THE EFFECTS OF CONTINUOUS CROPPING AND FALLOWING ON THE CHEMICAL PROPERTIES OF AN ULTISOL IN NSUKKA, NIGERIA

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ABSTRACT

In this study, soil chemical properties were determined in a cleared forestland continuously grown to cassava (Manihot esculenta Crantz), pigeon pea (Cajanus cajan), maize (Zea mays) and their combination for seven years and from then was fallowed for ten years. Soil samples were also collected from the adjacent cleared uncultivated but fallowed plots as well as the original forestland and analyzed. The objective was to compare nutrient recovery capacity as related to land use history under natural fallow. The study showed that the solely cassava plots were able to recover more available P, exchangeable Mg, CEC and had the highest pH value during the fallow period. Plots grown to sole pigeon pea were able to recover more organic matter, exchangeable K, exchangeable Na and exchangeable acidity than other plots. The control plot had the highest total N, while, the M + P plots recovered more exchangeable Ca. Compared to the year the forest was cleared, OM, CEC, exchangeable Ca, Mg, and Na were able to recover to about their original values, while, total N, exchangeable K and available P could not. Thus, soil nutrient recovery through natural fallow is related to previous cropping history but a period of ten years may be enough for some of the nutrients to recover their original levels.

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