236/jwarp.2010.27070

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### ABSTRACT

Establishment of effective sawah management system in parts of southeastern Nigeria may involve the manipulation of certain soil physical properties in form of ecological engineering works. This practice may affect the soil physical properties adversely. The objective of the study were basically to compare the influence of sawah and non sawah water management practices on the soil physical properties following rice cultivation with various inorganic and organic amendments. Parameters determined were soil bulk density, total porosity, moisture contents at field capacity (FC) and wilting point (WP), water-stable aggregates, dispersion ratio (DR), and hydraulic conductivity (Ks). Sawah managed soils reduced significantly the soil bulk density in the first and second year of planting thus increasing the soil total porosity during the same period Moisture content also improved in sawah management while WP increased significantly in the second year of planting. In spite of the destruction of soil structure as a result of cultural practices during rice cultivation the DR is improved on the long run by sawah water management. Moisture contents at FC and WP relates significantly with soil bulk density which also relates negatively with total porosity during the 2 years of cultivation. However, FC and WP may be very good tools in the estimation of bulk density. Again, the amendments were identified as promoting the development of soil aggregates and Ks on a long term.

### KEYWORDS

Water-Stable Aggregates, Bulk Density, Hydraulic Conductivity, Dispersion Ratio, Moisture Content

### Cite this paper

J. Nwite, C. Igwe and T. Wakatsuki, "Evaluation of Sawah Rice Management System in an Inland Valley in Southeastern Nigeria. II: Changes in Soil Physical Properties," *Journal of Water Resource and Protection*, Vol. 2 No. 7, 2010, pp. 609-618. doi: 10.4236/jwarp.2010.27070.

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