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Quality and Quantity Responses of Soybean (*Glycine Max* L.) Seeds to Water Deficit

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Abstract

A split-split-plot experiment with randomised complete block design in three replications was conducted in 2004 at the Research Farm of the Faculty of Agriculture, Tabriz University, Tabriz, Iran. The effects of limited irrigations on oil and protein accumulation of seeds in two soybean varieties (Zane and Hack) in the field were investigated. Irrigation treatments were assigned to main plot, and two soybean cultivars were allocated to the subplots. Harvest stages were considered as the sub subplots. Irrigation treatments I1, I2, I3 and I4 were defined based on the cumulative evaporation of 60 ± 3 , 80 ± 3 , 100 ± 3 and 120 ± 3 mm, from pan (class A) respectively. The results indicated that percentages of oil and protein in the seeds were not significantly affected by water deficit at different harvests. However, both oil and protein out put per unit area were significantly reduced, as water deficit increased. By increasing means 100 seeds weight, percentage oil content decreased, but percentage protein content was increased. In general, it was concluded that Moisture stresses during pod fill will not affect both the oil and protein content of soybean seeds. The resulting seed composition is a balance of the reduction is seed weight and the reduction in quantities of oil and protein content per unit area. In this study, the amount and distribution of water were regular and distinctness, resulting in differing effects on seed weight and differing relative effects on oil and protein components of the seed. Irrigation with short time interval and low water volume is better than irrigation with long time interval and much volume in soybean production. In general, it was concluded that soybean oil and protein production per unit area under full and limited irrigation conditions could be improve by increasing seed yield via selection of high-yielding varieties.

Keywords: Seed yield, Soybean, Water stress