



NEWSLETTER ISSUE #4

It is amazing how quickly the time flies!! The AGENT project has already passed its half-way point; thus, it is a good time to harvest first scientific results. In this edition of the AGENT newsletter, you will find information about the outcomes presented at the yearly general assembly as well as the traditional introduction of the project's partners, announcements of upcoming activities, and many other items.

Please enjoy this fourth edition of our newsletter and watch this space for more inspiring AGENT news over the coming months!

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Project Meetings



First half of the AGENT Project: significant scientific progress presented at the 3rd General Assembly

From the 24th to 25th November 2022, the AGENT consortium gathered together virtually to sum up the results of the first two and a half years of the Project. This time, more than 50 scientists joined the meeting, among whom not only partners' delegates, but also the representatives of external advisory board and even GenRes Networking, [PK1] who were invited to enable a more extensive exchange of acquired experience.

As the project has already generated significant results, the first day of the meeting was focused mainly on reporting on the scientific progress of each work package. One of the most impressive results was demonstrated during the presentation of Beat Keller (UZH) "Evaluation of disease resistance against the powdery mildew fungal pathogen in Swiss genebank accessions". No less admiration among the participants was triggered by the reports of M. Haupt (IPK) "Status of raw sequence data processing" and of M. Lange (IPK) "FAIR data supply in federated data ecosystems: challenges, concepts and opportunities". A.-F. Adam-Blondon (INRAE), in turn, raised and developed the outstanding issue of data collaborations between AGENT and various projects with common interests (ELIXIR-Converge, EMPHASIS, etc.).

Inevitably, the meeting didn't pass without progress reports, where presenters demonstrated whether project indicators, such as progress towards tasks, milestones, and deliverables were in line with the schedule prescribed in the grant agreement. Thus, we can pleasantly confirm that the

project is moving forward full steam ahead and does not plan to slow down! The second day of the General Assembly was dedicated to reflection on the project achievements and identification of areas to grow in future. All partners had the opportunity to address challenges within and across the work packages.

Overall, the meeting was perceived by participants as very successful, and it enabled vivid and fruitful discussions among the entire consortium. Wrapping up the assembly, project coordinator Nils Stein declared the assembly to have been highly productive and thanked everyone for their proactive and useful input.

Spotlight on ... AGENT Partners

WAGENINGEN RESEARCH (WR)

For more than a century Wageningen University & Research (WUR), which the Foundation Wageningen Research (WR) is part of, has been involved in research in the domain of healthy food and living environment. As such, WUR has built a reputation in performing high quality interdisciplinary research with an international orientation, in close collaboration with the users of the research results. Currently, WUR has nearly 14,000 students and over 6,000 staff members. WR consists of a number of leading, specialized institutes for applied research in this domain, including the Centre for Genetic Resources and the Department of Plant Breeding (both participating in the AGENT project).

The Centre for Genetic Resources, the Netherlands (CGN), established in 1984, carries out specific 'statutory research tasks' for the Dutch Ministry of Agriculture, Nature and Food Quality. CGN is a leading centre of expertise in Europe and globally for the conservation and use of genetic diversity in crops, farm animals, trees and shrubs. CGN carries out methodological research, and participates actively in national, European and global organizations and networks. CGN staff represent the Dutch government in the respective networks EUFORGEN, ECPGR and ERFPG for forest, plant and animal genetic resources. CGN collaborates actively with the private breeding industry and national NGOs and supports the Dutch government in the field of policy development and implementation. CGN has a long-lasting record of accomplishment of coordination and participation in EU projects. Because of this CGN has a unique position in Europe with an extensive network in the area of conservation and sustainable use of genetic resources. CGN maintains the Dutch national genebank, which includes over 23,000 accessions from a total of more than 30 crops. Currently, the cluster Plant of CGN has 13 staff members. CGN has a main focus on vegetable crops, but also maintains the genetic resources of 2,664 barley and 4,912 wheat accessions.

The Department of Plant Breeding is involved in education, research and consultation in the field of plant breeding in the broadest sense. Education is performed at all levels from BSc, MSc and PhD to specific courses for external parties. Within Plant Breeding the main research focus is on the development, characterization, maintenance and exploitation of genetic material. To this end collections of plants (segregating populations, NILs, RILs, DH, transformation host etc.) are made in the most important focus crops Brassica rapa, barley, potato, tomato, lily and rose. Besides this, tools for efficient breeding are developed, such as molecular markers for traits (genes, libraries, maps etc.). This leads to the deposition of large amounts of phenotypic and descriptive data (transcriptomics, proteomics, metabolomics, microarray, consumer tests) in databases. The efficient use and integration of all these datasets is made possible through the development and implementation of statistical & computer programs. The Department of Plant Breeding has more than 120 personnel and between 50-80 students and guests. Research is organized around five themes (growth, development and quality; (a)biotic stress resistance; biodiversity and genetic variation; biobased economy; quantitative aspects) with an emphasis on crop plants and the model species Arabidopsis.



Regeneration of cereals close to Wageningen campus

Read more about the WR, its contribution to the AGENT and the team involved in the project [here](#)

NARODNE POLNOHOSPODARSKE A POTRAVINARSKE CENTRUM (NPPC)

NPPC is a research organization under the Ministry of Agriculture and Rural Development in Slovakia involving seven research institutes. It is the only research organization in Slovakia dealing with strategic and applied research in agriculture and food. Work in the AGENT project is carried out in the Research Institute of Plant Production, which performs various activities in the field of technological research: sustainable and innovative technologies in plant production, including the integrated alternative and ecological forms; plant production greening research of effects and impacts of climate change on the plant production process and possibilities for an adaptation of agriculture to climate change. The genetic breeding research is focused on, in particular, the conservation and utilization of the plant gene pool for food and agriculture (the genebank is located at the Institute in Piešťany); analyses of plant genotypes and the phenotypes, the relationship between them and creation of new biological materials with improved properties using the progressive methods; biotechnological procedures applicable in plant production and in agriculture.

The main goal of the genebank is to conduct the conservation of seed species of the crops and to ensure monitoring, evaluation, study, identification and long-term conservation of gene pools of all agriculture crops. The Genetic Resources Information System of Slovakia can be found [here](#). The Gene Bank of the Slovak Republic cooperates with other gene banks worldwide, mainly in the bilateral exchange of seeds for research and breeding. The Slovak Republic, as a member of the Bioversity International Rome, participates in the activities of the European Cooperative Programme for Genetic Resources. Research activities are focused on cereals, oilseed forages, legumes, winter wheat, oats, triticale and poppy and some special crops.

The role of NPPC in the AGENT project is processing and documenting historical and new phenotypic data of wheat and barley varieties, contributing to the creation of a database for the pan-European gene bank phenotyping network, providing biological material and breeding varieties from Slovakia and their sources originating mainly in Eastern Europe and Central Asia, disseminating results, scientific publications, the multimedia publication for broad audience outreach, testing a gene bank monitoring system, and training and capacity building gene bank genomics management practices.



Harvest for AGENT handled by NPPC

More information about the partner can be found [here](#)

Highlight on data submission in AGENT



A key objective of the project is to activate the genebanks through integration and dissemination of their data in a common infrastructure following the FAIR principles.

To reach this goal, the AGENT data submission strategy relies on 3 pillars:

1. Agreed templates following existing standards, formats with rich metadata. For example the phenotyping data template follows the [MIAPPE standards](#), and the genotyping data are provided in VCF format, with associated metadata following [published recommendations](#).
2. A common tool to share, curate and validate the data. The INRAE-URGI instance of the [FAIRDOM](#) data management system hosts a dedicated site for the AGENT partners. FAIRDOM allows partners to submit data with rich metadata, to share them under a versioning system, and to validate the data through a specialised tool developed in the frame of AGENT. Once validated the data will be pushed to the AGENT portal (due for public release early next year). Moreover, FAIRDOM hosts project documentation such as templates and guidelines.
3. Support and trainings. Regular training is organized throughout the project to assist partners in the submission of data. Documentation is available in [FAIRDOM](#) such as (i) AGENT guidelines for dataflow, (ii) an AGENT FAIRDOM user manual and (iii) a FAQ. A bioinformatics helpdesk has been established with a dedicated email (agent-helpdesk@inrae.fr) and a recurring Zoom meeting on the first Monday of each month at 2PM CET for partners to drop-in with queries.

Communication and dissemination activities

Recent publications

We are pleased to present here the current scientific publications from the consortium.

- Feser M., König P., Fiebig A., Arend D., Lange M. and Scholz U. On the way to plant data commons - a genotyping use case. Journal of Integrative Bioinformatics, 05 September 2022, <https://doi.org/10.1515/jib-2022-0033>.
- Vasilescu L.; Petcu Eu.; Sîrbu A.; Petcu E.; Lazăr C. Grain morphometry analysis of Romanian winter barley cultivars registered during 1959-2019 period. Romanian agricultural research, No.39, 2022, 22 June 2022, <https://doi.org/10.5281/zenodo.6962256>.
- Berkner, M.O., Schulthess, A.W., Zhao, Y. et al. Choosing the right tool: Leveraging of plant genetic resources in wheat (*Triticum aestivum* L.)

benefits from selection of a suitable genomic prediction model. *Theor Appl Genet* (2022), 01 October 2022, <https://doi.org/10.1007/s00122-022-04227-4>.

- Röckel F., Schreiber T., Schüler D. et al. PhenoApp: A mobile tool for plant phenotyping to record field and greenhouse observations [version 2; peer review: 2 approved with reservations]. *F1000Research* 2022, <https://doi.org/10.12688/f1000research.74239.2>

Events

AGENT at ENA Facilities Day

The ENA (European Nucleotide Archive) facilities days is a feedback event hosted by the ENA team to discuss ongoing developments of ENA services together with the user community. As a flagship project with respect to FAIR data management, AGENT has been introduced to demonstrate the needs for sustainable workflows and high-quality metadata management in crop science. During the meeting that took place at 1st and 2nd of December 2022 (hybrid event) Anne Fiebig (IPK) delivered a talk 'Impact for the AGENT Project - Data management in Crop Science'.

AGENT Project - Data management in Crop Science

Science and Technology Week in the Spanish National Research Council Within the framework of Science and Technology Week, organised by Spanish National Research Council, students of two Madrid High Schools, Los Olivos, Mejorada del Campo and Adolfo Suárez de Paracuellos de Jarama, visited the Center of Plant Genetic Resources (CRF-INIA, CSIC) on the 7th and the 10th of November respectively. The students visited both the field experiments and the facilities where the seed collections are conserved. AGENT participants Isaura Martín, Cristina Nieto, and Encarna Zambrana presented to the visitors the activities carried out at INIA focused on the conservation of the plant genetic resources as well as those performed within the AGENT and INCREASE projects, which are both funded by the European Commission.



AGENT project presents at Plant Phenotyping Symposium 2022

Partner INRAE has presented a poster 'Research Data Management Toolkit (RDMkit): guidelines for plant phenotyping data management and sharing' at the 7th International Plant Phenotyping Symposium 2022 (IPPS2002), which took place in Wageningen, the Netherlands from the 26th to the 30th September, 2022, <https://doi.org/10.5281/zenodo.7148792>.

Upcoming events

Webinar January

Date(s): 26 January 2023 14:00-15:00 CET

[Link to the webinar](#)

Organizer: RBGK

Related WP: WP-6

Content: Introduction to genetics of genebanks landscape and to AGENT project; demonstration of beta version of AGENT data portal; discussion of community needs.

Target audience: anyone with an interest in genomic approaches to the management and use of genebanks through the use of genomic data, especially (but not exclusively) those with an interest in European collections of wheat and barley.

Workshop March 2023

Date(s): 7-8 March

Venue: IPK, Gatersleben

Organizer: IPK

Related WP: WP-6

Content: Training of trainers workshop, including training (databases, tools, webservices) for persons that are responsible for, or are involved in, PGR data life cycle and tool support on-site.

Target audience: AGENT partner on-site multipliers

[Link to the preliminary agenda](#)

Webinar April 2023

Date(s): To be determined

Venue: Internet

Organizer: INRAE

Related WP: WP-6

Content: AGENT portal: demonstration and exercises; Introduction to use of AGENT analysis container: demonstration and exercises; Discussion of community needs.

Target audience: Similar to the webinar that is planned for January 2023 but extended to the entire community. It is suggested to organize some marketing around the public release of the AGENT website (due end February 2023) which should promote the webinar as a first chance to find out more.

Datathon May 2023

Date(s): 2-3 days in the week before or after the annual project meeting. Two weeks before the datathon a virtual "get ready event" is planned to ensure that all datasets are ready.

Venue: Venue of annual project meeting

Organizer: CREA

Related WP: WP-4

Content: Training of all partners how to run GWAS and GS using their own historical datasets. This training relates to Milestone MS31 "Datathon to run GWAS and GEBV on historical data". At the end of the datathon all partners should be able to run the pipeline.

Target audience: AGENT partners. The training sessions will be recorded and made available to non-AGENT partners for training purposes.

Events of the partnering Projects:

15th March 2023, 9am-4pm; University of Applied Sciences, Dresden, Germany

BreedingValue Workshop on Genetic Resources: Pre-breeding materials: a grey zone between Genetic Resources and Cultivars - Introduction on regulatory aspects and protection of Intellectual Property.

!!!! Please look for the update details on the upcoming events at the Project website <https://www.agent-project.eu/events>

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