

## The HelEx project presents promising advances for more tolerant sunflowers.

From October 15 to 17, 2024, JOANNEUM RESEARCH Forschungsgesellschaft mbH hosted the second HelEx project annual meeting in Graz, Austria. This project, supported by the European Union's Horizon Europe program, brings together 18 partners from 9 countries, including research institutes, SMEs, and industrial players, to develop new sunflower varieties more tolerant to high temperatures and drought while maintaining production quality and biodiversity services.



During this second general meeting, researchers presented the results achieved over the past year, highlighting progress in integrating genomic traits from wild *Helianthus* species and gathering data to measure the impact of such sunflower species on biodiversity, agricultural landscape, and economy. The first results are starting, especially regarding the production and screening of climate-smart sunflowers in Spain, Romania and France. Over 30 genes linked to pollinator attractiveness, protein content, or seed quality and adapted to extremely hot and dry US locations are identified. These genes will be tested and validated to improve commercial sunflower seeds within the next two years.

HelEx scientists integrate their work with top European projects [Booster](#), [Tolerate](#), and [Agri4pol](#) that presented their work and identified synergies to share ongoing results and reach EU citizens. In the same line, the local researcher Prof. Dr. Thomas Schmickl, from Artificial Life Lab of the Institute of Biology Karl-Franzens University Graz introduced his work and develop solutions to mitigate honeybee decline using robot-bee interactions. Other agricultural adaptation to mitigate climate change impact, reduce phytosanitary treatments and produce local

low-carbon energy was presented at the Haidegg research center with agrivoltaism technologies, such as solar panels protecting pome orchards.

In addition to the scientific presentations, constructive exchanges took place through various collaborative workshops to prepare the next season 2025 in Chile and Europe and reinforce links between research teams and industrial partners.

This project emerged in 2023 in an ecological context where climate change has already significantly impacted sunflower seed production and quality, with potential yield reductions of -20% to -50% depending on the region in Europe (1).

In a tense geopolitical context, with half of the world's production in Ukraine and Russia (2), production has been growing steadily for 20 years (3% per year on average) to reach 30 million ha in Europe (3). This project proposes breakthroughs to accelerate innovation for this crop of the future and meet the challenges of more resilient and ecological agriculture while contributing to reducing the European Union's economic dependence on imports of vegetable oils and proteins in favor of sustainable alternatives.

1 Moriondo et al., 2010 Mitigation and Adaptation Strategies for Global Change. Impact and adaptation opportunities for European agriculture in response to climatic change and variability.

2 <https://chambres-agriculture.fr/actualites/toutes-les-actualites/detail-de-lactualite/actualites/le-tournesol-en-plein-essor/>

3 FAO Stats 2021 estimated data (consultation Sept. 2023)

### **The HelEx project in brief:**

*HelEx is a research and innovation project supported by the EU's Horizon Europe funding program, lasting four years (2023-2027).*

*This 5.5 million euro project is helping to create new sunflower varieties which will be more resistant to drought and extreme climates by using extremophilic Helianthus varieties and applying new plant breeding techniques (NBT). The aim is also to maintain, for these varieties, a high level of ecosystem services (resources for pollinators, biodiversity, etc.). Finally, a significant focus is placed on analyzing these new varieties' environmental and socio-economic impacts.*

*The consortium comprises 18 partners, including 4 SMEs, 3 industrial partners and research institutes from 7 European countries, Canada and the United States of America.*

*More information on [HelExProject.eu](https://HelExProject.eu)*

## **Partners :**

### **Research institutes**

- INSTITUT NATIONAL DE RECHERCHE POUR L'AGRICULTURE, L'ALIMENTATION ET L'ENVIRONNEMENT – France
- INSTITUT NATIONAL POLYTECHNIQUE DE TOULOUSE – France
- INSTITUT ZA RATARSTVO I POVRTARSTVO – Serbia
- STICHTING WAGENINGEN RESEARCH – Netherlands
- JULIUS KÜHN-INSTITUT - BUNDESFORSCHUNGSINSTITUT FÜR KULTURPFLANZEN (JKI) – Germany
- JOANNEUM RESEARCH FORSCHUNGSGESELLSCHAFT MBH – Austria
- FH KARNTEN – GEMEINNUETZIGE GmbH – Austria
- ÉCOLE NATIONALE SUPÉRIEURE DE FORMATION DE L'ENSEIGNEMENT AGRICOLE – France
- UGA RESEARCH FOUNDATION INC NON PROFIT CORP – U.S.A.



- UNIVERSITY OF BRITISH COLUMBIA – Canada
- UC Berkeley, Department of Plant and Microbial Biology – U.S.A

**SME**

- NAPIFERYN BIOTECH SP ZOO – Poland
- RN20 – MESH COMMUNICATION – France

- Innolea S.A.S. – France
- INRAE TRANSFERT SAS – France
- HIPHEN – France

**Industrial partners**

- MAS Seeds Romania – Romania
- SYNGENTA FRANCE SAS – France

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