

Drought Stress and Plant Density Effects on Yield and Yield Components of Maize KSc 301 Hybrid in Varamin Region

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Abstract

To investigate the effect of drought stress and plant density on yield and yield components of maize KSc 301 hybrid, a two-year study (2007-2008) was carried out in Varamin Agricultural Research Center by using strip split plot randomized based on complete block design in three replications. Four water stress levels (before flowering, during flowering and grain filling stage and no stress) were assigned as vertical factor and three plant densities (60, 75 and 90 thousand plants ha⁻¹), were assigned made up of horizontal factor. The effects of water stress and plant density were statistically significant on yield and its components. Water stress at flowering stage reduced the grain yield by 42% compared to the control treatment. Water stress before flowering and grain filling periods, although yield was significantly lower than control but there was no significant difference between treatments. Reduce the number of grains per ear and increased the interval between the pollination of flowers until silking were the main reasons for reduced yield in the treatment of water stress at the flowering stage. Density of 75 thousand plants ha⁻¹ was determined the best density for grain yield. Among the tested density, density of 90 thousand plants ha⁻¹, compared to the control treatment had the greatest reduction in yield (25% reduction). Water stress and plant density interaction was statistically significant at 1% level. The highest and lowest grain yield, respectively, related to the 75 thousand plants ha⁻¹ and without water stress (9100kg ha⁻¹) and water stress at the flowering stage and 90 thousand plants ha⁻¹ (3700 kg ha⁻¹). Water stress at flowering stage, and densities of less than 75 thousand plants ha⁻¹ or higher than 75 thousand plants ha⁻¹ was significantly decreased harvest index. The results showed that the density of 75 thousand plants per hectare and avoid stress, especially at the flowering stage; appropriate yields can be expected from hybrid KSc 301.

Keywords: Corn number, Silking, Grain yield, Flowering stage.

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