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Effect of Early Season Drought Stress on Growth Characteristics of Sugar Beet  
Genotypes

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**Abstract:** This study was conducted to determine the effects of early season drought stress on some plant characteristics of 9 sugar beet genotypes in the Khorasan Agricultural and Natural Resource Research Station, NE Iran. The experimental design was a split plot with a randomized complete block arrangement. Leaf area index, leaf dry weight, shoot dry weight and root dry weight decreased under drought stress compared to non-stress conditions. The decrease was more pronounced as the rate of stress increased. Leaf area index was more affected by water stress than was leaf weight (losses of leaf area indices were 14.1% and 66.6% in mild and severe stresses, respectively, and losses of total leaf dry weights were 16.2% and 54.2% in mild and severe stresses, respectively). Mild stress affected root dry weight more than shoot dry weight (percent losses of root dry weight and shoot dry weight were 31.7 and 19.5, respectively), while the effect was reversed under severe stress (percent losses of root dry weight and shoot dry weight were 50.5 and 60.2, respectively). Most of the genotypes with a high root dry weight and low shoot to root ratio before termination of stress also had a lower root dry weight under stress than non-stress and produced higher white sugar yields. The differences between the genotypes in leaf area index, leaf dry weight and shoot dry weight before termination of stress were not high enough to have a considerable effect on white sugar yield. Counting the leaf number before termination of stress and 1 month after termination of stress revealed that stress delays the growth of sugar beet. Although a higher number of leaves per plant is a good character under stress, this trait characteristic could not increase the shoot to root ratio. MSTC2 and 7233.P3 genotypes appeared to be better than the other genotypes for the studied traits under mild and severe drought stresses early in the growth season.

**Key Words:** drought, genotype, morphology, stress, sugar beet

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