**Effect of methanol and gibberellic acid foliar application on yield and amount of methanol in soybean grain under water deficit condition**

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**Abstract:**

In order to investigate the effects of methanol and gibberellic acid spray on yield and amount of methanol in grain of soybean under water deficit condition, a factorial- split plot experiment was performed based on randomized complete blocks design with three replications a year at research field of Islamic Azad University of Karaj branch in 2012. The experiment consisted of two levels of low irrigation factors: Normal (irrigation after 40% soil moisture evaporation) and water stress (irrigation after 70% soil moisture depletion), four levels of methanol solution spray (control=0%, 10%, 20%, 30% [v/v]) and gibberellic acid hormones as the third factor with two levels of testifier (control) and 40 ppm spray. In this experiment grain yield and methanol adjustment were measured. According to results, main effects of drought stress, methanol and gibberellic acid spray were significant on grain yield and amount of methanol in seeds. Also interactions of drought stress and methanol spray on seed yield was significant in P value≤ 0.01 but did not have any effect on amount of methanol. Furthermore, interaction of water stress and gibberellic acid had significant effect on grain yield (P value≤0.01), while it had no effect on the amount of methanol of grain. Moreover, interaction of methanol and gibberellic acid spray had significant impact on grain yield and methanol adjustment (P value≤ 0.01). Interaction of three factors was significant on grain yield, in a way that the most amount of yield was 3449.6 Kg/ha with consumption of gibberellic acid and 20% (v/v) of methanol in normal irrigation and this number was 3012.26 kg/ha without use of gibberellic acid and consumption of 20% (v/v) of methanol solution in drought stress. Besides, interaction of three factors, was also significant on amount of methanol of grains (P value≤ 0.05), since the most quantity of methanol without use of gibberellic acid and spray of 30% (v/v) methanol in normal condition and drought stress condition were 70.54 ppm and 58.44 ppm, respectively.

**Key words: Soybean, Methanol, Gibberellic acid, Grain yield**