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ADDENDUM TO CONSTRUCTION OF A EUROPEAN POTATO DATABASE WITH VARIETIES OF COMMON KNOWLEDGE AND ITS IMPLEMENTATION IN THE POTATO DUS TESTING SYSTEM PART I: CONSTRUCTION, MAINTENANCE AND USE OF THE COMMON DATABASE

Document prepared by an expert from Germany

The Annex to this document contains a copy of a presentation on “Construction of a European Potato database with varieties of common knowledge and its implementation in the potato DUS testing system Part I: Construction, maintenance and use of the common database”, prepared by an expert from Germany, which was made at the seventeenth session of the Working Group on Biochemical and Molecular Techniques and DNA-Profiling in Particular (BMT).

[Annex follows]

ANNEX

CONSTRUCTION OF A EUROPEAN POTATO DATABASE WITH VARIETIES OF COMMON KNOWLEDGE AND ITS IMPLEMENTATION IN THE POTATO DUS TESTING SYSTEM PART I: CONSTRUCTION, MAINTENANCE AND USE OF THE COMMON DATABASE

Presentation prepared by an expert from Germany

Construction of a European Potato database with varieties of common knowledge and its implementation in the potato DUS testing system

Examination offices:	AGES (AT), UKZUZ (CZ), BSA (DE), OEVV (ES), DAF (IE), Naktuinbouw (NL), COBORU (PL), UKSUP (SK), SASA (UK), CPVO (EU)
DNA profiling:	Naktuinbouw (NL), SASA (UK),
Database software:	GEVES (FR)
Coordinator:	BSA (DE)

HISTORY OF THE EUROPEAN POTATO DB

Potato I	- first CPVO co-financed R&D project in 2006-2008 - Partners: UK, NL, DE and PL. - Morphological descriptions, lightsprout pictures and molecular profiles with 9 SSR markers collected for ~ 900 varieties from EU Common Catalogue
Ringtests	- Harmonization morphological descriptions in 2012 -2013 - Partners: AT, CZ, DE, ES, IE; NL, PL, SK, UK (coordinated by CPVO) - DNA profiling of new varieties
Potato II	- continuation of ringtests and DNA profiling of new varieties in 2014-2015 - identification of characteristics for the DB
Potato III	- Construction of the European Potato DB in 2016-2017 - Partners: AT, CZ, DE, ES, IE; NL, PL, SK, UK

Projects were co-financed and accompanied by the CPVO.
Developments discussed with breeders. ESA actively participated in meetings.

MILESTONES OF THE 'POTATO III'- PROJECT

1. Construction of the database, definition of content
2.a Molecular profiling of new applications
2.b Collection and profiling of known varieties which were still missing
3. Development of procedures for feeding and maintaining the database
4. Implementation of the database into the DUS systems of examination offices
5. Conclusion of agreements on continued contribution to the database, rights and obligations of partners, confidentiality aspects

1. Construction of the database and definition of content

Construction of the database:

- Common database constructed using the GEMMA-software developed by GEVES, FR, in the framework of the CPVO co-funded R&D project "Management of peach tree reference collections" (see TWC/29/24)
- Training on use of software
- Adaptation of import files, management of access rights

Definition of DB content

- Varieties and related administrative data (inclusion & deletion)
- Based on ringtest results agreement on morphological characteristics with sufficiently harmonized descriptions (19 out of 37 in CPVO-TP/23/3)
- Standardized pictures of lightsprouts
- Profile of 9 SSR markers (see BMT/17/12)

2. Molecular profiling 2006 -2018

Procedures for the generation of molecular data including sampling were developed.

Number of varieties described for SSR markers in 2006-2018:

		DE	PL	NL	UK	ES	IE	AT	CZ	SK	Total
Potato I	2006-2007	215	187	326	403						895*
NL/UK	2008-2011			220	184						404
Follow up	2012	46	33	39	32						150
Follow up	2013	23	38	37	22						120
Potato II	2014	49	36	47	21	2	9	11	15	5	195
Potato II	2015	44	17	57	11	-	6	6	9	3	153
Potato III	2016	35	19	56	5	-	8	6	12	2	143
Potato III	2017 Cand	30	15	40	7	-	4	6	14	7	123
Potato III	2017 CC	10	27	38	9	32	12	21	38	22	209
Ongoing	2018	26	26	45	6	-	5	-	8	-	116

*) duplicates excluded

3. Development of procedures for feeding and maintaining the database:

- Examination offices are responsible to upload and update its own administrative, morphological and molecular data as well as the lightsprout pictures.
- Examination offices can allow specific access to the own data per variety, partner and data type (phenotypic and/or molecular and/or picture)

Data uploaded by June 2018:

	AT	CZ	DE	ES	IE	NL	PL	SK	UK
Varieties	23	207	568	2	34	279	126	257	36
Phenotypic data CPVO-TP 023/2	13	184	312	2	34	240	103	203	29
Phenotypic data CPVO-TP 023/3			21						
Molecular data	13	37	164	2	17	197	46	9	35
No. of photos (mostly 2 per variety)	23	37	144	2	58	412	0	228	0

4. Implementation of the database into the DUS systems

- Implementation of the database depends on the national DUS systems of potato.
- Despite of the ringtests morphological variety descriptions from different countries are not sufficiently consistent.
- National reference collections including in-house descriptions remain most important.
- Molecular marker information in the European Potato DB provides an efficient tool to identify varieties which should be added to the national reference collection.
- Varieties not (yet) in the national reference collection but with a high genetic similarity to a candidate variety can be added to the DUS growing trial. The risk to miss similar varieties will decrease.

EXAMPLES:

Currently, variety pairs with > 85 % similarity in the DNA profile are considered in more detail. 266 candidates were tested against the DB in 2016-2017 with the following results.

- All 100 % matches were expected due to administrative data (same variety in different countries)
- 8 pairs with similarity 85 to < 100 %
  - ☺ 5 pairs with clear morphological differences based on (previous) in-house descriptions
  - ☹ no comparison possible for 2 pairs (old varieties, no material available, no further data)
  - ☺ 1 pair with 95.5 % similarity was added to the growing trial in Germany in 2018. Clear differences in several morhpol. characteristics observed in direct comparison.
- 266 candidate varieties compared to ~ 2000 varieties in the DB resulted in one additional comparison in the field. This result confirms that the actual national reference collections are appropriate for reliable decisions on distinctness. Molecular markers provide additional safety.

5. Continuation of the database

The CPVO co-financed R&D project ended in 2017. From 2018 onward, the European Potato DB will be maintained, used and improved according to the conditions defined in a PARTNERSHIP AGREEMENT which specifies:

- rights and obligations of partners
- confidentiality aspects
- modalities of cooperation

Partnership agreement concluded between the nine examination offices and the CPVO.

Parties commit themselves to contribute regularly to the database and to provide actual data.

CONCLUSIONS:

- The maintenance and use of the DB comprising most varieties in the common catalogue will increase the quality of DUS decisions and will contribute to strengthen the system.
- Potential savings in growing trials depend on the national DUS systems. For the time being, most examination offices do not expect fundamental changes in the field trials.
- The establishment and maintenance of the DB activated sustainably the cooperation between the examination offices. It can be considered as a model for a common DB.
- Experience in the project shows that cooperation between 10 partners requires considerable continued coordinative work but it enables a better level of harmonization and exchange of information.

THANK YOU!

[End of Annex and of document]