Environmental Land Use on the Basis of Saline Water Content in Water Table

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Summary

1. The measurement of water table level and its quality through the year around.

The north-east Thailand is in the region of sodic soils. The sodic soil is generated by the capillary water rising and condensing in soil surface. Khon-Kaen district produces a lot of soils affected by salinity. The salinity concentration of water table and their levels will represent the state of soil salinization. The Electric conductivity values of the water were measured with piezometer for several years near by this area. The water levels and EC values had a big change, season by season. The mean values of EC and water level show simple curves, that is, the lower the water level is, the lower the salinity. To prevent salinization, this result shows that the cutting of capillary water rise by roots will be possible except in strongly governed layer by the capillary water. Water table less than 1 meter from the ground level will be in the area much affected by salinization. The economical way for protection against salinization will be the cutting off of capillary movement by plant roots. A crop with deeper root zone can intercept the saline water rising and protects a crop with shallower root zone in the multi- crop cultivation

2. Experiment of capillary cutting off

An artificial roots connected to desicccator bottles to absorb capillary water was made using the cotton fibers of many candle wicks. The artificial roots system was prepared for absorbing the capillary water. The root was set in sandy soil at several height above the water level. The uptake absorbed by the root was a small amount of water in total, so that it was not enough to intercept the capillary rising when the rate of water transferred by capillary movement was high. This method of capillary cutting off by roots will be only available to the water flux of capillary rise is rather small. The cutting effect will be only expected at the top layer of maximum capillary rising. This investigation will show the possibility of the multi-crop cultivation to prevent the soil from salinization.

3. Analysis of salinity condensation in the surface soil and making a soil classification map using EC values.

A material transfer model was proposed to investigate the salinity condensation dynamism in the soil- water system. This model predicts what change of the salinization will be going on in the surface soil. Finally The study shows us that a soil classification map for environmental land use of agriculture can be made using the relation between EC and ground water level.