

Kitti Wongsang 2010: Soil Characteristics and Land Capability Classification of Highland Soils on Limestone in Thailand. Master of Science (Agriculture), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Assistant Professor Saowanuch Tawornpruek, Ph.D. 99 pages.

A study on soil characteristics and land capability classification of highlands soils for agriculture was carried out on 6 representative areas in Huai Luek Royal Project Development Center, Chiang Mai province. These soils are Paleustults (4 pedons) and Haplustalfs (2 pedons). They are very deep soils. Their parent materials are local alluvium and colluvium over residuum derived mainly from limestone. Textures of these soils vary from clay loam to clay. Hydraulic conductivity ranges from very slow to very rapid. These soils are very strongly acid to neutral (pH 5-7). They have very low to very high organic matter content (0.7-62.4 g kg⁻¹). Total nitrogen content of these soils are very low to low (0.1-1.7 g kg⁻¹). Available phosphorus and potassium are very low to very high ranging from 0.6-76.3 mg kg⁻¹ and 25-525 mg kg⁻¹, respectively. Extractable bases are medium to high (8-46 cmol kg⁻¹). Extractable acidity is low (1-2.6 cmol kg⁻¹). Cation exchange capacity is medium to very high (13-64 cmol kg⁻¹). Base saturation percentage is low to high (17-85%). Kaolinite is the dominant mineral in all Paleustults while smectite and illite are the dominant minerals in Haplustalfs.

Land capability classification of these soils for agriculture indicates them as mostly suitable (U-I, U-IIe, U-IIIs) except pedon 3 that is a moderately suitable (U-IIIe) because of soil erosion problem. Land classification of highlands for agriculture also has similar result which most of the soils are very well suitable (C₁) and pedon 3 is suitable with minor soil conservation improvement (C₂). These soils are mostly suitable for field crop except for pedon 3 which has topographic problem. All of the soils are suitable for fruit tree but non-suitable for paddy rice. These soils have good capability for field crop and fruit tree because their low surface slopes and they are very deep soils. However they need proper practical soil conservation measures, for examples contour cultivation to minimize soil loss from surface soil erosion.

Student's signature

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