



Tropentag, October 9-11, 2007, Witzenhausen

“Utilisation of diversity in land use systems:
Sustainable and organic approaches to meet human needs”

New Relationship Between Crop Yield and Soil in the Cocoa Belt of Nigeria

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Abstract

The wealth of a nation depends largely on its ability to properly harness of its natural resources, which include soil. The Southwestern region of Nigeria is the largest administrative region in Nigeria with an estimated population of about 40 millions. About 90 percent of the rural dwellers depend on farming for livelihood but a downward trend has been noticed in both cash and food crops production in the last few years. This constitutes a threat to food security and calls for efforts to explain the trend and make recommendations for improvement. Soil qualities of selected farmlands in the Southwestern Nigeria were studied to evaluate its quality and its impact on agriculture using the case of Cocoa.

Soil samples were collected from three locations having similar agro-ecological features, namely Ibadan, Ife and Akure. Soils were analysed for chemical analyses. The soils were analysed for basic cations (determined in 1N NH₄OAc), total N (Kjedahl method), available P (Bray P method), organic C (Walkey-Black wet oxidation method) and pH (0.1 M CaCl₂). Biophysical data were also generated from the soil analyses.

Socio-economic analyses in combination of soil surveys were also adopted in the properties. Resource quality and constraints to agricultural production were covered in the socio-economic surveys while contribution of soil to crop yield was accessed through soil analyses. Information on factors affecting crop yield was elicited by interviewing farmers on their farms using standardised questionnaire. Linear multiple regressions were used to determine the relationships between crop yield and variables presumed to influence yield. Soil organic C, age of farm soil, and ECEC were identified as the major constraints to yield. Other variables are related to biophysical and management factors.

It is recommended that emphasis should be placed on soil management techniques that conserve organic matter and enhance the nutrient and water holding capacity of the soils. Policies that would foster sustainability of agricultural land use and crop marketing are also required.

Keywords: Cocoa, food security, land use, Linear Multiple Regressions, management, soil organic C, yield