

PROCEEDINGS OF THE

# 20<sup>th</sup> INTERNATIONAL SUNFLOWER CONFERENCE



Novi Sad, Serbia  
June 20-23, 2022

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Proceedings of the

# 20<sup>th</sup> International Sunflower Conference



**Novi Sad, Vojvodina, Serbia**  
**June 20-23, 2022**

**Sponsored by**



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*Proceedings of the 20<sup>th</sup> International Sunflower Conference*  
Novi sad, Serbia, June 20-23, 2022

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The proceedings of the 20<sup>th</sup> International Sunflower Conference contain 153 contributions from scientists of 30 countries. They include plenary lectures, oral talks and regular communications presented with posters, among which, selected contributions were emphasized with short oral talks. The manuscripts are classified by research areas in ten separate sections. They offer a thorough review of the current state of the art of sunflower research and production around the world. The Organizing Committee is grateful to Tanja Vunjak and Aleksandar Vojisavljević for their excellent editorial assistance in the preparation of these Proceedings.

ISC2022 Organizing committee



## Conference program

Sunday, 19 June

16.00-21.00	Registration
19.00-21.00	Welcome Reception

Monday, 20 June

8.00-17.00	Registration	
9.00-9.30	Opening Ceremony	
9.30- 10.15	<b>Invited talk</b> Section 1: Dr. Felicity Vear (France)	
10.15-11.00	Coffee break	
11.00-12.00	<b>Section 1: Breeding – New/old breeding goals and challenges</b>	<b>Section 2: Oils and proteins – Innovations for increased quality and feedstock supply</b>
	<b>Oral and short oral presentations</b>	<b>Oral and short oral presentations</b>
12.00-13.30	Lunch	
13.30-14.30	<b>Invited talks</b> Section 3: Dr. C.C. Jan (China) Section 4: Dr. Sreten Terzić (IFVCNS, Serbia)	
14.30-15.00	Coffee break	
15.00-16.00	<b>Section 3: Confectionery sunflower – Emerging crop</b>	<b>Section 4: Genetic resources – Investment for the future</b>
	<b>Oral and short oral presentations</b>	<b>Oral and short oral presentations</b>
16.00-17.00	<b>Poster session</b> – Sections 1, 2, 3, 4	
18.00-21.00	Novi Sad and Petrovaradin fortress tour	

## Tuesday, 21 June

8.30-17.00	Registration	
<b>9.30-10.30</b>	<b>Invited talks</b> Section 5: Dr. Leire Molinero Ruiz (CISC, Spain) Section 6: Dr. Philippe Debaeke (INRAE, France)	
10.30-11.00	Coffee break	
<b>11.00-12.00</b>	<b>Section 5: Biotic stress resistance – New and emerging pests and diseases</b>	<b>Section 6: Crop production and modeling – Yield stability in changing environment</b>
	<b>Oral and short oral presentations</b>	<b>Oral and short oral presentations</b>
12.00-13.30	Lunch	
<b>13.30-14.30</b>	<b>Invited talks</b> Section 7: Dr. Nicolas Langlade (INRAE, France) Section 8: Etienne Pilorgé (Terres Inovia, France)	
14.30-15.00	Coffee break	
<b>15.00-16.00</b>	<b>Section 7: Abiotic stress resistance – Challenges of changing environment</b>	<b>Section 8: Economy and market – Trends and prospects</b>
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## Wednesday, 22 June

8.30-17.00	Registration	
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<b>11.00-12.00</b>	<b>Section 9: Broomrape – Constant challenge</b>	<b>Section 10: Bees and seeds – Exploring new venues for increased yield and seed production</b>
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14.30-15.00	Coffee break	
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16.30-17.00	Closing ceremony	
20.00-24.00	Gala Dinner Pustavoit Award Presentation Ceremony IFVCNS Best Poster Award Presentation	

## Thursday, 23 June

9.00-15.00	Field day
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## NEW APPROACHES IN PHENOTYPE PREDICTION – MACHINE LEARNING TECHNIQUES

Milan Jocković<sup>1\*</sup>, Sandra Cvejić<sup>1</sup>, Siniša Jocić<sup>1</sup>, Ilija Radeka<sup>1</sup>, Jelena Jocković<sup>2</sup>,  
Aleksandra Radanović<sup>1</sup>, Sreten Terzić<sup>1</sup>, Boško Dedić<sup>1</sup>

<sup>1</sup>*Institute of Field and Vegetable Crops, Novi Sad, Serbia, M. Gorkog 30*

<sup>2</sup>*Faculty of Sciences, Department of Biology and Ecology, University of Novi Sad, Serbia,  
Trg Dositeja Obradovića 2*

\*Corresponding author: jockovic@gmail.com

### Abstract

Use of multivariate modelling in order to improve prediction accuracy has been widely applied in plant breeding programs. In these models phenotype prediction is based on large number of independent variables which is at the same time strength and weakness. Lately, intensive research in order to improve prediction accuracy resulted in extensive use of different machine learning techniques. The aim of this study is to present new approaches in phenotype prediction based on complex relationships between genotypes and phenotypes. Widely used, one of the main tools in machine learning is artificial neural network (ANN). Although it has a long history, this powerful class of algorithms has been recently used as a state-of-the-art solution for non-linear relationship between the genotype and the trait of interest. Another important advance, capable of identifying extremely complex patterns of prediction and classification of information is called deep learning (DL). Main difference between DL and ANN is in the numbers of layers of neurons. Being based on how humans learn and process information, machine learning is powerful tool for processing complex data in order to make accurate predictions.

**Keywords:** multivariate modelling, phenotype prediction, artificial neural network, deep learning

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