

ABSTRACT

Characterization, Genesis and Evaluation of Soils on a Part of The Marchmont Inlier, Western Jamaica

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The physical, chemical and mineralogical properties of soils on a part of the Marchmont Inlier, covering 2070 ha in Western Jamaica were studied. From the soil survey, five major and seven minor soils were identified and characterized, which included three new soils. More detailed mineralogical and pedological studies of representative profiles of some soil series were carried out in order to elucidate their genesis. Much attention was focussed on the major soils; however, some attention was also paid to the minor soils in light of differing characteristics, thus illustrating important variations in pedogenesis.

The soils are predominantly Inceptisols, the more fertile base rich members being classified as Eutropepts, and the acidic less fertile members classified as Dystropepts.

The studies indicate that variations in parent materials and topography profoundly affected the development of the soils in terms of their base status, colour, depth and mineralogy. Shale derived soils occur on steeply dissected terrain, and are generally only medium deep (< 75 cm) and extensively eroded. Weathering zones are considered thin (< 5m) by tropical standards, and the sola usually are also thin (< 30 cm). Limestone derived soils on the other hand, are much less eroded by virtue of the more stable structure of the A horizons.

Mineralogical studies carried out on seven representative profiles in the study area indicate that the mineralogy of the soils is inherited directly from the parent material. Petrographic studies of the sand fraction indicate a primary volcanic origin of the sediments. The soils are moderately developed, and pedological changes observed were confined mainly to changes in mineral ratios down the profile without drastic transformations.

Other investigations including phosphate fractionation studies, $\text{SiO}_2/\text{R}_2\text{O}_3$ ratios and micromorphological studies, the former although somewhat inconclusive, confirm the moderately weathered status of the soils.

Erodibility, high Al saturation, high alkalinity and low contents and availability of major and minor plant nutrients, are of primary concern in the management of the soils.