

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



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

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PROGRAM

Wednesday, November 13

17.00-18.00 Registration and Welcome Reception (The Serbian Academy of Sciences and Arts, Branch in Novi Sad, address Nikole Pašića 6)

from 18.00 Tour of Sremski Karlovci, Wine Tasting and Dinner

Thursday, November 14

9.15 - 10.00 Opening ceremony and welcome speeches by the organizers and special guests

10.00 - 10.30 Coffee break

Chairpersons: Prof. Dr. Miodrag Dimitrijević, academician Dragan Škorić, academician Teodor Atanacković

10.30-11.00 Opening lecture: From Cold Spring Harbour to the Novi Sad School of Genetics

Prof. Dr. Miodrag Dimitrijević, University of Novi Sad, Faculty of Agriculture

11.00-11.30 Plenary lecture: World Food Supply Present and Future - Problems and Prospects

Prof. Dr. Perry Gustafson, Adjunct Professor of Plant Sciences, College of Agriculture, Food and Natural Resources, University of Missouri, USA and retired geneticist of the Agricultural Research Service, USDA

11.30-12.00 Plenary lecture: Gene Manipulation In Wheat Improvement

12.00-12.30 Plenary lecture: Селекция мягкой пшеницы в Национальном Центре зерна имени П. П. Лукьяненко: традиционные и биотехнологические методы

Davojan Rumik Oganessovič, Research Institute of Agriculture named after P.P. Lukyanenko, Krasnodar, Russia

12.30-12.45 Changes in Senescence Pattern Related With Breeding Progress in Winter Wheat

Dr. Milan Mirosavljević, Institute of Field and Vegetable Crops, Novi Sad

12.45-13.00 Improvement of Spike-Stem-Tillers (SST) Complex is a Challenge In Wheat Breeding

Prof. Dr. Ivan Panayotov, Agricultural Experimental Station - Dunav, Bulgaria

13.00-13.15 Polymorphisms and Flow of Gliadin Alleles in Wheat

Prof. Dr. Desimir Knežević, University of Priština, Faculty of Agriculture in Lešak

13.15-13.30 Discussion

13.30-14.00 Poster Viewing Session

from 14.00 Lunch and Closing Ceremony

INTRODUCTORY NOTE

The greatness and wealth of a nation are not in numbers, area and material resources. The size and wealth of the nation are in people, ideas, achievements and moral values that this nation has created, reached and established.

Prof. Dr. Slavko Borojević, a geneticist, breeder, agronomist, professor, academician, built himself and his work into the greatness and wealth of his people, the state, and much wider than that - in the heritage of humanity.

The aspiration for freedom, the primordial, eternal struggle to achieve it, marked the life and deed of Professor Borojević. Firstly, he fought this battle as a warrior on the battlefield, then as a fighter against hunger, for food security, for liberty and independence through seed and food production self-sufficiency, creating our domestic, varieties of bread grain. It is this constant struggle that has helped to build the scientific thought of genetics at the Faculty of Agriculture in Novi Sad on the right foundation and to create the "Novi Sad School of Genetics", which, by the means of wheat breeding and through thousands of young people attending this school, has been introduced to the world, recognized and respected, like its father - professor Slavko Borojević.

The symposium "100th Birth Anniversary of Academician Slavko Borojević (1919-2019)" is devoted to remembrance of our great people, their work and legacy. In order to wisely go into the future, we need to know who we are, what we are and where we come from. We who are carrying all our ancestors in our genes, we do have the obligation to remember those who have indebted the Fatherland and preserve their work. This Symposium should bring us together around the scientific results of modern genetics and breeding, which were realized on the basis of the work and science of prof. Borojević. With this gathering, we recollect the great scientific and educational work that is possible, when the right people are in the right places and when there is concern for science and education. Professor Borojević created a highly valuable environment around him, but this environment created such a great person, as well. In these times, the Symposium "100th Birth Anniversary of Academician Slavko Borojević" should remind us that we are free, great and rich nation, especially with great achievements in agronomic science. By properly genotype by environment interaction, we could be richer for many new "borojevics", which would not leave for abroad in search for happiness, but remain here and work for the wellbeing of the Fatherland, as Slavko Borojević, a university professor, world known geneticist and wheat breeder honourably did, walking high and tall.

Prof. Dr. Miodrag Dimitrijević
University of Novi Sad
Faculty of Agriculture

ABSTRACTS

Opening lecture

1. From Cold Spring Harbour to the Novi Sad School of Genetics / Miodrag Dimitrijević, Sofija Petrović, Borislav Banjac (Serbia)

Past and Future of Cereal Improvement

2. Changes in senescence pattern related with breeding progress in winter wheat / Milan Mirosavljević, Vojislava Momčilović, Sanja Mikić, Vladimir Aćin, Verica Takač, Srbislav Denčić (Serbia)
3. Improvement of spike-stem-tillers (SST) complex is a challenge in wheat breeding / Ivan Panayotov (Bulgaria)
4. Grain yield changes in historical set of Pannonian winter wheat varieties / Bojan Jocković, Velimir Mladenov, Radivoje Jevtić, Sonja Ilin, Vladimir Aćin, Milan Mirosavljević, Dragan Živančev (Serbia)
5. Utilisation of sodium dodecyl sulphate sedimentation test for quality prediction of wheat cultivars in Serbia / Dragan Živančev, Milan Mirosavljević, Bojan Jocković, Vojislava Momčilović, Radivoje Jevtić, Vladimir Aćin, Slaviša Štatkić, Sanja Mikić (Serbia)
6. Variations of ecological factors in plant production – Frames of living activities of cultivated plants / Ljubica Šarčević-Todosijević, Vera Popović, Sara Has, Ljubiša Živanović (Serbia)

Biodiversity and Utilization of Genetic Resources in Cereals

7. Characterisation of small grains resources at IFVCNS with UPOV descriptors / Sanja Mikić, Verica Takač, Milan Mirosavljević, Dragana Trkulja, Vojislava Momčilović, Ankica Kondić Špika, Ljiljana Brbaklić (Serbia)
8. Estimation of genetic diversity and population structure of IFVCNS wheat collection using molecular markers and pedigrees / Ljiljana Brbaklić, Dragana Trkulja, Sanja Mikić (Serbia)
9. Analysis of chlorophyll content in a bread wheat collection and its correlations with flowering time and grain yield / Verica Takač, Sanja Mikić, Milan Mirosavljević, Vojislava Momčilović, Dragana Trkulja, Ljiljana Brbaklić, Ankica Kondić Špika (Serbia)
10. Improvement of buckwheat production / Vera Popović, Ljubiša Kolarić, Branka Žarković, Ljubiša Živanović, Ljubica Šarčević Todosijević, Jelena Golijan, Jela Ikanović (Serbia)

Cereals Genetics and Genomics

11. Polymorphisms and flow of gliadin alleles in wheat / Desimir Knežević (Serbia)
12. Genomic technology identification of varieties and hybrids of perennial grass crops / Kondratskaya I. P., Yuknimuk A. N., Chizhik O. V., Reshetnikov V. N., Stolepchenko V. A., Vasko P. P. (Belarus)

Cereals Breeding in a light of Climatic Changes - Biotic and Abiotic Stress Resistance

13. Obtaining of genetically changed wheat plants (*Triticum aestivum* L.) with increased resistance to drought / Mykhals'ka S.I., Komisarenko A.G., Pryadkina G.O. (Ukraine)
14. Evaluation of wheat (*Triticum aestivum* L.) response to different abiotic stresses using modern phenotyping platforms / Ankica Kondić-Špika, Sanja Mikić, Dragana Trkulja, Milan Mirosavljević, Ljiljana Brbaklić, Vesna Župunski, Imre Vass, Janos Pauk, Carl-Otto Ottosen (Serbia, Hungary, Denmark)
15. Stem store ability of winter wheat under natural drought conditions / V. V. Morgun, G. A. Pryadkina, O. V. Zborivska (Ukraine)
16. Photosynthetic traits of transgenic maize plants with dsRNA suppressor of proline dehydrogenase gene / O. O. Stasik, D. A. Kiriziy, O. G. Sokolovska-Sergiienko, G. O. Pryadkina, S. I. Mykhalska (Ukraine)

Improvement of Buckwheat Production

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Buckwheat (*Fagopyrum esculentum* Moench) is a diploid (2n=16) annual alternative cereal, from the family Polygonaceae, the genus *Fagopyrum*, which originated in China. Buckwheat is successfully cultivated in the plains and mountainous regions of Serbia. It has excellent technological grain quality, contains important amino acids, iron, magnesium, folic acid, rutin, quercetin, kaempferol-3-rutinoside and a small amount of triglycoside, making it suitable foodstuff for special nutrition. Buckwheat has multiple uses, as food and feed, in the pharmaceutical and other industries. Buckwheat variety 'Novosadska' is one of the most grown varieties in Serbia. For successful production it is necessary to apply varietal cultivation technology. Knowledge of the biological properties of the plant itself and its requirements according to environmental conditions, form the basis of cultivation technology. Important agro-technical measures in buckwheat production are nutrition and row spacing. The aim of this study was to present preliminary results of the effects of row spacing (25 and 50 cm) and NPK nutrients (0; 30; 60 and 90 kg ha⁻¹) of the tested buckwheat variety 'Novosadska' to the following traits: germination energy and germination of seeds (%), seed weight per plant (g), number of seeds per plant and seed yield (kg ha⁻¹). Based on the analysis of variance, row spacing and fertilization had a statistically significant effect on all of the examined factors. Germination energy varied from 86 to 95% and seed germination from 89 to 99%. A significantly smaller number of seeds per plant, seed mass per plant and seed yield were achieved at a distance of 50 cm between the rows and in the control variant compared to the variants with nutrition. Depending on the row spacing, the number of seeds per plant ranged from 23 (50 cm) to 34 (25 cm), seed weight varied from 0.45 g to 0.50 g while seed yield varied from 700 kg ha⁻¹ (50 cm) to 980 kg ha⁻¹ (25 cm). Significantly lower yields were obtained in the control variant compared to the fertilized variant. A significantly higher seed yield was obtained in the combination of NPK 90 kg ha⁻¹ (1180 kg ha⁻¹) compared to all tested variants. The obtained results showed that 'Novosadska' variety has great genetic yield potential and can achieve high yields when proper row spacing and fertilization is applied.

Key words: *Fagopyrum esculentum*, productive traits, row spacing, nutrition

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