

Abstract

In order to evaluate effects of drought stress and spraying methanol on quantity and quality traits in soybean, an experiment was run as split plot in a randomized complete block design with three replications done at Research center in Faculty of Agriculture of Moghan. Treatments included three levels of drought stress, $S_1= 40$ percent of available soil moisture depletion (control), $S_2= 55$ percent of available soil moisture depletion, $S_3=70$ percent of available soil moisture depletion as main plots and four levels of methanol, including $M_1=$ without spraying of methanol (control), $M_2=$ spraying with 7 volumetric percentage of methanol, $M_3=$ spraying with 21 volumetric percentage of methanol and $M_4=$ spraying with 35 volumetric percentage of methanol as subplots were. The Results showed that there was a more significantly difference as affected by drought stress treatments for quantity traits such as: number of seeds per pod, number of pods per plant, number of seeds per plant, pod length, thousand seed weight, stem diameter, number of leaf, leaf area, plant height, number of branch, biological yield, grain yield, harvest index. The Results showed that the increasing of drought stress, can lead to increased percentage of seed oil, soluble carbohydrates and decreased other traits So that depletion 70percent of available soil moisture decrease 51.2percentage of grain yield. Also the Results showed that the effect of methanol spray there was significantly on the The spraying methanol on the number of pods per plant, number of seeds per plant, number of leaf, thousand seed weight, plant height, leaf area, number of branch, biological yield, grain yield and chlorophyll content at 1percent probabilities level and there was a significant difference for the number of seeds per pod, pod length, percentage of seed protein, soluble carbohydrates, stomatal conductance and proline content at at 5percent probabilities level too. The results showed that the highest values were obtained by 21 volumetric percentage of methanol spray, in this treatment the grain yield was 25.6 percent more than control. With the increasing amount of methanol from 21 to 35 volumetric percentage of methanol was reduced yield, which is probably due to the negative effects of methanol in the high concentration of methanol. Interactions of drought stress and methanol spray on traits were not significant.

Key words: Irrigation, depletion water, prolin, leaf area, grain yield



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