

## **COMBINED STRESSES IN TOMATO: EFFECT OF A PLANT-BASED BIOSTIMULANT ON PLANT HEALTH AND STRESS TOLERANCE**

FRANCESCA S., ZHOU R., OTTOSEN C-O., BARONE A., RIGANO M.M.

\*) Department of Agricultural Sciences, University of Naples Federico II (Italy)

\*\*\*) Department of Food Science, Aarhus University, Aarhus (Denmark)

*drought, climate change, bioassay, heat stress, tomato*

Abiotic stresses including drought and heat stress are amongst the main limiting factors for plant growth and crop productivity. In particular, tomato (*Solanum lycopersicum*), is regarded as a heat sensitive crop, although its sensitivity varies among genotypes. In this work we investigated the effects of one plant-based biostimulant named CycoFlow (Agriges) on physiological responses of two tomato genotypes (E42 and LA3120) subjected to heat stress, drought and combined stress. The application of the biostimulant increased plant height (up to 11.86% higher under combined stress) and number of leaves (up to 29.89% under combined stress). This effect was associated to an increase in the net photosynthetic rate (PN). Indeed, E42 plants under drought treated with CycoFlow showed the same PN level as non-treated and non-stressed plants. Moreover, in treated LA3120 plants subjected to drought, the PN was higher compared to non-treated plants. Additionally, maximum quantum efficiency of photo system II (Fv/Fm) values in the two genotypes were affected by drought, but a higher value was observed in treated E42 plants compared to non-treated plants. The biostimulant application under heat stress increased also stomatal conductance and transpiration rate. Noteworthy, the application of the biostimulant increased chlorophylls content in both genotypes under combined stress. In general, the effect of the biostimulant was linked to the different stress applied. Our results will be important to understand the responses of plants under combined stress and will give an important contribution to the choice of practices to improve plant performances and final yield.