

Impact of Drought on Grain and Oil Yield of Sunflower cv. Azargol of Different Plant Density

Mehrdad YARNIA, Mohammad Bager KHORSHIDI, Hamid MADANI

Islamic Azad University, Faculty of Agriculture, Tabriz Branch, Iran
(e-mail: Yarnia@iaut.ac.ir)

Abstract

Sunflower yield strongly depend on plant density drought stress. Therefore, this study was conducted in order to evaluate effects of drought stress in different plant densities on yield and yield components of Azargol hybrid cultivar. The study was performed in RCBD based split plot design with four replications. Drought stress in four stages (including control, ten leaf, bud appearing and pollination stages) and four plant densities (45, 60, 75 and 90 thousands plant per hectare) were used. In order to perform drought stress, moisture content of soil was decreased into 40% of field capacity. Results showed that drought stress in any stages and increasing plant density from 45000 to 90000 plant.ha⁻¹ leads to significantly reduction in grain yield, oil percentage and oil yield (in hectare). Optimum density of sunflower was 75000 plant.ha⁻¹ in non-stress and 90000 plant.ha⁻¹ in stress conditions. Drought stress led in decreasing of oil percentage and yield. The highest amounts of oil yield and oil percentage was about 2926.6 kg.ha⁻¹ and 49.21% in non-stressed and lowest amounts of them (1864.9 kg.ha⁻¹ and 45.86%) were found during drought stress in pollination stage. The highest oil yield in drought stress in ten-leaf, bud appearing and pollination stages in 90000 plant.ha⁻¹ were 2150, 2290.7 and 2412 kg.ha⁻¹, respectively. During drought stress the lowest amounts of oil yield was obtained in 45000 plant.ha⁻¹. Azargol hybrid in 75000 plants per hectare and with suitable irrigation can produce 6647 kg/ha and have a high share in increasing oil production in country, but in deficit irrigation, can produce 4459 until 5256 kg.ha⁻¹ with 90000 plant.ha⁻¹.

Key words: sunflower, drought stress, plant density, grain and oil yield

sa2008_a0519