EFFECT OF SELECTED AGROFORESTRY TREE SPECIES ON THE FERTILITY REGENERATION OF A DEGRADED UTISOL.

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ABSTRACT

A degraded acid ultisol at Onne south eastern Nigeria was partitioned into three plots in 1985. The first plot was planted to *Dactyladenia barteri* the second to *Alchonea* while the third plot was left to natural revegetation. The main objective of the study was to compare the fertility regeneration potential of the improved fallow agroforestry system with the naturally revegetated fallow. In 1996, ten years after the establishment of the fallow species, the trees were cut back and the plots were cleared and prepared for cropping. Soil samples were collected in 1985 and in 1996 for analysis and cassava *Manihot Grantz var TMS 30572* was planted as a test crop in 1996. In a companion study, the decomposition of *Dactyladenia* and *Alchornea* leaves was monitored in litterbags for 75 days during the rainy season of 1996.

Results of soil analysis indicated that soil pH and total nitrogen increased by 17 and 400 % respectively in the surface soil (0-15 cm) compared to the 1985 valued. Higher microbial activity was recorded in the soil planted to the agroforestry tree species than in the plot with natural regrowth. However, approximately 18 t/ha of leaf litter was measured on the soil surface of the Dactyladenia plot while no litter was left on the *Alchornea* and naturally revegetated plot. This scenario is corroborated by the faster decomposition of Alchornea leaves than the Dactyladenia leaves.

The decomposition of the *Dactyladenia* and *Alchornea* leaves on the soil surface and the concomitant release of nutrient seem to explain the higher, by 38 % cassava tuber yields from the fallow plots than from the naturally revegetated plot.

Key words : Agroforestry trees, utisol, *Dactyladenia barteri*, *Manihot esculenta*