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STATISTICAL METHODS AND SOFTWARE TOOLS FOR MOLECULAR TECHNIQUES IN DUS EXAMINATION

Document prepared by an expert from France

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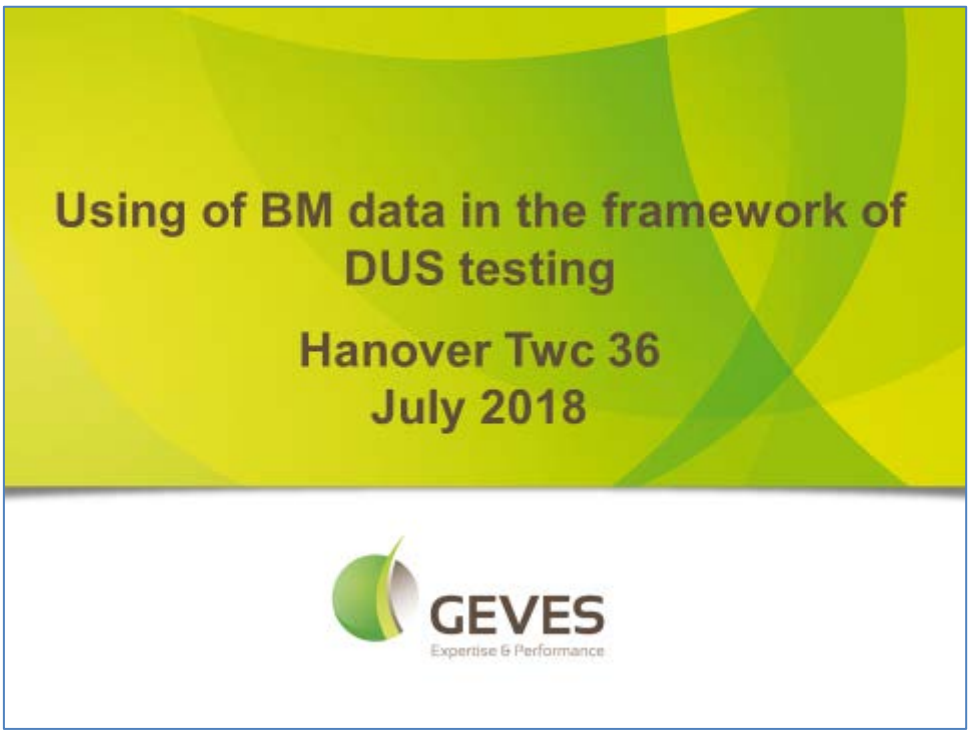
The Annex to this document contains a copy of a presentation on “Statistical methods and software tools for molecular techniques in DUS examination”, made at the thirty-sixth session of the Technical Working Party on Automation and Computer Programs (TWC).

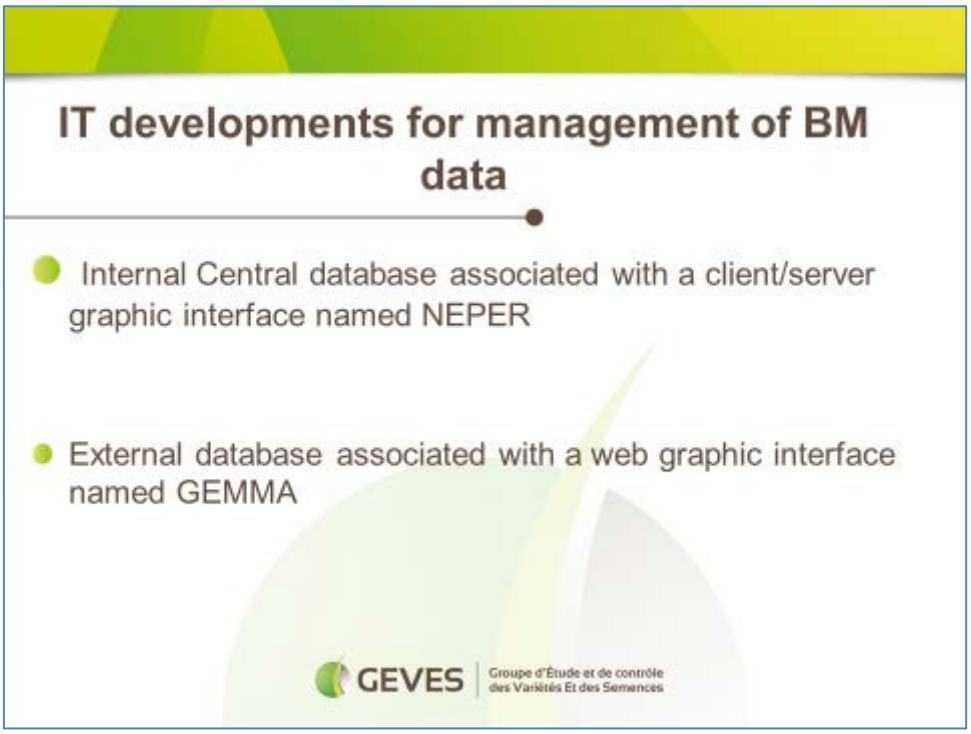
[Annex follows]

ANNEX

STATISTICAL METHODS AND SOFTWARE TOOLS FOR MOLECULAR TECHNIQUES IN DUS EXAMINATION

Presentation prepared by an expert from France





Internal Central Database NEPER

- Run under Oracle system
- Data model is based on 100 tables
- Database is not accessible from outside
- Concerns around 30 end users
- Store differents type of data : Electrophoteric data, chromatographic data, biomolecular data

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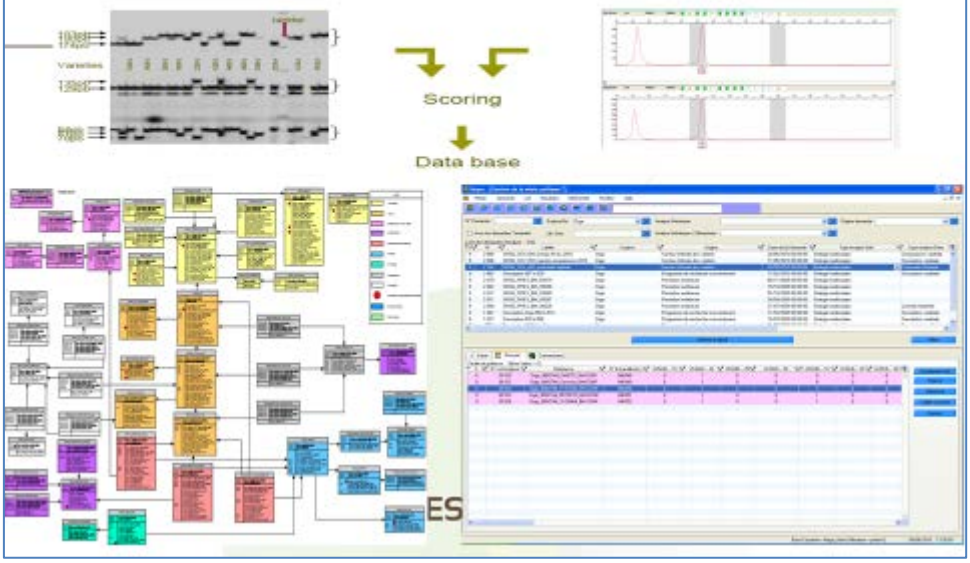
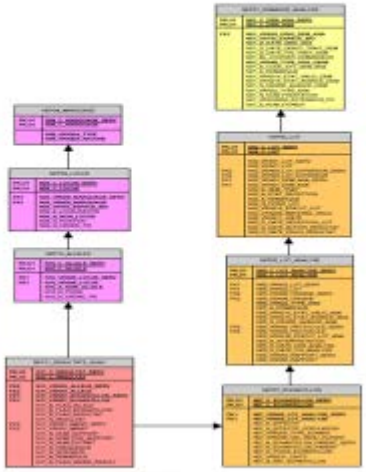
Internal Central Database NEPER



Internal Central Database NEPER

- Sump up of the data model to focus on storage of BM data



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Internal Central Database NEPER

- BM data are stored as presence or absence of each allele of each locus (large volumes of data, speed of statistical or numerical processes, ….)
- Up to now, the table that store BM data, reach 30 million lines
- 3 types of markers are stored
  - ISSR (2008)
  - SSR (2008)
  - SNP (2012)

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Internal Central Database NEPER

- Summary on SSR marker

Start Year	End Year	Nb Data	Specie
2009	2018	2427270	Wheat
2007	2018	2022815	Maize
2008	2018	1327179	Sunflower
2008	2018	863531	Barley
2012	2017	779773	Apricot
2010	2018	538529	Pea
2013	2017	386243	Cabbage
2014	2018	335723	Apple
2010	2018	327569	Date Palm
2010	2014	245231	Lettuce
2010	2016	191839	Peach
2008	2018	136412	Rapessed
2015	2017	114415	Pear
2010	2014	113436	Sorghum
2017	2017	89507	Walnut
2015	2017	47502	Cherry
2011	2018	33275	Starwberry
2016	2017	23765	Hazelnut
2010	2016	16580	Triticale
2017	2017	10079	Bean

- Summary on SNP marker

Start Year	End Year	Nb Data	Specie
2011	2018	8602388	Maize
2013	2017	980120	Sorghum
2017	2017	57368	Rapeseed

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External Database GEMMA

- We developed in 2010-2011 a technical website "GEMMA" to share DUS data beetween different couple Specie/Country.
- This development was made in the framework of CPVO R&D project "CPV8648" (Management of peach three reference collections). This project involved 4 countries: Spain, Hungary, Italy and France.
- In 2017, a new CPVO R&D project "Potato III" (Management of Potato reference collections) have been include in GEMMA website. This project involves 9 countries: Germany, Slovakia, Netherlands, Austria, Ireland, United Kingdom, Spain, Poland and Czech Republic.

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External Database GEMMA

- In 2018, a new CPVO R&D project “Melon database” (Setting up of a database with descriptions and photos of melon varieties of common knowledge) should be include in GEMMA website. This project involves 5 countries: Netherlands, Slovakia, Spain, Portugal and France.
- Store differents type of data : Qualitative data (=Observations), Quatitative data (=Measurements), Biomolecular data, Digital pictures

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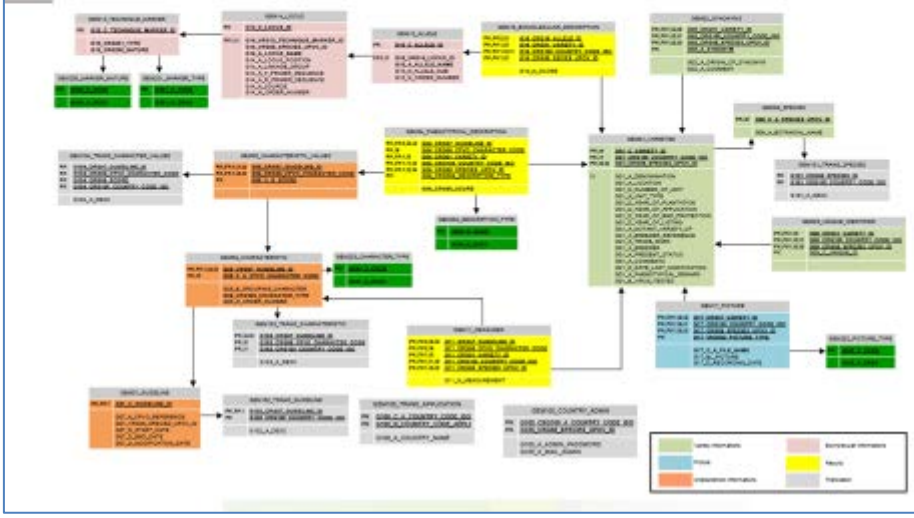
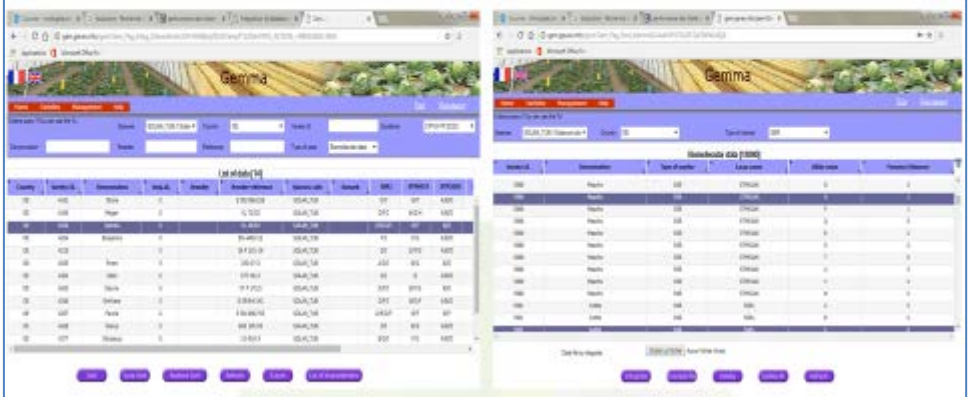
External Database GEMMA

Peach tree reference collection database : relational model



External Database GEMMA



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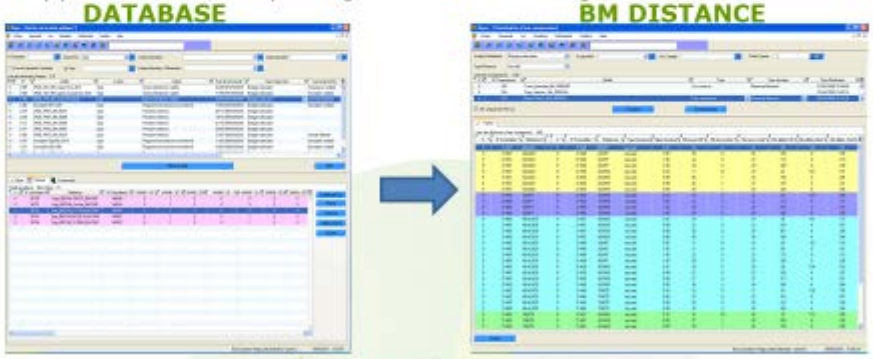
Main uses of BM data in the framework of DUS testing

- Computation of genetic distance to be used in the combined approach with morphological distance trough the GAIA software

DATABASE

BM DISTANCE



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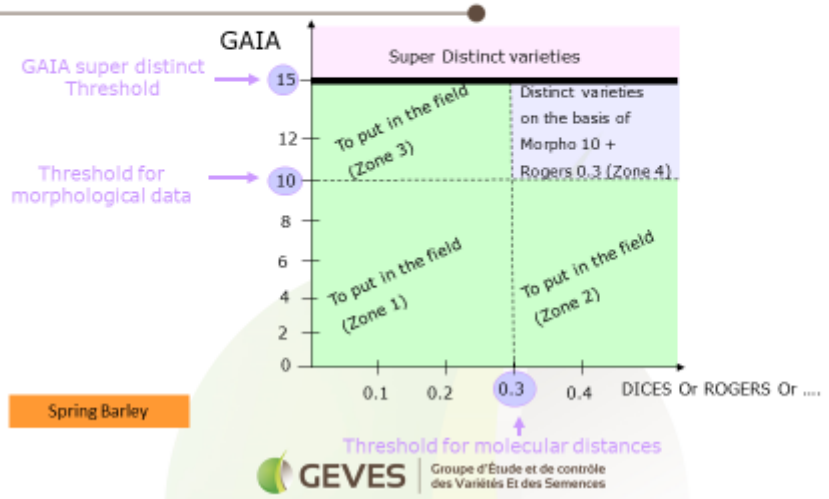
Main uses of BM data in the framework of DUS testing : Combined approach



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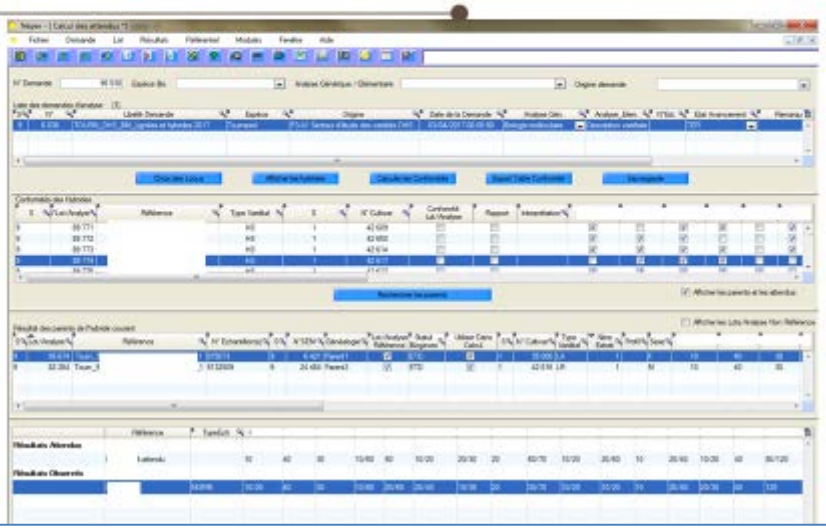
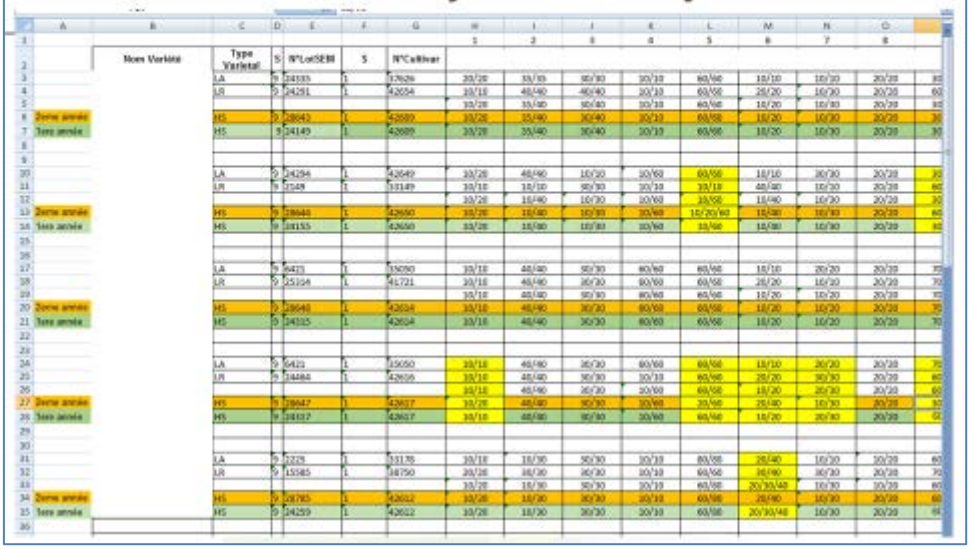
Main uses of BM data in the framework of DUS testing : Assement of Hybrid conformity



Main uses of BM data in the framework of DUS testing : Assement of hybrid conformity



To conclude

- Single database of BM data ? (Pluto, VarietyFinder, …)
- Type of BM data ? (Genetic distance, DNA profil, ….)
- Storage format of BM data ?
- Harmonization of referential data ? (locus, allele, marker, …)
- Strong link between differents information system ?
- Data access methods ? (Text file, WebService, …)

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