

AVENA¹
BARLEY²
MAIZE³
WHEAT⁴
WORKING GROUP
REPORTS 2024–2025

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ECPGR Working Group Chairs Meeting

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Major achievements and outcomes

Avena

- Updated morphological descriptor guide for oats is being prepared

Barley

- >130,000 accessions in EURISCO, >16,000 part of AEGIS, 50 *in situ* populations in EURISCO

Maize

- Phenotypic data collected within the EVA Maize Network

Wheat

- Genetic resources evaluated and selected for their resistance loci
- Inventory of wheat landraces cultivation sites
- Guide for good practices for on-farm conservation and sustainable use of wheat landraces.



Funded projects overview

Avena

- Umorpheas (Updated MORPHological dEscriptors for Avena Species) (2021-2026) **€15,000** (officially initiated in March 2022)

Maize

- MALANIRS (MAize LAndraces traits phenomic prediction using Near InfraRed Spectra) (2024-2027) **€29,920**

Wheat

- BiDifferent (Chances for the conservation and re-cultivation of central European club wheat (Binkel) through a nutritional and genetic differentiation towards other wheat species) (2022-2025) **€ 37,180** (with On-farm WG)
- INWHEATORY (Inventorying wheat on-farm diversity) (2024-2025) **€ 30,250** (with on-farm WG)



Avena Umorpheas-Partners

Tim Langdon
Aberystwyth University
Institute of Biological, Environmental and Rural Sciences
United Kingdom

Peter Hozlár
National Agricultural and Food Centre
Research Institute of Plant Production, Research Breeding Station
Slovakia

Christoph Germeier
Julius Kuehn Institute
Germany

Angelos Kyrtzizis
Agricultural Research Institute
Ministry of Agriculture, Natural Resources and Environment
Cyprus

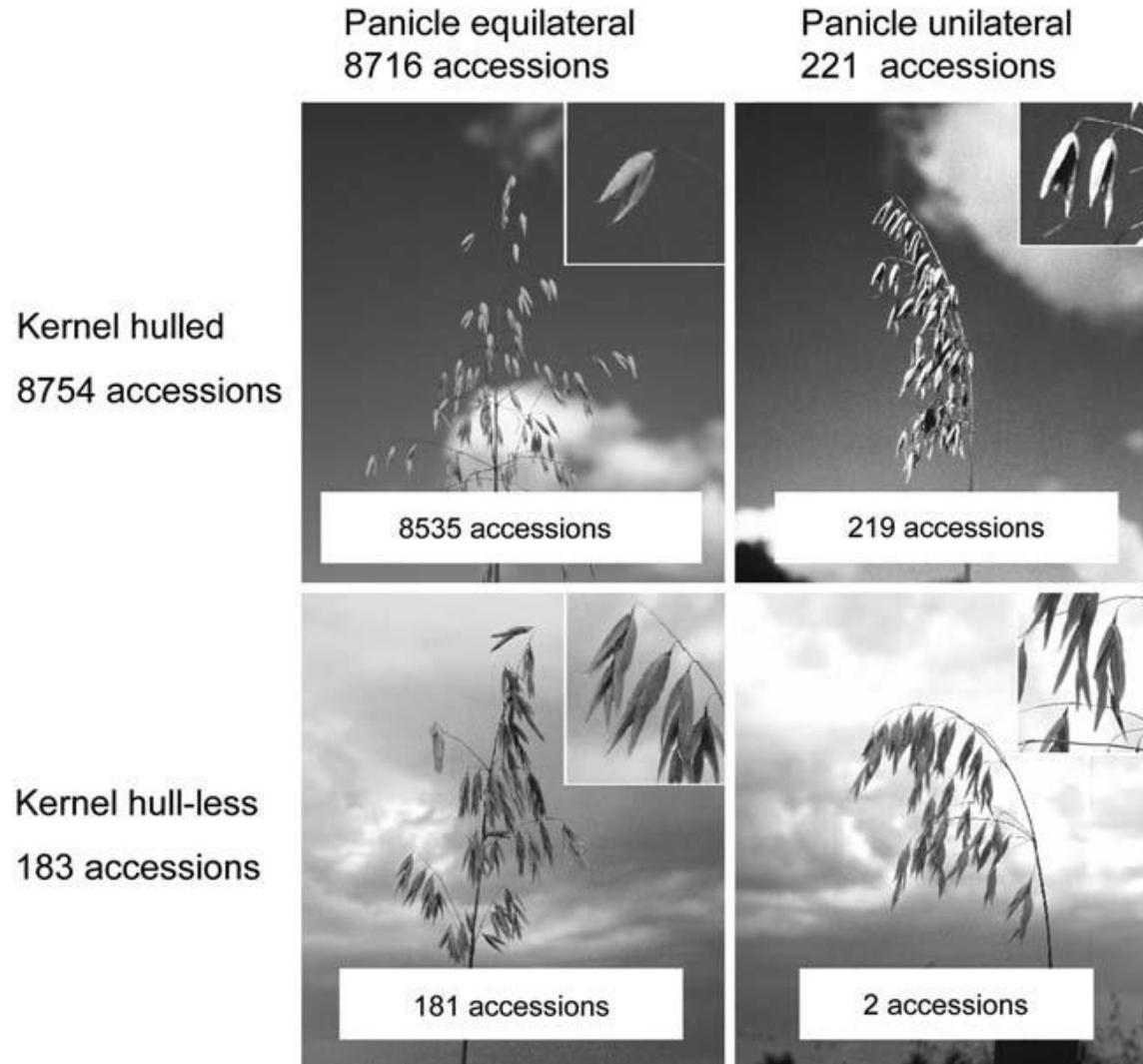
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Cyprus University of Technology,
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Department of Agricultural
Sciences, Biotechnology
and Food Science



Avena Umorpheas-Aims and Results



Source: Diedrichsen et al. 2008
Used for the creation of a uniform rating scale

Barley-Partners/ Chairs



Jan Svensson
NordGen Plants
at Swedish University of Agricultural Sciences in Alnarp



Nils Stein
Leibniz Institute of Plant Genetics and Crop Plant
Research

Barley -Aims and Results

- **Aims**

- Efficiently conserve and provide access to unique germplasm in Europe through AEGIS and the European Collection
- Provide passport and phenotypic information of actively conserved European PGRFA diversity *ex situ* and *in situ* through the EURISCO catalogue
- Improve *in situ* conservation and use of crop wild relatives

- **Results**

- 130.341 accessions of *Hordeum* are registered in EURISCO- Passport data available
- 16.667 accessions in the AEGIS collection for “*Hordeum*”
 - 30,547 accessions with C&E* data
 - 766,761 C&E datapoints
 - 309 traits
 - 648 experiments

*Characterization & Evaluation data

Wheat-BiDiffernet Partners

BiDiffernet (Chances for the conservation and re-cultivation of central European club wheat (Binkel))



Albrecht Serfling



VERN e.V.

Rudolf Vögel
Association for the Preservation and Recultivation of
Useful Plants



Christian Partl
Amt der Tiroler Landesregierung

INRAE

Clement Debiton
Génétique, Diversité et Ecophysiologie des Céréales



Ulla Konradl
Bavarian State Institute for Agriculture



Manuel Pramsohler



ECP/GR

BiDifferent- Genetic differentiation of Binkel accessions and identification of possible resistances

Albrecht Serfling, Rudolf Voegel
JKI- Institute for Resistance Research and Stress Tolerance



Are there genetic differences between binkel and common wheat?



Wheat-BiDifferent Aims and Results

- **Aims**

- Delimit the “Echter Binkelweizen” varieties from other bread/common wheat landraces
- Develop and validate molecular markers for the “compactum” allele
- Information about of its suitability for cultivation outside of the current region of cultivation
- Detection of disease resistance and tolerance to abiotic stress situations
- Analysis of suitability for bakery products

- **Results**

- Markers associated with the compactum phenotype were detected and validated
- Principal component analysis based on SNP information could be used to identify the origin of Binkel genotypes
- Resistance to biotic stress (fungal pathogens) was detected
- Accessions, adapted to regional weather and soil conditions could be selected
- Protein content and baking quality was measured so that best suitable genotypes could be selected for farmers and bakerys



Wheat- INWHEATORY Partners

INWHEATORY Inventorying wheat on-farm diversity

Institution	Partner
Department of Agricultural, Food and Environmental Sciences, University of Perugia	Lorenzo Raggi, Valeria Negri
University of Montenegro, Biotechnical Faculty, Podgorica, Montenegro	Zoran Jovović
Institute of Field and Vegetable Crops, Novi Sad, Serbia	Sanja Mikić
Institute of Plant Breeding and Genetic Resources, DIMITRA, Thessaloniki, Greece	Ioannis Mylonas, Parthenopi Ralli
Independent Researcher, 76, Thessaloniki, Greece;	Ricos Thanopoulos
Julius Kühn Institute (JKI) Quedlinburg, Germany	Albrecht Serfling
Genebank, Suceava, Romania	Silvia Străjeru
Agricultural Institute of Slovenia, Ljubljana, Slovenia	Jelka Šuštar Vozlič
Brandenburg LUGV, Department of Technical Environmental Protection Eberswalde Germany	Rudolf Voegel
Federal Office for Agriculture and Food (BLE), Information and Coordination Centre for Biological Diversity (IBV), Bonn, Germany	Sarah Sensen, Imke Thormann
Laboratory of Plant Breeding and Biometry, Department of Crop Science, Agricultural University of Athens, Greece	Penelope Bebeli
School of Biosciences, University of Birmingham, Birmingham, UK	Gabrielle Clarke, Nigel Maxted
University of Banja Luka, Faculty of Agriculture, Banja Luka, Bosnia and Herzegovina.	Gordana Đurić, Danijela Kondić
Foundation Alica, Banja Luka, Bosnia and Herzegovina	Gordana Đurić, Danijela Kondić
Natural Resources Institute Finland (Luke), Production Systems, Plant Genetics, Jokioinen, Finland	Maarit Heinonen
Faculty of Agricultural Sciences and Food Skopje, Ss. Cyril and Methodius University in Skopje, North Macedonia	Sonja Ivanovska

Wheat- InWheatory Aims and Results

• Aims

- Inventory wheat landraces in Europe with regard to the wheat on-farm diversity
- Create in situ and ex situ databases
- Propose recommendations for the best management of wheat landraces on farm, starting from examples of successful cultivation.
- Elaboration of a guide of good practices for the on-farm conservation

• Results

- 303 different landrace names were recorded from the 9 target countries, a summary of data collected from project partners is available
- ‘*In situ* database’, including all the records of landraces that occur on farm collated in the INWHEATORY project, and an “*Ex situ* database”, including records stored in Genesys database and representing the actual *ex situ* conserved landraces was generated.
- UNIPG prepared and distributed a MS Word template for recording case studies of successful examples of wheat landrace cultivation and use in the different countries involved. Organized as in Raggi *et al.* (2021), the template allows to record more than 10 traits.
- Guide for good practices for on-farm conservation and sustainable use of wheat landraces.

InWheatory



Maize- MALANIRs Partners

Institution	Partner
Institut National de la Recherche pour l'Agriculture, l'Alimentation et l'Environnement (INRAE), France	Stéphane Nicolas
Maize Research Institute Zemun Polje (MRIZP), Serbia	Natalija Kravic
University of Zagreb Osijek, Croatia	Hrvoje Šarčević
Agricultural Institute, Croatia	Domagoj Simic
Suceava Genebank (SVG), Romania	Danela Murariu
Misión Biológica de Galicia - CSIC, Spain	Rosa Ana Malvar
Council for Agricultural Research and Economics (CREA) - Research Centre for Cereal and Industrial Crops, Bergamo, Italy	Carlotta BALCONI
Banco Português de Germoplasma Vegetal - Instituto nacional de Investigação Agrária e Veterinária (BPGV-INIAV), Portugal	Ana Maria Barata
Agroscope, Switzerland	Beate Schierscher Viret
University of Montenegro	Zoran Jovović,
Agricultural University of Tirana (Albania)	Najada Kadiasi
Moreira Politécnico de Coimbra – Escola Superior Agrária de Coimbra (ESAC-IPC, Portugal)	Pedro Mendes
Eastern Mediterranean Agricultural Research Institute (DATAEM, Turkey)	Gönül CÖMERTPAY
Austrian Agency for Health and Food Safety (AGES, Austria)	Sylvia Vogl
University of Bologna (Italy)	Elisabetta Frascaroli



Maize- MALANIRS Aims and Results

- **Aims**

- Extending genomic characterization to 500 new landraces from European gene banks that are previously genotyped
- Predicting traits for these 500 landraces in contrasted environments based on their genotyping data using a genomic prediction
- Evaluating use of Near Infra-Red spectra (NIRs) in place of genomic data to predict agronomic traits in contrasted environments
- Evaluating the proof-of-concept of using individual near infrared spectra (NIRs) on grains

- **Results**

- The [crop-specific conservation standards for Maize](#), which were developed as part of the German-funded [New AEGIS](#) project were finalized
- 500 maize landraces are being genotyped using a 12k SNP
- Field trials in Zagreb and Belgrade (2025) generated phenotypic data for EURISCO–EVA, and harvested kernels will undergo NIRS analysis to calibrate phenomic prediction models.

Key learnings and challenges

Wheat (and other crops?)

- Low amounts of seeds and logistical problems for the wheat trials
- Timely and reliable shipment of seeds
- Curated and comparable data sets from the experiments
- **Genetic resources often reveal surprising properties**



Future priorities and ideas

Avena

- Engage the WG to establish joint priorities and directions, through online meetings and project proposal preparation

Barley

- Crop-specific genebank conservation standards in preparation

Maize

- Genomic characterization of maize landraces and trait prediction



Future priorities and ideas

Wheat and Barley

- Grant Scheme proposal for:
 - Further evaluation of genebank accessions
 - Validation of results about most resistant genotypes
 - **For phase XI**

Multi-environment validation, mapping, and marker development for resistance to fungal diseases in barley and wheat

- ValoResWB -

Publication of data from evaluations and results from further activities!

THANK YOU

 Instituto de
Investigación en
Cambio Global

 Universidad
Rey Juan Carlos