

PROCEEDINGS OF THE

20th INTERNATIONAL SUNFLOWER CONFERENCE



Novi Sad, Serbia
June 20-23, 2022

Proceedings of the

20th International Sunflower Conference



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

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**The Institute of Field and Vegetable Crops, National
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Proceedings of the 20th International Sunflower Conference
Novi sad, Serbia, June 20-23, 2022

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The proceedings of the 20th 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	Invited talk Section 1: Dr. Felicity Vear (France)	
10.15-11.00	Coffee break	
11.00-12.00	Section 1: Breeding – New/old breeding goals and challenges	Section 2: Oils and proteins – Innovations for increased quality and feedstock supply
	Oral and short oral presentations	Oral and short oral presentations
12.00-13.30	Lunch	
13.30-14.30	Invited talks Section 3: Dr. C.C. Jan (China) Section 4: Dr. Sreten Terzić (IFVCNS, Serbia)	
14.30-15.00	Coffee break	
15.00-16.00	Section 3: Confectionery sunflower – Emerging crop	Section 4: Genetic resources – Investment for the future
	Oral and short oral presentations	Oral and short oral presentations
16.00-17.00	Poster session – Sections 1, 2, 3, 4	
18.00-21.00	Novi Sad and Petrovaradin fortress tour	

Tuesday, 21 June

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

Wednesday, 22 June

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10.30-11.00	Coffee break	
11.00-12.00	Section 9: Broomrape – Constant challenge	Section 10: Bees and seeds – Exploring new venues for increased yield and seed production
	Oral and short oral presentations	Oral and short oral presentations
12.00-13.30	Lunch	
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14.30-15.00	Coffee break	
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15.00-16.30	ISA Assembly	
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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BEE VECTORING OF BIOLOGICALS IN SUNFLOWERS AS A CROP PROTECTION TOOL

John C. Sutton¹, Sherri Tedford², Gerardo Suazo², Christoph Lehnen²,
Sreten Terzić³, Michael Wunsch⁴, Venkataramana Chapara⁵

¹ (Professor (retired) University of Guelph, ON, Canada,

² Bee Vectoring Technology, Mississauga, ON, Canada,

³ Institute of Field and Vegetable Crops, Novi Sad, Serbia,

⁴ North Dakota State University, Carrington Research Extension Center, Carrington, ND, USA,

⁵ Langdon Research Extension Center, Langdon, ND, USA

Corresponding author: *christoph.lehnen@gmail.com

Abstract

An inoculum dispenser system developed by Bee Vectoring Technology Inc. (BVT) fits inside commercial bumble bee hives and another system attaches to honey bee hives. Each system is one-way so that bees acquire inoculum powder when exiting the hive but not when returning to the hive. BVT's dispensers are filled with Vectorite™, which is a specially formulated and patented powder prepared from all natural materials mixed with one or more beneficial microorganisms. BVT's own proprietary fungus, *Clonostachys rosea* strain CR-7, which is effective in controlling a number of devastating diseases such as Sclerotinia Head Rot (SHR). Vectorite™ adheres to bees, aiding in the transport of added active ingredients to flowers in the crop. Bumble bees can be universally used in greenhouse operations, and some countries approve their use in open field crops, whereas honey bees are exclusively used in open field conditions. The effectiveness of the BVT plant protection biocontrols combined with the pollination efficiency of both insects, make the BVT system a solution that harnesses the power of nature's best workers and microbials. In over 3 years of studies (2016 to 2019) conducted by North Dakota State University researchers, and IFVCNS in Serbia (2016-2018), Vectorite with CR-7 (*Clonostachys rosea* strain CR-7) was evaluated for its suppression of SHR. Bee vectored CR-7 resulted in 25 to 50 % reduction of disease incidence and in higher yields in repeated trials. Two NDSU test sites in 2020 demonstrated that SHR incidence and severity were reduced by up to 62 % with a 15 % yield increase over the control. Sclerotia contamination of grain was almost halved in BVT treated plots compared to the controls. Additionally, SHR symptoms did not increase with distance from the dispensing hive, indicating that the system provided sufficient coverage and delivery of Vectorite with CR-7 in the crop. Vectorite with CR-7 using honey bees, will be applied commercially for the first time in various sunflower production regions of North Dakota and Minnesota. Vectoring of biorational pesticides, such as CR-7, is a promising and sustainable agricultural tool for sunflowers to reduce *Sclerotinia* infections and may result in yield increases.

Keywords: bees, bioagent, vectoring, protection, sunflower, head rot

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