PERFORMANCE OF SEVEN CROP COMBINATIONS IN TWO SOILS OF DIFFERENT LAND-USE HISTORY IN EASTERN NIGERIA.

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ABSTRACT
Crop yields obtained from crop mixtures grown in a newly cleared virgin forestland were compared with those from a previously cultivated farmland to assess the crops' performance between the two sites without additional soil amendments. Generally a greater number of soil physicochemical properties were considered agronomically better in the forest than in the previously cultivated land. These soil properties may constitute the driving force for significantly (p<0.05) higher crop yields in the forestland and include: macroporosity, bulk density, saturated hydraulic conductivity, coarse sand content, pH. Soil organic matter, total N, exchangeable acidity and Fe as well as base saturation. In both years, the highest cassava root yields were obtained from either cassava + maize + pigeon pea or cassava + maize intercrops (not from sole cassava plots) even though the only significant (p<0.05) difference obtained was between cassava + maize + pigeon pea and all four crops combined and at the cultivated farmland (UNN farm) only. This suggests that it is even disadvantageous to grow cassava as a sole crop in the area. Cassava root yield reduction in 1999 relative to 1998 was higher (70\%) in the UNN farm than in the forestland (40\%). There was no significant difference due to crop combination on yam tuber yield in both locations in 1998. However, in 1999 sole yam plots gave significantly higher yields than cassava + yam + maize + pigeon pea plots. Increase in tuber yields was obtained in 1999 over 1998 in both locations but it was smaller (<3\%) in the forest than in the UNN form (27\%). There was no significant difference due to crop combination on maize grain yield. The pigeon pea yields obtained form sole pigeon pea plots in the forest locations in both years were generally significantly (p<0.05) higher than those obtained form the other plots, with the land equivalent ratio (LER) obtained ranging from about 1.16 to 3.48, the study shows clearly that it was much better to grow the test crops in mixtures than in pure stands. The number of crops in the mixture should, however, not exceed three as an additional crop led to depressed LER. The recommended intercrop mixture was cassava + maize + pigeon pea.

Key words: Land use, soil properties, intercropping, land equivalent ratio