

## POTENTIAL FOR RUBBER (*HEVEA BRASILIENSIS*) CULTIVATION ON THE BASALTIC SOILS OF SOUTH-EASTERN NIGERIA: CLIMATIC, PEDOCHEMICAL AND MINERALOGICAL CONSIDERATIONS

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Three soil profiles developed on Olivine basalt, located in three villages in Ikom area of south-eastern Nigeria were studied, described and characterised for the purpose of appraising their suitability for cultivation of rubber (*Hevea brasiliensis*) in that ecological zone. The mineralogy of clay fraction of these soils was also investigated using transmission electron microscope (TEM) and X-ray diffractometer (XRD).

The soils were generally deep, moist and heavy-textured, with clay content varying from 30 to 70 per cent. Silt ( $2 - 20 \mu\text{m}$ ) content varied from 14 to 43 per cent. In spite of the clayey texture, the soils were well-drained. All the soils were strongly acidic, with moderate to high levels of soluble Al, moderate to base saturation and low PCEC. Exchangeable Ca, K and organic C were, however, appreciably high in the surface horizons.

The soils had a kaolinitic clay mineralogy but there were substantial amounts of goethite, hematite, quartz and little smectite. The soils were appraised to be suitable for rubber cultivation on the basis of the prevailing agro-climatic conditions, excellent physical properties (texture, structure, drainage and rooting volume) and some chemical properties, mainly high organic matter, exchangeable Ca and K status.

**Key words**—*Hevea brasiliensis*, Soil analysis, Clay mineralogy, Nigeria.

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### INTRODUCTION

Although crops grow over wide areas, geographical segregation over a range of environments is common (Martin and Leonard, 1964) and adaptation to particular ecologies and soil conditions is also frequently encountered. Rubber (*Hevea brasiliensis*), the fifth most important non-oil export commodity, is one of Nigeria's principal export crops. It thrives well mainly in the humid forest regions of southern Nigeria. In south-eastern Nigeria the crop is grown on the gravelly, skeletal

soils (Lithosols) formed from acid crystalline rocks of the Pre-Cambrian basement complex and also on soils formed from cretaceous and tertiary sediments. Soils formed from Olivine basalt are, on the other hand, devoted mainly to cocoa (*Theobroma cacao*), *Gmelina arborea*, and *Oldfieldia africana* (Eshett, 1985). Absence of diagnostic studies appears to be the major factor hindering the much desired expansion of rubber cultivation into the hitherto little exploited areas of basaltic extrusions in south-eastern Nigeria. In this paper we report detailed morphological, pedological,