Chemical signalling and stomatal conductance in pot-grown strawberry under different irrigation regimes

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ABSTRACTS

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P 4.19 - Physiological responses to drought stress in cutleaf medic (*Medicago laciniata* (L.) Mill)

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Cutleaf medic (*Medicago laciniata*(L.) Mill) is a species of fabaceae family which a drought tolerant genotype of cutleaf medic was recognized from Iran arid areas (rainfall 170-190 mm y^{-1}). In order to study of physiological responses to drought stress in sensitive and tolerant genotype of cutleaf medic, a greenhouse experiment was conducted at the Agricultural Biotechnology Research Institute of Iran, using a factorial arrangement in RCBD with three replications. Two genotypes of cutleaf medic, sensitive and tolerant to drought stress was treated in four levels of water stress include -0.1, -0.2, -1 MPa as low, medium and high stress levels respectively and normal condition (FC = -0.03 MPa). Physiological Charac-teristics were measured in first day to reach per stress level and ten days after to remain in stress levels. Results indicated that tolerant genotype had a significant superiority to sensitive genotype in most studied characteristics such as, RWC, WP, OA and organic solutes including Proline, Total sugar and inorganic solutes among K^+, Ca^{2+}. RWC and water potential were decreased in both genotypes, but in sensitive genotype was more than another genotype. In tolerant genotype was decreased osmotic potential to cause osmolytes accumulation. Inorganic solutes as potassium and organic solutes as soluble sugar were caused for osmotic potential decrease and osmotic adjustment mechanism. This experiment indicated that osmotic adjustment is one of the major concerns of tolerance. Therefore it might be possible to use physiological responses for selection of drought tolerant medics or gene transfers them.

P 4.20 - Chemical signalling and stomatal conductance in pot-grown strawberry under different irrigation regimes

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The effect of partial root-zone drying (PRD), as compared to full irrigation (FI), deficit irrigation (DI), and non-irrigation (NI) on soil and plant water relations, leaf stomatal conductance (g_s) and abscisic acid concentration in the xylem sap ($[ABA]_{xylem}$) of strawberry [*Fragaria xananassa* (Duchesne) 'Honeoye'] plants were investigated in a split-pot green- house experiment. In the FI treatment the whole root zone was irrigated daily to pot holding capacity while the DI and PRD treatments were irrigated with 70% of the volume of the FI to either the whole or one half of the root system, respectively. In PRD, irrigation was shifted from one side to the other side of the plants when the soil water content (θ) of the dry side had decreased to ca. 10%. These irrigation regimes resulted in a significant reduction in θ of the DI and PRD as compared to FI. However, there were only observed significant differences in crown water potential (ψ_{crown}), leaf water potential (ψ_{leaf}) and g_s at a few occasions between the irrigation treatments at the end of the experimental period. The $[ABA]_{xylem}$ was significantly increased by the NI treatment but not significantly effected by the DI and PRD treatments as compared with the FI treatment. The increase in $[ABA]_{xylem}$ of NI plants coincided with marked decreases in ψ_{crown}, ψ_{leaf} and g_s three to four days after withholding irrigation. $[ABA]_{xylem}$ was linearly correlated with ψ_{crown} when ψ_{crown} dropped below a critical value of -0.4 MPa. The g_s tended to decrease as a function of $[ABA]_{xylem}$, but it was also highly related to the water vapour pressure deficit (VPD) of the air.