

ISA



ISA NEWSLETTER September 2018

Editorial

The ISA board is delighted to announce the launch of the ISA Newsletter which aims to keep members and partners informed on on-going activities and results, both globally and in the different regions around the world. Besides the regular briefing sections of regional news and upcoming events, the Newsletter will be open to anyone, public and private, to contribute with ideas, comments and suggestions. The Newsletter will be issued on a regular basis and will highlight the current activities of the ISA and of its members, and the ISA involvement in sunflower research.

The last months have been very active for ISA, with symposia in France, Romania and China, and the meeting of the Executive Board which worked on strategic thinking about the roles of ISA at the service of the sunflower world community, in a sustainable perspective.

The next International Sunflower Conference will be held in 2020, on June 22 to 26, in Serbia, at Novi Sad, as decided at the ISA board session of the 19th ISC held in Edirne, 2016, and in our last board meeting in Bucharest, last July. The preparations in Novi Sad again have started! It will take place 32 years after the 12th International sunflower conference in Novi Sad in July 1988. Worldwide participation is positively encouraged including early career scholars and postgraduate researchers to maximize the networking potential of the conference. News about the conference organization will regularly be published, starting with the ISA Newsletter.

As the first Editorial letter arrives from Serbia, the current status of Sunflower as an oil crop, sunflower research, breeding and seed production are presented in the section "Value chains and regional news".

Finally, on behalf of the ISA board, I wish to all members of the ISA success in the coming period, hoping that this newsletter, as well as other activities of our association will contribute to better communication and cooperation among us.

*With best regards,
Dr Vladimir Miklič
Principal Research Fellow
Head of Industrial Crops Department at IFVC, Novi Sad, Serbia
ISA President*

Activity and News of the association:

(news on conferences, technical meetings, issues on website, activities of the committees or working groups...)

Sunflower and Climate change in Toulouse

The Scientific Symposium on Sunflower and Climate Change was organized in the framework of the Sunrise Project, by INRA Toulouse and Terres Inovia in collaboration with the International Sunflower Association (ISA), the Association for Promotion of Oilseed Plant Selection (Promosol) and the International Consortium for Sunflower Genomics Resources (ICSG). This symposium gathered 150 attendees from 23 countries, among them 26 speakers.



Introduction keynote

Gathering the speakers of the Sunflower and Climate Change Symposium

The symposium was open by Nicolas Langlade and introduced by 2 keynote communications. Philippe Debaeke, with a very complete keynote on “sunflower and climate change in Europe, vulnerability, adaptation and mitigation potential, showed that climate change might be both a threat and an opportunity for sunflower due to the crop’s characteristics. Branislav Dozet (Syngenta) then spoke about “sunflower breeding strategies in relation to climate change”: if breeding programmes will still be driven by genetic gain (referring to notions of accuracy, time, selection intensity and genetic variation), the point for him is that climate change is changing the rules in directions that we do not really know, and that traits discovery will become the major point, more than ever, hence the importance of wild genetic resources. The symposium was then organized in 5 sessions on the understanding of the genome functioning to adapt sunflower to climate change (chaired by Loren Riesberg), on the emergent pests and diseases (chaired by Felicity Vear), on resilience and stability of the production (chaired by Roberto Tuberosa), on predicting production from genes to field (chaired by Xavier Pinochet).

The last session included short lectures and a round table on the future of sunflower breeding to adapt varieties to climate change, with Gerald Seiler (USDA, USA), H el ene Berg es (INRA, F), Nicola Gallai (ENFA, F) and S ebastien Chatre (RAGT). Michel Ragot introduced the round table by reminding some key issues of the previous communications: climate evolutions might let us expect a reduction of diseases pressure, but an enhancement of weeds through the evolutions of the weeds seedbank, but it is reported that climate evolutions in the US Dakotas have turned to the advantage of soybeans. What could do the breeding community for sunflower? Has it to be considered as an oilseed only? For S ebastien Chatre, several positive messages emerge from the symposium and show that for sunflower, breeding has been addressing climate change issues for a long time, and that sunflower has a strong potential through its diversity, which is competitive advantage compared to oilseed rape for example. There is a need to continue to strengthen this sunflower community, public and private. Nicola Gallai insisted on the sociological aspects of innovation, as a necessary complement to technical progress: taking with the farmers is a key aspect. H el ene Berg es mentioned the needs of tools and methods: we do not know yet how to handle and analyse all the data produced around the genome edition, and to use them in a better way. Gerald Seiler observed that we have a lot of genetic diversity for sunflower, but that we need to be more efficient in finding the genes in this gold mine. This diversity is largely made of species which are surviving in hard conditions, and the challenge is to develop hybrid with acceptable yields in harder environments. Climate change also affects the other crops, and sunflower reveals to be a very acceptable tool for this challenge.

The book of abstracts is available on the ISA website members’ space (Publications/ ISC and symposia)

The 4th Broomrape symposium took place in Bucharest on July 2-4, 2018

The Board of the International Sunflower Association (ISA) proposed in their past meeting, held in Paris in February 2017, to organize an International Symposium on Broomrape in Sunflower in July 2018, in Romania. This symposium is the fourth specific symposium on broomrape in sunflower after those held in Turkey 2008, Moldova 2011 and Spain 2014. It has been organized by the National Agricultural Research and development institute of Fundulea and the University of Agronomic Sciences and Veterinary Medicine of Bucharest, with the ISA, under the coordination of Maria Pacureanu, and gathered 197 participants from 17 countries, showing the importance of regular international coordination on this topic. At this occasion a proposition to launch an international consortium on sunflower for broomrape resistances has been exposed by Stephane Munos (INRA Toulouse, France) and Begonia Peres-Vich (CSIC Cordoba, Spain). More information will be given in the next issues of this newsletter.

Contact: sunflower-broomrape@incda-fundulea.ro

The **ISA board meeting** took place on July 2nd in Bucharest, after a first brain-storming session in Toulouse in February. The results of the survey addressed to all ISA members and participants to the last sunflower conferences were carefully examined (see on line: <http://isasunflower.org/news/single-view/article/survey-on-isa-and-its-website-jan-26th-2018.html>) in the perspective of developing the value of ISA for its members and enhancing the exchanges within the sunflower community. The board took several decisions, specially concerning the reorganization of the ISA website, and the possibility for ISA to label and/or advertise events of interest for the sunflower community organized out of the ISA work programme: some principles have been adopted to clarify the relations with the ISA partners. Reflexions have been initiated about several axes of progress: the identification of “key topics” which could federate international working groups, the ways to reinforce the relations with national sunflower associations, and to develop links with the downstream industries.

New Sponsor: SANRUI AGRITECH

The Chinese company SANRUI AGRITECH (<http://www.sunriseseed.com/>) joined the sponsors of ISA in January. Contacts were established by Dr Chao Chien Jan, ISA Honorary Member and presently Director of the Institute of Sunflower Technology, Sanrui Agritech.

On August 8-10, a specific **symposium on confection sunflower technology and production** has taken place in Wu Yuan, China Inner Mongolia, with the institutional support of ISA. More information will be given in the next issues of this newsletter.

Scientific news

(new projects (national or international), members initiatives, new PhD thesis on sunflower...)

Current works

PHD thesis project : PhD Thesis: Statistical and dynamic modeling of sunflower (*Helianthus annuus* L.) grain composition under agronomic and environmental factors effects
<https://www.researchgate.net/project/PhD-Thesis-Statistical-and-dynamic-modeling-of-sunflower-Helianthus-annuus-L-grain-composition-under-agronomic-and-environmental-factors-effects> **ISA**
contact: Dr Philippe Debaeke

USDA Research Project: Genetic Enhancement of Sunflower Yield and Tolerance to Biotic Stress. Start March 2018 to March 2023. Research team: Prasifka Jarrad, Seiler Gerald, Qi Lili, Hulke Brent, Underwood William. See: <https://www.ars.usda.gov/research/project/?accnNo=434406>

Call for collaboration

Bird damage appears as a new challenge for fundamental and applied research. Corvidae and colombidae damage during sunflower emergence and early stages has recently become a major issue for French farmers. It is a subject of tension between farmers, hunters and environmentalists and so far, no practical solution for crop protection is efficient enough. The scaring devices and repellents have a random and limited effectiveness. The destruction by shooting or trapping is controversial and difficult to implement. Research is needed to go beyond empirical approaches to identify promising solutions. This may involve the consideration of nested scales: the field where the depredation is observed, the landscape in which the birds select food resources, the region where they multiply.

Terres Inovia initiated work with French partners on that topic and is looking for international collaboration. *If you are interested in exchanging views, ideas, building a network or a project on this topic, please contact Christophe Sausse (c.sausse@terresinovia.fr)*

Publications

Aída García-González, Joaquín Velasco, Leonardo Velasco, M. Victoria Ruiz-Méndez. An Analytical Simplification for Faster Determination of Fatty Acid Composition and Phytosterols in Seed Oils/ November 2017 Food Analytical Methods /DOI10.1007/s12161-017-1111-z/ (Nov 2017) https://www.researchgate.net/publication/321279604_An_Analytical_Simplification_for_Faster_Determination_of_Fatty_Acid_Composition_and_Phytosterols_in_Seed_Oils?discoverMore=1

Hladni N, Terzić S, Mutavdžić B, Zorić M 2017. Classification of confectionary sunflower genotypes based on morphological characters. The Journal of Agricultural Science, 155: 10, pp. 1594-1609. <https://doi.org/10.1017/S0021859617000739> (Dec 2017)

Terzić S, Miklič V, Čanak P. (2017): Review of 40 years of research carried out in Serbia on sunflower pollination. OCL, 24:6, D608. <https://doi.org/10.1051/ocl/2017049> (Dec 2017)

Ren Na, Yanjie Luo, Haoyu Bo, Jian Zhang, Ruifang Jia, Qinglin Meng, Hongyou Zhou, Jianjun Hao, Jun Zhao, 2017. Responses of sunflower induced by Sclerotinia sclerotiorum infection. Physiological and Molecular Plant Pathology. <https://doi.org/10.1016/j.pmpp.2017.12.004> (December 2017)

Dimitrijević A and Horn R 2018. Sunflower Hybrid Breeding: From Markers to Genomic Selection. Front. Plant Sci. <https://doi.org/10.3389/fpls.2017.02238> (Jan 2018)

Nicole Combe, Olivier Henry, Carlos Lopez, Carole Vaysse, Isabelle Fonseca, Danièle Ribaud, Fathi Driss, Noémie Simon, Céline Le Guillou, François Mendy†. 2018 . Hospital Diet Enriched With Rapeseed or Sunflower Oils Is Associated With a Decrease in Plasma 16:1n-7 and Some Metabolic Disorders in the Elderly. Lipids (2018) 53: 145–155 / <https://doi.org/10.1002/lipd.12012> (Feb 2018)

Claudio Guilherme Portela de Carvalho, Matheus Felipe da Silva, José Marcos Gontijo Mandarino, Anna Karolina Grunvald, Nilza Patrícia Ramos, José Lopes Ribeiro, Vicente de Paulo Campos Godinho. 2018. Fatty Acid Profiles in Sunflower Grains During Storage in Different Environments. J Am Oil Chem Soc (2018) 95: 61–67. <https://doi.org/10.1002/aocs.12007> (Feb 2018)

Oscar Laguna, Abdellatif Barakat, Hadil Alhamada, Erwann Durand, Bruno Baréa, Frédéric Fine, Pierre Villeneuve, Morgane Citeau, Sylvie Dauguet, Jérôme Lecomte, 2018. Production of proteins and phenolic compounds enriched fractions from rapeseed and sunflower meals by dry fractionation processes. Industrial Crops & Products. <https://doi.org/10.1016/j.indcrop.2018.03.045> (March 2018)

Olaia Liñero & Jean-Yves Cornu & Alberto de Diego & Sylvie Bussière & Cécile Coriou & Stéphane Thunot & Thierry Robert & Christophe Nguyen, 2018. Source of Ca, Cd, Cu, Fe, K, Mg, Mn, Mo and Zn in grains of sunflower (*Helianthus annuus*) grown in nutrient solution: root uptake or remobilization from vegetative organs? *Plant Soil*. <https://doi.org/10.1007/s11104-017-3552-y> (March 2018)

Prasifka, J.R., Mallinger, R.E., Portlas, Z.M., Hulke, B.S., Fugate, K.K., Paradis, T., Hampton, M.E., Carter, C.J. 2018. Using nectar-related traits to enhance crop-pollinator interactions. *Frontiers in Plant Science*. <https://doi.org/10.3389/fpls.2018.00812>. (May 2018)

Adams, R.P., Lavin, M., Seiler, G.J. 2018. Geographic variation in hexane extractable hydrocarbons in natural populations of *Helianthus annuus* (Asteraceae, Sunflowers) II. *Phytologia*. 100(2):153-160. <https://www.ars.usda.gov/research/publications/publication/?seqNo115=353076> (June 2018)

Qi, L.L., Talukder, Z.I., Long, Y.M., Seiler, G.J. 2018. Registration of oilseed sunflower germplasms HA-BSR2, HA-BSR3, HA-BSR4, and HA-BSR5 with resistance to sclerotinia basal stalk rot and downy mildew. *Journal of Plant Registrations*. <https://doi.org/10.3198/jpr2017.11.0083crg>. (June 2018)

Hladni N, Zorić M, Terzić S, Ćurčić N, Šatović Z, Perović D, Panković D 2018. Comparison of methods for the estimation of best parent heterosis among lines developed from interspecific sunflower germplasm. *Euphytica* 214: 108. <https://link.springer.com/article/10.1007/s10681-018-2197-0> (July 2018)

HELIA volume 41 issue 68 July 2018 see <https://www.degruyter.com/view/j/helia> (free access for ISA members through <http://isasunflower.org/> and login to Members Space.

Gerald J. Seiler, 2018. Chao-Chien Jan: Thirty-five Years of dedicated Research Utilizing Wild Sunflower Crop Relatives for Sunflower Improvement <https://doi.org/10.1515/helia-2018-0005>

Elise Bartelme, Alan Bowsher, Lisa A. Donova 2018. *Helianthus porteri*, a Granite Outcrop Endemic, Does Not Have More Drought Resistant Traits Than Congeners. DOI: <https://doi.org/10.1515/helia-2017-0032>

Drumeva, Miglena / Yankov, Petar, 2018. Effect of *Sclerotinia sclerotiorum* on Sunflower Seeds Quality. DOI: <https://doi.org/10.1515/helia-2017-0022>

Yonet, Nilay / Aydin, Yıldız / Evci, Goksel / Altinkut Uncuoglu, Ahu, 2018. Genomic Evaluation of Sunflower Broomrape (*Orobanche Cumana*) Germplasm by KASP Assay. DOI: <https://doi.org/10.1515/helia-2017-0016>

Solodenko, A. 2018. Validation of Microsatellite Markers of PI Resistance Genes to Downy Mildew of Sunflower. DOI: <https://doi.org/10.1515/helia-2017-0026>

Hussain, Muhammad Mubashar / Kausar, Maria / Rauf, Saeed / Khan, M. Farukh Zafar / Paderweski, Jakub / Khan, Maria / ul Haq, Ikram / Raza, Abu Bakar Muhammad, 2018. Selection for Some Functional Markers for Adaptability of *Helianthus argophyllus* × *Helianthus annuus* Derived Population under Abiotic Stress Conditions. DOI: <https://doi.org/10.1515/helia-2017-0018>

Vedmedeva, K.V. 2018. Inheritance of Basal Branching in Sunflower. DOI: <https://doi.org/10.1515/helia-2017-0030>

Kostyuchenko, N.I. / Lyakh, V.A. 2018. Diversity of Fungi in Rhizoplane, Rhizosphere and Edaphosphere of Sunflower at Different Stages of its Development. DOI: <https://doi.org/10.1515/helia-2018-0001>

Tyagi, Vikrant / Dhillon, S. K. 2018. Performance and Water-Use Efficiency of Wild Cytoplasmic Sources in Sunflower. DOI: <https://doi.org/10.1515/helia-2017-0015>

Students works:

PhD Thesis: Nechifor Victoria August 2018: "The influence of gibberellins on the microsporogenesis at sunflower (*Helianthus annuus L.*)" ; PhD in Biological Sciences University of Moldova, Chişinău, 2018 directed by Dr Maria Duca.

Masters thesis Inner Mongolia Agricultural University (Directed by : Prof.Zhao Jun)

Zhao Xiaojun (Plant Pathology): The study on genetic diversity and pathogenicity differentiation of *Vorticillium dahliae* and cross infection of *V. dahliae* on potatoes and sunflowers.

Jia Ruifang (Crop protection): Biological Characteristics, Pathogenic Differentiation and Genetic Diversity of *Sclerotinia minor* on Sunflower.

Shi Shenghua (Plant Protection): Indoor evaluation of sunflower resistance to broomrape and system establishment for revealing the mechanism of sunflower resistance to broomrape

Value chains and regional news

Sunflower production in Serbia

The most common oil species in Serbia are sunflower, soybean and rapeseed. In 2017, sunflower in Serbia was grown on 230.000 ha with the average yield of 2,64 t/ha (in 2016 it was 3,27 t/ha). First estimates for 2018 are even higher, reaching 240.000 ha with the yield of above 3 t/ha. According to FAO and USDA data, Serbia was among the 10 world biggest sunflower producers and exporters in 2016. In the past several years the area is increasing, and the average yield is always among the highest in Europe.

Production is supported by an active research effort: during the past three years, two PhD thesis were defended, the first focusing on inheritance of quantitative traits in sunflower by Dr Milan Jocković <http://nardus.mpn.gov.rs/handle/123456789/5707> and the second on *Phoma macdonaldii* Boerema, causal agent of Phoma black stem by Dr Boško Dedić <http://nardus.mpn.gov.rs/handle/123456789/8744>. A total of 21 *Helianthus annuus* CAPS markers were registered in the NCBI Probe database, while 47 full paper publications (complete list is on ISA website), covered different topics including estimation of best parent heterosis among lines developed from interspecific sunflower germplasm, a review of genomic selection in sunflower, classification of confectionary sunflower genotypes based on morphological characters and mapping of a new gene for resistance to broomrape races higher than F..

Serbia is a center for cultivars creation: during the 2015-2017 period, IFVC registered 50 new sunflower hybrids internationally and 13 in Serbia. The market in Serbia is relatively small but with the presence of a number of international seed companies. The current official list of registered varieties in Serbia contains a total of 188 hybrids, 72 of which are from IFVC, while the rest is owned by 19 different companies. Most of the registered hybrids are oil type in the categories from medium early to medium late. Total area devoted to sunflower seed production in Serbia varied roughly from 1.000 to 3.000 ha in the last ten years, with an average yield close to 1 t/ha, in 2017 sunflower hybrid seed have been produced on 2.490 ha and 2.383.652 kg of hybrid seed have been certified.

As a leader in sunflower research in Serbia, Institute of Field and Vegetable Crops, Novi Sad, in 2018. is celebrating 80th anniversary and got the status of Institute of National Importance. Besides organizing 20th International Sunflower Conference in 2020. the same year Institute is organizing XI World Soybean Research Conference, the first of that kind ever in Europe.

Coming International and national events

17-21 September 17th OILB meeting of the Working Group "Integrated Control in Oilseed Crops"
OILB Zagreb, Croatia <http://iobc-zagreb2018.agr.hr/>

16-19 September 2018: 16th EuroFed Lipid Congress: Fats, Oils and Lipids: Science, Technology and Nutrition in a Changing World. Belfast, UK.
https://veranstaltungen.gdch.de/tms/frontend/index.cfm?l=7660&sp_id=2

15-16 October 2018, 1st International conference on Oil Bodies/ Oleosomes Wageningen, The Netherland. St <http://www.oilbodyconference2018.org/en/>

5-8 May, 2019: AOCs Annual Meeting, St Louis, Missouri, USA. <http://annualmeeting.aocs.org/>

18-21 September 2019: European Conference on crop diversification. Budapest, Hongrie.
<https://www.cropdiversification2019.net/call-for-abstracts.html>

We invite all the persons who read this newsletter to share information with the Sunflower community: let us know the scientific projects, events organized in your country, crops performances or any information of interest for sunflower R&D.

Contact ISA Newsletter:

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Or: contact@isasunflower.org

Visit the ISA Website: <http://isasunflower.org/home.html>

If you are not member, join ISA! <http://isasunflower.org/presentation/how-to-become-a-member.html>