

# Investigation of Durum Wheat Plant Density for Maximum Yield for Different Degrees of Dehydration Stress

This study was conducted to determine the best and most suitable plant density of durum wheat under normal irrigation conditions and drought stress levels during the reproductive growth phase, at Research Farm of Tehran Agricultural Research Center, Varamin city. The statistical design of the study was split plot design based on randomized block design with 5 replications. The main design factors included irrigation regime at three levels of normal irrigation (area custom), irrigation at the beginning of seed filling stage (mild stress) and irrigation at the beginning of flowering stage (severe stress) and sub-factor including planting density at three levels of 5 plants. There were 2 plants / m<sup>2</sup> and 2 plants / m<sup>2</sup>. Results showed that except for plant height, the effect of stress treatment was significant on all studied traits. Also, the effect of plant density treatment was significant for all traits except flag leaf protein and protein content. Both mild and severe stress treatments significantly reduced grain yield by 6.5% and 0.5%, respectively. In mild stress treatments, the highest grain yield components loss was related to 1000-grain weight and number of fertile panicles, while for severe stress treatments, in addition to traits, number of days to maturity, biological yield and leaf area green viability were strongly affected. Got it. Percentage and yield of seed protein were also affected by stress. Stress increased the percentage and decreased protein yield. There was also a significant increase in leaf proline content in both stress treatments. By increasing the density from 1 to 2 plants / m<sup>2</sup>, many of the

yield components improved and increased grain yield. The highest grain yield was at 1 plant / m<sup>2</sup> and 2 kg / ha. Increasing the density to 5 plants / m<sup>2</sup> caused a decrease in grain yield. However, the lowest grain yield was obtained from the lowest density (2 plants / m<sup>2</sup>). Plant density had no significant effect on protein percentage but its effect on protein yield was significant. Proline content of flag leaf was not affected by density, but both irrigation stress treatments increased it significantly. The trend of changes in the curves of wheat growth indices was affected by the treatments. Stress during the reproductive phase caused the leaves to fall faster and to reduce green area durability and to increase the slope of the leaf area index curve slope and crop growth rate. The plant density affected the rate and timing of maximum LAI and CGR. The trend of changes in the curves of wheat growth indices was affected by the treatments. Stress during the reproductive phase caused the leaves to fall faster and to decrease the green surface durability and to increase the slope of the leaf area index curve and crop growth rate. The plant density affected the rate and timing of maximum LAI and CGR. The trend of changes in the curves of wheat growth indices was affected by the treatments. Stress during the reproductive phase caused the leaves to fall faster and to decrease the green surface durability and to increase the slope of the leaf area index curve and crop growth rate. The plant density affected the rate and timing of maximum LAI and CGR.