DROUGHT TOLERANCE IN TOMATO PLANTS EXPRESSING THE ARABIDOPSIS TRANSCRIPTION FACTOR ATHB7

IANNACONE R., PETROZZA A., ARMENTANO N., LA VECCHIA G., TADDONIO G., CELLINI F.

Metapontum Agrobios, Metaponto (MT), Italy

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*ATHB7* is a member of HD-zip proteins that is involved in drought response in *Arabidopsis*. The gene is transcriptionally induced by dehydration in post-germinative stages of the life cycle and it is supposed to act as a negative regulator of growth.

To assess the effect of this gene in an heterologous system tomato plants expressing *ATHB7* mRNA, by using a CaMV35S::*ATHB7* construct were obtained. The expression of the inserted trait, monitored by real time PCR, was stable across six generations.

Drought tolerance was evaluated in tomato plants grown in pots in greenhouse. Trials were conducted for 3 years and several parameters (water potential, osmotic potential, spad, soil and leaves conductivity) were evaluated. In the last year parameters were evaluated on small plantlets. Four replicates for each line were grown under normal agronomic trial and under drought stress conditions. The drought trial was conducted for 18 days and daily leaf and stem water potential, leaf dry weight, and the foliar pigments (chlorophylls and carotenoids) were determined. Plant phenotype under normal and drought stress conditions was evaluated by using high-throughput non-destructive method. Automated screening of complete plants was led using Scanalyzer 3-D system (LemnaTec) under near-infrared (NIR) and visible (RGB) light conditions. NIR imaging was used to get information on watering status of plant leaves and their reaction to limited water availability. RGB imaging was used for assessing morphological parameters.

Transgenic tomato plants expressing the *ATHB7* factor, showed a higher leaf water content than isogenic line grown under dry conditions. Furthermore morphological differences, in terms of dimensions of plants, visible leaf area and colour leaf, were detected between transgenic and UC82 control plants.

Data obtained by measuring physiological indexes and image analyses indicate an increased drought tolerance and a high level of recover after re-watering of *ATHB7* plants compared to control plants.