



Maize Research Institute  
**ZEMUN POLJE**  
Serbia, Belgrade



## International Conference

# The Frontiers of Science and Technology in Crop Breeding and Production Conference

8 – 9 June, 2021  
Belgrade, Serbia

## **BOOK OF ABSTRACTS**

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## Conference Programme

**June 8, 2021**

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9:00 - 9:20	<i>Dr. Nenad Delić</i> <b>Conference opening remarks</b>
<hr/>	
<b>Genetic resources and pre-breeding</b>	
9:20 - 9:40	<i>Dr. Alain Charcosset</i> Advances in maize genetic resources characterisation and use
9:40 - 9:55	<i>Dr. Vlatko Galić</i> Diversity patterns and selective sweeps in Southeast European maize genetic resources
9:55 - 10:10	<i>Dr. Natalija Kravić</i> Pre-breeding activities on MRIZP Gene bank collection towards its more efficient use in breeding programmes
10:10 - 10:25	<i>Dr. Nikola Grčić</i> Historical development and diversity characterization of ZP breeding germplasm
10:25 - 10:40	<i>Dr. Vesna Perić</i> Genetic diversity of soybean accessions in Maize Research Institute „Zemun Polje“ collection

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### Discussion

#### Abiotic and biotic stress

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11:30 - 11:50	<i>Dr. Pedro Revilla</i> Breeding Mediterranean maize for drought tolerance
11:50 - 12:10	<i>Dr. Dragan Perović</i> Comparative genomics of cereals as backbone of molecular breeding to biotic and abiotic stresses in wheat and barley
12:10 - 12:25	<i>Dr. Ana Nikolić</i> Understanding low- temperature and waterlogging stress impact on early stages of maize plant development
12:25 - 12:45	<i>Dr. Antonio Logrieco</i> Mycotoxin management along food/feed chain: <i>MycoKey actions</i>
12:45 - 13:00	<i>Dr. Milica Nikolić</i> Effects of climate changes on mycopopulations in

13:00 - 13:15	cereal grain in Serbia <i>Dr. Željko Popović</i> Not just a pest: <i>Ostrinia nubilalis</i> – A Model system for studying ecophysiology of insect diapause
<b>Discussion</b>	
<b>Genetics and breeding</b>	
16:00 - 16:20	<i>Dr. Paul Scott</i> Using gametophytic incompatibility systems to improve genetic purity of specialty crops
16:20 - 16:40	<i>Dr. Thanda Dhliwayo</i> Use of temperate germplasm in a tropical maize breeding program: Rationale and some results
16:40 – 17:00	<i>Prof. Dr. Thomas Lübberstedt</i> Past, present and future of maize doubled haploid technology
17:00 – 17:20	<i>Prof. Dr. Seth Murray</i> Unoccupied aerial systems temporal phenotyping and phenomic selection for maize breeding and genetics
17:20 - 17:40	<i>Dr. Radomir Stojšin</i> Breeding for Short Stature Maize
<b>Discussion</b>	

**June 9, 2021**

<b>Genetics and breeding</b>	
9:00 - 9:20	<i>Dr. Lee Hickey</i> Speed breeding crops to feed 10 billion
9:20 - 9:35	<i>Dr. Primož Titan</i> Conditional chemical male sterility system and common wheat ( <i>Triticum aestivum</i> L.)
9:35 - 9:50	<i>Dr. Vesna Kandić</i> Evaluation of bread wheat genotypes ( <i>Triticum aestivum</i> L.) for root architecture and shoot traits
9:50 - 10:10	<i>Dr. Goran Drinić</i> Utilizing technological advances to improve and accelerate genetic gain
10:10 - 10:25	<i>Dr. Sofija Božinović</i> Optimization of the double haploid technology for temperate maize breeding programs: A case study from Maize Research Institute Zemun Polje
10:25 - 10:45	<i>Prof. Dr. Johann Vollmann</i>

**01 - 08 Poster**

**EVALUATION OF WINTER WHEAT VARIETIES FROM  
CENTRAL AND EASTERN EUROPE FOR IMPORTANT  
AGRONOMIC TRAITS**

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Different wheat germplasm exploited in breeding programmes in continental Europe and Pannonian region reflects specific breeding requirements in distinctive environmental conditions. In order to evaluate a potential of locally bred and grown wheat varieties from central Europe, as a source of new genetic variability in a wheat breeding programme in Serbia, 42 elite winter wheat representatives of two different European breeding pools were assessed at the Institute of Field and Vegetable Crops (IFVNC), Novi Sad, Serbia. A field trial with 20 elite wheat varieties was set at the IFVNC in a randomized complete block design with three replications during three seasons (2016/2017, 2017/2018 and 2018/2019). The genotypes were phenotyped for heading and flowering time, plant height, ear length, number of spikelets per spike, number of grains per spike, thousand grain weight, yield, protein content, chlorophyll content index and prevalent wheat diseases. In addition, the varieties were genotyped with microsatellite markers. A significant phenotypic variation was found for most of the traits. Coefficients of variation were the largest for the chlorophyll content (26.1%), while the coefficients of variation for yield was 14.2%. Generally, the early genotypes were more susceptible to leaf rust, while the late maturing genotypes produced more grains per spike. The varieties from the Pannonian plain had earlier heading and flowering dates, shorter plant stems, higher chlorophyll content and were more susceptible to leaf rust than the genotypes from the central Europe. The protein content varied significantly among the genotypes but not between the groups. The varieties from two breeding pools were clearly differentiated with principal coordinate analysis (PCoA) obtained from the marker data matrix. The principal component analysis (PCA) highlighted varieties



with the distinctive properties that could facilitate the choice of parent combinations for crossing.

**Key words:** *genetic diversity, grain yield, microsatellites, wheat.*

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