

Effect of short-term water deficiency on photosynthesis in sugar beet genotypes

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Abstract

Water deficit is one of the major problems in production of sugar beet (*Beta vulgaris*). Physiological changes which it causes are numerous. In this paper we analyzed functioning of photosystem II with the aim to select genotypes differently reacting to short-term water deficiency. Genotypes included in this experiment previously showed differences in response to water shortage in the observation tests in the field.

Plants were grown in semi-controlled conditions of a glasshouse, in a mixture of soil (2/3) and sand (1/3) and watered daily. After 90 days, water deficit was imposed by the cessation of watering, while the control plants continued to be watered up to 80% of FWC. Five days later parameters of photosystem II (Fo, Fm, Fv/Fm) were measured and analyzed.

Parameters of chlorophyll fluorescence did not show significant variation after imposition of water deficiency. Average stress effects were marginally noticeable for Fv and Fm, but not for the Fv/Fm ratio. Some genotypes had higher Fm, Fv and Fv/Fm values and water stress did not change these scores to an appreciable extent. Therefore, overlapping intervals for stress x genotype interaction components signify that imposed stress induced similar variation in chlorophyll fluorescence of all genotypes. This means that, to assess genotypic differences, it should be considered in combination with the other physiological parameters.

Key words: sugar beet, drought tolerance, stress meter, photosynthesis, genetic variability

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