

Symposium on Genetics and Plant Breeding in Cereals: 100th Birth Anniversary of Academician Slavko Borojević (1919-2019)



BOOK OF ABSTRACTS

Novi Sad, Serbia, 13-15th November 2019, organized by the Serbian Academy of Sciences and Arts – Branch in Novi Sad, Faculty of Agriculture of the University of Novi Sad, and Institute of Field and Vegetable Crops in Novi Sad



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Academician Slavko Borojević (1919-2019)

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Evaluation of Wheat (*Triticum aestivum* L.) Response to Different Abiotic Stresses Using Modern Phenotyping Platforms

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In a context of climate change and soil and water resource degradation, it becomes increasingly important to reduce the need for high fertilisers, water, or pesticides inputs, leading to more sustainable agricultural practices. In this context, our aim is 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 conditions. During the last decade, we evaluated the effect of drought stress and its combinations with other abiotic stresses (salt and N nutrition) on wheat grow and development using high-throughput shoot and root phenotyping platforms. The study of combined effect of water- and N- availability indicated that a Serbian cultivar NS 40S had very good water use efficiency, while in cv. NS Avangarda water use efficiency and N-use efficiency were well combined. Also, we identified a Serbian cultivar Subotičanka that was able to continue root growth in soil with limited water supply. In the study of complex interaction of drought and salt stresses, we analysed 14 wheat (*Triticum aestivum* L.) cultivars, from Serbia (5), Austria (4) and Azerbaijan (5) under controlled laboratory conditions and in a greenhouse. The best performance in total grain yield under salt stress alone was observed in the NS-Avangarda, Gobustan and Tale-38 cultivars, while under water stress alone the Gallio, Balkan and Grymzyl gul-1 showed the highest grain yield. Under conditions of combined water and salt stress the Capo, Tale-38, and NS-40S showed the best performance. Using the knowledge and the results from these studies, we extended our work by evaluating wheat response to heat stress at two important developmental stages, flowering time and grain filling period. Three Serbian cultivars were found to perform better under heat stress in comparison to the heat tolerant check variety. The results of all these studies will help breeders in the selection and improvement of abiotic stress tolerance in wheat.

Key words: wheat, abiotic stresses, improved tolerance, high-throughput phenotyping platforms