

Study of Photosynthesis and Respiration Changes in Different Sugar Beet (*Beta vulgaris* L.) Genotypes Under Salinity Stress

N. Assadi Nassab^{1*}, P. Hassibi², H. Roshanfekr³, and M. Meskarbashee³

1*. **Corresponding Author:** M.Sc. Student of Agronomy, Shahid Chamran University of Ahvaz, Iran (Nafisehasadi@gmail.com)

2,3. Assistants, Associate Professors Respectively, Department of Agronomy and Plant Breeding, Shahid Chamran University of Ahvaz, Iran

Received: 22 February, 2011

Accepted: 6 November, 2011

Abstract

This experiment was conducted to study the effect of salinity stress on growth characteristics, respiration, photosynthesis and gas exchange in three sugar beet genotypes (13030, 22393 and IC) during 2009-2010 growing season, in the greenhouse of Shahid Chamran University. The study was complete randomized factorial block design with three replications. 35 days sugar beet seedlings were kept for eight weeks under three salinity levels including control (zero), 100, and 200 mM sodium chloride (NaCl). Salinity Stress decreased the shoot and root dry matter and leaf area. The results showed that with increasing salinity, the rate of photosynthesis (carbon dioxide assimilation), stomatal conductance, and leaf transpiration rate decreased, whereas respiratory rate, leaf temperature and SPAD value increased. Based on stress susceptibility index (SSI), in 200 mM sodium chloride, 13030 and 22393 genotypes were semi tolerant and IC genotype as semi-sensitive were identified. According to the results, maintaining leaf area as the main source of plant photosynthesis improved root dry weight significantly ($r=0.92^{**}$). The results showed that root dry weight, can be used as a criterion for salinity resistance of sugar beet varieties.

Keywords: *Respiration, Sugar beet, Transpiration rate, Photosynthesis, Root weight, Stomatal conductance*