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## Foliar Application of Methanol on Some Quality Traits of Soybean under Deficit Irrigation

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### Abstract

To determine effects of methanol foliar application on soybean grain yield under, a factorial split-plot experiment based on a randomised complete block design with four replications was done at Research Field of Faculty of Agriculture and Natural Resources, Islamic Azad University-Karaj Branch, Karaj, Iran, during 2011. The first factor was drought stress in two levels (based on depletion of a1=40 % and a2=70 % of available soil moisture). The second factor was spraying times of methanol in two levels (in the morning at b1= 8–10 AM and in the evening at b2=19–21 PM). Third factor was foliar application number of methanol with three levels (each c1=7, c2=14 and c3= 21 days, Methanol spray was applied 5, 3 and 2 times during growth season of soybean, respectively). All treatments were sprayed with 21 % (v/v) methanol concentration. Grain yield, biomass, protein and oil percentage and yields were measured in this study. The results showed that there was significant ( $p > 0.05$ ) differences between effects of drought stress level on measured parameters. Under normal irrigation, the highest (3187 kg ha<sup>-1</sup>) and lowest (1526 kg ha<sup>-1</sup>) soybean grain yield was obtained in a1 and a2, respectively. results of oil yield indicated that a1 and a2 were produced the most (731 kg ha<sup>-1</sup>) and least (484 kg ha<sup>-1</sup>), respectively. Besides, results showed that significant differences exists ( $p > 0.05$ ) between interaction effects a\*b, a\*c, b\*c and a\*b\*c in some traits, as under normal and deficit irrigation maximum grain yield were observed by methanol spraying every other week in the evening and every 7 days in the morning, respectively. Conclusion: It seems applying aqueous solutions 21 % (v/v) methanol on water deficit condition on different periods on soybean plants and time application can reduce harmful effects of drought and improve plant potential to cope with stress.

**Keywords:** Biomass, harvest index , methanol, soybean, yield