

International Sunflower Conference: A global overview for industry partners

By Dr Nicky Creux, Forestry and Agricultural Biotechnology Institute, University of Pretoria

The International Sunflower Association is the host of the International Sunflower Conference (ISC) every four years and was expected to host its 20th event in 2020. However, due to the Covid pandemic, the meeting was postponed to 2022 and took place at the end of June in Novi Sad, Serbia.

The 438 participants from around the world attended nine keynote lectures, 74 oral presentations and 80 poster presentations. There were ten different sections, and each was opened by an invited plenary speaker to provide an overview of each topic. The sections could be grouped into four main themes: sunflower breeding, sunflower pest control, sunflower yield improvement and sunflower production.

Speakers impart their knowledge

Sunflower breeding was a major focus and the plenary speakers included Dr Felicity Year of the National Research Institute for Agriculture, Food and the Environment (INRAE) in France (retired), who provided a beautiful overview of traditional breeding goals and shifts in these goals in her career. She highlighted several new breeding goals and indicated areas where more efforts should be concentrated, including pollination, predation and abiotic stress.

Dr Sreten Terzić of the Institute of Field and Vegetable Crops in Serbia, discussed the importance of diverse wild sunflower collections. Identifying and incorporating desired wild species traits into breeding populations are important for cultivar improvement. Dr Nicolas Langlade of INRAE provided an overview of the Sunrise Project, a multimillion-Euro initiative to survey the genetic diversity of sunflower to identify important genetic tools for breeding better abiotic resistance. The goal is to incorporate information from

high-powered genetic studies into crop models to better predict yield outcomes in changing environments.

Finally, Dr Stéphane Muñoz, also of INRAE, focussed on using genetic and sequencing tools to understand and breed for resistance to sunflower broomrape (*Orobanche cumana*). It was interesting to note that many breeding programmes are moving away from *Sclerotinia* resistance, as this pest has significantly declined in many European climates due to warmer, drier seasons in the region.

Tackling challenges

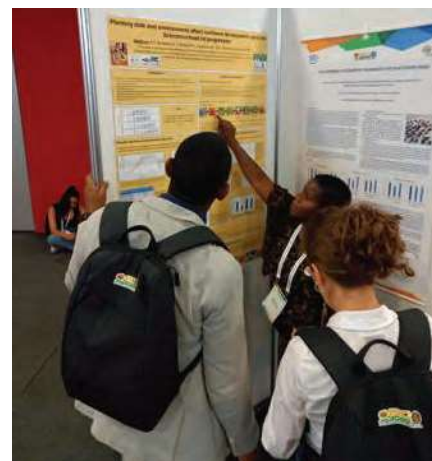
There was a large number of talks and discussions on the different pests and pathogens affecting sunflower production around the world. In the plenary session, Dr Leire Molinero-Ruiz of the Spanish National Research Council (CSIC) discussed the continued efforts to find biological control agents against the major sunflower pests including *Sclerotinia*, *Verticillium* wilt, downy mildew and broomrape.

While there were a few discussions on *Sclerotinia* and its control, the majority of the research was focussed on controlling broomrape and downy mildew. While broomrape is not a current threat for South African sunflower producers, it is important to monitor the situation. Dr Muñoz highlighted that broomrape was recently identified in North Africa and has spread to many other parts of the globe. An interesting study assessed the use of *Trichoderma* to control *Sclerotinia* head-rot with bumble bees as a dispersal method. This work is, however, in the early stages and the effectivity across a field is unclear.

As expected, there were also several presentations focussed on improving sunflower yield, including the role of pollination and alternative agronomical practices. In her plenary session,



On the left is Phrasia Mapfumo, PhD student at the University of Pretoria, who was the runner-up in the best poster presentation. Next to her is Dr Hüdaverdi Gürkan, a postdoctoral fellow at Ankara University in Turkey, who was the winner of the best poster presentation. The award was presented at the gala dinner of the 20th International Sunflower Conference in Novi Sad, Serbia, to early career scientists who showed good communication skills and scientific excellence.



Phrasia Mapfumo (PhD student, University of Pretoria) presenting her poster, which earned her the runner-up award.

Dr Nicky Creux of the University of Pretoria presented an overview of how anthesis and pollination are affected by abiotic factors. Other studies also



Dr Nicky Creux of the Forestry and Agricultural Biotechnology Institute of the University of Pretoria presented her invited plenary talk on the delicate balancing act of climate control during flowering, pollination and seed development in sunflower.

highlighted that even though cultivated sunflower is self-fertile and does not require insect pollination, insect pollination appears to greatly improve seed yield.

Dr Philippe Debaeke of INRAE discussed emerging agricultural practices and growing environments for sustainable sunflower production. He spoke about shifting planting dates and growing regions as a strategy to mitigate the effects of climate change. Dr Debaeke also highlighted the need to explore double-cropping systems and agroforestry as sustainable options in the future.

In the agronomy section, Phrasia Mapfumo, a PhD student at the Forestry and Agricultural Biotechnology Institute at the University of Pretoria, won the runner-up poster award for her presentation on how planting date and environments affect sunflower development, yield and *Sclerotinia* head-rot progression.

A look at the global market

There were several important discussions about the global oilseed market and Dr Etienne Pilorgé of Terres Inovia in France provided a comprehensive overview, mentioning that South Africa is currently one of the top ten producers worldwide. He said the impact of the global political landscape, where Russia and Ukraine normally produce 80% of the world's sunflower oil, is significantly affecting availability and pricing.

According to Dr Pilorgé, there is a possibility that sunflower could lose its market value due to the increased prices, driving individuals to cheaper alternatives. However, he also highlighted the opportunity for other sunflower producing nations to step up and help fill the current gap. On this same topic, Dr Chao-Chien Jan of the United States Department of Agriculture in Fargo (retired) discussed the

potential of confectionary sunflower as an emerging market.

Overall, this was an important event in the global sunflower community, bringing together industry partners and researchers to discuss the major threats facing sunflower production. Companies such as Syngenta, Corteva, Limagrain Zaad, Sanrui and Feed & Seed were major sponsors of the event and also participated by hosting a field day at the end of the conference and presenting results on new products making their way to the market.

Much of the research presented at the conference is available online in the 2022 topical issue of the *Oilseeds and Fats, Crops and Lipids Journal*, Volume 27, 2020, under Sunflower/Tournesol. Visit <https://www.oil-journal.org/component/toc/?task=topic&id=1158> to access the issue. The presentation line-up of the ISC can also be viewed at <https://isc2020.com/detailed-program/>. For any additional enquiries, contact Dr Nicky Creux at nicole.creux@fabu.up.ac.za.

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