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In 2017, all tasks in the WHEALBI project have seen important achievements. All 512 barley and 512 wheat varieties of the WHEALBI panels have been multiplied and most made available through INRA and IPK gene banks. EXOME data have been re-analyzed with the recently updated reference sequences of barley and wheat.

Two major manuscripts describing the levels of polymorphism, its spatial and temporal structuration, the evolutionary forces that shape the diversity and its interest in breeding programs are ready to be submitted in high standard scientific journals. Evaluation data in the field and in controlled conditions for disease, frost and drought tolerance, canopy development and adaptive phenology have also been analyzed together with polymorphisms in candidate genes to identify useful associations. Other deliverables have been produced, like newly developed pre-breeding materials such as barley and wheat lines with introgression of alien (other species) or exotic (e.g. old landraces) genetic materials into modern lines, which are easier to use in applied breeding programs. These newly developed materials have been characterized for both agronomic traits and molecular markers. Statistical methods have been adapted or developed to address specific issues of genomic prediction of breeding value in such materials.

Management trials have been conducted in UK, Hungary and Italy with a subset of diverse barley and wheat lines to identify ideotypes most adapted to conservation agriculture or organic farming. Many trainings and dissemination events, like the college project (<http://www.whealbi.eu/college-project-videos/>) have been organized in 2017 and many videos have been produced (<http://www.whealbi.eu/presentation-of-the-whealbi-project/>). Finally, the two last trainings, one on agronomy and one on pre-breeding, are organized in 2018 at NIAB in UK, and registration are just open (<http://www.whealbi.eu/trainings-crop-management-innovative-cropping-systems-practical-assisted-pre-breeding-may-2018-cambridge/>).

I wish you, on behalf of the WHEALBI consortium, all the best for 2018!

Gilles Charmet, *WHEALBI coordinator*



Group picture of the Whealbi Consortium during the annual meeting 2017 organised in Israel, March 2017



WHEAt and barley Legacy for Breeding Improvement

Symposium 'Genotype to Phenotype Modelling of Plant Adaptation' organized in Wageningen

A symposium on genotype to phenotype modelling in relation to adaptation and GxE took place in Wageningen the 16th of November 2017. The symposium was co-organized by WUR-Biometris and Whealbi, with a program subdivided in three sessions.

The first session focused on the importance of collecting, generating and characterizing the genetic variation for traits contributing to adaptation. During this session, Gilles Charmet (coordinator of the EU-Whealbi project) gave an overview about the project objectives and achievements. He also discussed the potential of genetic resources like the ones in the Whealbi wheat and barley collections as source of valuable alleles to obtain well-adapted varieties. The second session focused on strategies for phenotypic characterization across environments. A number of modelling approaches to integrate phenotypic data from the field and high throughput phenotyping platforms with genetic/genomic data were discussed. Finally, we discussed statistical and crop growth modelling approaches to connect genotypes and phenotypes across environments.



Speakers at the symposium 'Genotype to Phenotype Modelling of Plant Adaptation'. From left to right: Chris Schön (TUM), Scott Chapman (CSIRO), Charlie Messina (DuPont-Pioneer), Francois Tardieu (INRA), Ep Heuvelink (WUR), Cris Wijnen (WUR), Fred van Eeuwijk (WUR), Daniela Bustos-Korts (WUR), Willem Kruijer (WUR), Gilles Charmet (INRA).

More than 80 people joined this symposium allowing a fruitful discussion.

More details about the program can be found via this link:

<https://www.wur.nl/en/Expertise-Services/Research-Institutes/plant-research/Biometris-1/Genotype-to-Phenotype-Modelling-of-Plant-Adaptation.htm>



Participants at the symposium 'Genotype to Phenotype Modelling of Plant Adaptation'



Annual meetings

The 2017 annual meeting was organized in Israel by the University of Haifa in March 2017. Videos presenting the field visits and interviews of consortium members are available at:

<https://www.youtube.com/channel/UCkwqKIC8tgGgB768ZprZtyw/videos>

The 2018 annual meeting will be organized by JHI in Scotland 23-25th of October 2018. This final annual meeting will discuss internal issues to the project and is not open to the broad community.

2018 trainings

During the course of the WHEALBI project, an important focus is given to the knowledge transmission.

After the Allele mining and genetic analysis trainings organised in 2017 at Wageningen, the two last trainings will be organised by the Workpackages 6 and 7 in May 2018 in Cambridge:

› WHEALBI WP7 workshop: Crop management and Development of Innovative Cropping Systems

Organizer: NIAB

Cambridge, 29-30 May 2018

› WHEALBI WP6 workshop: Wheat and Barley Pre-Breeding

Organizer: KWS

Cambridge, 30-31 May 2018

Detailed programs are available at:

<http://www.whealbi.eu/trainings-crop-management-innovative-cropping-systems-practical-assisted-pre-breeding-may-2018-cambridge/>

Both trainings have a limited number of attendees (35 each) and can be attended independently.

Inscription will favour young researchers (Ph.Ds and post-doc) and private companies.

Please register through the WHEALBI website and wait for confirmation (end of March) to book your travel.

For more infos: contact@whealbi.eu.

The college project

To communicate around WHEALBI project and show the importance of genetic resources for the future of agriculture, 5 European agriculture colleges and universities, coming from 5 different countries (Italy, France, UK, Germany and Hungary) were involved in the dissemination of the project.

Each of the participating university was asked to conduct for one year the same trial containing 16 wheat and 16 barley (showing high diversity: different origins, landraces or modern varieties...), the set of varieties coming from the pool of varieties studied in the WHEALBI project.

The students investigated for one year the genetic diversity contained in this pool of varieties, with the opportunity to exchange observations and questions with the other European students observing the same varieties, but in a different environment.



Visit in Italy at the "Istituto Tecnico Agrario e Chimico Scarabelli – Ghini"
April 2017 – first results of the College project

This project gave us the opportunity to explain to the students the functioning of Europe and the Europe of Research, how a European research project works with the detailed example of WHEALBI, and gave them the chance to work on a concrete case with crop genetic diversity and discuss the importance of genetic resources for breeding.

Students have been involved in 2016-2017 and lot of data, material, interaction have been produced.

The full description of the project and the results are available in the deliverable:

<http://www.whealbi.eu/d8-5-farmer-colleges-field-trials/>



Dissemination of Whealbi videos: Youtube channel & social networks

A number of videos have been released in 2017 and published on different social networks with a short description explaining the WHEALBI project.

Each link below presents a different WHEALBI page of a social network:

- > **Youtube WHEALBI Project channel** : <https://www.youtube.com/channel/UCkwqKIC8tgGgB768ZprZtyw>
- > **Twitter**: <https://twitter.com/whealbi>
- > **Facebook**: <https://www.facebook.com/whealbi/>
- > **LinkedIn**: <https://www.linkedin.com/company/whealbi/>

New videos recorded until the end of the project will be broadcasted in the different social networks – don't forget to register to get informations !

Other news and initiatives

Eucarpia Cereal Section Meeting, 2018

INRA, the WHEALBI coordinating institute, is organizing the next meeting (symposium) of EUCARPIA, cereal section (<https://symposium.inra.fr/eucarpia-cereal2018/>).

The cereal section congress of EUCARPIA (www.eucarpia.org) is the opportunity to learn about recent developments in genetics and cereal breeding, from basic research on quantitative genetics, breeding methodology, crop modelling, genome organization and evolution to applied research on genome editing, QTL detection for marker assisted selection, plant-micro-organism interaction, biotic and abiotic stresses.

The meeting takes place in Clermont-Ferrand, 19-21 march, 2018. Registrations are still open until beginning of February 2018. This meeting will give WHEALBI consortium the opportunity to present some highlights on WHEALBI results.

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