



HAL
open science

BreedWheat genotyping and phenotyping data in GnpIS information system

Marie Laine, Thomas Letellier, Raphaël-Gauthier R.-G. Flores, Loïc Couderc, Nacer Mohellibi, Cyril Pommier, Delphine Steinbach, Hadi Quesneville, Frederic Sapet, Nathalie Rivière, et al.

► **To cite this version:**

Marie Laine, Thomas Letellier, Raphaël-Gauthier R.-G. Flores, Loïc Couderc, Nacer Mohellibi, et al.. BreedWheat genotyping and phenotyping data in GnpIS information system. JOBIM 2015 - Journées Ouvertes Biologie Informatique Mathématiques, Jul 2015, Clermont-Ferrand, France. 2015. hal-02801654

HAL Id: hal-02801654

<https://hal.inrae.fr/hal-02801654v1>

Submitted on 5 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

M. Lainé¹, T. Letellier¹, R. Flores¹, L. Couderc¹, N. Mohellibi¹, C. Pommier¹, D. Steinbach¹, H. Quesneville¹, F. Sapet², N. Rivière², E. Paux³, A. Didier³, F. Balfourier³, G. Charmet³, J. Le Gouis³ & M. Alaux¹

Mathilde.laine@versailles.inra.fr

¹ INRA, UR1164 URGI, route de Saint-Cyr, RD 10, 78026 Versailles, France

² Biogemma, route Ennezat, Chappes, 63720, France

³ INRA, UMR 1095 GDEC – Génétique Diversité Ecophysiologie des Céréales, INRA de Clermont-Ferrand, Domaine de Crouël, 5 chemin de Beaulieu, Clermont-Ferrand, 63039, France



BreedWheat project aims to support the competitiveness of the French wheat breeding sector, answering to societal challenges for a sustainable and quality production. Moreover, the BreedWheat project will characterize yet poorly exploited genetic resources to expand the diversity of the elite germplasm. Finally, new breeding methods will be developed and evaluated for their socioeconomic impact. In this frame, bioinformatics goals are (i) to establish and maintain a centralized repository of generated data, (ii) to support user requirements for data query and facilitate large scale statistical analyses through an integrated system.

URGI (Unité de Recherche en Génomique Info) is a genomics and bioinformatics research unit at INRA dedicated to plants and crop parasites. It develops and maintains a genomic and genetic Information System: GnpIS (Steinbach et al., Database 2013, doi:10.1093/database/bat058). In collaboration with the Biogemma biotechnology company, GnpIS was updated to manage and integrate genotyping and phenotyping data and new types of data such as GWAS and genomic selection. BreedWheat data already available in GnpIS are BreedWheat germplasm (collection of 5197 accessions), SNP discovery (724020 SNPs from 10 sources), genotyping (Affymetrix Axiom TaBW420K array) and phenotyping data (48000 plots in 21 locations): <http://wheat-urgj.versailles.inra.fr/Projects/BreedWheat>. Association and genomic selection data will be generated and integrated in the coming years.

BreedWheat Collection

<https://urgj.versailles.inra.fr/siregal/siregal/accesionSimpleForm.do>

BreedWheat collection contains 5197 accessions which 5088 are public.

Image 1: Card of the accession ADAM

Genotyping Data

<https://urgj.versailles.inra.fr/GnpSNP/snp/genotyping/form.do>

The axiom 420k array is in process of integration (registered access to BreedWheat partners).

Image 3: Sample of the genotyping matrix. Markers are blurred for confidentiality purpose.

Phenotyping Data

<https://urgj.versailles.inra.fr/ephehis/ephehis/viewer.do#showForm>

GnpIS contains 28 BreedWheat phenotyping trials. Public phenotyping data are also available from 2000 to 2014.

Image 2: Example of phenotyping data from Clermont-Ferrand in 2000. (a) Trial level. (b) Repetition level. (c) Download in csv format.

SNP Discovery Data

<https://urgj.versailles.inra.fr/GnpSNP/snp/createSnpSelect.do>

724 020 SNPs discovery from 10 different sources are available for BreedWheat partners.

Image 4: SNP Discovery form.

Acknowledgements:

INRA (GDEC, BIA, EPGV, CNRNV, Le Moulon, URGI, BIOGER-CPP, GAEL, BF, EGC, LIMOS, EMMAH, AgroParisTech), INRA Transfert, ARVALIS Institut du végétal, GEVES, RAGT 2n SAS, Florimond Desprez, Biogemma, Limagrain Europe, Syngenta France SAS, Agri-Obtentions S.A., SARL Adrien MOMONT & Fils, Caussade Semences, Bayer CropScience, Secobra Recherches SAS, Céréales Vallée.