B-83: Characterization of soil physical properties and moisture retention in Andigama series

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The Andigama series is located in the agro-climatic region IL_1, which is a moderately well-drained, shallow to moderately deep, sandy clay loam soil mixed with a considerable amount of iron stone gravel. One of the major limitations in this soil against coconut growth is the poor moisture availability in the dry period of the year.

The objective of this study was to characterize soil physical properties of Andigama series related to moisture status which is useful for the formulation of management practices for coconut cultivation on this soil.

Texture profile, bulk density, aeration capacity and water holding capacity of the Andigama series at 10 locations were evaluated. The depth of sampling was, horizons of A (0-15 cm), AB (15-50 cm) and B (50-100 cm).

The clay fraction and % of different gravel sizes (> 12, 12-5, 5-3, 3-2 mm) was significantly ($P>0.01$ and $P>0.001$ respectively) higher in the B horizon compared to the other horizons. In the B horizon, gravel particles were cemented by the clay fraction forming a hard layer of which the bulk density (1.62 ± 0.07 g/cc) was significantly greater compared to that of other horizons. The field capacity (17.96 ± 3.58% vol/vol) and permanent wilting (14.31 ± 3.02% vol/vol) were significantly higher ($P>0.05$) in the B horizon compared to the others but its available water fraction was lower (36.5 mm/m). This is due to high compaction of its clay fraction with gravel compared to the A and AB horizons. The available water fraction in horizon A, AB and B decreased by 63% before reaching 1 bar (100 kPa) suction in 7, 9 and 11 days respectively during the dry period.

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