

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**



**The International Sunflower Association, Paris, France,**

**In cooperation with**



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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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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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## IMPORTANCE OF HALAUXIFEN-METHYL FOR INTEGRATED WEED MANAGEMENT IN SUNFLOWER, WITH SPECIAL EMPHASIS ON THE CONTROL OF RESISTANT COMMON RAGWEED TO ALS INHIBITORS

Goran Malidža<sup>1\*</sup>, Maria Salas<sup>2</sup>, Miloš Rajković<sup>1</sup>, Notter Jean-Sébastien<sup>2</sup>

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

<sup>2</sup>*Corteva Agriscience, France*

Corresponding author: \*goran.malidza@ifvcns.ns.ac.rs

### Abstract

Halauxifen-methyl is a new herbicide and the only member of synthetic auxins that can be used in all sunflower hybrids. The most important sunflower weeds in Europe include members of the same family as sunflower, with typical representative such as difficult to control common ragweed (*Ambrosia artemisiifolia*). Relying mostly on ALS inhibitors in the last two decades, some weeds (including recently *A. artemisiifolia*) developed resistance to these herbicides and have a negative impact on the sustainability of the existing strategies in weed management. Due to its unique properties, such as exceptional efficacy against some difficult to control weeds, halauxifen-methyl has potential to occupy a significant place in integrated weed management.

During 2017-2019 in field trials in northern Serbia, the halauxifen-methyl based product Viballa was tested in conventional and tolerant sunflower to imidazolinones and tribenuron-methyl in order to examine the possibilities for control some economically important weeds, with special emphasis on *A. artemisiifolia*. Viballa (1 L·ha<sup>-1</sup>) was applied post-emergence in growth stages of 4-8 leaves of crop and weeds. In addition to single use, Viballa was also used in tank mix with recommended field rates of imazamox and tribenuron-methyl based products, or after previously applied pre-emergence herbicides. Weed control was evaluated 14, 28, 56 and 84 days after herbicides application (DAA).

Viballa showed excellent (>95%) and mainly better efficacy than standards in the control of *A. artemisiifolia* and *Chenopodium album*, but weaker on *Datura stramonium* and *Solanum nigrum* control. In all trials was an extreme infestation with *A. artemisiifolia*, including resistant biotypes to ALS inhibitors in 2019, so imazamox and tribenuron performed less efficiently. The resistance of this weed has been confirmed by whole-plant bioassays, and further testing is underway to confirm which mutation is responsible for it. Viballa exhibited transient acceptable phytotoxicity to sunflower after 7 and 14 DAA, and afterwards the symptoms disappeared without affecting the seed yield and oil content. It is a unique example which confirms that the mixtures of Viballa and imazamox or tribenuron-methyl based products is excellent approach in herbicide resistant weed management and control of important weeds, such as invasive and ALS-resistant *A. artemisiifolia*.

**Keywords:** halauxifen-methyl, common ragweed, resistance, control, integrated weed management

**Acknowledgement:** This research was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia, grant number: 451-03-68/2022-14/ 200032.

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CIP - Каталогизација у публикацији  
Библиотеке Матице српске, Нови Сад

633.854.78(082)

INTERNATIONAL Sunflower Conference (20 ; 2022 ; Novi Sad)  
Proceedings of the 20th International Sunflower Conference, Novi Sad,  
June 20-23, 2022 / [editors Sreten Terzić, Dragana Miladinović]. - Novi Sad :  
The Institute of Field and Vegetable Crops ; Paris : The International Sunflower  
Association, 2022 (Novi Sad : Atelje «Mudri»). - 306 str. : ilustr. ; 25 cm

Tiraž 400. - Bibliografija uz svaki rad.

ISBN 978-86-80417-89-9

a) Сунцокрет - Узгајање - Зборници

COBISS.SR-ID 68512521

Front page design: Aleksandar Vojisavljević  
Photography: Goran Mulić – Petrovaradin fortress

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