

Chaleamraj Jitjalearnporn 2011: Genesis, Classification and Agricultural Potential of Red Soils in Upper Part of Northern Thailand. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Professor Irb Kheoruenromne, Ph.D. 159 pages.

The study on properties and agricultural potential of red soils in upper part of Northern Thailand was carried out on seven selected areas in Chiang Mai and Chiang Rai provinces. Methods of study included analysis of soil morphology in the field, laboratory analysis on physicochemical properties and mineralogical characteristics of soil samples according to standard methods. Assessment of the soil fertility status and fertility capability was included.

Results of the study revealed that these soils are very deep soils. The soils have developed on residuum and colluvium derived from weathered basic igneous rock. They are highly developed having fine texture and good structure. These soils are extremely acidic to neutral (pH 4.4-6.8) and their organic matter content ranges from very low to high (1.04-41.3 g kg⁻¹), very low to low total nitrogen (0.27-1.83 g kg⁻¹), very low to very high available phosphorus (0.00-295.1 mg kg⁻¹) and very low to very high available potassium (5.6-157.0 mg kg⁻¹). They have moderately low to high cation exchange capacity (7.49-23.00 cmol kg⁻¹) moderate to very high extractable acidity (4.36-21.34 cmol kg⁻¹) and low to medium base saturation percentage (2.88-69.30%). The soils have kaolinite as the major mineral in clay fraction and quartz in silt fraction. These soils include two areas each of Kandiuustult and Kandiuustox and one area each of Kandiuudox, Kandiuudult and Paleudult.

These soils have low to medium fertility. Their agriculture limitation encompasses being acidic, insufficient available phosphorus and potassium. Their agricultural land use needs nutrient management with proper crop type selection. Nevertheless, for soils occupying sloping areas, proper soil and water conservation management is needed to maintain general environment for sustainable land use.

Student's signature

Thesis Advisor's signature