

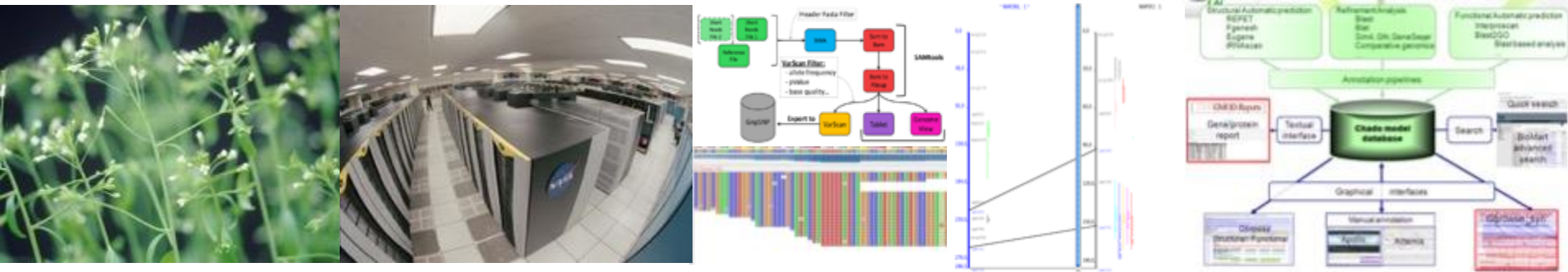
URGI

Gestion des données de séquençage (GnplS)

Hadi Quesneville

« Séminaire de restitution de l'étude sur l'utilisation des données de séquençage de ressources génétiques pour l'agriculture et l'alimentation. »

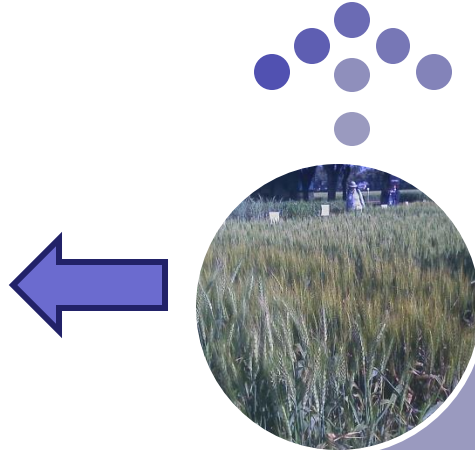
Paris, Oct 8, 2018



ALIMENTATION
AGRICULTURE
ENVIRONNEMENT

A bioinformatic unit for crop improvement

URGI DB
« GnpIS »



Phenotypes

- GxE
- QTL maps
- GWAS



Genetics

- Genetic maps
- Genetic markers
- Genetic resources



Genome

- Annotation
- Transcriptome
- SNP / Structural variant

URGI
Data & tools

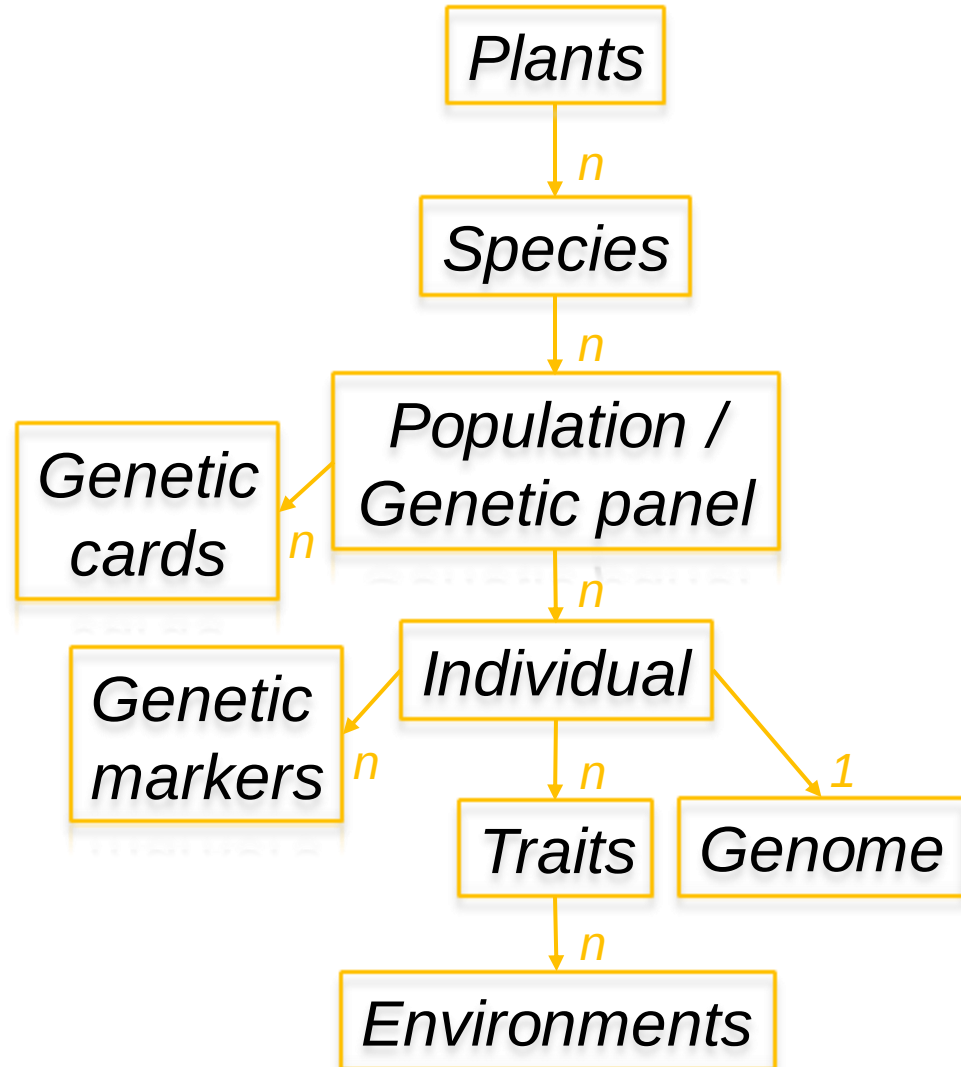
Plant scientific challenge



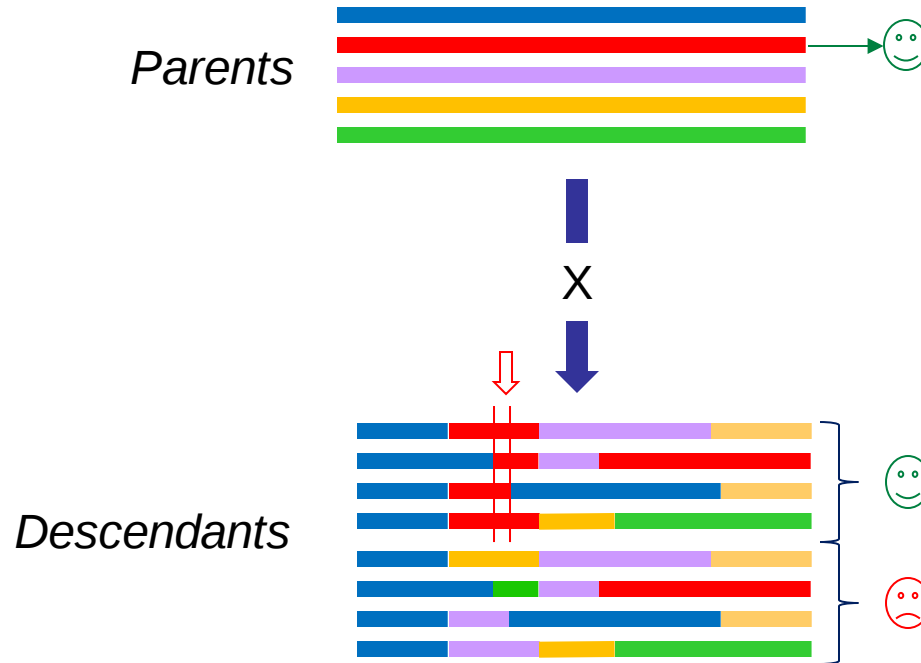
Scientific challenge

Study of Complex interactions

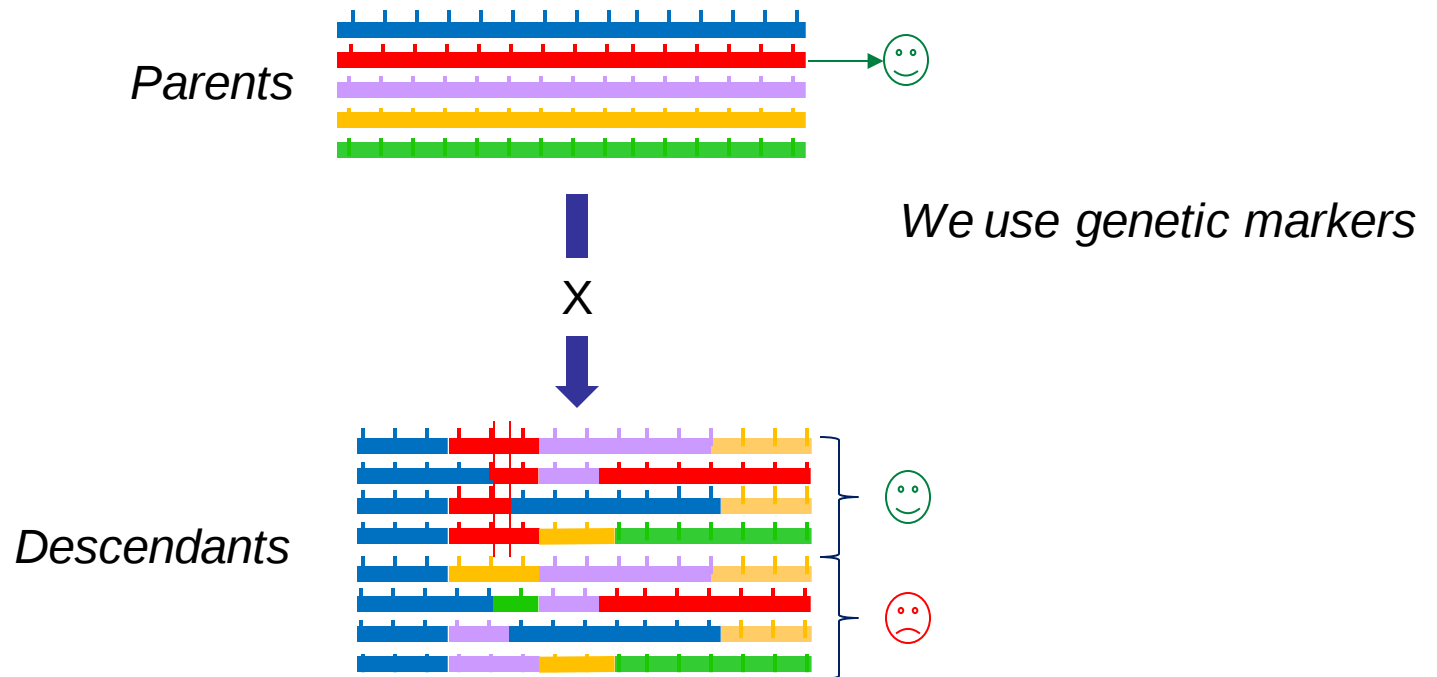
$$\text{Phenotype} = \left[\begin{array}{l} \text{Genome} \\ \times \text{Environment} \\ \times \text{Management practices} \end{array} \right]$$



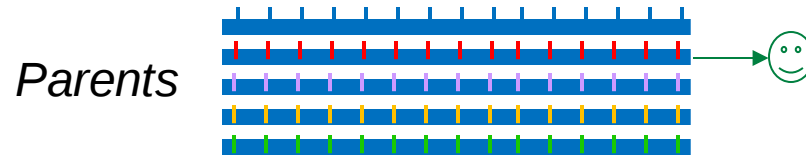
Genetic Association



Genetic Association



Genetic Association



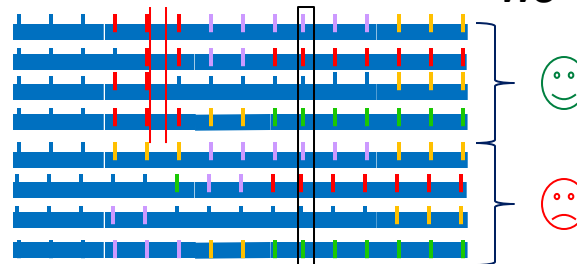
We use genetic markers

X

But ...

we only see genetic markers

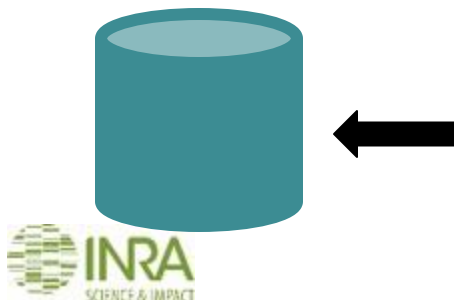
Descendants



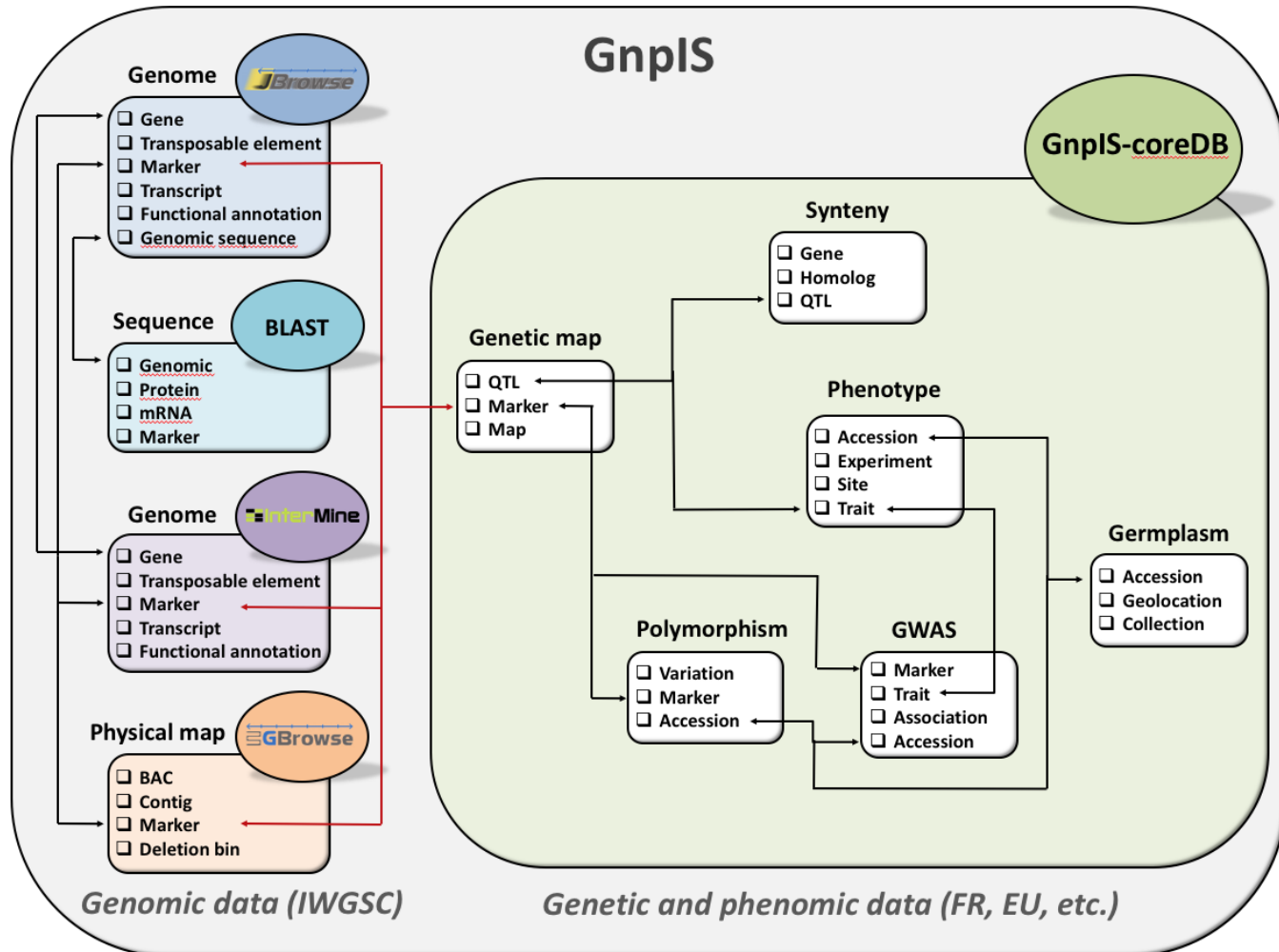
C
G
A
T
C
G

ATGTATGCCGTAATTGCA
ATGTATGCCGTAATTGCA
ATGTATGCAAGTAATTGCA
ATGTATGCTGTAATTGCA
ATGTATGCCGTAATTGCA
ATGTATGCCGTAATTGCA

Hadi Quesneville



An Information system for Plant and Pests genomics and genetics



Genetic resources

Germplasm: 101-74



ORIGIN

Geographical origin [WSNH101 \(United States of America\)](#)

Breeding [Institution name](#) [UMR0588-BioForA \(Biologie Intégrée pour la valorisation de la diversité des arbres et de la Forêt\)](#)

POPULATION

[WSNH101 \(Provenance\)](#) [WSNH101](#) is composed by

COLLECTION

[breeding_gispeuplier \(Base collection\)](#) [3940 accessions](#)

[mapping_pedigree_0504B \(INRA collection\)](#) [1609 accessions](#)

IDENTIFICATION

[Accession number](#)

[Accession name](#)

[Permanent Unique Identifier](#)

[Taxon name](#)

[Taxon common names](#)

CROSS-REFERENCE

Only the first 10000 results can be previewed

1-2 of 2

Name	Source	Type	Description
clonal test of mapping_pedigree_0504B in nursery	GnplS	Experiment	POPYOMICS-POP2-F is a trial lead at site: Ardon (lat/long: 47.828/1.9136), described as 'clonal test of mapping pedigree 0504B in nursery', designed as follows: 'Randomized complete block'. Observation variables: CO_357:0000010 Budflush scoring at 2 years, CO_357:0000016 , CO_357:0000020 Tree circumference at 1 year, CO_357:0000020 Tree circumferen...
Popyomics_Orleans	GnplS	Experiment	Popyomics_Orleans is an experiment (type: genotype) ran using samples of Populus deltoides, Populus trichocarpa, Populus x generosa, based on the marker set Popyomics_Orleans Set. This experiment belongs to the scientific project POPYOMICS. Accession names: 101-74, 661300224, 661300225, 661300226, 661300227, 661300228, 661300229, 661300230, 661300232...

HOLDING

[Institution name](#)

[Stock center name](#)

Genotyping form

[Back to form](#)

GENOTYPING EXPERIMENTS (1)

Project	Genotyping experiment	Markers set	Raw data file	Description
EXEGESE-BLE	EXEGESE-BLE ...	SNP Set of E...	not available	Polymorphic ...

LOTS (42)

Taxon	Access
Triticum aestivum aestivum	A4
Triticum aestivum aestivum	AIFENG
Triticum aestivum aestivum	SNP DISCOVERY MA
Triticum aestivum aestivum	1-10 of 95
Triticum aestivum aestivum	Marker name
Triticum aestivum aestivum	Tae_1272268
Triticum aestivum aestivum	Tae_1272281
Triticum aestivum aestivum	Tae_1272282
Triticum aestivum aestivum	Tae_1272289
Triticum aestivum aestivum	Tae_1272292
Triticum aestivum aestivum	Tae_1272294
Triticum aestivum aestivum	Tae_1272296
Triticum aestivum aestivum	Tae_1272300
Triticum aestivum aestivum	Tae_1272303
Triticum aestivum aestivum	Tae_1272306

Export: [CSV](#)

Export: [CSV](#) [VCF](#)

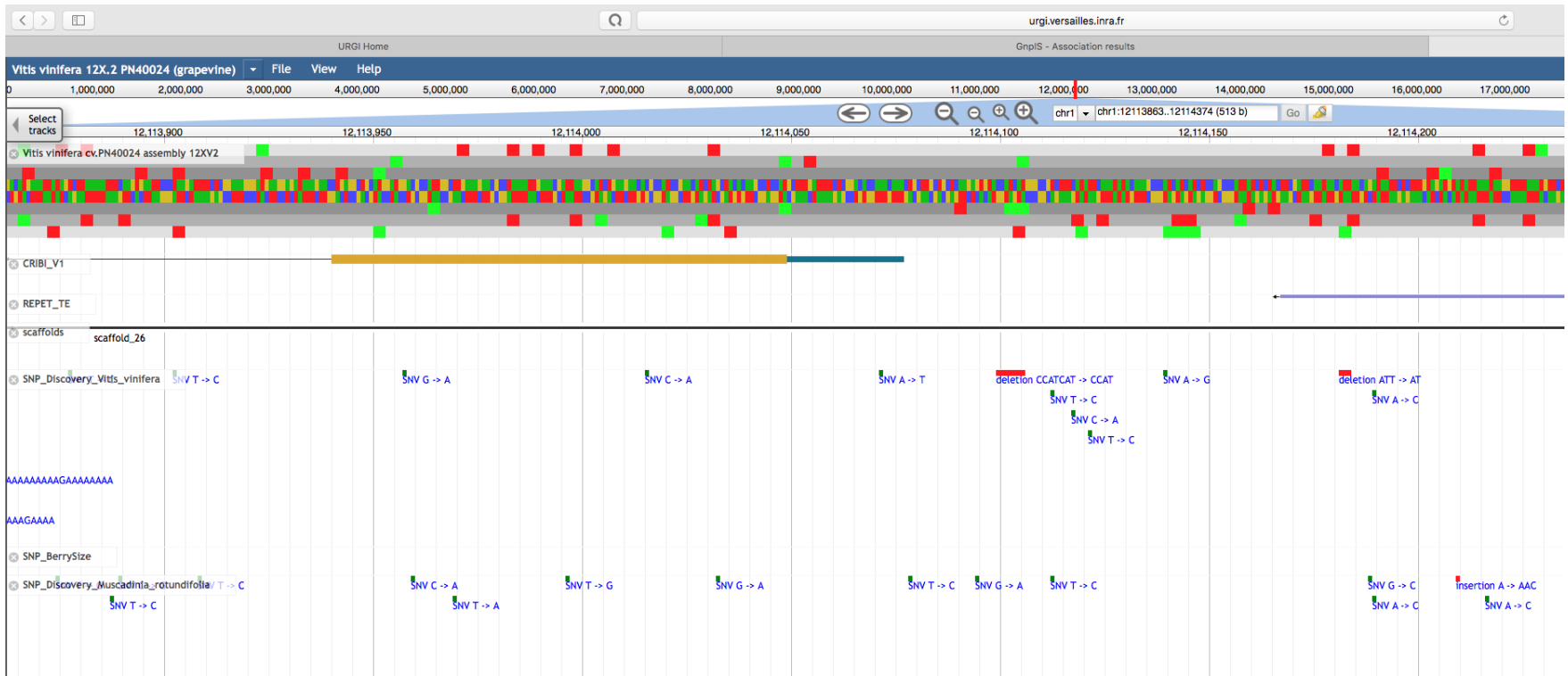
EXEGESE-BLE SNP calling analysis

1 - 25 of 95 markers

Marker \ Accession	CHINESE SPRING (2135)	AIFENG NO4 (AIFENG NO4)	COURTOT (COURTOT)	ARCHE (ARCHE)	A4 (A4)	BELLIE 590 (BELLIE 590)
Tae_1272278	C	G	C	C	C	C
Tae_1272279	C		G	G	G	G
Tae_1272302		---				
Tae_1272258	T		T	T	T	T
Tae_1272309	G		A	G	G	G
Tae_1272327	C	T	T	T	T	C
Tae_1272251	G	C	G	G	G	G
Tae_1272252	T	C	C	C		C
Tae_1272254	C	G	C	C	C	C
Tae_1272255	C	G	C	C	C	C
Tae_1272293	G	T	G	G	G	G
Tae_1272274	C		T	C	T	C
Tae_1272297	----		----	----	----	----
Tae_1272273	C		C	C		C
Tae_1272272	G	G	C	C	C	C
Tae_1272268	C	G	C	C	C	C
Tae_1272246	-			-	-	-
Tae_1272316	C	T	C	C	C	C
Tae_1272245	C	G	C	C	C	C
Tae_1272331	A	G	G	G	G	A
Tae_1272244	C		G	G		G
Tae_1272265	----			----	----	----

Export: [CSV](#) [VCF](#)

Genomes



Genetic association

Association results Association regions Genotyping input Phenotyping input

ASSOCIATION RESULTS

1-10 of 60,384 | Display 10 results per page

Boxplot	Experiment name	# of lots	Panel	Trait	Treatment	Location	Year	Marker	Chromosome	Position	Model	Genome browser	pval	-logPval
	GWAS_Tomato_Solcap	163	solcap	Brix	-	Avignon	2007-2008	solcap_snp_sl_26136	2	29851866	MLMM_COF(K+Q)	link	7.8E-26	25.108
	GWAS_Tomato_Solcap	163	solcap	Brix	-	Avignon	2007-2008	solcap_snp_sl_35206	6	1748321	MLMM_COF(K+Q)	link	2.93E-21	20.533
	GWAS_Tomato_Solcap	163	solcap	Erythritol	-	Avignon	2007-2008	solcap_snp_sl_60698	10	64445598	MLMM_COF(K+Q)	link	5.98E-16	15.223
	GWAS_Tomato_Solcap	163	solcap	Brix	-	Avignon	2007-2008	solcap_snp_sl_10594	11	2481288	MLMM_COF(K+Q)	link	1.89E-13	12.723
	GWAS_Tomato_Solcap	163	solcap	Brix	-	Avignon	2007-2008	solcap_snp_sl_53288	7	60078938	MLMM_COF(K+Q)	link	1.23E-12	11.911
	GWAS_Tomato_Solcap	163	solcap	Malate	-	Avignon	2007-2008	solcap_snp_sl_19899	6	41345468	MLMM_COF(K+Q)	link	1.82E-12	11.739
	GWAS_Tomato_Solcap	163	solcap	ASA	-	Avignon	2007-2008	solcap_snp_sl_37057	7	63886889	MLMM_COF(K+Q)	link	2.95E-10	9.53
	GWAS_Tomato_Solcap	163	solcap	Brix	-	Avignon	2007-2008	CT232_snp229	2	43207732	MLMM_COF(K+Q)	link	7.73E-10	9.112
	GWAS_Tomato_Solcap	163	solcap	ASA	-	Avignon	2007-2008	solcap_snp_sl_62616	11	3393788	MLMM_COF(K+Q)	link	4.66E-8	7.331
	GWAS_Tomato_Solcap	163	solcap	GABA	-	Avignon	2007-2008	solcap_snp_sl_35255	6	1330594	MLMM_COF(K+Q)	link	5.54E-8	7.257



Association Results :60384

GRAPHICAL DISPLAY

Draw QQPlot :

pval

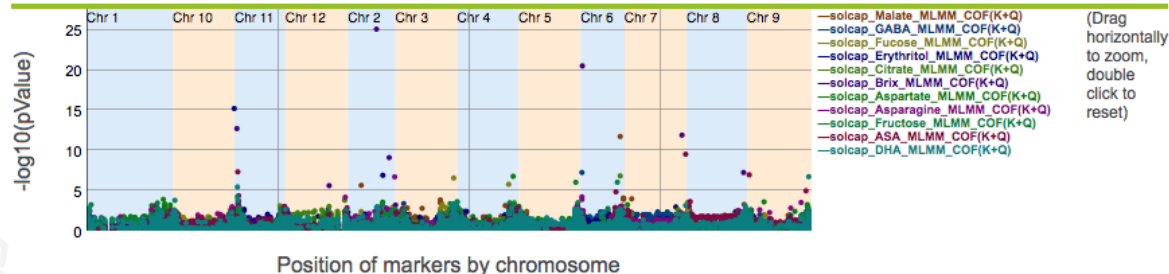


Draw Manhattan Plot:

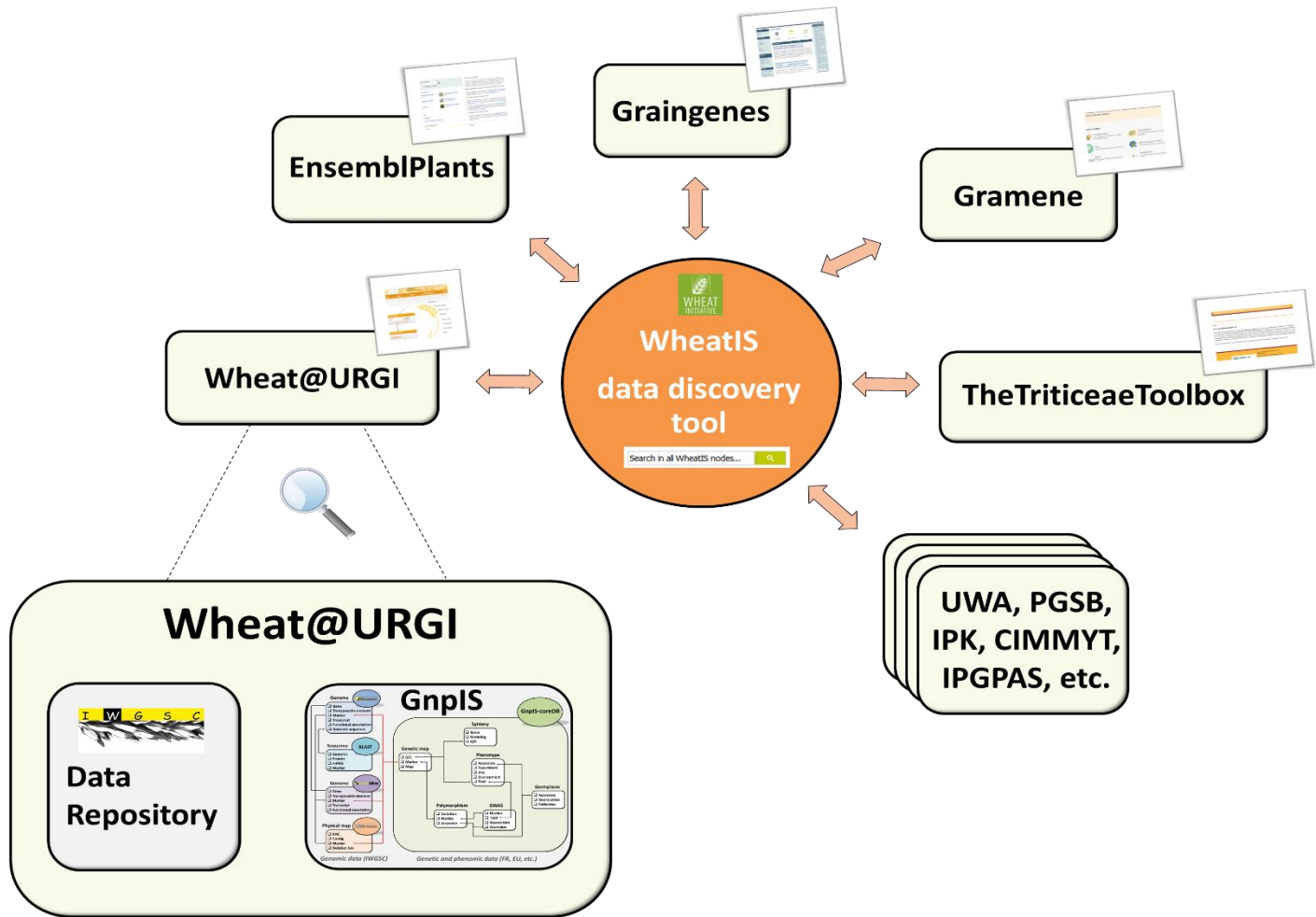
-log(pval)



Plots:



We are part of the WheatIS



Acknowledgment

