

Soil nutrient and cassava yield variations under continuous cultivation of three-crop mixtures in Eastern Nigeria

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Abstract. A research farm at UNN which was under cultivation for >25 yrs before it was fallowed for 8 yrs, was cleared in 1998 and grown to three common crop mixtures for four years. The aim was to assess the performance of the cassava component under continuous cultivation relative to soil nutrient variations. The crop mixtures were cassava + pigeon pea, cassava + pigeon pea + maize, and cassava + pigeon pea + maize + yam. Incorporation of crop residues from each of the respective plots into the soils and the use of a legume (pigeon pea) served as means of restoring soil fertility. The experimental design was a randomized complete design (RCBD) replicated thrice each year. Changes in eight selected soil fertility indicators were monitored for the period. An analysis of the nutrient contents in the soils under the crop mixtures indicated narrow variations over the four years except in the cases of exchangeable cations where coefficients of variations of >25% were obtained. Comparatively, year-to-year variations were more substantial though not consistent. This is because in some years some nutrients decreased while others increased relative to the values obtained in the preceding year. Except in 1999 when cassava root yields from all the crop mixtures decreased substantially (>60%) relative to their 1998 respective values, the trends in other years were not consistent in all the crop mixtures. The mean yields obtained were generally below the expected mean yield for the same cassava variety in the area. The study also showed that all the soil parameters selected contributed to the variations in cassava yields though they were not consistent in each year and in each crop mixture. Thus, adequate management of these soil factors is required to enhance the performance of cassava in the crop mixtures.