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BreedWheat genotyping and phenotyping data in GnpIS information system

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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/epheis/epheis/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.

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