ISA NEWSLETTER N°4, June 2019

International Sunflower Association

Contents

Editorial

Almost one year ago, in July 2018, the ISA executive board decided to launch this newsletter, to contribute to develop the communication among the sunflower community in the world.

One-year experience shows that the sunflower research agenda is quite rich, even if we detect only the tip of the iceberg. Sharing information to get a global vision of what happens in sunflower is a must for the International Sunflower Association to fulfil its mission "to develop research and development of sunflower and to improve international cooperation on the agronomic, technical and nutritional levels". This newsletter is yours, and we encourage everyone to share information on its works, ongoing activities and desirable collaborations.

In this issue, you will find some news from the Executive Board meeting and the progress of the organization of the next conference in Novi Sad, initiatives concerning the complex and critical issue of birds' damage in sunflower crops, and about the sunflower crops and research in major producing country, Ukraine.

We encourage you to join ISA and take an active part in its activities.

Etienne Pilorgé, ISA General Secretary-Treasurer

Activity and News of the association

ISA Executive Board meeting

The executive board of ISA held its annual meeting on May 2019 in Novi Sad, Serbia, hosted by the IFVC Novi Sad, organizer of the next International Sunflower Conference 2020. The agenda was quite substantial, beginning with the classical review of the association activities and financial aspects for the very rich 2018 season: remember the Sunflower and Climate Change symposium (February) in Toulouse, the 4th Broomrape symposium (July) in Bucharest, organized by ISA, and the visit to the Symposium on Confection sunflower Technology and Production (August, Wu Yuan, China) for which ISA gave its institutional support, and the launching of the ISA newsletter. The financial situation is positive, and ISA will invest in a renewed website, allowing to promote a better communication and exchanges among the sunflower community. Going on with the reflections initiated by our former Secretary Felicity Vear, the E. Board also reviewed the statutes and articles of association in order to propose some evolutions to the next General Assembly, which will take place during the 2020 Conference in Novi Sad.

Orobanche being a permanent issue for sunflower, it was decided to organize the next (5th) orobanche symposium in Toulouse, France, in 2022.

The ISA board: from left to right/ front: Valentina Eencheva (Bulgaria), Kateryna Makliak (Ukraine), Maria Joita-Pacureanu (Rumania), Etienne Pilorgé (France/Secretary-Treasurer), Ana Marjanović Jeromela (Serbia, Scientific Director IFVC), Yalcin Kaya (Turkey), Mariano Martin Sposaro (Argentina), Nicolas Langlade (France) / back: Jun Zhao (PR China), Laetitia Devedeux (France/Assistant Secretary), Maria Duca (Moldova), Leonardo Velasco (Spain), Vladimir Miklič (Serbia/President), László Hargitay (Hungary), Stevan Masirevic (Serbia), Yakov Nikolaevich Demurin (Russia). (absent/sent apologies: Mulpuri Sujatha (India), Brent Hulke (USA), Gian-Paolo Vanozzi (Italy))

The progress in the organization of the 2020 Sunflower Conference in Novi Sad was a major point of the agenda, and the Executive Board visited the site of the Congress Centre Master of the Novi Sad Fair (https://www.sajam.net/en/congress-centre) where the conference will take place, which offer all guarantees, high level professional staff and technical devices, for the logistics for a successful conference. At last, a short visit allowed the Board members to get a first contact with the very pleasant city of Novi Sad, on the side of the famous Danube river.

Registration to the conference is scheduled to open on next June 20th, and propositions for abstracts until October 20th. Prepare yourselves!

Bird damage: an initiative

In the first issue of this newsletter (September 2018), our French colleague Christophe Sausse, of Terres Inovia, called for collaborations, suggesting exchanging views and ideas, in order to build a network or a project to progress on this hot issue affecting many sunflower producing countries.
The proposal has met interest in several countries in Americas and Europe, and permitted, after preliminary exchanges and preparation, to organize a 3 hours web meeting on March 12th, 2019, with researchers from France (Terres Inovia, INRA), Argentina (INTA), Italy (Scuola Superiore Sant'Anna), Switzerland (Agroscope) and United States (USDA, NWRC). Unfortunately, connection problems made it impossible for colleagues from Uruguay Ministry of Agriculture to participate to the meeting in spite of their interest. However, they participated in sharing preliminary preparation and a short presentation.
The meeting allowed us to draw up the situation of bird damage to crops in the different countries, crossing concerned crops and bird species. The European presentations insisted on damage at sowing-emergence with few cases at maturity. In North and South America, damages occur at both sowing and maturity. Even when the European cases are rather similar, the situations seem more diverse in South and North America. However, this simply could be due to larger territories and better monitoring policies (especially in USA).

Damage variation in time and space is not fully understood. Works from Argentina show damage intensity following a Poisson-like distribution, but no such data exist in Europe yet. Both in America and Europe, there is a high influence of farmer´s perceptions of damage, with consequences on the research agenda. Addressing aspects of human dimensions of bird damage problem could probably help to define new research agendas.
At the management techniques level, there is no silver bullet: the techniques are partially effective, even the lethal control. Their effectiveness decreases between the controlled conditions and the field. The management is rather empirical (trials/errors). One major difference between Europe and Americas is the absence/withdrawal of repellent products in the European context. However, in Argentina, the application of this technique has not really been effective to mitigate eared doves' damages.
Recent evaluations in South America suggest a relationship between eared doves damages in mature sunflower and sunflower varieties, based on:
- head inclination,
- size and type of the seed

In the case of emerging soybean, there seems to be a relationship between damage and seed vigor (more vigor, less damage, based on empirical observations from farmers, without link with seed producers.
Agricultural practices in South America are also adapted to mitigate damages on mature sunflower:
- Crop management with the aim to increase the grain size and head inclination;
- Chemical desiccants to accelerate sunflower harvest

Research seems more advanced in America than Europe on this issue. The USDA-APHIS-Wildlife Services are in charge of managing conflicts between wildlife and agriculture and proposing solutions. There is no such centralized management organization in the other countries, where the research institutes are challenged by farmers and should consider other stakeholders, especially hunters and environmental protection associations.
There is also a close interaction in Europe between rural and urban areas (the birds come and go), but no coordinated management. In fact, pigeons have both defenders and opponents in urban areas.

The participants of this workshop agreed to stay in touch sharing information, especially concerning feedback information coming from adaptive (or "PDCA") management. Two topics of common interest are identified at this time, which could lead to collaborative projects:
- proof of damage with a systematic framework, and
- on farm field experiment network

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20th International Sunflower Conference, Novi Sad, Serbia.

https://isc2020.com/program/program-overview/

The International Sunflower Association (ISA) and the Institute of Field and Vegetable Crops (IFVC) are pleased to announce that **registration** for the 20th International Sunflower Conference will **open on June 20th, 2019**. The Organizing Committee has defined registration conditions and program structure with details available on www.isc2020.com.

Registration:

Registration opens	20 June 2019
Early fee deadline	20 October 2019
Regular fee deadline	20 May 2020
On site fee	from 21 May 2020
Abstract Submission Deadline:	October 20, 2019

For supporting the Conference and possibilities of company presentation and/or special trial on the Field day check the document with detailed information on the options available at:
https://isc2020.com/documents/ISC_2020_Sponsor_and_Exhibitor_packages.pdf

There will be a Field day on June 25th, 2020, where the demonstration trial of **sunflower hybrids from all around the world** will be organized to include the hybrids of all interested parties. Up to five hybrids per Institution can be included at no cost. You are therefore cordially invited to **contact sinisa.jocic@ifvcns.ns.ac.rs before October 20th, 2019**, to have enough time for proper trial preparation.

Yours sincerely,

Dr. Vladimir Miklič

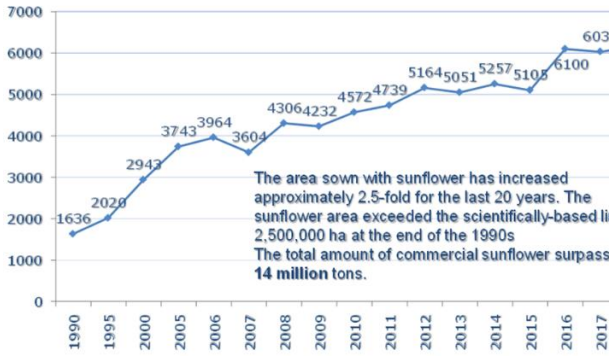
ISA President
Chair of the ISC2020 Organizing Committee

Value chains and regional news

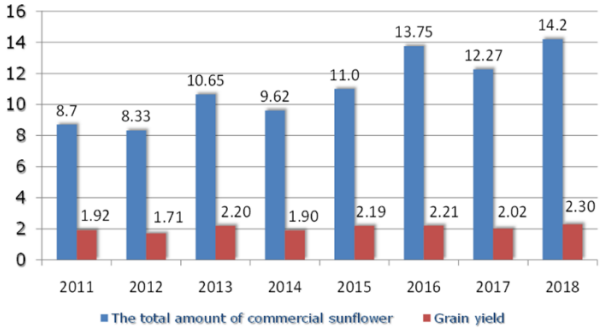
Sunflower crop in Ukraine

The climatic conditions of Ukraine are favorable for sunflower growing. In 2018, the production of sunflower seeds for oil amounted to almost 14.2 million tons, with the average yield across the country of 2.30 t/ha. Field crop rotations are overloaded with this crop. At the end of the 1990s, the area under sunflower in Ukraine reached 2-2.5 million hectares, and since 2012 they have exceeded 5 million hectares. In 2018, the sunflower was harvested from 6.17 million hectares, while the total area of arable land was near 30 million hectares, meaning that sunflower occupied almost 20% of the acreage.

The area sown with sunflower in Ukraine, 1990-2018

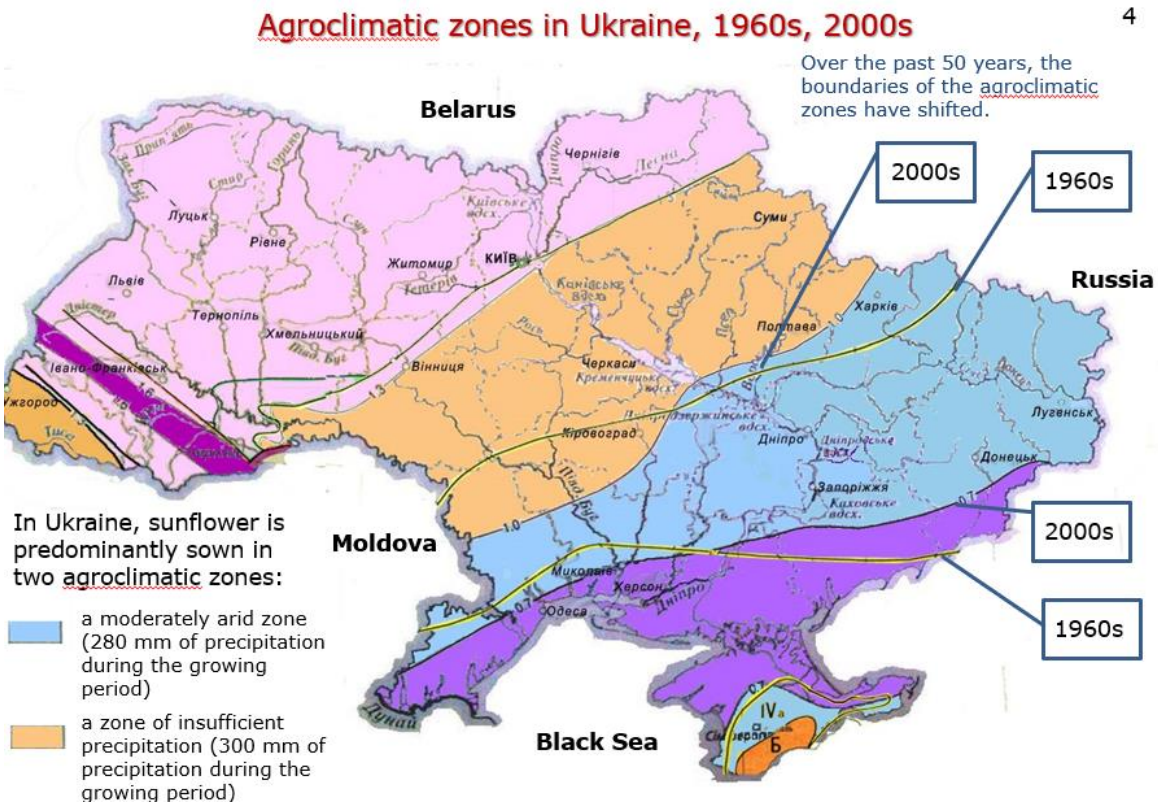


The total amount of commercial sunflower in Ukraine (mln t) and yield (t ha^{-1}), 2011-2018



Sunflower is considered to be one of the main sources of financial support for agricultural enterprises in Ukraine and is in high demand by agricultural producers due to the high profitability of cultivation. For example, in 2015, the average profitability of sunflower production was 80.5% across agricultural enterprises, with category-dependent fluctuations from 34.6% (state enterprises) to 86.7% (cooperatives).
In Ukraine, sunflower is predominantly sown in two agroclimatic zones: a zone of insufficient precipitation (300 mm of precipitation during the growing season) and a moderately arid zone (280 mm of precipitation during the growing season). Sunflower areas are limited in a very arid zone (240 mm of

precipitation during the growing season) and in a zone of sufficient precipitation. They began to sow sunflower in small areas in regions that are traditionally considered unfavorable for its cultivation. In particular, this year in the Ukrainian Carpathians sunflower was sown on an area of about 30 thousand hectares.



Almost half the territory of Ukraine (the central part) is in the insufficient precipitation and moderately arid zones. The southern regions of the country are very arid. Over the past 50 years, the boundaries of the agroclimatic zones have shifted. Droughts have enhanced in easternmost parts. For example, the northern boundary of the moderately arid zone in Eastern Ukraine has shifted by 100-150 km to the north, pushing the boundary of the zone of insufficient precipitation.

The southern part of the moderately arid agroclimatic zone and the northern part of the very arid zone are in the natural zone of steppe. In 2018 in Ukraine, over 60% of sunflower plantings were concentrated in the steppe. Reduced performance of sunflower in these areas is often due to droughts, the harmful effect of which mainly depends on water deficit in the arable layer of soil during the first half of the vegetation season and on lengths of periods with high temperatures.

The zone of insufficient precipitation and the northern part of the moderately arid zone are in the natural zone of forest-steppe. In 2018, over 30% of sunflower plantings were concentrated in the forest-steppe. Greater rainfall typical for the forest-steppe (compared to the steppe) is unevenly distributed during the growing season, and periodic lack of precipitation can be accompanied by high temperatures and even dry hot wind, which is detrimental to the development of sunflower plants. However, sunflower in this zone is undoubtedly in better conditions than in the steppe.

The climatic conditions of the Ukrainian woodlands located in the zone of sufficient precipitation contribute to significant infection of sunflower with rot-causing organisms and other pathogens in some years. In 2018, the area under sunflower in this zone exceeded 400 thousand hectares (about 7% of the acreage).

The weather variations in the main agro-climatic zones of sunflower growing in Ukraine account for the yield variability. In the 1970-1990-ies, the average sunflower yield across the country, varied within 0.9 - 1.8 t/ha, depending on agrometeorological conditions, and was 1.47, 1.55 and 1.21 t/ha in the steppe, forest-steppe and woodlands, respectively.

The Odesa and Zaporizhzhia (Zaporozhye) administrative regions are located mainly in the moderately arid part of the steppe. In 2018, the sunflower yield in these regions was 2.16 t/ha and 1.27 t/ha, respectively. These yields correspond to the 17th and 24th rating places among the 24 administrative regions of Ukraine. At the same time, the yield in the Kharkiv region located at the boundary between

the moderately arid zone and the zone of insufficient precipitation, in the best conditions in terms of moisture and thermal regimes, was on the 9th place (2.78 t/ha). A similar pattern is observed from year to year, with slight fluctuations.
Additional information is available in the article: https://doi.org/10.30835/2413-7510.2018.152133 (Ukrainian and English)

Three institutions of the national Academy of Agrarian Sciences (NAAS) breed sunflower:

the Yuriev Plant Production Institute in Kharkiv since 1989, the Oil Crops institute in Zaporizhzhia, since 1989, and the Plant Breeding and Genetics Institute – National Center of Seed and Cultivar Investigation in Odesa, since 1912. Their share of hybrids in the Register exceeds 14% with 90 hybrids. These hybrids are registered in Ukraine, Russia, Kazakhstan, Belarus and Moldova. 18 hybrids have been developed by these institutions collaboratively as a result of a breeding program guided by the Yuriev Plant Production institute since 2006. The institutions perform 15 State programs on sunflower breeding, seed production and cultivation technologies.

The main axes for breeding are :

- Yield stability: heterosis hybrids with wide adaptability to different growing conditions, drought resistance and heat resistance, growing period length, plant architectonics,
- Broomrape and disease resistance: resistance to broomrape, downy mildew, and sunflower moth is economically justified (Ukrainian researchers reported about broomrape races G and H in some areas of the country); tolerance to Phomopsis, white, grey, dry and charcoal rots is evaluated.
- Herbicide resistance: imidazolinone and sulfonylurea;
- Oil quantity and quality: high oil content over 50%, hybrids with elevated oleic acid content in oil (70-75%) as well as very high (85% and higher), high percentage of vitamin E;
- Confectionary sunflower: hybrids with 1000 seeds weigh over 10 grams, easily dehulling and high gustatory quality of kernels.

Concerning the breeding methods, a breeding program on development of starting material by traditional methods have been actively expanded:

- Inbreeding using accessions from the world collections,
- Distant hybridization using wild species
- Both traditional cytoplasm and cytoplasm of *H. argophyllus, H. rigidus, H. praecox, H. giganteus, H. debilis, H.annuus texanus* were used.
- Chemical and physical mutagenesis
- Breeding in fields, greenhouses and biotesting.

Scientific news

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Coming International and national events

16-21th June 2019, 60th Jubilee Conference "Production and processing of oilseeds", with international participation Herceg Novi, Montenegro. http://www.indbilje.co.rs/2018/03/14/59-savetovanje-proizvodnja-i-prerada-uljarica-inovacije-za-bolji-svet/

7-10 July 2019, 9th European Symposium on Plant Lipids Marseille, France, https://veranstaltungen.gdch.de/tms/frontend/index.cfm?l=8858&sp_id=1

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

20-23 October 2019, 17th Euro Fed Lipid Congress and Expo. Seville, Spain, http://www.eurofedlipid.org/pages/sevilla.html

9-12 February 2020. World congress on oils and fats. Sidney, Australia. www.wcofsydney2020.com

22-25 June 2020, 20th International Sunflower Conference, Novi Sad, Serbia. https://isc2020.com/

Registration:

Registration opens	20 June 2019
Early fee deadline	20 October 2019
Regular fee deadline	20 May 2020

On site fee from 21 May 202

Abstract Submission Deadline: October 20, 2019

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.

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