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International Sunflower Association

Contents

Editorial

The Covid 19 crisis reminds us that the mankind is not always in a dominant position when interacting with nature. People aware of life sciences cannot really be surprised as this kind of event affects mankind since immemorial times. But in practice, at the scale of a human life, this situation is very exceptional: all countries are progressively affected, and even if the summer season may slow down the epidemic in the Northern hemisphere, the pandemic of Covid 19 might go on in the Southern part of the globe, and the time span to reach effective sanitary solutions have good chances to reach one year, since things might be very fluctuant as long as a vaccine is not developed and populations treated.

Our Sunflower Conference being an international event which gathers the world community of sunflower, we had no other choice than postponing it by one year. Sometimes, Nature decides for us.

It is a pity for all of us, but we are certain that our investment will not be lost, whether as a participant proposing a communication or organizer.

Finally, it has never been so relevant to compare the sunflower conference to the Olympic Games…

The ISA Executive Board

Activity and News of the association

The 20th International Sunflower Conference is postponed to June 2021 due to the Covid 19 pandemic

https://isc2020.com/

ISC 2020
20th International Sunflower Conference, Novi Sad

The message of the organizing team addressed to the participants gives practical information on the next steps:

“Global crisis caused by COVID-19 virus is affecting all aspects of our lives. Institute of Field and Vegetable Crops, Novi Sad, and International Sunflower Association, as organizers of the 20th International Sunflower Conference in Novi Sad, are closely monitoring the situation since the beginning of the crisis.

The health, safety and security of all conference participants, speakers, sponsors, exhibitors and others are, of course, more important than anything else.

Since further development of the situation cannot be foreseen, we have decided to postpone the conference for the next year. The new time for the conference is June 21st to June 24th, 2021. The conference will be held in the same place, Master center, in Novi Sad, Serbia.

Already paid registration fees and hotel reservations will remain valid, and any individual requests on this issue will be handled with the supporting agency Panacomp. We hope that the sponsors and exhibitors will agree to continue supporting the conference. Conference program and speakers will remain the same, maybe with minor changes. Already received abstracts and papers are valid.

We hope and believe that most of the participants, sponsors and exhibitors already registered will be able to adapt to the new date of the conference.

We invite everyone interested to continue submitting abstracts and papers. The conference website remains active and all conference information will continue to be published there.

We wish all of you good health, and to get through this difficult period as easily as possible.

See you next year in Novi Sad!"

Value chains and regional news

US: Birds Damage Management Conference

The Sunflower Magazine publication of the US National Sunflower Association, in its issue dated March/April 2020, publishes a paper about the Bird Damage Management Conference held last February in Salt Lake City, Utah (see https://www.sunflowernsa.com/magazine/articles/default.aspx?ArticleID=3896), reporting information and learnings from the landscape ecology to the attention of farmers.

The conference itself has been registered and videos are accessible on https://conference.usu.edu/blackbirds/Livestream.cfm with the common password "Starlings2020"

The US Sunflower Association funds notably works for birds' damage management through a project carried out by USDA-APHIS "Efficacy of an Avian Repellent Applied Via a Spraying Drone for Repelling Blackbirds from Sunflower Fields".

Works in progress: research and innovation projects funded by the US NSA in 2020:
The March and April 2020 issue of the Sunflower Magazine also informs on diverse research and innovation projects funded by the NSA (see https://www.sunflowernsa.com/magazine/), (some of them managed by ISA members)

- Enhancing Rust Resistance in Confection Sunflower (Lili Qi, Guojia Ma))
- Effect of Sunflower Growth Stage on Phomopsis Stem Canker Development (F Mathew, S Markell, B Harveson)
- Effectiveness of Fungicides to Manage Phomopsis Stem Canker of Sunflower (F. Mathew, B Harveson)
- Investigating the Impact of Diseases and Associated Factors on Yield (S Markell, H Kandel, F Mathew, B Harveson)

- Evaluate the Distribution of Red Sunflower Seed Weevil Populations That Are Resistant to Pyrethroid Class Insecticides (A. Varenhorst , P Wagner, J. Knodel, P Beauzay)
- Sunflower Nectar Volume: Impact on Pollinator Choice and Genetic Determination (Jarrad Prasifka & Brent Hulke)
- Using Insect Biology and Cultural Practices for Management of Red Sunflower Seed Weevil (Jarrad Prasifka, B. Fergusson, D. Prischmann-Voldseth)
- Evaluation of Sunflower Tolerance to Fall-Applied Herbicides (Brian Jenks, Caleb Dalley)
- Influence of Rainfall on the Timing and Efficacy of PRE/POST Soil Residual Herbicides for Control of Herbicide-Resistant Kochia and Palmer Amaranth (N Lawrence, V Kumar)
- Sunflower Tolerance to Fall- and Spring-Applied PPO Inhibitors (B Jenks)
- Early Maturing Sunflower for Double-Crop Use in the Central Plains (Brent Hulke)
- Identification and Mapping of Genetic Factors Affecting the Stability of Oleic Acid in Inbred Lines and Hybrids (Brent Hulke, Qing Ming Gao)
- Assessing the Importance of Plant Spacing Heterogeneity (skips, doubles,gaps) on Yield, and Heritability of Seedling Emergence in Field Conditions (Brent Hulke, R Meyer, C Trostle)
- Efficacy of an Avian Repellent Applied Via a Spraying Drone for Repelling Blackbirds from Sunflower Fields (P Klug, M White)
- Genetic Variation of Sunflower Seed Macronutrients for Feed and Food Applications (Brent Hulke, M Grusak)

France: 31st Meeting of sunflower breeding / 31ème Carrefour de la sélection du tournesol

Since 1977, the French association Promosol supports works on oilseed crops breeding (rapeseed and sunflower) and actions promoting the dissemination of scientific progress. Promosol members are Terres Univia (Interprofessional Organization of the French Oil and protein crops sector), Terres Inovia (Technical Institute of the French Oil and protein crops sector), INRAE (National Institute for Agriculture, Food and Environment Research), and UFS (French seed association for seed companies & plant breeders). Practically, the association defines research priorities of common interest, funds research programs considered to be strategic and disseminates results to breeders and farmers. Promosol organizes the Carrefour de la Sélection du Tournesol every year in February.

The 31st Carrefour of sunflower breeding took place on February 6, 2020 at the INRAE research center in Auzeville-Tolosane, near Toulouse.

Bringing together around sixty participants from public research, GEVES (which coordinates varieties registration trials in France), the industry and sunflower breeders; this meeting, moderated by Nicolas Langlade, offered a review of the sunflower crop context and scientific advances of the French research.

Luc Ozanne, Sofiproteol director of investments, gave an update on the international oils and proteins market, and the challenges for the sunflower sector.

Jim Westwood, professor at Virginia Tech College of Agriculture and Life Sciences, presented research to better understand the specificity mechanisms of germination stimulants in Orobanche.

Emmanuelle Mestries (Terres Inovia), and Jean-Noel Aubertot (INRAE) detailed two new models under construction to manage the risk of sunflower diseases. One, Sunflower Pest, analyzes the effects of the dynamics of six sunflower pests on yield development. The other, SimMat Diaporthe, aims to predict phomopsis risk. The latter will be evaluated in field conditions by Terres Inovia in 2020, to validate its usefulness for producers.

Concerning the socioeconomic aspects of the new sunflower ideotypes, Mikael Akimowicz (LEREPS) and Nicola Gallai (ENSFEA) presented their research conducted in the frame of the SUNRISE project, at the farm, sector and regional levels. Interviews with different actors with complex interactions were allowed to specify the factors of adoption of varietal innovation in sunflower by French farmers.

The participants visited the TPMP platform (Toulouse Plant Microbe Phenotyping) dedicated to high-throughput automated phenotyping under controlled conditions of plant species, which allows to study models of agronomic interest and the associated microorganisms with non-invasive monitoring of plants (by visual imagery, infrared, fluorescence for example), and to simulate precise climatic and environmental conditions. (see: https://www.genotoul.fr/en/portfolio_page/plant-microb-phenotyping/)

The Carrefour was an opportunity to follow the progress of four ongoing research projects supported by Promosol:

- RESODIV (Coordinator: Mireille Chabaud, INRAE LIPM Auzeville). This collaborative project between INRAE and the University of Cordoba (Spain) aims to anticipate the circumvention by *Orobanche cumana* of the genetic resistances of sunflowers. It explores the genetic diversity in species of the *Helianthus* genus, in order to find new sources of resistance and make resistant material available to breeders, with various defense mechanisms, the accumulation of which will make it possible to create new varieties with lasting resistance.
- DEMELER (Coordinator: Pierre Casadebaig, INRAE AGIR Auzeville) aims to analyze evolutions and variability in the yield of sunflowers in France over the past thirty years, and assess the effects of genetic progress, climate and cultural practices. The project is beginning, and results are expected in 2022.
- HELIADIV2 (Coordinator: Brigitte Mangin, INRAE LIPM): the “Helianthus” network, managed by INRAE with the help of seed companies, aims to multiply and conserve genetic resources of sunflower, and to characterize them from a phenotypic point of view, for different criteria of interest such as tolerance to water stress . This characterization is long and costly when we want to evaluate several hundred sunflower genotypes. To facilitate this work, INRAE proposed to use genomic selection models to predict the behavior of the lines and facilitate the work of varietal creation.
- HELIASEN (Coordinator: Philippe Burger, INRAE AGIR) (see: https://www.youtube.com/watch?v=VZSvgeWuhlw). This project aims to develop phenotyping methods of leaf senescence in sunflower at 3 levels (organ, plant, plot), to differentiate genotypes with contrasting behaviors, but also knowledge on the genetic control of senescence. This project is in collaboration with the Sunrise and Phenome projects and the INTA teams from Castelar and Manfredi in Argentina.

(*adapted from Terres Inovia news : https://www.terresinovia.fr/-/31eme-carrefour-de-la-selection-du-tournesol-une-journee-riche-autour-d-acteurs-mobilises*)

Scientific news

Publications

GENETICS AND BREEDING

Ostevik, K. L., Samuk, K., & Rieseberg, L. H. (2020). Ancestral Reconstruction of Karyotypes Reveals an Exceptional Rate of Non-random Chromosomal **Evolution in Sunflower**. Genetics. https://doi.org/10.1534/genetics.120.303026

Mykhailenko, V., Kyrychenko, V., Bragin, A., & Chuiko, D. (2019). Generation, Evaluation, and Prospects of Further Use of Mutations Based on New Homozygous Self-Pollinated Sunflower Lines. In Genotoxicity and Mutagenicity-Mechanisms and Test Methods. IntechOpen. https://www.intechopen.com/online-first/generation-evaluation-and-prospects-of-further-use-of-mutations-based-on-new-homozygous-self-pollina

Bulatova, K.M., Mazkirat, S., Gavrilova, O.A. et al. **Genetic Diversity** of Inbred Sunflower Lines of the Kazakhstan Collection Fund for Protein and SSR Markers. Cytol. Genet. 54, 10–17 (2020). https://doi.org/10.3103/S009545272001003X

Zeinakzadeh-Tabrizi, H., Hosseinpour, A., Ghaffari, M., Haliloglu, K., Pour-Aboughadareh, A., & Poczai, P. (2020). Genetic structure and marker-trait associations in parental lines of sunflower (Helianthus annuus L.). *Manuscript submitted for publication. University of Helsinki*

Abdelsatar, M. A., Elnenny, E. M. M., & Hassan, T. H. A. (2020). Inheritance of seed yield and yield-related traits in sunflower. Journal of Crop Improvement, 1-19. https://doi.org/10.1080/15427528.2020.1723767

Kamardin, V.A., Nazarov, D.A., & Shurakov, A.N. (2019). Selection of **synthetic sunflower varieties**: features, directions and possible prospects (review)/ Камардин, В. А., Назаров, Д. А., & Шураков, А. Н. (2019). Масличные культуры, (3 (179)). *Russian, English abstract.* https://cyberleninka.ru/article/n/selektsiya-sinteticheskih-sortov-podsolnechnika-osobennosti-napravleniya-i-vozmozhnye-perspektivy-obzor

Qi, L., & Ma, G. (2020). Marker-Assisted **Gene Pyramiding** and the Reliability of Using SNP Markers Located in the Recombination Suppressed Regions of Sunflower (Helianthus annuus L.). Genes, 11(1), 10. https://doi.org/10.3390/genes11010010

Terzić S, Zorić M, Seiler G. (2020) **Qualitative Traits** in Sunflower Breeding: UGA-SAM1 Phenotyping Case Study. Crop science 60:1, 303-319. doi: 10.2135/cropsci2019.02.0112.

Jocković, J., Rajčević, N., Terzić, S., Zorić, L., Jocković, M., Miladinović, D., & Luković, J. (2020). Pericarp features of **wild perennial Helianthus** L. species as a potential source for improvement of technical and technological properties of cultivated sunflower. Industrial Crops and Products, 144, 112030. https://doi.org/10.1016/j.indcrop.2019.112030 ; see also researchgate.net

Terzić S, Boniface MC, Marek L, Alvarez D, Baumann K, Gavrilova V, Joita-Pacureanu M, Sujatha M, Valkova D, Velasco D, Hulke BS, Jocić S, Langlade N, Muños S, Rieseberg L, Seiler G and Vear F (2020) **Gene banks** for wild and cultivated sunflower genetic resources. OCL, 27. DOI: https://doi.org/10.1051/ocl/2020004

Voronova O. N.* and Babro A. A. **Apospory in Helianthus ciliaris** DC. (Asteraceae). The International Journal of Plant Reproductive Biology 11(1) Jan., 2019 https://pdfs.semanticscholar.org/7abd/c1c16ec870f178273ad8f5fbe30690170fb4.pdf

Adams, R. P., Johnson, S. T., & Seiler, G. J. (2019). **Screening** hydrocarbon yields of **sunflowers**: Helianthus maximiliani, H. grosseserratus H. nuttallii, and H. tuberosus in the North Dakota-Minnesota-South Dakota area. Phytologia, 101(4), 208-217. https://www.juniperus.org/uploads/2/2/6/3/22639912/422._-_2019._phyto_101_4_208-217adams_and_seiler_screeing_max_nut_tub_gross_in_nd__9-27-19.pdf

Dubovaya, E. V., Gruba, E. A., & Lyakh, V. A. Morphological and biochemical characteristics of underground organs in various **perennial species** of sunflower. *Russian, English Summary*. http://imk.zp.ua/bulletin/index.php?year=&number=&lang=en&menu=4&id=322

Meena, H. P., Sujatha, M., Pushpa, H. D., & Lai, J. J. (2020). Cytomorphological and molecular characterization of **inter-specific hybrid** between cultivated sunflower and Helianthus argophyllus. Journal of Environmental Biology, 41(1), 66-72. https://doi.org/10.22438/jeb/41/1/MRN-1116

Ayaz, U., Bashir, S., Awan, S. I., & Khan, M. F. Genetic variability, association and diversity study among the sunflower genotypes at seedling stage based on different morpho-physiological parameters under polyethylene glycol induced stress. http://ejggpb.com/uploads/49_pdf.pdf

Singh, V. K. Genetic architecture of quantitative traits and **aluminium tolerance** in sunflower (Helianthus annuus L.) (Doctoral dissertation, CCSHAU). http://krishikosh.egranth.ac.in/handle/1/5810136495

Goloshchapova, N.N., Goncharov, S.V., Savchenko, V.D., & Ivebor, M.V. (2019). Creation of lines for restoring fertility of sunflower pollen, resistant to the most common **downy mildew** races in the Krasnodar Territory. Oilseeds, (3 (179)). *Russian, English abstract.* https://cyberleninka.ru/article/n/sozdanie-liniy-vosstanoviteley-fertilnosti-pyltsy-podsolnechnika-ustoychivyh-k-naibolee-rasprostranennym-rasam-lozhnoy-muchnistoy

Akpınar, E., Hasançebİ, S., & Kaya, Y. (2019). Determination of **downy mildew** [Plasmopara halstedii (Farl.) Berl. and de Toni] resistant genotypes by using molecular markers in sunflower. Anadolu, 29(2), 140-153. *Turkish, English abstact* https://www.cabdirect.org/cabdirect/abstract/20203073633

Goncharov, S.V., & Goloshchapova, N.N. (2019). Sunflower durable **resistance to downy mildew.** Proceedings of the Kuban State Agrarian University, (80), 93-97. https://doi.org/10.21515/1999-1703-80-93-97

Qi, L. L., Ma, G. J., & Seiler, G. J. (2020). Registration of two confection sunflower germplasms, HA-DM5 and HA-DM6, resistant to sunflower **downy mildew.** Journal of Plant Registrations. https://doi.org/10.1002/plr2.20014

Guchetl, S.Z., Antonova, T.S., Araslanova, N.M., & Chelyustnikova, T.A. (2019). Inheritance of **resistance to race G broomrape** (Orobanche cumana Wallr.) at new sunflower lines. Proceedings of the Kuban State Agrarian University, (80), 104-108.*Russian, English abstract.* https://doi.org/10.21515/1999-1703-80-104-108

Guchetl, S.Z., Antonova, T.S., Araslanova, N.M., Chelyustnikova, T.A., et Pitinova, Yu.V. (2019). Genetic analysis of resistant to **race G of Orobanche cumana** Wallr. in F2 and BC1 of sunflower lines RGP1, RGP2, RGB, RGL1, RGL2. Масличные культуры, (4 (180)) (Russian, English abstract) https://www.elibrary.ru/item.asp?id=42393299

Cvejić S, Radanović A, Dedić B, Jocković M, Jocić S, Miladinović D (2020) Genetic and Genomic Tools in Sunflower Breeding for **Broomrape Resistance.** Genes 11(2), 152 https://doi.org/10.3390/genes11020152

Talukder, Z. I., Underwood, W., Ma, G., Seiler, G. J., Misar, C. G., Cai, X., & Qi, L. (2020). Genetic Dissection of **Phomopsis Stem Canker Resistance** in Cultivated Sunflower Using High Density SNP Linkage Map. International Journal of Molecular Sciences, 21(4), 1497. https://doi.org/10.3390/ijms21041497

Prasifka, J. R., & Hulke, B. S. (2020). Capitate Glandular Trichomes Fail to Provide Significant Resistance to **Banded Sunflower Moth** (Lepidoptera: Tortricidae). Environmental Entomology. https://doi.org/10.1093/ee/nvaa002

Whitted, Eric, "Evaluating the relationship of **pollinator attractiveness** to floret length in inbred sunflower (Helianthus annuus, Asteraceae) lines" (2019). Iowa State university, Creative Components. 438. https://lib.dr.iastate.edu/creativecomponents/438

Aurori A, & Rakosy-Tican E. (2019). A simple method for sunflower in vitro regeneration starting from meristematic tissues. Agronomy Series of Scientific Research/Lucrari Stiintifice Seria Agronomie, 61(2). http://agronomyjournal.usamv.ro/pdf/2019/issue_2/Art10.pdf

Demurin, Ya.N., & Rubanova, O.A. (2019). **Seed set of sunflower hybrids** in competitive variety test. Proceedings of the Kuban State Agrarian University, (80), 109-113 *Russian, English abstract.* .https://doi.org/10.21515/1999-1703-80-109-113

dos Santos, I. G., Carneiro, V. Q., de Castro Sant'anna, I., Cruz, C. D., de Carvalho, C. G. P., Borba Filho, A. B., & Alves, A. D. (2019). **Factor analysis and GGE** biplot for environmental and genotypic evaluation in sunflower trials. Functional Plant Breeding Journal, 1(2). https://www.alice.cnptia.embrapa.br/bitstream/doc/1120438/1/aSantosfactor.pdf

Bran, A., Ion, V., Joiţa-Păcureanu, M., Prodan, T., Rîşnoveanu, L., Dan, M., & Sava, E. Sunflower hybrids with high genetic potential for the seed yield in different environmental conditions. http://www.incda-fundulea.ro/rar/nr37/rar37.28.pdf

Clapco, S., Gisca, I., Cucereavii, A., Duca, M. (2019). Analysis of yield and yield related traits in some sunflower (*H. annuus* L.) hybrids under conditions of the Republic of Moldova. *The Scientific Papers. Series A. Agronomy* 8(2): 248-258. http://agronomyjournal.usamv.ro/index.php/scientific-papers/past-issues?id=961

PATHOLOGY / CROP PROTECTION

Korejo, F., Urooj, F., Farhat, H., Moin, S., Sultana, V., & Rahman, A. (2019). Effect of soil amendment with Launaea Nudicaulis L. on **biocontrol** potential of endophytic fluorescent **pseudomonas** against **root rot disease** of sunflower. Int. J. Biol. Res, 7(1), 33-38. REFERENCE

Moin, S., Ali, S. A., Hasan, K. A., Tariq, A., Sultana, V., Ara, J., & Ehteshamul-Haque, S. (2020). Managing the **root rot disease** of sunflower with endophytic fluorescent **Pseudomonas** associated with healthy plants. Crop Protection, 130, 105066. https://doi.org/10.1016/j.cropro.2019.105066

Addrah, M. E., Zhang, Y., Zhang, J., Liu, L., Zhou, H., Chen, W., & Zhao, J. (2020). Fungicide Treatments to Control **Seed-borne Fungi** of Sunflower Seeds. Pathogens, 9(1), 29. https://doi.org/10.3390/pathogens9010029

El_Komy, M.H., Hassouna, M.G., Abou-Taleb, E.M. et al. A mixture of Azotobacter, Azospirillum, and Klebsiella strains improves **root-rot disease** complex management and promotes growth in sunflowers in calcareous soil. Eur J Plant Pathol 156, 713–726 (2020). https://doi.org/10.1007/s10658-019-01921-w

Ye, X., Zhang, M., Zhang, M., & Ma, Y. (2020). Assessing the Performance of Maize (Zea mays L.) as **Trap Crops** for the Management of **Sunflower Broomrape** (Orobanche cumana Wallr.). Agronomy, 10(1), 100. https://doi.org/10.3390/agronomy10010100

Duca, M. (2019). Aspects related the resistance mechanisms of the sunflower against **broomrape.** Akademos, 4, *Romanian, English Summary*, http://akademos.asm.md/files/Akademos%204_2019_pp34-43.pdf

Tabara, O. (2020). Estimation of the physiological and molecular changes of the defensive response in the host-parasite system *(Helianthus annuus* L. - ***Orobanche cumana*** Wallr.), PhD thesis in Biological Sciences, Chisinau, *Romanian, English Summary*, http://www.cnaa.md/files/theses/2020/55627/olesea_tabara_thesis.pdf

Spring O., Gómez-Zeledón J. (2020): Influence of oxathiapiprolin on preinfectional and early infection stages of ***Plasmopara halstedii***, downy mildew of the sunflower. Plant Protect. Sci., 56: 83-91. https://doi.org/10.17221/112/2019-PPS

Cer, C., & Morca, A. U. (2020). First report of ***Athelia rolfsii*** (***Sclerotium rolfsii*** Sacc.) causing collar rot disease on sunflower in Turkey. Journal of Plant Pathology, 1-1. https://doi.org/10.1007/s42161-020-00512-7

Araslanova, N.M., Ivebor, M.V., Antonova, T.S., et Khatnyansky, V.I. (2019). Race identification of isolates of ***Puccinia helianthin Schwein***. That affect sunflower in some region some Russia. Масличные культуры, (4 (180)) *(Russian, English abstract)* https://www.elibrary.ru/item.asp?id=42393312

Gad, S. B., & Osman, M. A. (2019). Preliminary evaluation of the effect of three rates of ground leaves and fruits powders of Myristica fragrans on **Meloidogyne incognita** infecting sunflower in vivo. https://doi.org/10.5897/JEN2019.0235

Pachkin, A.A., Popov, I. B., Kremneva, O. Yu., & Zelensky, A.A. (2019). Application of **light traps** for capture of **insects** in agrocenosis of sunflower. Advances in Science and Technology AIC, 33 (12). *Russian English abstract*. https://cyberleninka.ru/article/n/primenenie-svetolovushek-dlya-otlova-nasekomyh-v-agrotsenoze-podsolnechnika

Teodoru, A., Chiriloaie-Palade, A., Manole, D., Manole, T., & Chireceanu, C. (2019). **Insect fauna** associated with sunflower cultivated in system with black locust windbreaks. Romanian Journal for Plant Protection,12.
http://www.rjpp.ro/images/Archive/2019/10.%20INSECT%20FAUNA%20(full%20text).pdf

Gvozdenac, S., Ovuka, J., Miklič, V., Cvejić, S., Tanasković, S., Bursić, V., & Sedlar, A. (2019). The effect of seed treatments on **wireworm (Elateridae)** performance, damages and yield traits of sunflower (Helianthus annuus L.). Journal of Central European Agriculture, 20(4), 1188-1200. https://doi.org//10.5513/JCEA01/20.4.2133

Travlos, I., Papastylianou, P., Alexos, A., Kanatas, P., Bilalis, D., Tsekoura, A., Cheimona, N. (2019). Changes of **Weed Flora** due to Nitrogen Addition in Sunflower. Notulae Botanicae Horti Agrobotanici Cluj-Napoca, 47(4). https://doi.org/10.15835/nbha47411744

Vega, T., Gil, M., Martin, G., Moschen, S., Picardi, L., & Nestares, G. Stress response and **detoxification** mechanisms involved in non-target site **herbicide resistance** in sunflower. Crop Science. https://doi.org/10.1002/csc2.20138

Delchev, G. (2019). Efficacy of **herbicides** and their tank mixures at sunflower (Helianthus annuus L.). Agronomy Series of Scientific Research/Lucrari Stiintifice Seria Agronomie, 61(2). http://agronomyjournal.usamv.ro/pdf/2019/issue_2/Art11.pdf

Mouillon, P., Caldwell, B. A., Cordeau, S., Pelzer, C. J., Wayman, S., & Ryan, M. R. (2020). Crop density affects **weed suppression** in organically managed Sunflower. Agronomy Journal, 112(1), 450-457. https://doi.org/10.1002/agj2.20059

AGRONOMY

Bashir, S., Iqbal, A., & Hasnain, S. (2020). Comparative analysis of **endophytic bacterial diversity** between two varieties of sunflower Helianthus annuus with their PGP evaluation. Saudi Journal of Biological Sciences, 27(2), 720-726. https://doi.org/10.1016/j.sjbs.2019.12.010

Mattern, Mackenzie, "**Sunflower Pollinators** in South Dakota: An Evaluation of Species Composition, Abundance and Influence on Yield" (2019). Electronic Theses and Dissertations. 3642. https://openprairie.sdstate.edu/etd/3642

Eltarabily, M. G., Burke, J. M., & Bali, K. M. (2020). Impact of **Deficit Irrigation** on Shallow Saline Groundwater Contribution and Sunflower Productivity in the Imperial Valley, California. Water, 12(2), 571. https://doi.org/10.3390/w12020571

Morsali Aghajari, F., Darvishzadeh, R., Hatami Maleki, H., Gholinezhad, E., & Kalantar, A. (2019). Selection of **salinity tolerant** lines of sunflower using some **physiological characteristics**. Journal of Crop Breeding, 11(31), 185-195.(Persian, English abstract) http://jcb.sanru.ac.ir/article-1-899-en.html

Aziz, A., Ashraf, M., Sikandar, S., Asif, M., Akhtar, N., Shahzad, S. M., ... & Babar, B. H. (2019). Optimizing **sulfur for improving salt tolerance** of sunflower (Helianthus annuus L.). *Soil & Environment*, *38*(2). Link Https://www.doi.org/10.25252/SE/19/71647

Zamani, S., Naderi, M. R., Soleymani, A., Nasiri, B. M., & Miransari, M. (2020). Sunflower (Helianthus annuus L.) biochemical properties and seed components affected by **potassium fertilization under drought conditions.** Ecotoxicology and Environmental Safety, 190, 110017. https://doi.org/10.1016/j.ecoenv.2019.110017

Avetisyan, D., & Cvetanova, G. **Water status assessment** in maize and sunflower crops using **Sentinel-2** multispectral data. http://www.space.bas.bg/SES/archive/SES%202019_DOKLADI/3_Remote%20Sensing/4_Avetisyan.pdf

Barros, H. M. M., Gheyi, H. R., Travassos, K. D., Dias, N. da S., Leite, M. de S., Barros, M. K. L. V., & Rivera, R. C.-. (2019). Sunflower growth **irrigated with sewage effluent** under organic fertilization. *Bioscience Journal*, *35*(6). https://doi.org/10.14393/BJ-v35n6a2019-42227

Xiao-Bo, L., Ya-Li, Y., Pu-Te, W., Shi-Kun, S., Yu-Bao, W., Xue-Rui, G., & Jing, L. An improved method for calculating regional **crop water footprint** based on hydrological process analysis. https://d-nb.info/1161035877/34

Echarte, L., Echarte, M. M., Cerrudo, D., Gonzalez, V. H., Alfonso, C., Cambareri, M., ... & Maggiora, A. D. (2020). Sunflower evapotranspiration and **water use efficiency in response to plant density**. Crop Science, 60(1), 357-366. https://doi.org/10.1002/csc2.20001

ZOHRY, A. E. H., Samiha, O. U. D. A., & ABDEL-WAHAB, T. (2020). Sustainable intensive cropping to **reduce irrigation-induced** erosion: **Intercropping** systems under surface irrigation practice. Moroccan Journal of Agricultural Sciences, 1(2). https://www.techagro.org/index.php/MJAS/article/view/832

Xue, J., Huo, Z., White, I., Kisekka, I., Sheng, Z., Wang, S., Wang, C., Huang, G., and Xu, X.: A novel regional **irrigation water productivity model** for complex cropping patterns in arid regions coupling soil water and salinity dynamics, irrigation and drainage, and shallow groundwater movement, Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2019-359 , in review, 2019.

Ceran, R., & Topak, R. (2020). **Economic analysis for groundwater-irrigated** oil sunflower farming in Konya region. Selcuk Journal of Agriculture and Food Sciences, 34(1), 7-13. http://sjafs.selcuk.edu.tr/sjafs/article/view/1143

BIOLAN, I., DRĂGAN, I., CONSTANTIN, N., & POPESCU, C. The technology of the **furrow diker** at sunflower. http://www.fluidas.ro/hervex/proceedings2019/pp.217-222.pdf

de Oliveira Sousa, V. F., dos Santos, G. L., Maia, J. M., Meneses, C. H. S. G., Rodrigues, M. H. B. S., & Dias, T. J. (2019). **Edaphoclimatic Conditions** of the Brazilian Semi-Arid Region Affect the Productivity and **Composition of Sunflower Oil.** Journal of Agricultural Studies, 7(4), 309-322. http://www.macrothink.org/journal/index.php/jas/article/view/15580/12333

Hilwa, D., Marajan, W. A., & Idris, B. E. M. (2019). Influence of Sowing Date On Growth and **Yield Components** of Sunflower (helianthus Annuus L.) in Semi-arid Zone. Journal of Agronomy Research, 2(2), 36. https://doi.org/10.14302/issn.2639-3166.jar-19-2961

Gurkan, H., Ozgen, Y., Bayraktar, N., Bulut, H., & Yildiz, M. (2020). Possible Impacts of **Climate Change on Sunflower Yield** in Turkey. In Sunflower. IntechOpen. https://doi.org/10.5772/intechopen.91062

Khezrinejad, N., Khodakaramian, G., & Shahryari, F. (2019). Characterization of **potential plant growth-promoting rhizobacteria** isolated from sunflower (Helianthus annuus L.) in Iran. Biologia Futura, 70(4), 268-277. https://akademiai.com/doi/full/10.1556/019.70.2019.30

Koutroubas, S.D.; Damalas, C.A. Physiology and Yield of **Confection Sunflower** under Different Application Schemes of **Mepiquat Chloride**. Agriculture 2020, 10, 15. https://doi.org/10.3390/agriculture10010015

Seleem E.A, Taha Z.K (2019). Enhancement of Biometrics, Anatomical Characteristics and Fatty Acids Profile of Sunflower Plants by **Foliar Application with Yeast Extract and Salicylic Acid**. Middle East J, 8(4), 1271-1280. http://www.curresweb.com/mejar/mejar/2019/mejar.2019.8.4.29.pdf

Karami, M., Kazemeini, S. A., Zarei, M., & Alinia, M. (2020). Interaction Effect of Arbuscular Mycorrhiza and Redroot Pigweed (Amaranthus retroflexus L.) on Growth and Yield of Sunflower under Water Stress Conditions. Isfahan University of Technology-Journal of Crop Production and Processing, 9(4), 1-15. *Persian, English abstract.* https://www.pakjas.com.pk/papers/3137.pdf

Vasily G. Vasin, Denis V. Potapov, Lyudmila V. Kiseleva, Ramis N. Saniev and Mikhail A. Zhizhin. The formation of **agrophytocenoses of sunflower hybrids** when using fertilizers in the Middle Volga forest-steppe. BIO Web Conf., 17 (2020) 00006. https://doi.org/10.1051/bioconf/20201700006

Startsev, A. S., Demin, E. E., Danilin, A. V., Vasilyev, O. A., & Terentyev, A. G. (2020, January). Results of the production test of **sunflower harvesting** attachment with an **auger reel**. In IOP Conference Series: Earth and Environmental Science (Vol. 433, No. 1, p. 012006). IOP Publishing. https://iopscience.iop.org/article/10.1088/1755-1315/433/1/012006/pdf

Startsev, A. S., Makarov, S. A., Nesterov, E. S., Kazakov, Y. F., & Terentyev, A. G. (2020, January). Comparative evaluation of the operation of a combine harvester with an additional sieve with adjustable holes for **sunflower harvesting**. In IOP Conference Series: Earth and Environmental Science (Vol. 433, No. 1, p. 012007). IOP Publishing. https://iopscience.iop.org/article/10.1088/1755-1315/433/1/012007/pdf

F. Fuentes-Peñailillo, S. Ortega-Farías, D. d. l. Fuente-Sáiz and M. Rivera, "**Digital count of Sunflower plants** at emergence from very low altitude using **UAV images**," 2019 IEEE CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), Valparaiso, Chile, 2019, pp. 1-5. https://doi.org/10.1109/CHILECON47746.2019.8988024

PHYSIOLOGY

Saux, M., Ponnaiah, M., Langlade, N., Zanchetta, C., Balliau, T., El-Maarouf-Bouteau, H., & Bailly, C. (2020). A multiscale approach reveals regulatory players of **water stress responses in seeds during germination**. Plant, Cell & Environment. https://doi.org/10.1111/pce.13731

Jones-Baumgardt, C., Llewellyn, D., & Zheng, Y. (2020). Different **Microgreen Genotypes** Have Unique Growth and Yield Responses to Intensity of Supplemental PAR from Light-emitting Diodes during Winter **Greenhouse Production** in Southern Ontario, Canada. HortScience, 55(2), 156-163. https://doi.org/10.21273/HORTSCI14478-19

López-Pereira, M., Connor, D. J., & Hall, A. J. (2020). Intercepted **radiation and radiation-use efficiency** in sunflower crops grown at conventional and wide inter-**row spacings**: Measurements and modeled estimates of intercepted radiation. Field Crops Research, 246, 107684. https://doi.org/10.1016/j.fcr.2019.107684

Mangieri, M.A., Hall, A.J. & Chimenti, C.A. Cytokinin dynamics in xylem sap and leaves of fruiting and de-fruited sunflower hybrids of contrasting post-anthesis canopy senescence patterns during flowering and grain-filling. Plant Soil (2020). https://doi.org/10.1007/s11104-019-04412-3

Richardson, F., Jordan, G. J., & Brodribb, T. J. (2020). Leaf hydraulic conductance is linked to leaf symmetry in bifacial, amphistomatic leaves of sunflower. Journal of Experimental Botany. https://doi.org/10.1093/jxb/eraa035

Patel, S. S., Kumar, B. A., Singh, M. D., Alagundagi, S. C., Savalgi, V. P., & Rabinal, M. K. (2019). Foliar Application of Green Synthesized Zinc Sulphide and Zinc Oxide Nano Particles Enhances Growth, Root Attributes, Yield and Oil Quality of Sunflower (Helianthus Annuus L.). https://pdfs.semanticscholar.org/ba7a/4efb9521162b4f0710bb4a48598584c1946f.pdf

Jan, A. U., & Hadi, F. (2019). Physiological and Biochemical Characteristics of **Salt Stress Tolerance** in Selected Varieties of Sunflower Under Various Treatments of Potassium, Zinc and Gibberellic Acid. Journal of Stress Physiology & Biochemistry, 15(4). https://search.proquest.com/openview/05b4fce5d60098c5b3ae5b57b42274a8/1?pq-origsite=gscholar&cbl=4431314

Noreen, S., Faiz, S., Akhter, M. S., & Shah, K. H. (2019). Influence of foliar application of osmoprotectants to ameliorate **salt stress** in sunflower (Helianthus annuus L.). Sarhad Journal of Agriculture, 35(4), 1316-1325. http://dx.doi.org/10.17582/journal.sja/2019/35.4.1316.1325

ARSLAN, Ö., NALÇAİYİ, A. B., ERDAL, Ş., PEKCAN, V., KAYA, Y., ÇİÇEK, N., & EKMEKÇİ, Y. (2020). Special issue in honour of Prof. Reto J. Strasser–Analysis of drought response of sunflower inbred lines by chlorophyll a fluorescence induction kinetics. Phosynthetica head of print https://doi.org/10.32615/ps.2019.171

Bourioug, M., Ezzaza, K., Bouabid, R. et al. Influence of hydro- and osmo-priming on sunflower seeds to break dormancy and improve crop performance under water stress. Environ Sci Pollut Res (2020). https://doi.org/10.1007/s11356-020-07893-3

Rasheed, R., Yasmeen, H., Hussain, I., Iqbal, M., Ashraf, M. A., & Parveen, A. (2020). Exogenously applied 5-aminolevulinic acid modulates growth, secondary metabolism and oxidative defense in sunflower under water deficit stress. Physiology and Molecular Biology of Plants, 1-11. https://doi.org/10.1007/s12298-019-00756-3

Farid, M., Ali, S., Rizwan, M., Yasmeen, T., Arif, M. S., Riaz, M., ... & Ayub, M. A. (2020). Combined effects of citric acid and 5-Aminolevulinic acid in mitigatin chromium toxicity in sunflower (*Helianthus*

annuus L.) grown in Cr spiked soil. Pakistan Journal of Agricultural Sciences, 57(2). https://www.pakjas.com.pk/papers/3137.pdf

Guo, K., Mellinger, P., Doan, V., Allen, J., Pringle, R. N., & Jammes, F. (2020). Identification of Novel Regulators of Plant Transpiration by Large-Scale Thermal Imaging Screening in Helianthus Annuus. Journal of visualized experiments: JoVE, (155). https://doi.org/10.3791/60535

EKMEKÇİ, Y., ERDAL, Ş. Ç., NALÇAİYİ, A. S. B., & ÇİÇEK, N. (2020). Acquisition of boron tolerance by salt pretreatment in two sunflower cultivars. Turkish Journal of Botany, 44(2), 153-166.http://journals.tubitak.gov.tr/botany/issues/bot-20-44-2/bot-44-2-4-1910-26.pdf

Davodi, S., Mir Shekari, B., Mir Mahmoodi, T., Farahvash, F., & Yazdan Seta, S. (2019). Effect of seed priming with salicylic acid and ascorbic acid on antioxidant activity, grain yield and oil content of sunflower (Helianthus annuus L.) under normal and water deficit conditions. University of Birjand. https://dx.doi.org/10.22077/escs.2019.1497.1333

PROCESS AND PRODUCTS

Kostić, A. Ž., Milinčić, D. D., Gašić, U. M., Nedić, N., Stanojević, S. P., Tešić, Ž. L., & Pešić, M. B. (2019). Supplementary data for article: Kostić, AŽ; Milinčić, DD; Gašić, UM; Nedić, N.; Stanojević, SP; Tešić, ŽL; Pešić, MB Polyphenolic Profile and Antioxidant Properties of **Bee-Collected Pollen** from Sunflower (Helianthus Annuus L.) Plant. LWT 2019, 112. https://doi.org/10.1016/j.lwt.2019.06.011

Kostić A.Ž. et al. (2020) Content and Nutritional Value of Selected Biogenic Elements in Monofloral **Sunflower Bee-Collected Pollen** from Serbia. In: Brka M., Omanović-Mikličanin E., Karić L., Falan V., Toroman A. (eds) 30th Scientific-Experts Conference of Agriculture and Food Industry. AgriConf 2019. IFMBE Proceedings, vol 78. Springer, Cham. https://doi.org/10.1007/978-3-030-40049-1_27

Demydova, A., Nosenko, T., Shemanska, E., & Molchenko, S. (2019). Conditions for the obtaining of **tocopherols** from deodorizing distillates of sunflower oil. Ukrainian Journal of Food Science, 198. http://www.ukrfoodscience.ho.ua/Archiv/Ukr%20Jour%20Food%20Sci%20V%207%20I%202.pdf#page=18

Adesina S.A. Effects of conventional food processing methods on the mineral and **anti-nutrient composition** of sunflower (Helianthus annuus) Seeds. https://www.ajol.info/index.php/afsjg/article/view/193114

KOTTAPALLI, B., NGUYEN, S. P., DAWSON, K., CASULLI, K., KNOCKENHAUER, C., & SCHAFFNER, D. W. (2020). Evaluating the **Risk of Salmonellosis** from Dry **Roasted Sunflower Seeds**. Journal of Food Protection, 83(1), 17-27. https://doi.org/10.4315/0362-028X.JFP-19-171

Ortiz-Hernandez, A. A., Araiza-Esquivel, M., Delgadillo-Ruiz, L., Ortega-Sigala, J. J., Durán-Muñoz, H. A., Mendez-Garcia, V. H., ... & Vega-Carrillo, H. R. (2020). Physical characterization of sunflower seeds dehydrated by using electromagnetic induction and low-pressure system. Innovative Food Science & Emerging Technologies, 60, 102285. https://doi.org/10.1016/j.ifset.2019.102285

Bhatnagar, R. (2020). Formation of **Maillard reaction** products and chlorogenic acid-quinone induced green pigments in **gluten-free pretzels** made using sunflower flour. Master's thesis, Chapman University. https://doi.org/10.36837/chapman.000122

Herrmann, K. R., Ruff, A. J., & Schwaneberg, U. (2020). **Phytase-based phosphorus recovery process** for 20 distinct press cakes. ACS Sustainable Chemistry & Engineering. https://doi.org/10.1021/acssuschemeng.9b07433

Slabi, S. A., Mathe, C., Basselin, M., Framboisier, X., Ndiaye, M., Galet, O., & Kapel, R. (2020). Multi-objective optimization of **solid/liquid extraction of total sunflower proteins** from cold press meal. Food Chemistry, 317, 126423. https://doi.org/10.1016/j.foodchem.2020.126423 / also available on researchgate.com

Dabbour, M., He, R., Mintah, B., Golly, M. K., & Ma, H. (2020). Ultrasound **pretreatment of sunflower protein**: Impact on enzymolysis, ACE-inhibition activity, and structure characterization. Journal of Food Processing and Preservation, e14398. https://ifst.onlinelibrary.wiley.com/doi/abs/10.1111/jfpp.14398

Tessier, R., Khodorova, N., Calvez, J., Kapel, R., Quinsac, A., Piedcoq, J., ... & Gaudichon, C. (2020). 15N and ²H Intrinsic Labeling Demonstrate That Real **Digestibility** in Rats of Proteins and Amino Acids from **Sunflower Protein Isolate** Is Almost as High as That of Goat Whey. The Journal of Nutrition, 150(3), 450-457. https://doi.org/10.1093/jn/nxz279

Wissink, L., van Blokland, W. B., Osterholt, J., van Royen, J., & Schott, D. (2019). **Reducing sunflower oil production** disturbances. In 13th International Conference on Bulk Materials Storage, Handling and Transportation (ICBMH 2019) (p. 33). Engineers Australia. https://search.informit.com.au/documentSummary;dn=808490327244223;res=IELENG

Shorstkii, I., & Khudyakov, D. (2020). Influence of pulsed electrical discharge, hydrostatic pressure and temperature on rheological properties of sunflower cake during **oil pressing**. Heliyon, 6(1), e03046. https://doi.org/10.1016/j.heliyon.2019.e03046

Thesis: Njiku, A. R. (2019). Determinants of Technical Efficiency and Financial Sustainability of **Small-Scale Sunflower Oil Processing Firms** in Tanzania (Doctoral dissertation, Mzumbe University). http://scholar.mzumbe.ac.tz/handle/11192/2824

Luan, Z., Li, C., Ding, S., Wei, M., & Yang, Y. (2020, January). **Sunflower seed sorting** based on Convolutional Neural Network. In Eleventh International Conference on Graphics and Image Processing (ICGIP 2019) (Vol. 11373, p. 113731K). International Society for Optics and Photonics. https://doi.org/10.1117/12.2557789

Manmai, N., Unpaprom, Y. & Ramaraj, R. **Bioethanol production from sunflower stalk**: application of chemical and biological pretreatments by response surface methodology (RSM). Biomass Conv. Bioref. (2020). https://doi.org/10.1007/s13399-020-00602-7

Havrysh, V.; Kalinichenko, A.; Mentel, G.; Mentel, U.; Vasbieva, D.G. **Husk Energy Supply Systems** for Sunflower Oil Mills. Energies 2020, 13, 361. https://doi.org/10.3390/en13020361

Melnichuk, M.M., & Prutenskaya, E.A. (2019). Development of complex **processing of sunflower husks**. *Russian, English abstract.* https://www.elibrary.ru/item.asp?id=41494320

Verdier, T., Montibus, M., Balthazar, L., Magniont, C., Evon, P., & Bertron, A. (2019). Development of **sunflower-based insulation materials** coated with glycerol esters to prevent microbial growth. https://oatao.univ-toulouse.fr/24117/

Calero, J., Luna, D., Luna, C., Bautista, F. M., Romero, A. A., Posadillo, A., & Estevez, R. (2020). Optimization by response surface methodology of the reaction conditions in 1, 3-selective **transesterification** of sunflower oil, by using CaO as heterogeneous catalyst. Molecular Catalysis, 484, 110804. https://doi.org/10.1016/j.mcat.2020.110804

Muñoz-Almagro, N., Prodanov, M., Wilde, P. J., Villamiel, M., & Montilla, A. (2020). Obtainment and characterisation of **pectin** from sunflower heads purified by membrane separation techniques. Food Chemistry, 126476. https://doi.org/10.1016/j.foodchem.2020.126476

Peng, X., Yang, G., Shi, Y. et al. Box–Behnken design based statistical modeling for the extraction and physicochemical properties of **pectin** from sunflower heads and the comparison with commercial low-methoxyl pectin. Sci Rep 10, 3595 (2020). https://doi.org/10.1038/s41598-020-60339-1

Thesis: Almagro, N. M. (2019). Innovative approaches in the production of low-glycemic index carbohydrates: structural and functional evaluation of **pectin** obtained from sunflower by-products (Doctoral dissertation, Universidad Autónoma de Madrid). https://dialnet.unirioja.es/servlet/tesis?codigo=259351

Kim, J. W., Lee, J., & Nyachoti, C. M. (2020). Net Energy of **high-protein sunflower meal** fed to growing pigs and effect of dietary phosphorus on measured values of NE. Journal of Animal Science, 98(1), 1-8. https://doi.org/10.1093/jas/skz387

Baghban-Kanani, P., Janmohammadi, H., & Ostadrahimi, A. R. (2019). Effect of Different Levels of Sunflower Meal and Niacin on Performance, Biochemical Parameters, Antioxidant Status, and Egg Yolk Cholesterol of **Laying Hens**. Iranian Journal of Applied Animal Science, 9(4), 737-746. http://www.iaujournals.ir/article_669421.html

Chobanova, S. (2019). Effects of compound **poultry feed** with different content of high-protein sunflower meal on growth performance of broiler chickens. Bulgarian Journal of Agricultural Science, 25, 3. https://www.agrojournal.org/25/03s-15.pdf

Kulikov, M.A., Glinushkin, A.P., Startsev, V.I., Kvitko, A.V., Aisuvakova, T.P., & Kislov, A.V. (2019). Prospects for the cultivation of **sunflower for silage** in the non-Chernozem zone of the Russian Federation. *Russian, English abstract.* Advances in Science and Technology AIC, 33 (12). https://doi.org/10.24411/0235-2451-2019-11210

ECONOMY AND MARKETS

Matkovski, B., Jeremić, M., Đokić, D., & Jurjević, Ž. **Serbia** oil crops export potentials. https://www.ifvcns.rs/wp-content/uploads/2019/12/Matkovski-Online.pdf

Gumata N., Ndou E. (2019) What Is the Role of **Trade Liberalisation and Food Commodity Price** Booms in the Agricultural Sector? Implications for the Export-Led Growth Strategy. In: Accelerated Land Reform, Mining, Growth, Unemployment and Inequality in South Africa. Palgrave Macmillan, Cham https://doi.org/10.1007/978-3-030-30884-1_20

POPESCU, A., STOIAN, E., & ȘERBAN, V. (2019). **OIL SEEDS CROPS** CULTIVATED AREA AND PRODUCTION **IN THE EU-28**-TRENDS AND CORRELATIONS, 2008-2018. Scientific Papers: Management, Economic Engineering in Agriculture & Rural Development, 19(4). http://managementjournal.usamv.ro/pdf/vol.19_4/Art37.pdf

IN HELIA: Ahead of prints: *see https://www.degruyter.com/view/j/helia (free access for ISA members through http://isasunflower.org/ and login to Members Space. Helia Vol 42 Issue 71*

Gerald J. Seiler. **Genetic Resources** of the Sunflower Crop Wild Relatives for Resistance to Sunflower Broomrape

V. A. Lyakh, N. I. Kostyuchenko and I. A. Shevchenko. **Broomrape** (*Orobanche cumana Wallr.)* can Influence the Microbial Cenosis in Sunflower Rhizosphere

S. Guchetl, T. Antonova, N. Araslanova and T. Tchelyustnikova. Sunflower Resistance to Race G of **Broomrape (***Orobanche Cumana Wallr.)* In the Russian Federation: the Development of the Lines and the Study of Inheritance

Ana Laura Martínez, Freda Anderson, Facundo Quiroz, Antonio Garayalde, Ignacio Erreguerena, Lorena Armando, Norma Huguet and Alicia Carrera. Methodologies for ***Plasmopara halstedii*** Research

Vikrant Tyagi and S. K. Dhillon. **Water use** Efficient Sunflower Hybrids having Diverse Cytoplasmic Background

K.V. Vedmedeva. **Inheritance of Top Branching** in Sunflower (*Helianthus Annuus L*.) Collection Samples

V.M. Popov and T.A. Dolhova. A New Source of Yellow Coloration of the Sunflower Plant Top and Its Importance in Breeding

A. I. Soroka and V. A. Lyakh. Polygenic Inheritance of Bracts Number in Sunflower

Soolmaz Ahmadian, Sattar Tahmasebi Enferadi and Abbas Alemzadeh. Assessment of **Genetic Diversity** of Cultivated Sunflower in Terms of Oil Content, Fatty Acid Compositions and Seed Traits

Mojtaba Nouraein, Raheleh Bakhtiarzadeh, Mohsen Janmohammadi, Maryam Mohammadzadeh and Naser Sabaghnia. The Effects of Micronutrient and Organic Fertilizers on Yield and Growth Characteristics of Sunflower (*Helianthus annuus L*.)

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