Ekkarach Meewassana 2009: Characteristics and Problem of Plough Pan in Cassava Production Areas, Nakhon Ratchasima Province. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Mr. Somchai Anusornpornperm, Ph.D. 117 pages.

The investigation on characteristics and problems of plough pan in cassava production areas, Nakhon Ratchasima Province was undertaken in three soil series, namely Warin and Yasothon in Dankhunthod district, and Satuk soil series in Serng Sang district. Samples collection and soil miniprofile characterization were done along toposequence at each site, objectively to acquire specific information of the sites and to examine soil physical and chemical property along with determining relationship between an occurrence of plough pan and soil characteristics.

The results revealed that the soils studied were developed from residuum of sandstone and siltstone with some areas being overlaid by local alluvium and wash materials. They had loamy sand to sandy loam texture. The plough pan occurred on every position of the landscapes, starting at the depth of 15-25 cm from soil surface with thickness of the layer ranging between 13-32 cm. Plough pan layer had high bulk density (>1.6 Mg m^{-3}) with the highest value of 1.83 Mg m^{-3} being in Yasothon series. Layers directly overlying and underlying plough pan layer was clearly less dense than this compacted layer in all locations. Dry soil strength of plough pan layers varied between 0.34-5.23 kg cm^{-2}. This pan had low saturated hydraulic conductivity (0.2-3.4 cm hr^{-1}) and got slower as bulk density increased. Plough pan found in Satuk series tended to have lower saturated hydraulic conductivity than did other two because this soil comprised higher content of silt particle which resulted in smaller soil pores. Available moisture capacity of plough pan in all soils was lower than 3.17% by volume with the lowest amount (2.36% by volume) being in Yasothon series. Depth where plough pan started to form and its thickness, including other soil physical properties had no relationship with positions within the same toposequence whereas soil chemical property was not affected by the occurrence of this pan. Properties of plough pan such as very hard when dry, high bulk density, low hydraulic conductivity and low available water capacity were considered harmful to the growth of cassava.

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