Nanthita Deeyai 2011: Changes of Soil Moisture and Characteristics along Toposequence on Limestone Mountain Footslope. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Assistant Professor Somchai Anusontpornperm, Ph.D. 139 pages.

Changes of soil moisture and characteristics along toposequence on limestone mountain footslope was studied in farmer field used for growing sugarcane in Wongdong sub district, Mueang district, Kanchanaburi province. There were eight locations selected, comprising lower footslope (ND-1), upper lower footslope (ND-2), lower middle footslope (ND-3), middle footslope (ND-4),upper middle footslope (ND-5), erosional lower upper footslope (ND-6), lower upper footslope (ND-7), and upper footslope (ND-8). This study aimed at investigating the relationship of soil characteristics on a toposequence and the chages of soil moisture. Soil morphological, physical and chemical properties were examined and analyzed based on standard methods and weekly soil moisture monitoring was undertaken using Timed Domained Reflectromery (TDR).

All soils studied were classified as Aquic Haplustalf (ND-6), Inceptic Haplustalf (ND-3), Calcic Haplustalfs (NDs-1, 2, 4 and 5) and Typic Haplustalfs (NDs-7 and 8). The position on the landscape had no relationship with soil classification units but land surface form and break of the slope reflected a difference in their classification at subgroup level. Their effective depth ranged from 52-163 cm. Soils formed form colluvium of limestone located on the upper footslope were deeper than those derived formed local alluvium and situated on lower position of the footslope. Landscape position also had a relationship with clay content. Soils on the upper and middle footslope had greater amounts of clay (306-700 g kg^{-1}) than did those on the lower position (232-532 g kg^{-1}). In addition, available water capacity increased with increasing elevation on the footslope. Soil chemical properties rarely showed clear association with the landscape position. All soils were composed of moderlately low to low organic matter content and calcium tended to decrease in soils on the upper footslope where cation exchamge capacity tentatively increased. They had modest fertility level in both top and subsoils and were moderately suitable for growing sugarcane (N-III). Soil constraints included a presence of hardpan or more than 60% gravel at shallow depth, alkalinity, water shortage, soil texture and topography. Soil moisture storage at all depths measured increased from the lower to the higher positions of the footslope. Soil moisture changes chiefly depended upon the amount of marl fragments and the depth where concreted marls were occurred. Soils on the upper footslopes contained less moisture at depth between 0-20 cm than did those on the lower positions while soils on the lower part of limestone footslope having moisture contant higher than the moisture content at field capacity throughout growing season.

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