

Jeeranut Hongjaturun 2011: Potential of Soils on Toposequences for Cassava and Sugarcane Production. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Miss Suphicha Thanachit, Ph.D. 122 pages.

The potential of soils for growing cassava and sugarcane on toposequence of sandstone low hill at Krissana subdistrict, Sikhio district, Nakhon Ratchasima province was undertaken on four locations; summit slope, upper middle slope, lower middle slope, and footslope of low hill. Elevation of the area ranges between 343-320 m above MSL. Relief of the area is nearly gentle to undulating, with 1-4% slope and long length of slope. Surface runoff is moderate and permeability is moderate to rapid.

All four soils were classified as Typic Paleustults. They were deep soils with well drained feature. Groundwater depth at the time of sampling was between 125-200 m where the soil on the middle slope had the shallowest ground water level of 125 m. Their topsoils had brown to strong brown colors. The color of subsoils of soil on the summit was red and became yellow with a presence of mottles in soils located on the middle slope to the lowest position of the study area. Physico-chemical properties of these soils along toposequence were rather similar, having sand to sandy loam textures. Their bulk density was low to high ($1.39-1.88 \text{ Mg m}^{-3}$). They were slightly to extremely acid (pH 4.4-6.2) and low fertile. Organic matter content ($1.02-5.49 \text{ g kg}^{-1}$), amounts of available phosphorus ($0.16-10.67 \text{ mg kg}^{-1}$), available potassium ($3.10-46.25 \text{ mg kg}^{-1}$), and cation exchange capacity ($1.25-3.75 \text{ cmol kg}^{-1}$) of these soils were low.

Soil on crestral slope is moderately suitable for cassava (S2en) whereas the rest, situated on the lower landscape, were slightly suitable (S3dne and S3nd). This conformed well to cassava's fresh tuber yield and aboveground biomass of 4.57 and $1.53 \text{ ton rai}^{-1}$, respectively as well as starch content (29.9%) obtained from soil on the highest position whereas the lower lying soils having indifferent fresh tuber yield and aboveground biomass but the values were significantly lower than that of the summit and the lowest values (0.53 and $0.41 \text{ ton rai}^{-1}$, respectively) were found in the soil on the upper middle slope. Soil on the lower midslope gave the lowest starch with the amount of 23.6%

All soils were moderately suitable for sugarcane but with different limitations (S2nm and S2ns). Yields of sugarcane obtained from all position were similar. Soil on the summit tended to give the highest yield of $12.08 \text{ ton rai}^{-1}$ with the lowest yield retrieved from soil on the lower middle slope. These results indicated that soil potential for the production of both plants depends upon the level of groundwater and soil physical properties involving soil moisture rather than soil chemical properties.

Student's signature

Thesis Advisor's signature