ISA NEWSLETTER N°11, November 2021

International Sunflower Association

Contents

Editorial

Farmers and agronomists are used to dealing with the uncertainties of climate, crop pests and ultimately markets. It seems that the covid crisis, with its own twists and turns and their consequences for human organisations, will eventually extend this state of uncertainty to all human activities. There is no choice but to adapt and ISA is trying to do its best in this difficult context.
The quality and success of the webinars organised this year show that ISA is pursuing its mission honourably, and the content of this letter shows that scientific production and innovation for sunflower are not weakening, in a context where the demand for vegetable oils and proteins continues to grow.

Etienne Pilorgé, ISA Secretary

Activity and News of the association

ISA Board Meeting June 3rd, 2021

The ISA board held its second meeting this year on June 3rd to review the past and current activities, examine the financial results of the ISA and coordinate on future events, notably the next General Assembly at the occasion of the International Sunflower Conference, which will the occasion for the ISA members to appoint a new Executive Board, and to nominate the Pustovoit Awards recipients.

ISA webinars

The 3 webinars scheduled by the ISA Board, based on voluntary initiatives, were quite successful with a significant attendance considering the relatively specialized topics.

- The webinar on sunflower genetic resources for breeding: germplasm evaluation and conservation, by Maria Duca, on June 15th, 2021, as a specific international sunflower session in the framework of the XI congress of Moldavian Association of Geneticists and Breeders: 170 registered persons from 27 countries and 120 active attendees, of which only 25% were ISA members.
- Workshop on climate change, resistance to drought, by Maria Joita-Pacureanu & Dumitru Manole, August 19th–20th, 2021.
- Webinar on sunflower pollinator interactions, by Nicolas Langlade and Olivier Catrice, on October 7th, 2021: 198 registered persons, among them 19% ISA members, showing that this webinar attracted complementary research communities.

These successful experiences show that webinars are certainly an efficient lever to animate the sunflower community, make ISA better known from sunflower researchers and other actors, and also link with other research communities, like for pollinators/pollination issues.

Another aspect is that these webinars initiatives make a good preparation for further exchanges during the next International Sunflower Conference. Out of the three topics, only "Sunflower and pollinators" is not present as a section in the 20th ISC program. The interest is high, as we have seen by the number of people registered for the webinar and participating, and based on the submitted papers, this group could be made more visible during the conference.

Sunflower genetic resources for breeding: germplasm evaluation and conservation. Webinar June 15th, 2021, and further initiatives

The conservation and use of plant genetic diversity as important sources of pest and disease resistance, as well as of adaptability to current climate change, including increased droughts and extreme weather events, is a key component of sustainable solutions to ensure food security.

The webinar organized on June 15th 2021 by the Center of Functional Genetics of the Moldova State University in partnership with the Scientific Association of Geneticists and Breeders of the Republic of Moldova and N.I. Vavilov All-Russian Institute of Plant Genetic Resources (VIR), Sankt-Petersburg, Russian Federation, under the auspices of the International Sunflower Association (France, Paris) was focused on the “Sunflower genetic resources for breeding: germplasm evaluation and conservation”.

The event provided a platform of discussions on sunflower germplasm collections, methods of research, conservation, and evaluation. It brought together more than 170 participants from 27 countries (Argentina, Austria, Brazil, Bulgaria, China, Equator, France, Germany, Greece, Hungary, India, Iran, Israel, Moldova, Nigeria, Pakistan, Portugal, Romania, Russia, Serbia, Spain, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States of America), including representants of research and educational institutes, as well as private companies.

The webinar began with a short information about International Sunflower Association activities, presented by Etienne Pilorgé, Secretary-Treasurer ISA and moderator of the event. After, Prof. Maria DUCA, head of the Center of Functional Genetics, presented a brief information regarding the history of the VIR collection, one of the oldest germplasm collections in the world. Prof. Irina ANISIMOVA, prof. Nicolas LANGLADE, PhD Laura Fredrick MAREK, PhD Sreten TERZIC and PhD Gabriela ROMANCIUC shared their knowledge and experience regarding the sunflower collections of five gene banks, in Russia, France, USA, Serbia and Republic of Moldova, according to the following agenda:

- VIR sunflower germplasm collection: structure, importance and methods of studies, Irina ANISIMOVA, PhD, Prof., VIR, Sankt-Petersburg, Russia; Vera GAVRILOVA, PhD, Prof., VIR, Sankt-Petersburg, Russia
- INRAE Genetic Resources of sunflower, Nicolas LANGLADE, PhD, Prof., INRAE, Toulouse, France; Marie-Claude BONIFACE, PhD, INRAE, Toulouse, France
- The USDA sunflower gene bank, Laura Fredrick MAREK, PhD, Curator Oil Seed Crops, National Plant Germplasm System, USDA-ARS, USA
- Sunflower genetic resources for breeding: germplasm evaluation and conservation, Sreten TERZIC, PhD, Institute of Field and Vegetable Crops, Novi Sad, Serbia
- Plant genetic resources in Republic of Moldova: role and research priorities, Anatol GANEA, PhD, Prof., Curator of Plant Genetic Resources, Republic of Moldova; Gabriela ROMANCIUC, PhD, associated professor, Republic of Moldova KWS

Presentations and further debates were very rich and raised several issues.
Proper conservation, focused on maintaining genetic identity of accessions is essential as well as sharing information on genetic resources for increased use and value. The contributions to the information networks (Genesys, FAO WIEWS, Eurisco…) are affected by many factors and unfortunately made even more seldom by various international agreements like the CBD, Nagoya etc... Some countries still do not even have the national PGR systems completely established. Fortunately, resources are maintained in gene banks around the world, but as concluded during the webinar, the material and the associated information could be put to much better use through cooperation and sharing.

The question of the genetic drift was raised, an important issue in gene banks with short- and medium-term storage, and when the same accession is maintained in different collections for a long time, reinforcing the importance of better sharing the information on genetic resources, as collections and genes banks, and not only the major ones.
The issue of the genetic drift should raise several questions:

- How rapid is it? Is there variability depending on species? Is it more or less important than/ with the importance of the climate conditions in which the collections are maintained?
- How to manage it? Either to limit it (the issue of seeds life duration in cold storage…) or favor it, for example by maintaining the same source in very contrasted conditions…
- The meta data: weather information for the conservation sites?

The collection in Novi Sad, Serbia, includes accessions collected in the 1980s that are duplicated in Ames, Iowa, but maintained separately for the past 40+ years, which could be compared to check the extent of genetic drift after all regenerations, especially among annual species.
The variability between species also exists for loss of viability due to seed ageing and some species just cannot be maintained if the conditions are too different from the original habitat. Most often the problem is late flowering and early frost at the ex-situ site, but different soil type and quality can also make cultivation difficult.
Semi controlled conditions in ex situ gene banks limit the effect of climate, so that genetic drift has more influence on accessions depending on regeneration frequency and number of plants per population. Long term storage is a solution for lowering genetic drift, but it is not available to every gene bank. Another aspect is in situ conservation of wild species in protected areas for conservation of crop wild relatives, but such CWR sites are rare and wild sunflowers are more likely to be protected as a part of nature protected areas. Old sunflower cultivars are still used as a source of desired traits and mostly obtained from the largest gene banks. Their potential on-farm maintenance in diverse growing conditions since the 1970s or longer, could also be of interest for new diversity. However, such farms, still using old cultivars, may be difficult to find these days.

Since the Genetic resources webinar (170 registered participants, 120 active attendees), an initiative from the Global Crop Diversity Trust (the Crop Trust: https://www.croptrust.org/) about developing global conservation strategy for sunflower took place to develop a global conservation strategy for sunflower (*Helianthus spp*.). The first survey results, including responses and data from 30 institutions, were formulated into a draft report during October and the activities continued with online consultations in November.

ISA will continue to help share information and we may hope there could be enough interest to really organize an exchange between gene banks, not only accession information but possibly maintenance methods and eventually accession comparison about the genetic drift effect for accessions with single source but separately maintained.
The Sunflower Conference in Novi Sad would be the ideal place to launch or develop an initiative.

Maria Duca, Sreten Terzić, Etienne Pilorgé

20th International Sunflower Conference, Novi Sad, Serbia.

The Conference will be held from June 20th to 23rd with the already announced program. The Field Day is scheduled for June 23rd with demonstration trials and exhibitor presentations.
Detailed information is available at https://isc2020.com/program/program-overview/

We thank all the Companies supporting the Conference, as well as the increasing number of registered participants.
See you in Novi Sad next year!

20th ISC Organizing committee

Value chains and regional news

Honeybees as promising vectors of biological agents against sclerotina head rot

The Sunflower Magazine reports in its October issue that the North Dakota State University has tested the “Bee Vectoring Technology” making use of honeybees to disseminate the biological control agent *Clonostachys rosea* for management of Sclerotinia head rot in sunflower, on the proposition of a Canadian company. The first-year results on susceptible cultivars are encouraging: in field studies conducted in two situations, 50% reduction in head rot with the biologicals, increased sunflower yield — and reduced contamination of the grain from sclerotia (resting structures of the Sclerotinia fungus) were obtained. The biological seems to be effective despite the distance from the hives, to be confirmed. These results are of special interest in US for the production of confectionary types for which contamination of the grain with sclerotia must be below 4% by weight to sell for human consumption.

Full article at: https://www.sunflowernsa.com/magazine/articles/default.aspx?ArticleID=3967

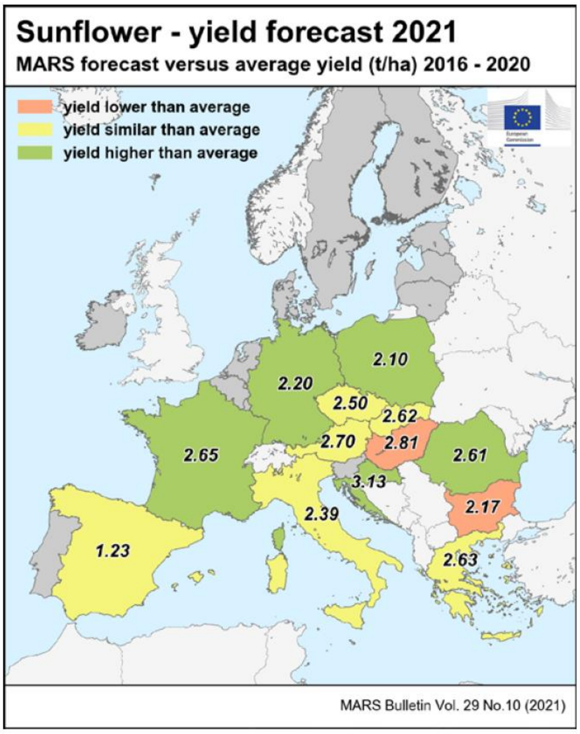
NSA 2022 Research Priorities

https://www.sunflowernsa.com/magazine/articles/default.aspx?ArticleID=3965

Sunflower crops in Europe

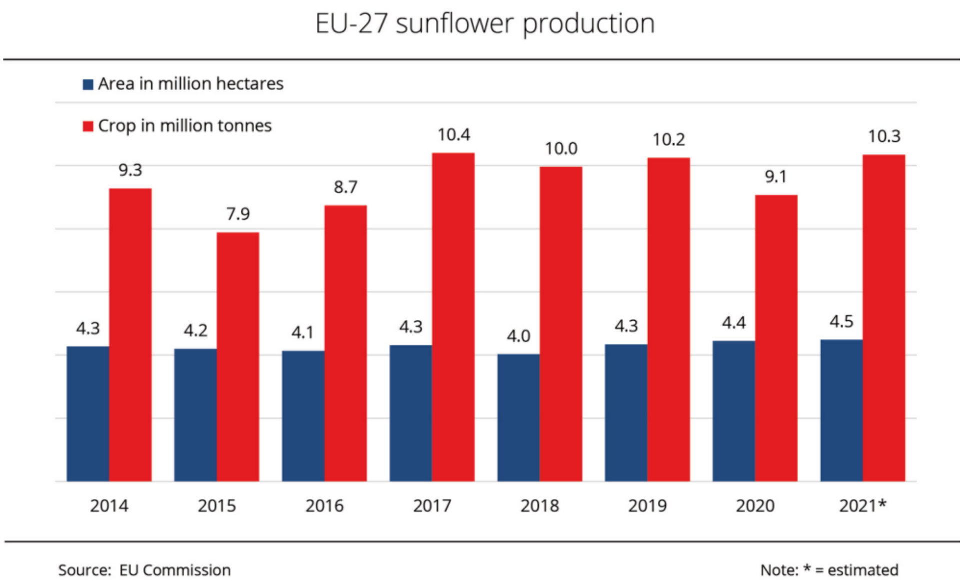
Fair autumn weather conditions in most parts of Europe allowed farmers to harvest summer crops in good conditions and benefited the summer crops that are still in the field during their final stages of development. At EU level, the yield forecasts for most summer crops were revised slightly upward compared with the figures reported in September. In Ukraine, cool and dry conditions allowed the harvest of summer crops in good conditions and according to the Ministry of Agriculture, 70% of sunflower and soybean were harvested by mid-October.

Source: JRC MARS Bulletin - Crop monitoring in Europe, October 2021 - Vol.29 No 10, doi: https://doi.org/10.2760/90692 , JRC124855



EU sunflower harvest record in 2021?

The German UFOP comments the very good sunflower harvest this year in Europe: “In the EU-27, the 2021 harvest of sunflower seed was considerably larger than the previous year. It also far exceeded the long-term average. However, the 2017 record level was not topped. An estimated 10.3 million tons of sunflower seeds were produced in the European Community in 2021. This was a 14 per cent rise over the previous year and translates to a 10 per cent increase on the long-term average. The sunflower area was also expanded compared to the previous year, although only just under 1 per cent to 4.5 million hectares, 7 per cent more than the five-year average. The average yield amounted to 23 decitons per hectare, which was a 13 per cent growth on the weak previous year. In other words, this year's yield fell just under 0.6 per cent short of the long-term average."



Read more on https://www.ufop.de/english/news/chart-week/#kw45_2021

France : Sunflower crop reports for 2021, a historic year!

Paris, November 22nd, 2021 -Terres Inovia, the technical institute of the vegetable oil and protein sector, unveils the 2021 sunflower crop reports. This is a record year for the crop, with performances in most regions. Thus, the 2021 campaign ends with average yields ranging from 28 to more than 30 q/ha depending on the production basin. These good results come from the combination of favorable conditions that allowed for quality sowing (emergence density and rooting quality) and regular water supply, particularly during the key flowering period. The sowings that could be carried out early and until the end of April benefited this year from the rains of July better than later sowing.

In the historical sectors of the South-West, the average yields ranged between 2.6 and 3 t/ha, reaching 3.3 t/ha in the South-Aquitaine. In other regions average yields reach or exceed 3t/ha. Some plots with record yieldscould reach more than 4.5 t/ha. The consolidated national average should be close to 3 t/ha thus exceeding the previous historical record dating from 2017 (2.76 t/ha according to Agreste) and well above the average of 2.28 t /ha of the last ten years. These very positive results illustrate the capacity of sunflowers to express their potential when conditions are fully favorable.

These good performances can also be explained by a good general health record and cultivars tolerance. Diseases were generally not present. The conditions were favorable to the contamination leading to sclerotinia head rot but attacks remained very local. .

With regard to gross margins for sunflower, the results obtained in 2021 were significantly higher than those of 2020 and of the previous campaigns, thanks to the changes in yields, prices and operating expenses between these two campaigns. Assuming a yield of 3t//ha, for a selling price between 450 €/t and 500 €/t, the gross margin of sunflower is respectively between 1045 €/ha and 1195 €/ha (operating expenses of 305 €/ha) against 500 €/ha in the ten-year indicative average.

The 2021 campaign has shown the importance of choosing a variety with an earliness adapted to the territory and to the sowing date in order to avoid or limit drying costs and to allow the implantation of the following winter crop in good conditions. This aspect is crucial in the basins of the northern half of France

and on the oceanic border, especially since drying costs have risen sharply in the context of soaring fossil fuel prices (natural gas, fuel oil).
For the next season 2022, in the context of the very strong increase in the cost of fertilizers, sunflower will be able to make the most of its limited needs in nitrogenous fertilizers, with an optimal dose usually between 0 and 80 units, leading to a limited increase in fertilization costs and overall costs that remain significantly lower compared to other more demanding crops.
More information : https://www.terresinovia.fr/en/-/bilans-de-recoltes-tournesol-2021-une-annee-historique

Turkey: Oilseeds and Products Update

Turkey's marketing year (MY) 2021/22 sunflower seed area and production is estimated at 760,000 hectares and 1.75 million metric tons (MMT) respectively. Turkey continued imports of sunflower seeds to meet stable demand. Accordingly, during the first eleven months (Sept-July) of MY 2020/21, oilseed sunflower seed imports were 899,000 MT, sunflower seed meal imports were about 788,000 MT, and sunflower seed oil imports were 732,000 MT. Turkey's sunflower seed oil imports and exports have increased significantly in recent years due to additional capacity for refining and re-exporting. Turkey continues to be negatively affected by high domestic oil prices.
Source: USDA GAIN Reports, October 5, 2021

And what next on global oilseeds markets?

The USDA oilseeds outlook observes that the global production of vegetable oils continues to increase in the 2021/22 crop year to reach new record highs. An expected decline in rapeseed oil output can be more than offset by production increases in palm, sunflower, and soybean oil. The 2021/22 global production of vegetable oils will amount to 214.8 million tonnes. This would be an 8.21 million tonne rise compared to 2020/21. The production will presumably fully cover demand of 211.8 million tonnes also in the current crop year. The German UFOP reports « that according to investigations conducted by the Agrarmarkt Informations-Gesellschaft (mbH), palm oil is set to remain the world's most important vegetable oil in terms of production and consumption, with output estimated at 76.5 million tonnes. Palm oil accounts for just less than 36 per cent of total vegetable oil production. Production of soybean oil is expected to grow 4 per cent to 61.7 million tonnes based on larger harvests and could hit a new record. Production of sunflower oil is expected to climb as much as 14 per cent to 21.8 million tonnes in 2021/22 due to larger harvests in Eastern Europe and the EU-27. On the other hand, the USDA has projected a 6 per cent decline in global rapeseed oil production to 27.4 million tonnes based on inadequate rapeseed supply ». (See chart and details *on: https://www.ufop.de/english/news/chart-week/#kw46_2021*

Despite these good results in terms of overall production, oilseed complex markets are at their highest for many years and are experiencing high volatility with stocks remaining at low levels. Sunflower seed has reached record highs of €630/t and rapeseed €700/t in Europe. According to the FAO, "The FAO Food Price Index at its highest since July 2011 and the increase was driven by firmer price quotations for palm, soy, sunflower and rapeseed oils. International palm oil prices increased for a fourth consecutive month in October, largely underpinned by persisting concerns over subdued output in Malaysia due to ongoing migrant labour shortages. In the meantime, world prices of palm, soy and sunflower oils received support from reviving global import demand, particularly from India that lowered import tariffs further on edible oils. As for rapeseed oil, the continued strength in international values chiefly stemmed from protracted global supply-demand tightness. Noticeably, rising crude oil prices also lent support to vegetable oil values". These developments should be seen in the context of a general upward movement in commodities, but vegetable oils are particularly affected: over one year (October 2020 to October 2021), the FAO Food index rises from 101.4 to 133.2, with the indices for cereals, sugar and vegetable oils rising from 112.1 to 137.1, 84.7 to 119.1 and 106.5 to 184.8 respectively. *(See https://www.fao.org/worldfoodsituation/foodpricesindex/en/)*

Sunflower as a target for C3 to C4 metabolism conversion: European project GAIN4CROPS

The EC-funded project H2020 GAIN4CROPS is developing novel disruptive technologies to overcome one of the main constraints on photosynthetic efficiency: photorespiration, a process that reduces CO2 assimilation efficiency, and thus biomass yield and agricultural productivity. In 5-years the project aims improve the efficiency of the most common photosynthetic metabolism in plants, the C3 metabolism, by following a stepwise approach. it will validate its findings in a set of model organisms of increasing cellular and anatomical complexity before moving to its final target: the sunflower. The capacity to evolve the C3-C4 intermediate and C4 metabolism is already present in the *Helianthae*, which makes this important oil crop a promising target for a C3- C4 conversion. The project is coordinated by Prof Andreas P.M. Weber of the Heinrich Heine University, Düsseldorf, Germany, and gathers 14 partners from 9 EU countries. *See: http://gain4crops.eu/*

Scientific news

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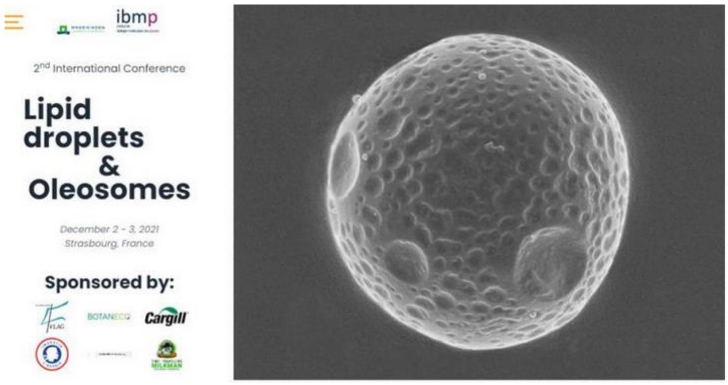
Coming international and national events

2nd International Conference: Lipid droplets & Oleosomes, December 2-3, 2021, Strasbourg, France

https://lipiddropletsoleosomes.org/



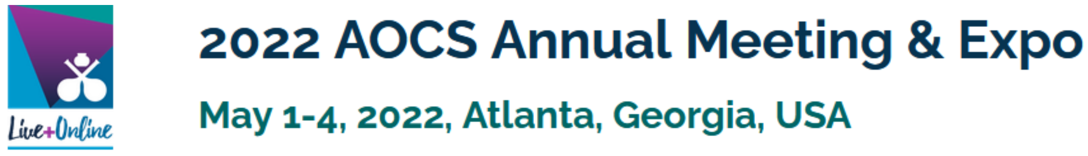
2022 NSA Research Forum, January 12-13, 2022, in Fargo, ND: Call for Papers

https://www.sunflowernsa.com/events/

The National Sunflower Association is inviting research papers to be presented at the NSA Research Forum. Presentations may be either oral or in the form of a poster. A time will be designated for authors to be with their posters and answer questions. Each oral presentation will be limited to 10-12 minutes with 2-3 minutes allowed for questions. 2022 NSA Research Forum. Location: Holiday Inn, Fargo, ND

AOCS Annual Meeting, May 1-4, 2022, Atlanta, USA / live and online

https://annualmeeting.aocs.org/



Congress SISSG 2022, June 15-17, Perugia, Italy
https://www.sissg.it/en/congresso-di-perugia-2022/

20th International Sunflower Conference, June 20-23, 2022, Novi Sad, Serbia.
https://isc2020.com/

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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