

Thesis Title	Soil Surface Crust Formation and Management Affecting Seed Emergence and Crop Yield.
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M.S.	Agriculture (Soil Science)
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**Abstract**

The studies on soil surface crust formation and management affecting seed emergence and crop yield were divided into two parts. In the first experiment, the effects of three simulated rainfall intensity levels on soil crust formation of three soil series and emergence of mungbean, soybean and peanut were investigated using surface soil bulk density as an index. The experiment was arranged as 3x3x3 factorial in a randomized complete block design. This study indicated that there were significant differences ( $P < 0.05$ ) in surface soil bulk density among 3 soil series when receiving water for 30 minutes at 75, 50 and 25 mm/h intensity levels. Korat/Sanpathong association and Renu soil series showed higher surface soil bulk density than San Sai soil series. The bulk density of the soil surface decreased as the water intensity levels were reduced from 75 to 50 and to 25 mm/h. There was no significant difference in seedling emergence of all tested crops between water intensity at 75 and 50 mm/h. However, the seedling emergence of all tested crops at water

intensity of 25 mm/h was significantly lower than those at 75 and 50 mm/h ( $P < 0.05$ ). The percentage of emergence of mungbean was found to be the greatest followed by peanut and soybean.

In the second experiment, two types of crust breakers were developed and tested in the field. A randomized complete block design was used in this study. The treatments on crust breaking included no crust breaker, crust breaking with a spike roller crust breaker and with a saw-tooth roller crust breaker. The tested crops were mungbean, soybean and peanut. Both crust breakers induced significant increase in water infiltration rate comparing with no crust breaker. However, there was no significant difference in crop emergence and soil physical properties between plots treated with different tools for crust breaking.