

Wittaya Jindaluang 2008: An Analysis of Soil Factors Influencing Crop Production in Inthanon Area. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science.
Thesis Advisor: Mr. Somchai Anusornpomporn, Ph.D. 224 pages.

The study on an analysis of soil factors influencing crop production in Inthanon area was carried out on 15 locations that were used for various crops within the area of Inthanon Royal Project Research Station in 2007. Elevation of sites selected was 1,276 up to 1,563 metre above mean sea level. All morphological data including general information of the sites and analyses of soil physical and chemical properties were investigated and conducted, all based on standard method.

Field study showed that most soils were derived from colluvium and residuum of granite and gneiss except in ornamental plot that formed from intermountain local alluvium. Sloping surface of the studied areas ranged from 1 to 62%. Soils were deep to very deep with sandy loam to clay texture. A presence of argillic horizon was found in all soils.

Analytical data revealed that soil chemical property played a major role on limiting plant production in the area. This comprised soil reaction in which soils of most areas, such as those found in the lower to middle parts of landscape in Khun Huai Haeng substation (INT1-3) and almost all soils of Mae Ya Noi substation, were strongly acidic to very strongly acidic (pH 4.2-5.5). Also, exchangeable acidity values were high to very high ($>10 \text{ cmol kg}^{-1}$) in combination with most of the soils having low base saturation ($<35\%$). As a consequence, aluminium toxicity would tentatively restraint plant growth in addition to phosphorus fixation by iron and aluminium under this acidic condition indicated by low available phosphorus content in all soils ($<0.83 \text{ mg kg}^{-1}$). Furthermore, calcium and magnesium contents in most soils chosen were also low inherently and because of leaching. Additionally, other plant nutrients, such as nitrogen, potassium in some soils, molybdenum in soils with pH of lower than 5.5 (Mae Ya Noi substation), and possibly copper, boron and zinc in the case of soils that the pH was lower than 5.0, would be likely to play a part in controlling plant yields in the area.

Soil erosion and soil physical degradation problem were rarely critical due to good conservation practices installed such as terracing with various trees were mainly grown on. In some areas, growing plants under greenhouse cover seemed suitable in this respect but fertilization must be careful to prevent heavily residual accumulation of some nutrients. Soil management in the area must be dealing with soil reaction first and then make a proper use of fertilizer based on other soil properties and crop requirements.

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