P-96 (185)
EVALUATION OF WATER STRESS RESISTANCE IN PERSIAN WALNUT

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Persian walnut (*Juglans regia* L.) is one of the most sensitive nut crops to water stress. The reduction of annual precipitation in recent years has affected the yield of walnut in many walnut-growing regions of Iran. To evaluation of walnut genotypes for water stress resistance, six genotypes namely 'Ghuchan', 'Shiraz', 'Khansar', 'Frieden', 'Tuserkan' and 'Bardsir' beside 'Chandler' (as control) were assessed using morphological and physiological indices in a glasshouse experiment. One-year old seedlings of the genotypes and 'Chandler' were treated with two irrigation regimes, control (no water stress) and withholding irrigation (for 28 days). Based on the data, the highest and the lowest leaf relative water content (RWC) was observed in 'Bardsir' and 'Khansar' genotypes, respectively. Proline content in the leaves of all genotypes was strongly rose under stress compared to normal conditions. The highest and lowest concentration of free proline was observed in 'Bardsir' and 'Ghuchan' genotypes, respectively. The greenness index was the highest at 'Chandler' and the lowest at 'Ghuchan'. Also, water stress was decreased the levels of soluble proteins and chlorophyll *a* and *b* concentrations, and increased malondealdehyde (MDA) and activity of superoxide dismutase. In aggregate, the genotype of 'Bardsir' was introduced as the most drought- tolerant genotype of this research.

Keywords: Drought, Withholding irrigation, Walnut, Relative water content, Osmoregulation.