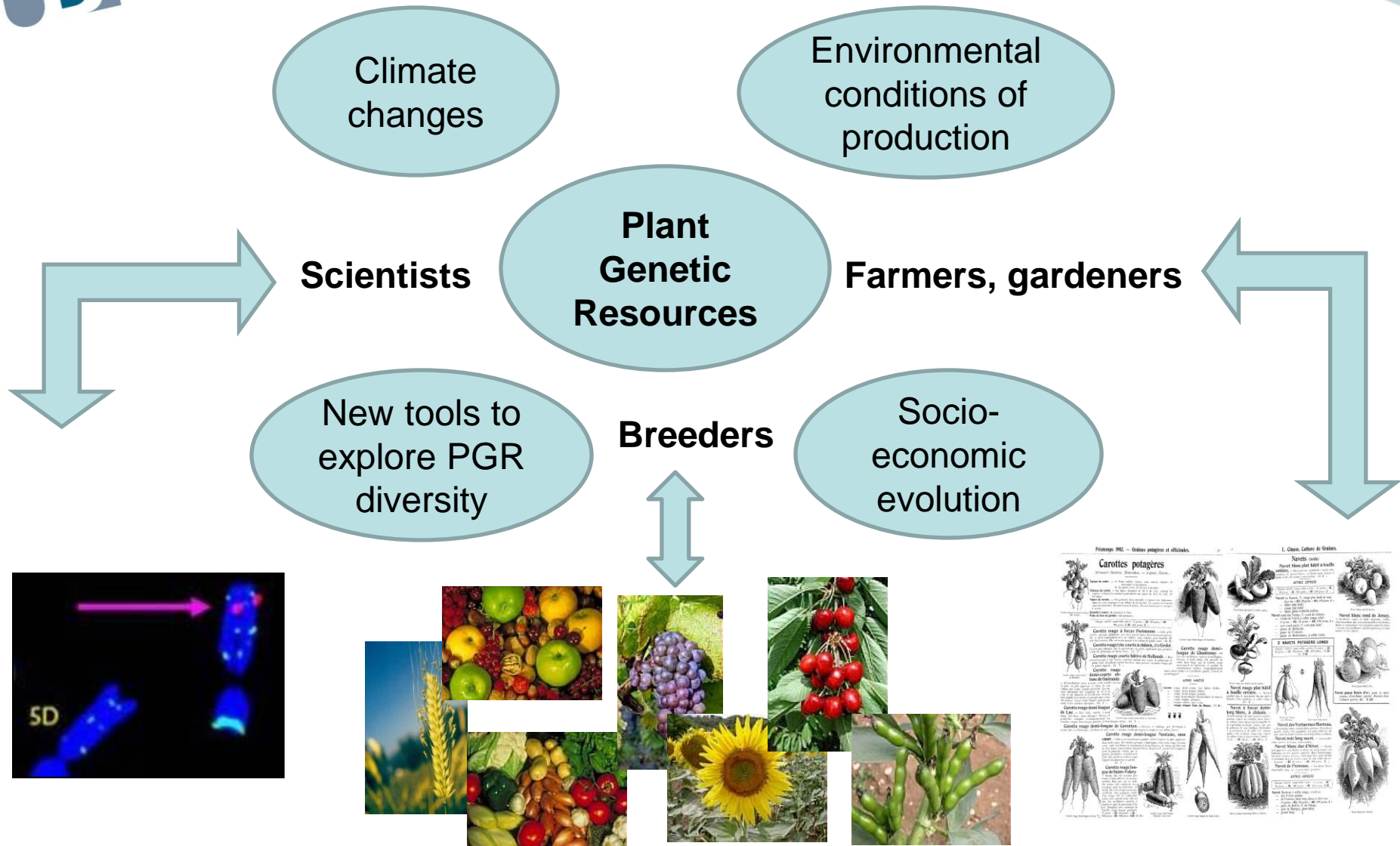




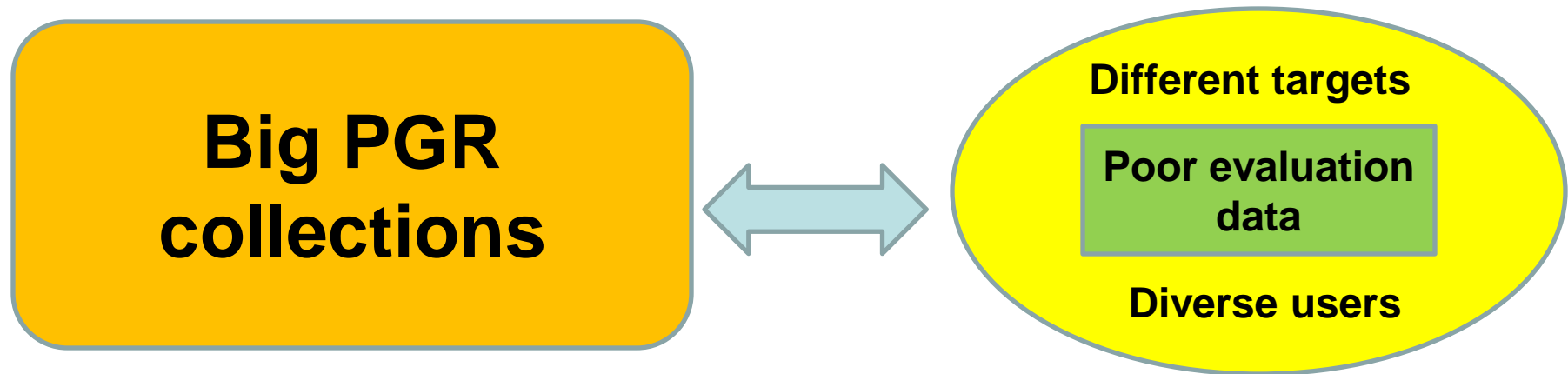
**About the PGR networks in
France: collaboration between
users and
the Genetic Resource Centre
on small grains cereals**

**Audrey DIDIER and François BALFOURIER
INRA – UBP « Genetic, Diversity and Ecophysiology of Cereals »
Clermont-Ferrand – France –**

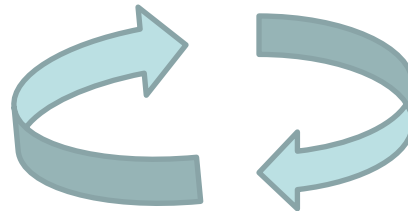
GR context in evolution



Main question

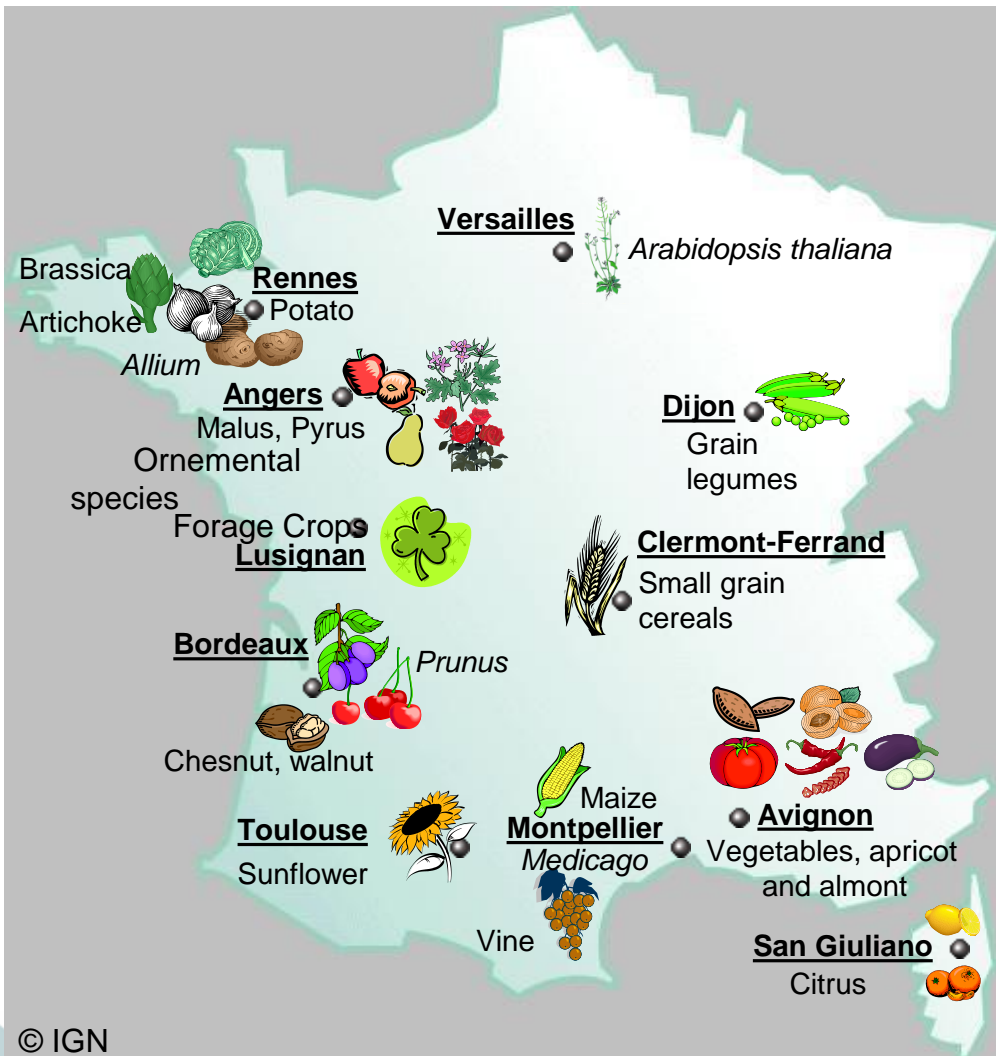


How to act, to better promoting genetic resources present in collections to answer both to socio-economic evolution of agriculture and to the developpment of basic scientific knowledge in genetic and genomic?



**How to share responsibility between actors managing GR?
How to manage the collection in order to be able to propose adapted samples to different users?**

The network of Genetic Resources Centres in INRA Plant Breeding Division



11 Resource Centres associated with species-specific research units working on crops or model species.

Missions :

- ✓ Centralization and preservation of GR
- ✓ Characterization of resources
- ✓ Stock management ensuring the quality control
- ✓ Data management
- ✓ Diffusion of knowledges and exchange/distribution of biological resources
- ✓ Definition of a policy of enrichment of the collections.

Collections maintained in Small Grains Cereals Genetic Resources Centre (GRC)



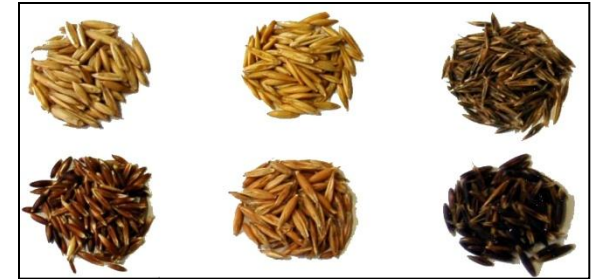
Triticum

11 800 hexaploid wheats
2 800 tetraploid wheats



Hordeum

6 550 barleys



Avena

1200 oats



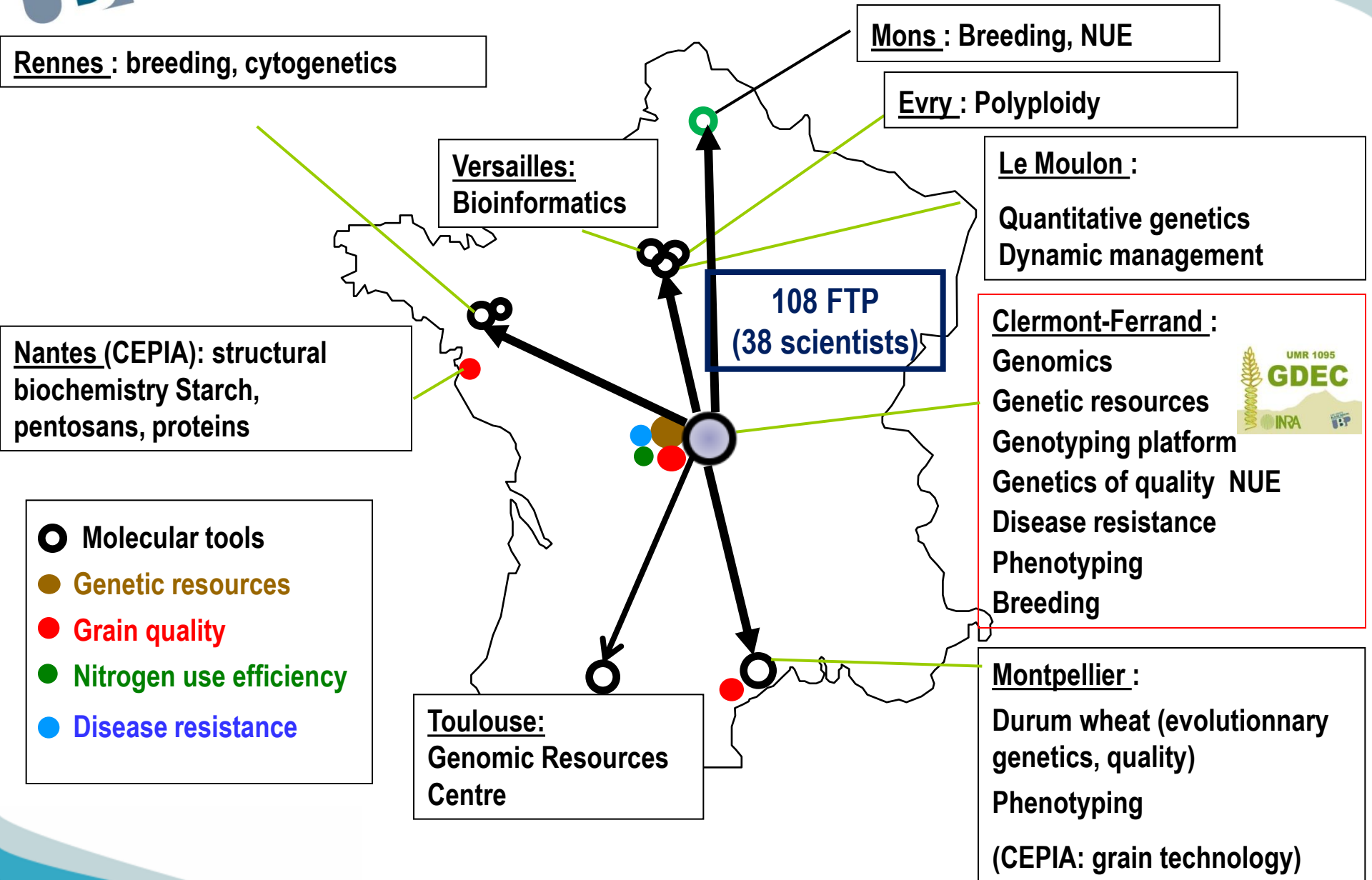
Secale
86 ryes



Triticosecale
1200 triticales

+
wild and
related
species
(450 *Aegilops*
sp.)

Total accessions conserved ≈ 25 000 accessions

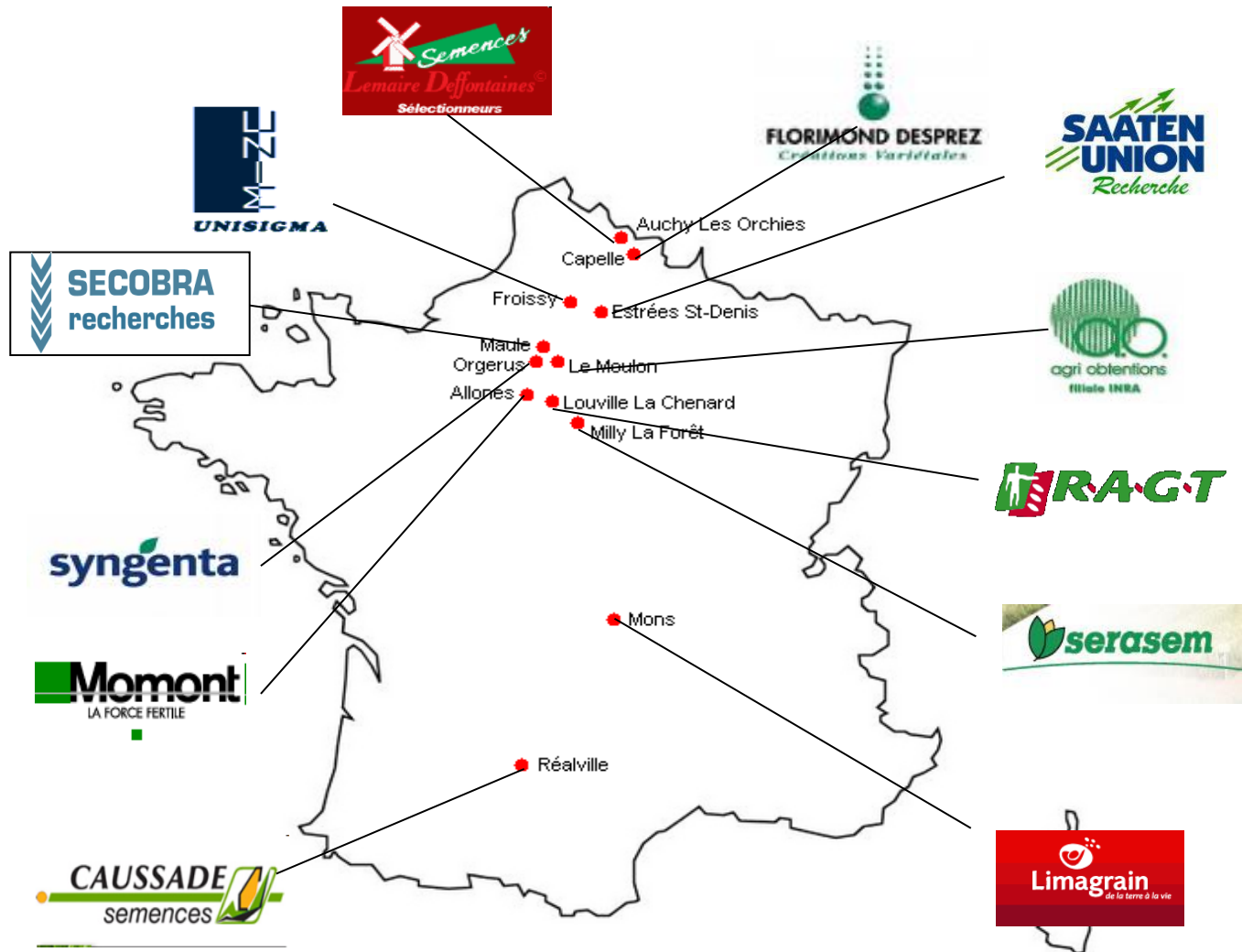


UFS Private breeders genetic resources network



**French Union
of Seeds
Producers**

Cereal section



Management of small grains cereals genetic resources in France:

Share of responsibility between actors



UFS network

- Phenotyping activities
biotic and abiotic stress
- Pre-breeding activities
inter-specific crosses
enlargement of diversity
- Specific multiplication



INRA Clermont-Ferrand

- Primary characterisation
- Seed batch
multiplication
conservation
distribution
- Data Management
- Molecular and technological characterisations

Small Grains Cereals GRC

INRA – Clermont-Ferrand - France

Permanent Staff
3FTP

Field and glasshouses facilities:

- Experimental farm (90 ha)
 - 2 ha (nurseries for primary characterisation and multiplication)
 - 200 m² glasshouses (wild species multiplications)

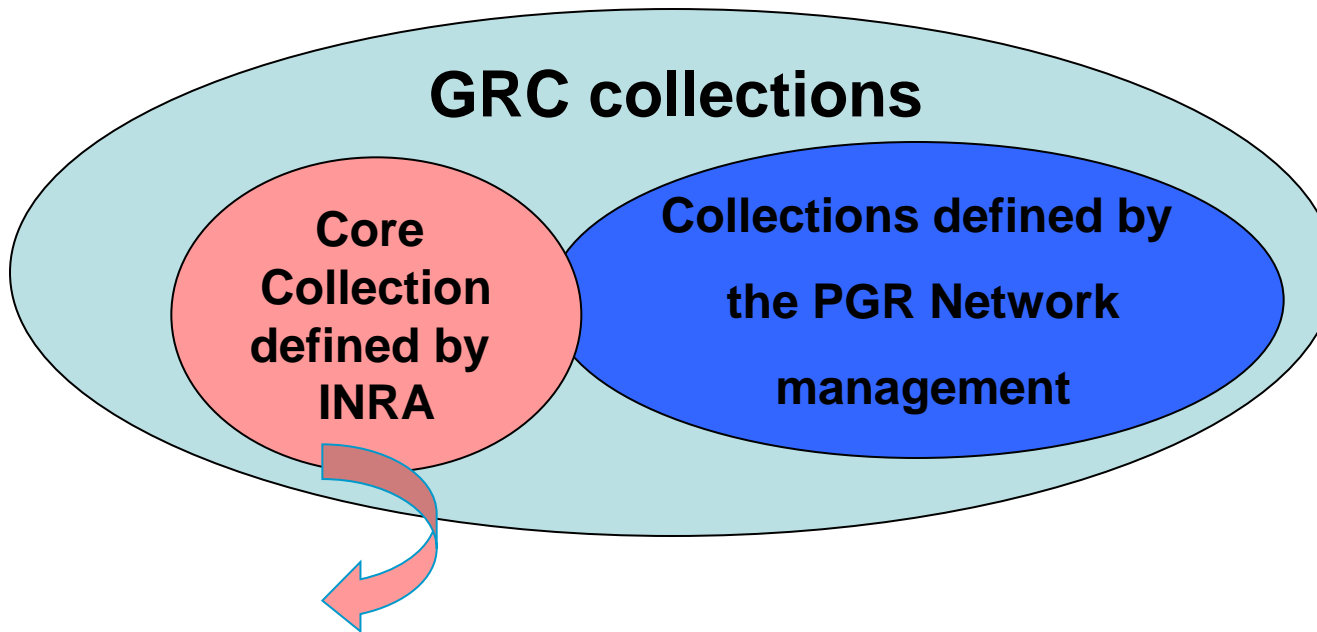


Specific lab for seeds management

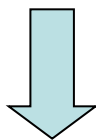
- 50 m² seeds laboratory
- 20 m³ drying room (20°C, 15% Hr)
- 100 m³ cold room (4°C, 30% Hr)
- 4 no-frost freezers



Design reference collections for specific targets

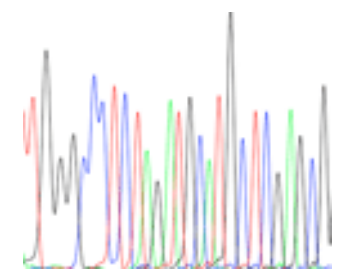


INRA 372 CC



Scientists

The worldwide wheat core collection 372CC: a sample for scientific project



Genotyping
Horvath et al., (TAG 2009, 119:1523-1537)

Phenotyping
Bordes et al., (JCS 2008, 48:569-579)



Flour and dough quality
Bordes et al., (JCS 2011, In press)

372 CC
Balfourier et al., (TAG 2007, 114:1265-1275)

Earliness
Le Gouis et al., (TAG 2011, submitted)



(support: FUI SDD)

Bread making quality

Nitrogen Use Efficiency

(support: ANR Wheatgrowth)



(support: FUI QualiNble)

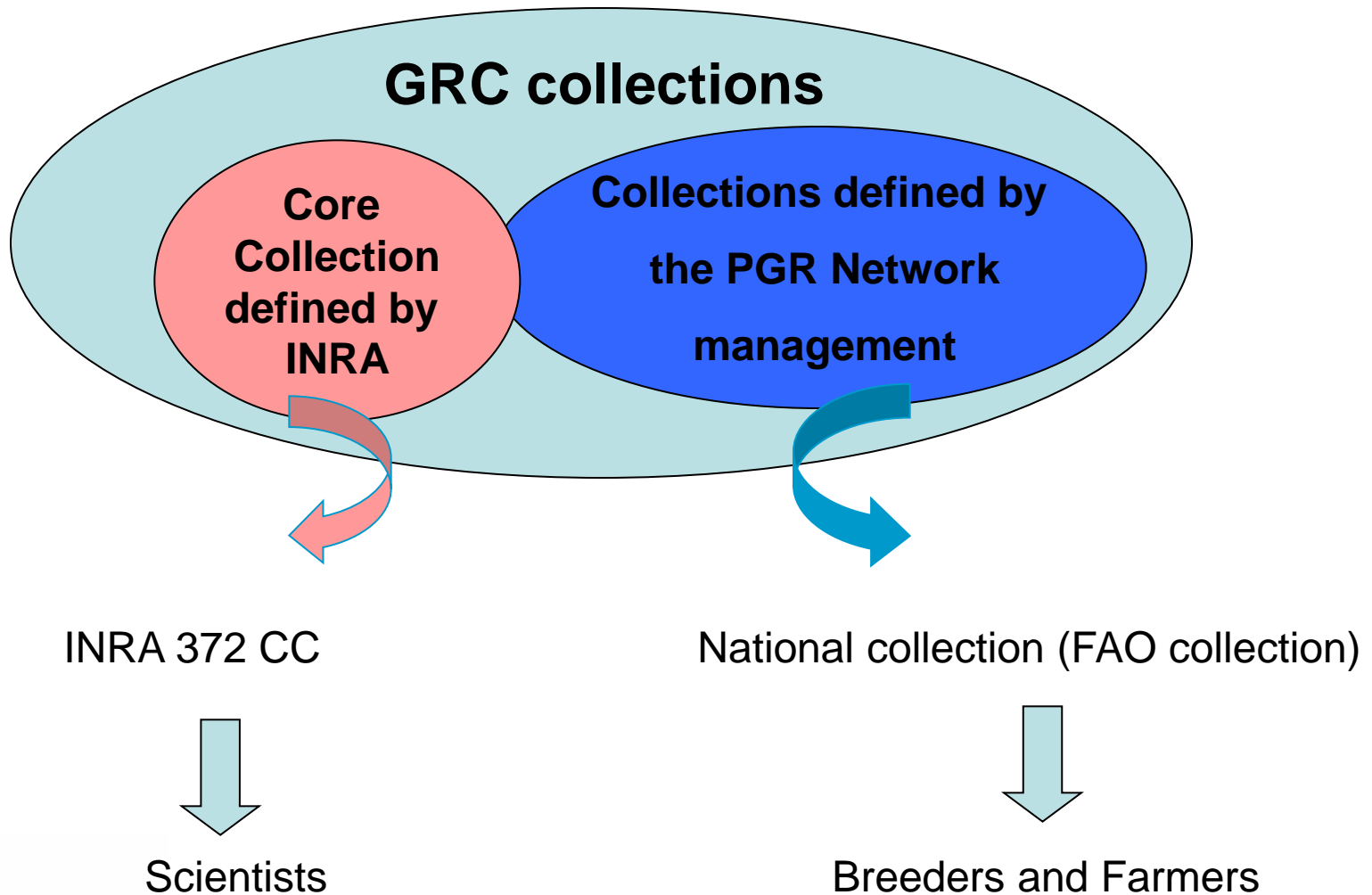
Grain proteins content

(support: ANR NOMAC)



(support: FSOV Low Nitrogen Efficiency)

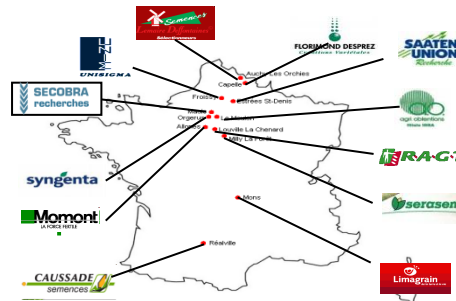
Design reference collections for specific targets



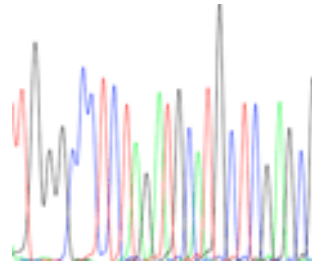
Example of common evaluation work on GR within the French PGR network

Project: Molecular and agronomical characterisation of National bread wheat collection (2009-2011 – supported by French Min. Agric. Fish.)

WP1: 3 years field evaluation of 1785 bread wheats (leader: UFS private breeders)

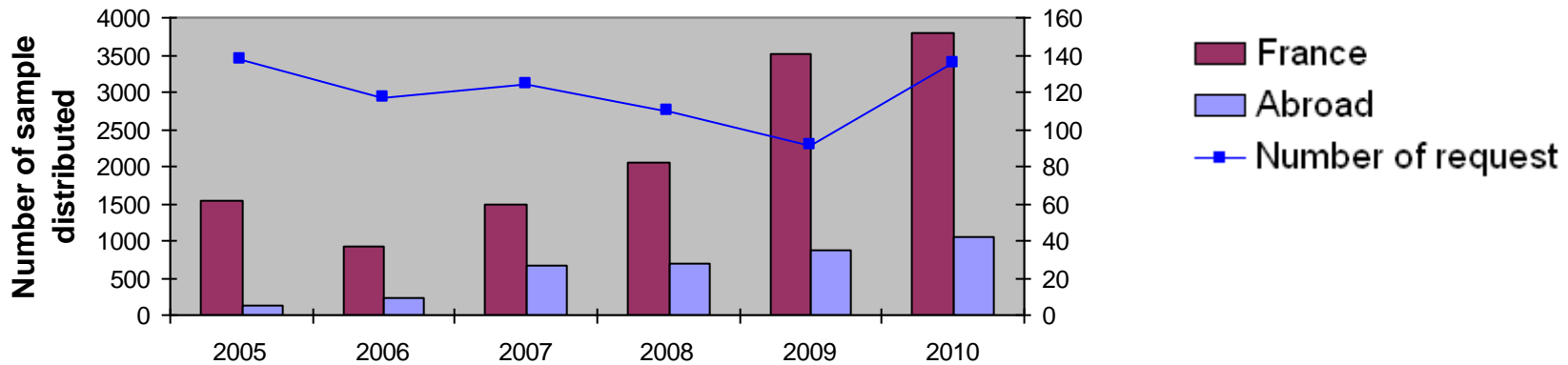


WP2: genotyping 1785 acc. x 42 SSR (leader: INRA Clermont-Ferrand)

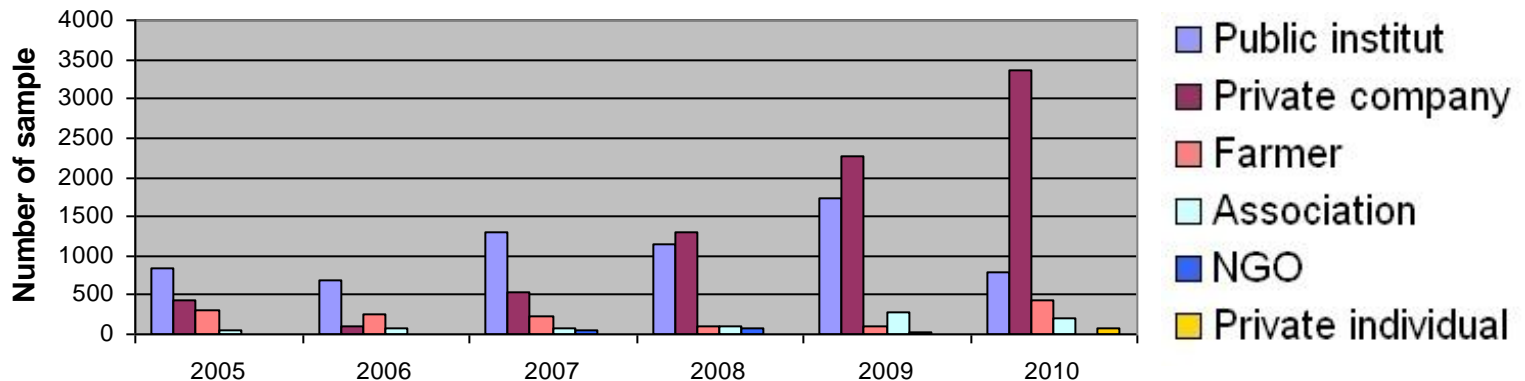


WP3: data analysis (common task)

Seed batches distribution in small grain cereals collections: Who are the users ?



Seed distribution : + **290%** in 5 years
20% sent abroad



Specific requests from farmers

Users

Brewer & farmer



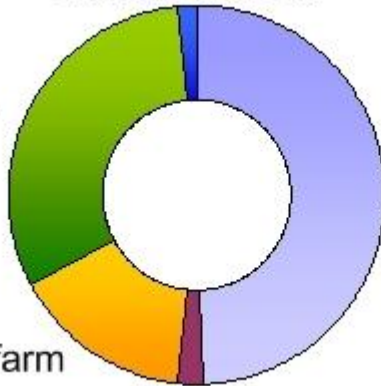
Farmer



Farmer network



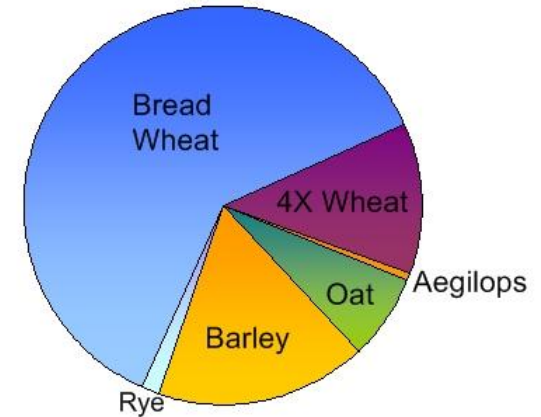
Organic farm



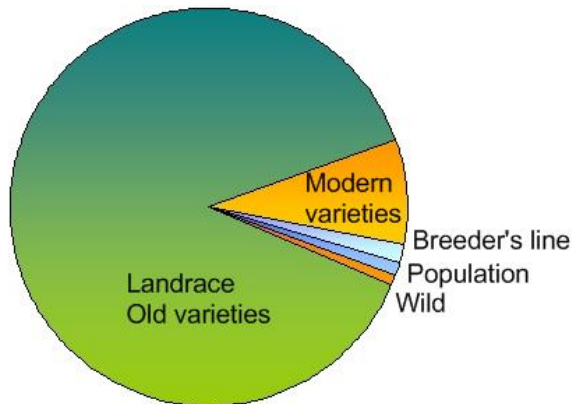
Baker & farmer



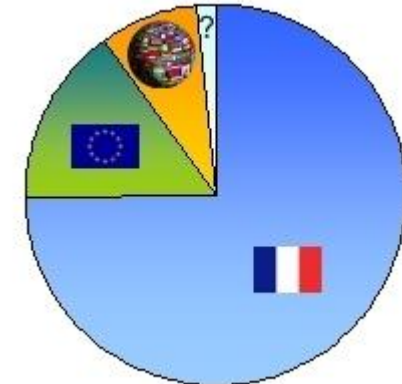
Species requested



Biological status



Origin's country of accession





My basket
0 item(s)

Main

- Home
- Preferences
- About

Queries

- Taxon
- Accession
 - Simple
 - Passport

Documentation

- User guide
- How to order
- FAQ
- SIReGal news
- Release notes

Links

- Data submission
- GnpIS
- Ephasis
- GnpArray
- GnpGenome
- GnpMap
- GnpProt
- GnpSeq
- GnpSNP
- Genetic Resources

Identification



Accession number :	1117
Accession name :	AUTOMNE ROUGE BARBU
Synonyms :	BLE D'AUTOMNE ROUGE BARBU [Français] BLE BRUN D'HEIDENBERG [Français]
subspecies :	<u>Triticum aestivum aestivum</u>
Pedigree :	variété locale
Biological status :	Traditional cultivar/landrace
Comment :	-

Origin

- Geographical origin : [France](#)
- Holding institution : [UMR Génétique, Diversité et Ecophysiologie des Céréales, INRA Clermont](#)

Evaluation data

	Growth class	Hiver - Winter
- Days to heading (Counted as days from sowing to 50% of panicles fully emerged)		149,8
- Scale of days to heading	8	
- Plant height (cm)	145	
- Scale of plant height	9	
- Susceptibility to <i>Puccinia recondita</i> (Leaf rust) - Year 2000	5	
- Susceptibility to <i>Puccinia striiformis</i> f. sp. hordei (Yellow rust) - Year 2000	1	
- Scale of 1000 kernels weight	3	
- Wheat awnedness	7	

Distribution

Presence status :	Maintained
Available :	 Yes
Distributor(s) :	UMR Génétique, Diversité et Ecophysiologie des Céréales, INRA Clermont



- My basket
0 item(s)
- Main**
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 - GnpSeq
 - GnpSNP
 - Genetic Resources

SIReGal, the Plant Genetic Resources Information System of the National Institut for Agronomical Research (INRA), France relies on a database gathering descriptions on several agronomically interesting plant species. The main stored data are of two types:

1. multicrop passport descriptors (common to all plant species): taxonomy, country of origin, biological status (wild, mutant, hybrid...), pedigree...
2. specific data (may be different for each species group) : morphology (size, shape, colour, ...), agronomy (yield, quality, ...), resistance to diseases, ...

Fruit species



Grapevine



Cherry



Nuts



Plum



Almond

Vegetable species



Allium



Brassica

Crop species



Small grain cereals



Maize



Grain Legumes

Overview of the database content

Taxons	4747
Accessions	12600
Phenotypes	71404

<http://urgi.versailles.inra.fr/siregal/siregal/welcome.do>

Acknowledgement

- **UFS cereal section**



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- S. Sunderwirth (Momont)
- B. Duperrier (Limagrain-Verneuil)
- V. Lein (Staaten Union)
- J.M Delahaye (Lemaire Deffontaines)
- S. Regnault (Unisigma)
- P. Lonnet (Florimond Desprez)
- S. Caiveau (Syngenta)

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- L. Bardy (seeds multiplication, distribution)
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- E. Boulat (network coord.)
- J. Bordes (data analysis)
- J. Koenig (Avena sp.)
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- F. Exbrayat (genotyping)
- N. Guilhot (bioinformatics)
- C. Poncet (genotyping platform)
- B. Debote (experimental farm)

- **INRA URGI Versailles**



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