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Pre Emergence Effect to Imbibition of Soybean Seeds

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Abstract

Soybean (*Glycine max* L.) is grown in the irrigated areas in upper-north of Thailand. The most widely planted cultivar is Chiangmai 60 (CM60) which has cultivation limitation in that seed may not germinate or seed rot may occur if planted in clay loam soil and water logged condition. Therefore, this experiment was done to identify factors influencing on water absorption or imbibition degree and investigate imbibition pattern before seed germination process. In soybean seeds of 5 varieties, seed coat thickness before soaking as well as protein and lipid content of the seeds were determined. Seed weight before and after soaking were measured. After soaking, the coats from the seeds were picked out and dried and re-soaked for 12 hours for imbibition and then seed weight were measured. Measurements were also made to evaluate changes in seed length due to cell expansion after imbibition in closed and un-closed seed. This study found that the thickest seed coat occurred in SJ5 variety whereas that of CM60 was slightly thinner. At first stage of imbibition (within first 5 hours of soaking) water enters the seed in relatively high and steady rate. At the following stage (between 5 and 12 hrs.), the imbibition process slow down and seed reaches almost full capacity of hydration. In the initial stage of imbibition, the water absorption rates were similar in every line but CM60 variety had the highest concentration of water. This evidence probably result in higher protein contents in CM60 compared with others varieties which absorbed more water for metabolism process before germination. Moreover, its thicker seed coat allowed better water absorption. In this study, hilum and micropyle were found as important parts of the seed for the water entry in soybean seed.

Keywords: Germination, imbibition, seed coat, soybean seed