

PROJECT TITLE

Phenotyping of wheat (*Triticum aestivum* L.) response to heat stress at different developmental stages

CONSORTIUM

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SUMMARY OF THE REPORT

In a context of climate change and soil and water resource degradation, it becomes increasingly important to reduce the need for high nutrient, water, or pesticides inputs, leading to more sustainable agricultural practices. In this context, our aim was to select the best performing wheat varieties in various deleterious abiotic environments, having both a higher yield, better quality and higher resource use efficiency in such stress-prone environments. Twelve wheat genotypes, some with known tolerance to different abiotic stresses established in previous projects and some with unknown response, were screened for their tolerance to heat stress using Dynapheno phenotyping facilities at Aarhus University in Denmark. Ten Serbian and two international checks (tolerant and susceptible) were screened for heat tolerance at flowering time and grain filling stages, as the most sensitive developmental stages to heat stress in Serbian ecological conditions. Four treatments were applied: the control treatment, the heat stress treatment at flowering stage only, the heat stress treatment at grain filling stage only and the heat stress treatment at both flowering and grain filling stages. Chlorophyll fluorescence, leaf temperature and leaf chlorophyll content on flag leaves were measured on all 12 genotypes for all treatments. Gas exchange parameters, net photosynthetic rate, intercellular CO₂, stomatal conductance and transpiration rate, as well as contents of pigments (chlorophyll a, chlorophyll b and carotenoid) and carbohydrates (soluble sugars: glucose, fructose and sucrose) in leaves were analysed on four selected genotypes for all stress treatments. The statistical analyses showed differences in applied treatments and responses of selected wheat genotypes to the heat stress. The results of this research will help breeders in the selection and improvement of heat tolerance in wheat.