

## **An experimental study on salt accumulation prevention by capillary cut off zone in saline soil.**

(塩類土壌地域における農地生産環境の改良手法に関する研究)

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### ABSTRACT

Effects of capillary cut off zone (C-COZ) in a soil profile on salt accumulation and movement were tested experimentally. Two experiments were conducted in this study. One was field scale experiment which took place near Kohn Kaen in northeast Thailand. The other laboratory experiment using sand column was performed to confirm the explanation of field experiment data.

During the field experiment, 10 cm of C-COZ with three different implementation depth (+10, 0 and -10 cm of original ground level) and two materials (rice husk and gravel) were tested for salt concentration profile change during the dry season. Influence of vegetative surface cover also compared in field experiment.

The +10 cm C-COZ resulted in less salt accumulation in tested soil profile, while no significant salt concentration difference observed between 0 and -10 cm C-COZ implementation. The rice husk and gravel showed no significant difference in salt profile when implemented at 0 or -10 cm depth. But when installed at +10 cm, gravel C-COZ showed less accumulation of salt than rice husk because of its less sorptivity of saline water as well as its ease of drainage. The surface cover was always effective and showed the lower soil salinity than bare soil in all the cases tested.

Sand column experiment showed the importance of C-COZ drainage capability to prevent salt accumulation during drying period following the leaching practice in which saline water move upward. Though the C-COZ drainage capability did not affect the effectiveness of capillary rise prevention, the leaching period made the C-COZ saturated and provide saline water for upward movement caused by evaporation from the soil surface.

The sand column experiment confirmed that the effective leaching depth can be expected about 70 to 80 % of applied leaching water depth in terms of "saturated pore depth (Toguchi and Negishi, 1992)".

This study showed qualitative effects of C-COZ and its characteristics of salt accumulation prevention. The potential of C-COZ utilization in salt management was expected but further quantitative and statistically designed field investigation was needed to examine the design parameters including materials and thickness of C-COZ as well as the location and drainage capabilities.