

XXVth EUCARPIA Maize and Sorghum Conference

*Current Challenges and New Methods for Maize and Sorghum
Breeding*

Book of Abstracts

May 30 – June 2, 2022.

Belgrade – Serbia



Organizers

EUCARPIA (European Association for Research on Plant Breeding)
Maize Research Institute Zemun Polje

Scientific Committee

Violeta Anđelković (Serbia), Alain Charcosset (France), Carlotta Balconi (Italy), Chris-Carolin Schön (Germany), Domagoj Šimić (Croatia), Pedro Revilla (Spain), Alain Murigneux (France), Silvio Salvi (Italy), Jean-François Rami (France)

Local Organising Committee

Jelena Srdić, Violeta Anđelković, Branka Kresović, Nenad Delić, Snežana Mladenović Drinić, Vesna Kandić, Marija Kostadinović, Milica Nikolić, Danijela Ristić, Iva Savić, Vesna Perić, Milan Brankov, Nikola Grčić, Jovan Pavlov, Milan Stevanović

Editors

Violeta Anđelković, Jelena Srdić, Milica Nikolić

Publisher

Maize Research Institute, Zemun Polje
Slobodana Bajića 1, 11185 Belgrade - Zemun, Serbia

Multiplied by

Maize Research Institute, Zemun Polje
Slobodana Bajića 1, 11185 Belgrade - Zemun, Serbia

Number of e-copies

150 USB flash drive

Online on the website <https://eucarpia maize sorghum 2022.com>

ISBN-978-86-80383-15-6

Financially supported by Ministry of Education, Science and Technological Development of the Republic of Serbia

CIP - Каталогizacija u publikaciji

Народна библиотека Србије, Београд

633.15/.17:631.527.53(048)(0.034.2)

EUCARPIA Maize and Sorghum Conference Current Challenges and New Methods for Maize and Sorghum Breeding (25 ; 2022 ; Beograd)

Book of abstracts [Електронски извор] / XXVth EUCARPIA Maize and Sorghum Conference Current Challenges and New Methods for Maize and Sorghum Breeding, May 30 – June 2, 2022. Belgrade – Serbia ; [organizers EUCARPIA (European Association for Research on Plant Breeding) [and] Maize Research Institute Zemun Polje] ; [editors Violeta Anđelković, Jelena Srdić, Milica Nikolić]. - Zemun Polje : Maize Research Institute, 2022 (Zemun Polje : Maize Research Institute). - 1 USB fleš memorija ; 4 x 2 x 1 cm

Sistemski zahtevi: Nisu navedeni. - Nasl. sa naslovne strane dokumenta. - Tiraž 150. - Registri.

ISBN 978-86-80383-15-6

a) Кукуруз -- Оплењивање -- Апстракти б) Сирак -- Оплењивање -- Апстракти

COBISS.SR-ID 66525961

Keynote lecture

| | |
|---|----|
| CAN MACHINE LEARNING MODELS AND METHODS ENHANCE GENOME AND PHENOME PREDICTION ACCURACY IN PLANT BREEDING? <i>José Crossa</i> | 1 |
| THE GENETICS AND CONSEQUENCES OF MAIZE DOMESTICATION AND BREEDING: CAN WE MAKE A BETTER TASTING CORN? <i>Sherry Flint-Garcia</i> | 2 |
| TACKLING MAIZE'S CONTRIBUTIONS TO CLIMATE CHANGE BY LEARNING FROM ALL PLANT GENOMIC DIVERSITY <i>Edward Buckler</i> | 3 |
| EXPERIMENTAL EVOLUTION: TWO DIVERGENT SELECTION STUDIES, 16 CYCLES FOR VEGETATIVE PHASE CHANGE AND 7 CYCLES FOR ENDOSPERM STARCH SYNTHESIS <i>William Tracy</i> | 4 |
| GENETIC DIVERSITY MANAGEMENT AND BROADENING IN MAIZE BREEDING PROGRAMS USING GENOMIC SELECTION <i>Antoine Allier</i> | 5 |
| MAIZE AND SORGHUM PHENOTYPING IN A CONTEXT OF GLOBAL CHANGE: WHAT TO MEASURE AND HOW TO DO IT <i>José Luis Araus</i> | 6 |
| NOVEL MAIZE BREEDING STRATEGIES ARE NEEDED TO FACE CLIMATE CHANGE <i>Claude Welcker</i> | 7 |
| BREEDING MAIZE FOR STRESS TOLERANCE <i>Pedro Revilla</i> | 8 |
| MODULATION OF WATER USE EFFICIENCY AND CARBON ISOTOPE DISCRIMINATION IN MAIZE <i>Viktoriya Avramova</i> | 9 |
| ENDURING STRESS: TRANSLATIONAL APPROACHES TO SORGHUM ADAPTATION TO TROPICAL SOILS <i>Jurandir Vieira Magalhaes</i> | 10 |
| FROM MYCO-KEY TO MYCO-TWIN: MYCOTOXIN MANAGEMENT ALONG FOOD/FEED CHAIN <i>Antonio Logrieco</i> | 11 |
| THE PROGRAMME VASO: A LONG-TERM PARTICIPATORY MAIZE BREEDING FOR MAIZE BREAD <i>Pedro Mendes-Moreira</i> | 12 |
| MAIZE ENDOSPERM VITREOUSNESS: GENETIC ANALYSIS AND THE IMPACT IN STARCH BIOAVAILABILITY DURING ENSILING <i>Natalia de Leon</i> | 13 |
| BIODIVERSITY OF AND DIAGNOSTIC TOOLS FOR TOXIGENIC <i>ASPERGILLUS</i> AND <i>FUSARIUM</i> SPECIES ON MAIZE <i>Antonio Moretti</i> | 14 |
| FROM SEED SCIENCE TO ISTA RULES FOR SEED TESTING <i>Florina Palada</i> | 15 |
| SHOULD MAIZE BREEDERS ROUTINELY DO RECURRENT SELECTION? <i>Rex Bernardo</i> | 16 |
| TRANSITIONING FROM SELECTION OF MAIZE GRAIN FOR HIGH PROVITAMINA CAROTENOIDS FOR SUB-SAHARAN AFRICA TO SELECTION FOR HIGH MACULAR AND TOTAL CAROTENOIDS FOR USA <i>Torbert Rocheford</i> | 17 |
| RECENT ADVANCES IN MAIZE DOUBLED HAPLOID TECHNOLOGY <i>Thomas Lübberstedt</i> | 18 |
| IMPROVING GENOMIC PREDICTIONS WITH INBREEDING AND NON-ADDITIVE EFFECTS IN TWO ADMIXED MAIZE HYBRID POPULATIONS IN SINGLE AND MULTI-ENVIRONMENT CONTEXTS <i>Laurence Moreau</i> | 19 |
| CURRENT LIMITATIONS IN QUANTITATIVE GENETICS, AND POTENTIAL SOLUTIONS FOR ROBUST GENOMIC PREDICTION AND BIOLOGICAL INFERENCE <i>Guillaume Ramstein</i> | 20 |

Session I

| | |
|---|--------------|
| Oral presentations | 22-29 |
| THE SEQUENCE AND GEOGRAPHICAL DISTRIBUTION OF THE MYSTERIOUS B CHROMOSOME IN MAIZE <i>Jan Bartoš</i> | 22 |
| EVA - EUROPEAN EVALUATION NETWORK HARNESSING MAIZE GENETIC DIVERSITY PRESENT IN EUROPEAN GENE BANKS <i>Sandra Goritschnig</i> | 23 |
| DIVERSITY OF NUTRITIONAL QUALITY IN IFVCNS GRAIN SORGHUM COLLECTION <i>Simona Jaćimović</i> | 24 |
| CONTRIBUTIONS OF LINKAGE DISEQUILIBRIUM TO THE GENETIC VARIANCE IN PLANT BREEDING POPULATIONS <i>Tobias Lanzl</i> | 25 |
| THEORETICAL AND EXPERIMENTAL ASSESSMENT OF GENOME-BASED PREDICTION IN LANDRACES <i>Manfred Mayer</i> | 26 |
| PROMAIS, FIFTY FIVE YEARS OF COLLABORATIVE RESEARCH WITH INRAE <i>Alain Murigneux</i> | 27 |
| PRESENCE/ABSENCE VARIATION CONTRIBUTES TO ADAPTATION, AGRONOMIC TRAITS VARIATION AND HYBRID PERFORMANCES IN MAIZE <i>Stéphane Nicolas</i> | 28 |
| MAINTAINING AND BROADENING THE GENETIC DIVERSITY OF SORGHUM THROUGH NOVEL POLLINATION CONTROL BAGS <i>Daljit Virk</i> | 29 |
| Poster presentations | 30-39 |
| IDENTIFICATION OF NEW SOURCES FOR EARLINESS AND LOW GRAIN MOISTURE AT HARVEST THROUGH MAIZE LANDRACES TEST-CROSS PERFORMANCE <i>Vojka Babić, Dušan Stanisavljević, Miroslav Zorić, Sanja Mikić, Bojan Mitrović, Violeta Andjelković, Natalija Kravić</i> | 30 |
| CREA MAIZE GENE BANK: GERMPLASM ENRICHMENT AND INNOVATION THROUGH ITALY – BOLIVIA COOPERATION PROJECT <i>Carlotta Balconi, Alessio Torri, Giuseppe De Luise, Pietro Raineri Paolo Valoti, Nicola Pecchioni, Rita Redaelli</i> | 31 |
| POPULATION STRUCTURE AND DIVERSITY IN FORMER ZP MAIZE BREEDING PROGRAM ASSESSED WITH SNP MARKERS <i>Nikola Grčić, Ana Nikolić, Nenad Delić, Marko Mladenović, Zoran Čamdžija, Sofija Božinović, Snežana Mladenović Drinić</i> | 32 |
| RECIPROCAL EFFECT ON GRAIN YIELD AND YIELD COMPONENTS IN SINGLE-CROSS MAIZE HYBRIDS <i>Olivera Đorđević Melnik, Sofija Božinović, Tomislav Živanović, Marko Mladenović, Aleksandar Popović, Jelena Vančetović</i> | 33 |
| GENETIC DIVERSITY WITHIN A COLLECTION OF ITALIAN MAIZE INBRED LINES: A RESOURCE FOR MAIZE GENOMICS AND BREEDING <i>Anna Maria Mastrangelo, Hans Hartings, Chiara Lanzanova, Carlotta Balconi, Sabrina Locatelli, Giuseppe Petruzzino, Nicola Pecchioni</i> | 34 |
| CHARACTERIZATION OF CHEMICAL AND BIOACTIVE PROPERTIES OF THE GRAIN OF NEW MAIZE INBRED LINES <i>Valentina Nikolić, Marijana Simić, Slađana Žilić, Natalija Kravić, Vojka Babić, Mile Sečanski, Jelena Vančetović</i> | 35 |
| SUITABILITY OF MAIZE HYBRIDS FOR THE ENRICHMENT OF MARINATED BABY CORN WITH ANTHOCYANINS EXTRACTED FROM BLACK SOYBEAN <i>Valentina Nikolić, Marijana Simić, Slađana Žilić, Vesna Perić, Jelena Srdić, Jovan Pavlov, Nenad Delić</i> | 36 |
| MOLECULAR VARIABILITY OF MAIZE LANDRACES ESTIMATED BY SSR MARKERS <i>Aleksandar Popović, Natalija Kravić, Dragana Branković-Radojčić, Danijela Ristić, Vojka Babić, Olivera Đorđević Melnik, Mile Sečanski</i> | 37 |

| | |
|---|--------------|
| POTENTIAL AND ADVANTAGES OF COLORED MAIZE HYBRIDS APPLICATION IN BAKERY PRODUCTS | |
| <i>Marijana Simić, Valentina Nikolić, Olivera Šimurina, Jelena Vančetović, Vesna Kandić, Slađana Žilić</i> | 38 |
| ENCAPSULATION OF ANTHOCYANINS FROM BLUE MAIZE IN ORDER TO CREATE FUNCTIONAL CARRIERS WITH APPLICATION IN THE FOOD AND PHARMACEUTICAL INDUSTRY | |
| <i>Slađana Žilić, Nada Čujić Nikolić, Marijana Simić, Valentina Nikolić, Katarina Šavikin, Jelena Živković, Marko Vasić</i> | 39 |
| Session II | |
| Oral presentations | 41-44 |
| circRNAs INVOLVED IN CHILLING STRESS RESPONSE DURING EARLY DEVELOPMENTAL STAGES IN MAIZE | |
| <i>Manja Božić</i> | 41 |
| FORTIFYING AND ENHANCING RESILIENCE IN C4 CROPS FOR CURRENT AND FUTURE CLIMATE CHANGE ADVERSITIES | |
| <i>Jorge Del Cueto</i> | 42 |
| DROUGHT RESPONSE QTLs DETECTED ON PHENOTYPIC RATIOS CONTRIBUTE TO THE GENOTYPE X ENVIRONMENT INTERACTION | |
| <i>Yacine Djabali</i> | 43 |
| DECONSTRUCTING MALADAPTATION TO MINE DIVERSITY IN MAIZE | |
| <i>Randall Wisser</i> | 44 |
| Poster presentations | 45-65 |
| THE RESPONSE OF MAIZE LINES TO FOLIAR HERBICIDES | |
| <i>Milan Brankov, Vesna Dragičević, Jelena Vukadinović, Jelena Srdić, Milena Simić</i> | 45 |
| NON-PARAMETRIC YIELD STABILITY ANALYSIS OF ZP MAIZE HYBRIDS IN SERBIA | |
| <i>Dragana Branković-Radojčić, Vojka Babić, Tanja Petrović, Marija Milivojević, Snežana Jovanović, Aleksandar Popović, Jelena Srdić</i> | 46 |
| MORPHOMETRIC AND COLOR ANALYSIS OF PLANTS IN RESPONSES TO DROUGHT USING HIGH-THROUGHPUT PHENOTYPING | |
| <i>Marian Brestič, Marek Kovár, Marek Živčák, Milan Skalický and Pavol Hauptvogel</i> | 47 |
| INBRED SELECTION FOR INCREASED RESISTANCE TO KERNEL CONTAMINATION WITH FUMONISINS | |
| <i>Ana Butrón, Rogelio Santiago, Antonio Ramos, Ana Cao, Rosa Ana Malvar</i> | 48 |
| THE IMPACT OF CROP DENSITY ON GRAIN FILLING AND WATER RETENTION IN MAIZE GRAINS | |
| <i>Vesna Dragičević, Marijenka Tabaković, Milan Brankov, Milena Simić</i> | 49 |
| BIORESPONSE OF MAIZE GENOTYPES TO European corn borer (<i>Ostrinia nubilalis</i> Hbn) ATTACK AND INSECTICIDE TREATMENTS | |
| <i>Snežana Gošić-Dondo, Jelena Srdić, Vesna Dragičević, Željko Popović, Milomir Filipović, Danijela Ristić, Dragan Grčak</i> | 50 |
| ECOLOGICAL STABILITY AND PLASTICITY ASSESSMENT OF EXPERIMENTAL MAIZE HYBRIDS | |
| <i>Mima Ilchovska, Penka Vulchinkova, Natalya Petrovska, Valentina Valkova</i> | 51 |
| STABILITY OF SOME ZP MAIZE HYBRIDS IN FAO MATURITY GROUP 700 BASED ON THE GENOTYPE × ENVIRONMENT INTERACTION | |
| <i>Aleksandar Kovačević, Milan Stevanović, Tomislav Živanović, Jovan Pavlov, Nenad Delić, Sanja Perić</i> | 52 |
| SALINITY-INDUCED RESPONSES OF PRIMARY PHOTOCHEMICAL REACTIONS OF SWEET SORGHUM GENOTYPES | |
| <i>Marek Kovár, Marek Živčák, Marián Brestič, Milan Skalický, Pavol Hauptvogel</i> | 53 |
| SorgEnloS: SORGHUM FOR GRAIN USE IN HESSE: ESTABLISHMENT OF NEW, LOCALLY ADAPTED VARIETIES | |
| <i>Natalja Kravcov, Benjamin Wittkop, Rod Snowdon, Antje Herrmann, Steffen Windpassinger</i> | 54 |
| DROUGHT-INDUCED ADJUSTMENT OF PRIMARY METABOLITES IN MAIZE HYBRIDS | |
| <i>Natalija Kravić, Danijela Ristić, Vojka Babić, Jelena Srdić, Anika Kovinčić, Violeta Andjelković</i> | 55 |

| | |
|---|--------------|
| SOBINEN: INSECT FRIENDLY ENERGY CROPPING SYSTEMS: COMBINATION OF SORGHUM WITH FLOWERING UNDERSOWN CROPS | |
| <i>Luisa Neitzert, Katrin Rehak, Maendy Fritz, Reinhold Siede, Ralph Büchler, Nic Boerboom, Martin Frauen, Benjamin Wittkop, Rod Snowdon, Steffen Windpassinger</i> | 56 |
| TRANSCRIPTOME PROFILING OF MAIZE SEEDLINGS RESPONSE TO LOW TEMPERATURES | |
| <i>Ana Nikolić, Manja Božić, Nenad Delić, Jelena Vančetović, Dragana Ignjatović-Micić</i> | 57 |
| TOXICOLOGICAL PROFILE OF PATHOGENIC SPECIES ON MAIZE IN SERBIA | |
| <i>Ana Obradović, Milica Nikolić, Iva Savić, Vesna Krnjaja, Slavica Stanković</i> | 58 |
| EXPLOITATION OF STRESS TOLERANCE INDICES FOR THE IDENTIFICATION OF PROMISING MAIZE GENOTYPES | |
| <i>Chrysanthi Pankou, Fotakis Gekas, Iosif Sistanis, Foteini Papadopoulou, Fokion Papathanasiou, Ioannis Tokatlidis</i> | 59 |
| EVALUATING MAIZE GENOTYPES UNDER TWO INPUT REGIMES AFTER MYCORRHIZAL INOCULATION | |
| <i>Fokion Papathanasiou, Chrysanthi Pankou, Fotakis Gekas, Iosif Sistanis, Evangelia Sinapidou, Michail Orfanoudakis, Ioannis Tokatlidis</i> | 60 |
| IDENTIFICATION OF EARLY DECLINE OF SEED QUALITY BY VIGOR TESTS | |
| <i>Tanja Petrović, Marija Milivojević, Dragana Branković-Radojčić, Snežana Jovanović, Jasna Vujinović, Radmila Vukadinović, Jasmina Stojadinović Životić</i> | 61 |
| FACTOR ANALYTIC APPROACH FOR THE ANALYSIS OF MAIZE EARLY TESTING MULTI-ENVIRONMENT TRIALS | |
| <i>Dušan Stanisavljević, Bojan Mitrović, Milosav Babić, Aleksandra Nastasić, Goran Bekavac, Maja Šumaruna</i> | 62 |
| DYNAMICS OF GRAIN YIELD AND MOISTURE AT HARVEST AND PROGRESS OBSERVED IN AN EIGHTEEN-YEAR TESTING OF MAIZE HYBRIDS FROM 4 FAO GROUPS | |
| <i>Stefan Vulchinkov, Zhelyazko Vulchinkov</i> | 63 |
| EVALUATION OF THE STABILITY OF EARLY MAIZE HYBRIDS BY PARAMETRIC AND NONPARAMETRIC METHODS | |
| <i>Stefan Vulchinkov, Natalia Petrovska, Zhelyazko Vulchinkov, Valentina Valkova</i> | 64 |
| HIGH-THROUGHPUT ANALYSIS OF BIOMASS ACCUMULATION AND GEOMETRY TO ASSESS STRESS RESPONSES AND WATER USE EFFICIENCY OF SORGHUM GENOTYPES | |
| <i>Marek Živčák, Marian Brestič, Marek Kovár, Milan Skalický, Pavol Hauptvogel</i> | 65 |
| Session III | |
| Oral presentations | 67 |
| GENOMIC REGIONS FOR MAIZE CELL WALL HYDROXYCINNAMATES USING A MAGIC APPROACH AND THEIR RELATIONSHIP WITH MAIZE USAGES | |
| <i>Ana López-Malvar</i> | 67 |
| Poster presentations | 68-75 |
| CONNECTING TOTAL PHENOLIC COMPOUNDS AND AGRONOMIC TRAITS IN A DARK RED CORN POPULATION | |
| <i>Goran Bekavac, Božana Purar, Biljana Kiprovska, Miroslav Zorić, Ivica Đalović, Bojan Mitrović, Maja Šumaruna</i> | 68 |
| ESTIMATION OF PHENOLIC CONTENT IN YELLOW, RED, BLUE AND REDBLUE MAIZE BY NEAR-INFRARED REFLECTANCE SPECTROSCOPY | |
| <i>Sofija Božinović, Olivera Đorđević Melnik, Zoran Čamdžija, Ana Nikolić, Marija Kostadinović, Jelena Vančetović</i> | 69 |
| NUTRITIONAL AND COST EFFECTS OF ADAPTED QUALITY PROTEIN MAIZE ON BROILER FEEDING | |
| <i>Marija Kostadinović, Danijela Ristić, Jelena Vančetović, Nenad Delić, Dragana Ignjatović Micić</i> | 70 |
| LOCAL VARIETIES OF MAIZE FOR BREAD | |
| <i>Rosa Ana Malvar, Ana Butrón, Fernando Almeida, Roberto López-Toja, Pedro Revilla</i> | 71 |
| SEARCHING FOR MAIZE PRE-BREEDING MATERIALS IN ORDER TO IMPROVE BOTH ANIMAL DIGESTIBILITY AND ETHANOL PRODUCTION | |
| <i>Rogelio Santiago, Ana López, Ana Butrón, Sonia Pereira, Leonardo Gómez, Rosa Ana Malvar</i> | 72 |

| | |
|--|--------------|
| DONORS OF FAVOURABLE ALLELES FOR THE IMPROVEMENT OF THE EAR LENGTH IN MAIZE HYBRIDS <i>Mile Sečanski, Jelena Srdić, Snežana Mladenović Drinić, Marijenka Tabaković, Anika Kovinčić, Aleksandar Popović, Jelena Golijan</i> | 73 |
| COMBINING ABILITIES AND HETEROSIS FOR BIOMASS YIELD AND QUALITY RELATED TRAITS IN SINGLE-CUT FORAGE SORGHUM ADAPTED TO TEMPERATE CLIMATES <i>Jean-Baptiste Amadou Sory, Aline Rocher, Patrice Jeanson, Joël Alcouffe, Quentin Devaud, Gilles Trouche, David Pot</i> | 74 |
| VARIABILITY OF ANTIOXIDANTS IN WHITE KERNEL MAIZE VARIETIES AND HYBRIDS <i>Jelena Srdić, Vesna Dragičević, Vojka Babić, Snežana Mladenović Drinić, Natalija Kravić, Vesna Perić, Violeta Anđelković</i> | 75 |
| Session IV | |
| Oral presentations | 77-82 |
| IDENTIFYING QTLS INVOLVED IN HETEROTIC GROUP COMPLEMENTARITY: NEW GWAS MODELS APPLIED TO A FACTORIAL AND AN ADMIXED DIALLEL MAIZE HYBRID PANEL <i>Aurélien Beugnot</i> | 77 |
| EFFICIENT FLOWERING CLASSIFICATION BASED ON DEEP LEARNING AND MARKER DATA IN MAIZE INBRED LINES <i>Vlatko Galić</i> | 78 |
| GENOMIC VS PHENOTYPIC SELECTION FOR RESISTANCE AND TOLERANCE OF MAIZE TO STEM BORERS <i>Noemi Gesteiro</i> | 79 |
| GENOMIC PREDICTION OF HYBRID PERFORMANCE: COMPARISON OF THE EFFICIENCY OF FACTORIAL AND TESTER DESIGNS USED AS TRAINING SETS IN A MULTIPARENTAL CONNECTED RECIPROCAL DESIGN FOR MAIZE SILAGE <i>Alizarine Lorenzi</i> | 80 |
| IDENTIFICATION OF SNP MARKERS ASSOCIATED WITH PHENOTYPIC TRAITS IN ZP ELITE MAIZE INBRED LINES <i>Marko Mladenović</i> | 81 |
| QTL MAPPING IDENTIFIES NOVEL MAJOR LOCI FOR EAR FASCIATION, EAR PROLIFICACY, AND TILLERING IN MAIZE <i>Silvio Salvi</i> | 82 |
| Poster presentations | 83-87 |
| GENOTYPING OF MAIZE USING OPTIMIZED SNP ARRAYS <i>Heike Gnad, Joerg Plieske, Andreas Polley, Dagmar Kulosa, Thomas Gross, Martin W. Ganal</i> | 83 |
| DO GENETIC ARCHITECTURE OF TRAITS MEASURED IN PHENOTYPING PLATFORM FACILITATE YIELD PREDICTION? <i>Italo Granato, Santiago Alvarez Prado, Emilie Millet, Llorenç Cabrera-Bosquet, Raphael Perez, Laurie Maistriaux, Aude Coupel-Ledru, Claude Welcker, Francois Tardieu</i> | 84 |
| GENETIC DIVERSITY OF MAIZE INBRED LINES ASSESSED BY SNP MARKERS <i>Anika Kovinčić, Ksenija Marković, Tomislav Živanović, Danijela Ristić, Natalija Kravić, Milomir Filipović, Ana Nikolić</i> | 85 |
| MOLECULAR CHARACTERIZATION OF POPCORN INBREDS USING 25K SNP ARRAY <i>Snežana Mladenović Drinić, Jelena Srdić, Violeta Anđelković, Nikola Grčić, Natalija Kravić, Miomir Filipović, Ana Nikolić</i> | 86 |
| GENETIC DISTANCE OF MAIZE INBREDS BASED ON SSR MARKERS FOR PREDICTION OF HETEROSIS <i>Sanja Perić, Danijela Ristić, Aleksandar Kovačević, Jovan Pavlov, Marko Mladenović, Nikola Grčić, Slaven Prodanović</i> | 87 |

FACTOR ANALYTIC APPROACH FOR THE ANALYSIS OF MAIZE EARLY TESTING MULTI-ENVIRONMENT TRIALS

Dušan Stanisavljević*, Bojan Mitrović, Milošav Babić, Aleksandra Nastasić, Goran Bekavac, Maja Šumaruna

Institute of Field and Vegetable Crops, Novi Sad, Serbia
(dusan.stanisavljevic@ifvcns.ns.ac.rs)

In early stages of maize breeding program, large number of new genotypes is grown in a set of field trial locations. The best ones are identified to move to the next stage so that in the final stages of breeding program small number of superior hybrids is grown in pre-registration and post-registration field trials across set of locations. Field trials were conducted in a partially replicated design, each genotype with two replications per location at six locations in 2020. The experiments included 150 hybrids obtained by crossing different S2 progenies with an elite inbred tester. These field trials were conducted to identify the best performing genotypes using appropriate statistical model. The factor analytic (FA) model accommodates the heterogeneity of genetic variance for locations and heterogeneity of genetic covariance between pairs of locations. Assuming that data from our field trials had high degree of the heterogeneity, we applied the FA model approach which resulted in accurate prediction of the hybrid by location effects. The FA (1) was identified as the best fitting model explaining about 80% of the hybrid \times location interaction. The resulted genetic correlation matrix indicates moderate to high positive association among the locations. Using the FA (1) model, the most promising genotypes in terms of grain yield and yield stability were identified.

Keywords: Grain yield, Yield stability, Maize breeding, Early testing, Hybrid \times location interaction, Factor analytic model (FA)