



TWC/30/37

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

**TECHNICAL WORKING PARTY ON AUTOMATION AND
COMPUTER PROGRAMS****Thirtieth Session****Chisinau, Republic of Moldova, June 26 to 29, 2012****REPORTS ON DEVELOPMENT IN PLANT VARIETY PROTECTION
FROM MEMBERS AND OBSERVERS***Document prepared by the Office of the Union*

1. The Technical Committee (TC), at its forty-seventh session held in Geneva, from April 4 to 6, 2011, agreed to request the Office of the Union to invite experts to submit written reports to the Office of the Union in advance of the Technical Working Party (TWP) sessions in order that a document containing those reports could be prepared by the Office of the Union. The TC noted that TWP experts would be invited to make a brief oral summary of their written report at the session and would also be encouraged to make reports under the agenda item "Experiences with new types and species", as appropriate. The TC also noted that TWP experts would have an opportunity to raise questions concerning matters of interest (see document TC/47/26 "Report on the Conclusions", paragraphs 9 and 10).

2. Written reports were requested by the Office of the Union in Circular E12/159. The following reports were submitted (in alphabetical order):

Members of the Union: Annexes I to VIII: Denmark, European Union, France, Italy, Japan, Netherlands, Republic of Korea and United Kingdom

3. In agreement between the Chairperson of the Technical Working Party on Automation and Computer Programs (TWC) and an expert from the Netherlands, the TWC, at its thirtieth session held in Chisinau, Republic of Moldova, from June 26 to 29, received a presentation on "Tools for the Management of Variety Collections" made by an expert from the Netherlands and noted the information on management of reference collections using molecular markers, a copy of which is included as Annex IX to this document.

[Annexes follow]

DENMARK

On November 16, 2011, Denmark received the Community Plant Variety Office (CPVO) entrustment for the agriculture species: Wheat, Barley, Oat, Rape seed, Sugar beets (hybrids), Fodder beets (hybrids), Festulolium, Field bean and Quinoa.

On October 1, 2011, the Danish Plant Directory, Directory of Fisheries and "FødevareErhverv" merged and formed one large organization named "The Danish AgriFish Agency". The Danish AgriFish Agency is an agency under the Danish Ministry of Food, Agriculture and Fisheries and has about 1100 employees.

The Variety Testing in respect to DUS, VCU and post control has kept the name "Department of variety Testing" and is now a part of The Danish AgriFish Agency.

The Variety administration and personal doing the DUS, VCU and post control are still located at the address:

Department of Variety Testing,
Teglværksvej 12, Tystofte, DK- 4230 Skælskør
Tel: +45 58160600, Fax: +4558160606
Web site: http://agrifish.dk/variety_testing.aspx?ID=46545

The statisticians at the previous Faculty of Agricultural Sciences have been reorganized and are now formally attached to separate departments. However, the statisticians are still located closed to each other (i.e. on the same gangway).

[Annex II follows]

EUROPEAN UNION

The expert from the Community Plant Variety Office (CPVO) of the European Union reported that the office has a new President. Since 01.09.2011 M. Martin EKVAD has taken up duties for a period of five years. In March 2012, the mandate of the Vice President, Mr. Carlos GODINHO, has been prolonged for another five years by the Council of the European Union.

In 2011, the Office had received 3184 applications for Community plant variety rights (CPVR), this represents an increase of 10% compared with the previous year and the highest number ever received during one year. The total number of Community titles in force reached 20.000 in June 2012. However, a 15% decrease could be recorded so far this year.

The CPVO Variety Finder contains more than 710.000 denominations from national listing, plant variety rights and commercial registers. Since November 2011, the database is freely available but still requires identification. The initial aim of the database is the verification of the suitability of a proposed variety denomination with regard to similarity, but it turns out that it is also a useful tool in order to search for varieties of common knowledge. Applicants use this database also to pre-check their denomination proposals for similarity. During 2011, 60.000 tests were performed by users.

Following the implementation of the so-called "one key, several doors" principle, whereby DUS test reports produced by any "CPVO-entrusted" authority in the EU are accepted for listing or protection purposes throughout the Community, an independent technical audit (QAS) of the CPVO was set up and continued audits during 2011. Since the introduction of the system, 18 positive entrustment decisions have been taken by the Administrative Council, against two negative decisions. Seven audits still have to be conducted to conclude the first audit cycle of three years.

Since the end of March 2010 the CPVO is able to offer to applicants the possibility of e-filing. E-technical questionnaires have been developed for a large number of species meantime and besides English, the application form and the web site have been available in Dutch, French and German since March 2012. More than 2000 applications have been received online so far and the Office expects to receive more than 50% of e-applications in 2012. A pilot project involving the Dutch Naktuinbouw and the French GEVES is currently looking for possibilities to share this system with other EU authorities which could use it also for their national applications, with the possibility for applicants to re-use the information provided for a variety for another application of the same variety in another procedure.

Since April 2012, the original of the Decision to grant Community plant variety rights and Certificates of protection will no longer be issued on paper but as electronic documents bearing an electronic signature. The documents are available for the title holder on a secured area of the CPVO web site.

A pilot study involving 5 examination offices of the CPVO was launched at the end of 2011 to investigate on the possibility to use an exchange platform in order to exchange between partners a set of electronic documents. It is foreseen that such a platform would be more efficient than the use of emails in order to exchange documents, especially in respect of security, traceability and integration with the local IT environment.

[Annex III follows]

GEVES's quality management system

- Audit for the renewal of the ISO 9001 - V2008 certification

The audit for the renewal of the ISO 9001: 2008 of the Group for Testing and Control of Varieties and Seeds (GEVES) was held from 2 to 6 April 2012. It was conducted by LRQA (Lloyds Register Quality Assurance). The auditor has recommended the renewal of the ISO 9001 certification for GEVES and the new certificate has been delivered from May, 8, 2012 to April, 29, 2015.

- Audit by CPVO

From April 7 to 19, 2012, the Community Plant Variety Office (CPVO) audit took place at GEVES. It was conducted by two technical auditors and by Gerhard Schuon, CPVO's quality manager, according to the quality reference plan of CPVO.

Regulatory developments

- Law No. 2011-1843 of 8 December 2011 on plant variety protection certificates

France became the 49th UPOV member part of the 1991 convention on May, 27, 2012 after the deposit of the instruments based on the law 2011-1843 ratified on December, 8, 2011.

- Creation of the National Office for Plant Breeders' Rights (INOV)

INOV (Instance Nationale des Obtentions Végétales) has replaced since the 1st of March 2012 the Committee on Plant Variety Protection (CPOV) . It is settled in GEVES Headquarters in Beaucouzé.

Mrs Virginie BERTOUX is in charge of the management of INOV.

Simultaneously, the decision has been taken to change the publication of the Official Gazette which is now available on Internet and no more published on paper. This Gazette is accessible free of charge for all official authorities and through a subscription for any interested party

News about GEVES

- New postal address

GEVES
25 rue Georges Morel, CS 90024, 49071 Beaucouzé Cedex - France

- New Web site

<http://www.geves.fr/>
<http://www.cat.geves.info/>

- National List database
- UE Provisional Market Authorization

News about IT Events

- Sharing the online application of CPVO

The aim of this project it to use the CPVO online application by national examination offices for their own applications (PVR and/or National list).

The system should include the management of: Application form, DUS TQ and VCU TQ.

Two country pilot were identified for this project: France and Netherlands.

For France, We've started to use the system on two species Maize and Lettuce. We want to finalize the setting up of these two species for a selection of clients before the end of this year.

- Electronic Exchange platform with CPVO

The aim of this project is to exchange electronic documents between several partners (CPVO and examination offices) via a exchange platform hosted on dedicated server.

To send or to read the messages and files on the platform the user will have two possibilities:

- To go on a restricted area web site
- To use an application program interface.

If possible, the platform will integrate an outlook plugging. With this tool, a user could upload easily files to the platform only by sending an email to an addressee.

- Gemma : A technical web site to share DUS data

CPVO ask GEVES if it could be possible to use GEMMA in the framework of the R&D program developed on potato and more generally for other R&D projects. That should be normally possible and GEVES prepared a paper that will fix the conditions under which the platform could be accessible for the end of June.

[Annex IV follows]

ITALY

Situation of varieties protection in Italy (year 2011)

In Italy it is the Ministry of Economic development that grants plants variety rights in collaboration with the Ministry of Agriculture and Forest.

The situation with the Italian Property Rights (national protection) is as follows:

-during the year 2011, 8 applications for variety protection were filed: 1 for flower and 7 for fruit species.

The total number of plants variety rights granted over last year (2011) was 4:

- 3 for Agricultural species (durum and soft wheat)
- 1 for Fruit species

The situation of Community Plant Variety Right – EU protection is as follows:

-the total number of applications sent from Italy to CPVO in 2011 was 94

[Annex V follows]

JAPAN

1. Number of application and granted in 2011

(1) Number of applications

Year	Number	(2011/2010)
2010	1,038	
2011	1,126	(108%)
1978 to 2011	26,648	-

(2) Number of granted

Year	Number	(2011/2010)
2010	1,404	
2011	1,139	(81%)
1978 to 2011	21,286	-

2. Average examination duration (from application to registration)

2010	2011	2014 (target)
2.5 year	2.4 year	2.3 year

3. Japanese Test Guidelines harmonized with UPOV TG (in 2011)

Amaranth, Bitter Gourd, Broccoli, Brussels Sprout, Cauliflower, Ginseng, Gypsophila, Marigold, Meadow Fescue, Passion fruit, Potato, Raspberry, Runner Bean, Tall Fescue

4. PVP Office of JAPAN

MAFF has reorganized September 2011.

Plant Variety Protection Office,
New Business and Intellectual Property Division
Food Industry Affairs Bureau
Ministry of Agriculture, Forestry and Fisheries (MAFF)

[Annex VI follows]

NETHERLANDS

Number of applications received for testing for the first year in 2011 for national listing and national and European Plant breeders right In brackets the difference with 2010:

Ornamentals	994	(+ 27%)
Agriculture	138	(- 5%)
Vegetables	726	(+ 5%)
Total	1858	(+ 15%)

2010 showed an increase of 3% in relation to 2009.

Training in DUS related measures

- The sharing of knowledge is important in order to work on a global, harmonized and strong Plant Breeders right system for the benefit of society. Naktuinbouw contributes to this principle on different levels

- two colleagues are tutors in the UPOV distance learning course- annually Naktuinbouw, with the help of UPOV and the Community Plant Variety Office (CPVO) is organising the PVP course in Wageningen. In 2011, 30 participants from 18 countries participated in this two week training.

- Naktuinbouw is involved in bilateral projects to exchange knowledge and to train staff of countries that are working in or on Plant Breeders Rights systems. In 2011 the 10 year cooperation with China has been concluded with a closing seminar in Beijing. The training provided together with the colleagues from the Japanese Plant variety Right Office in Vietnam has also been concluded as well as the project in Indonesia. The project in Ethiopia continues as well as the newly started project in India.

- In 2011 Naktuinbouw received again colleagues as interns from New Zealand, Republic of Korea (2) and China. The colleagues worked together with Naktuinbouw colleagues and thus learn the details of the DUS test work as it is performed in the Netherlands. The use of the Naktuinbouw helpdesk is increasing as more colleagues from all over the world find this opportunity to ask DUS related questions.

- Finally our newly retired colleague Arndjan van Wijk will, in cooperation with the UPOV office develop a second distance learning course, aimed at the DUS test itself. This more practice related course will combine the knowledge from the TGP documents with practical examples from the actual tests.

Research projects

DUS testing is constantly in development. New techniques become available and national research projects funded by the Dutch Ministry for Economic affairs, Agriculture and Innovation, help to incorporate these in the DUS test system. This year projects are assigned to

- The replacement of ordinary light bulbs by LED techniques in potato light sprouts,
- A system will be developed to observe colours in relation to the RHS colour charts using a colour measuring system,
- The management of minimal distances in ornamentals
- How to reduce the number of comparing varieties in vegetables
- The use of DNA technique for the management of variety collections
- Molecular characterisation of the stability of Bremia in lettuce
- A workshop for maintainers of amateur varieties.

Finally the improvement and harmonization of disease resistance partly funded by the CPVO R&D system will start.

Variety descriptions on the Naktuinbouw website

Naktuinbouw now publishes not only all variety descriptions on its website, but for all ornamental varieties also a picture is included in the website.

'Moederplantentuin' re-organized

The 'Moederplantentuin' (Garden for Perennial varieties traded in the Netherlands) has been re-organized into a Reference garden for perennial varieties for which Naktuinbouw is entrusted by CPVO.

Cooperation between GEVES and Naktuinbouw

The Group for Testing and Control of Varieties and Seeds (GEVES) in France and Naktuinbouw decided to jointly work on variety description databases and the cooperation on disease resistance tests.

Visit to potato ring test

The visit to the CPVO organised ring test on potato will take place in Emmeloord on 17 and 18 July. Aim of the test is to harmonize the scoring of morphological characteristics. Also the Naktuinbouw DNA laboratory will be visited for an explanation on the work that is being done on the joint the Science and Advice for Scottish Agriculture (SASA)/Naktuinbouw DNA-database on potato.

[Annex VII follows]

REPUBLIC OF KOREA

1. Plant Breeder's Right

Total number of application as of May 31, 2012 has been reached 6,020 and among them, 3,991 varieties were registered and 538 were rejected since implementation of PVP system in 1998.

2. Online Application System

The Korea Seed and Variety Service (KSVS) operates online application system "SeedNet" (<http://www.seednet.go.kr>) which any applicant can access through the internet.

□ Background

- well-established broadband network
 - Republic of Korea is one of the world's most wired countries in the world
 - The average internet speed of Republic of Korea (ITIF report) : 49.5Mbps
- Easy access by Web browser such as Internet Explorer
 - User need not to install client software in one's own computer

□ On-line Payment for application, examination, registration, and annual fee

- credit card
- real-time account transfer
- attachment receipt for the payment of fee(deposit slip issued by bank)

□ Yearly online application rate

section	2009			2010			2011			2012 (May 31)		
	online	total	%	online	total	%	online	total	%	online	total	%
Application for PVP	434	547	79.3	479	574	83.5	484	587	82.5	326	372	87.6
Application for the entry in National List	27	31	87.1	22	25	88.0	25	25	100.0	10	10	100

※ Total number includes online and postal, visiting application.

□ SeedNet Operation Environment

- Initial Open year: 2004
- Web Server and DB Server OS: Windows Server 2003(Web), 2008(DB)
(To balance on the work load of server, we operate Web Server, DB Server respectively)
- Database Management system: MS-SQL 2008 Enterprise Edition
- System Environment
 - User Interface: Freemaker, Framework: Spring and iBatis

3. Variety Characteristic Search System

□ Objective

- PBR judge or examiner for DUS trial is easy to select comparing variety by searching plant variety characteristics

- Database
 - protected variety, reference variety and so on (since 1998)
 - registered variety number: 11,164 (151 crops)

(as of May. 31. 2012)

Total	Rose	Red pepper	chrysanthemum	Rice	Others
11,164	861	1049	651	528	8,075

- Development course
 - To store various image of variety in PV Database
 - variety image: 11,052

4. Plant Variety Protection Law

In Republic of Korea, Plant variety protection was enforced by Seed Industry Law since 1997. Recently, Plant Variety Protection Law was enacted in 1 June this year for reinforcing its effectiveness. Thereafter, its decree and regulations also will be enacted.

5. Molecular Techniques

Recently, our country is actively applying DNA analysis to seed circulation management of several crops. The representative example is analyzing about comparison of DNA profiles between registered seed and marketing seed. In addition, we are utilizing molecular markers in genetic purity assessment of national list of varieties of rice, barley and soybean.

6. International Cooperation

KSVS and the Korea International Cooperation Agency (KOICA) are preparing to provide PVP training course for the experts from countries which are trying to introduce PVP system and developing system for 3 weeks in June 2012.

[Annex VIII follows]

UNITED KINGDOM

In 2011/12, the United Kingdom PBR applications remained at a modest level, with the bulk of applications continuing to relate to smaller companies that market varieties largely within the United Kingdom or those that prefer to obtain the United Kingdom Rights before submitting applications to the Community Plant Variety Office (CPVO). Across all species, the United Kingdom national list applications rose slightly and remained at about 10 times that for PBR. Around a third of applications were for winter oilseed rape of which approximately half were hybrid varieties. Cereal breeding activity remained robust and also accounted for around a third of all the United Kingdom applications. Herbage and forage variety applications, although slightly increased on the previous year, still accounted for around 20% of the United Kingdom total, with sugar beet at 10% and the remaining 5% being made up of applications for potatoes and various pulses.

A number of research and development projects were pursued at examination centers in the United Kingdom during 2011-12. These included the following examples:

- The CPVO co-funded project on the use of molecular markers in barley at NIAB was completed in December 2011. The one year project entitled "A Potential UPOV Option 2 approach for barley using high density SNP genotyping" used existing data from a large set of markers with close associations with traits (DUS and VCU) to determine whether a correlation exists between genetic and phenotypic distances.
- SSR markers are now being used to verify seed stocks in winter oilseed rape. The assay was implemented in autumn 2011 and will be used to replace additional field plots grown for authentication purposes only.
- The Agri-Food and Biosciences Institute (AFBI) Crossnacreevy has migrated its herbage expert system for field recording to a new data logger platform (Husky FEX21), which has facilitated a continued running under the GW Basic operating system. This has avoided considerable cost in rewriting of the expert system to make it MS Windows compatible.
- The Science and Advice for Scottish Agriculture (SASA) is involved in a ring test for potato DUS with the eight other CPVO entrusted centers potato for potato. The exercise includes a mid trial meeting on the 17 and 18th July. All characters are being assessed.
- The CPVO is considering the molecular marker genotyping system (microsatellite analysis using 9 SSR markers) developed by the United Kingdom and the Netherlands for inclusion as part of the DUS report for potato candidates. Entrusted centers will be asked to submit leaf samples to the two test centers for genotype testing from 2012. Some issues remain to be concluded. The markers would be used in addition to the morphological character assessments.

[Annex IX follows]

Experiences of Members of the Union in Measures to
Improve the Efficiency and Effectiveness of DUS Testing

Tools for the management of variety collections

**Kees van Ettehoven,
The Netherlands**

**Chisinau, Republic of Moldova
June 26, 2012**

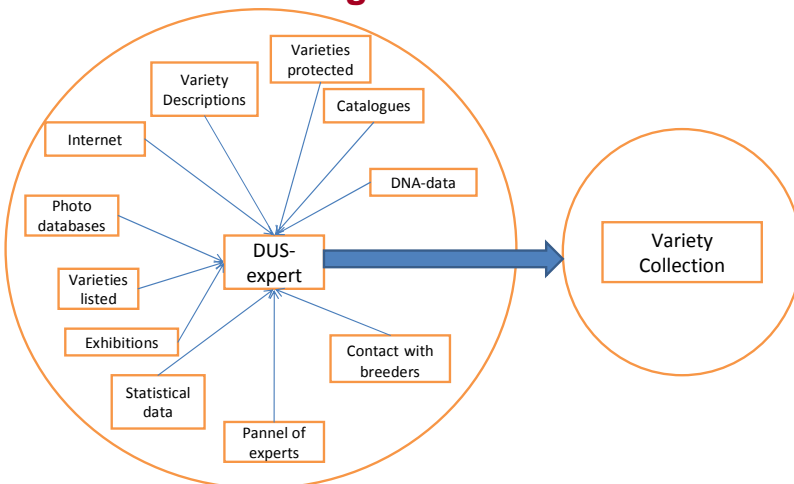
How to go from common knowledge to a reliable growing trial

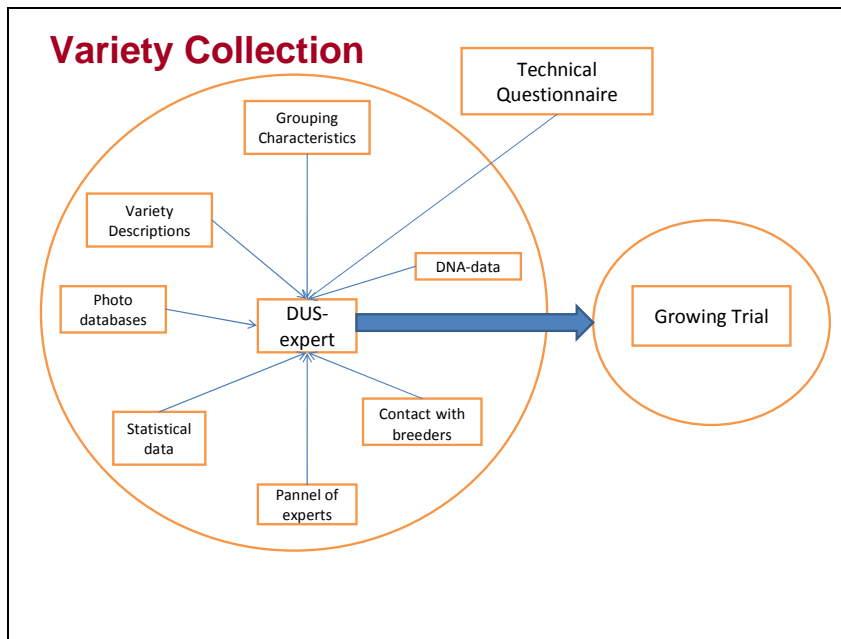
- TGP/9/1
- 1.1 Article 7 of the 1991 Act of the UPOV Convention establishes that a “variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of the filing of the application.”

From common knowledge to variety collection

- It is clear that the list of varieties of common knowledge (CK) can be very large. Therefore, the number of varieties of CK that need to be included in trials with a candidate variety needs to be reduced. That process knows the following steps:
- Step 1: Making an inventory of the varieties of common knowledge;
- Step 2: Establishing a (“variety collection”) of varieties of common knowledge which are relevant for the examination of distinctness of candidate varieties according to document TGP/4 “Constitution and Maintenance of Variety Collections” ;
- Step 3: Selecting the varieties from the variety collection which should be included in the growing trial or other tests for the examination of distinctness of a particular candidate variety.

Common Knowledge

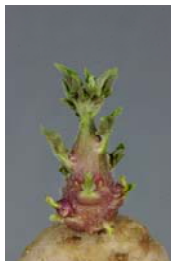




Combining morphological and molecular distances in the management of the reference collection of potato

DUS testing of potato

Potato varieties are mostly distinct (and uniform):



- Tetraploid, heterozygous
- Parental cross resulting in unique seedlings
- Seedlings: vegetatively propagated (fixed genotype)
- Lightsprout test: > 80 % distinct
- Uniformity is usually no problem



Limitations in DUS potato testing

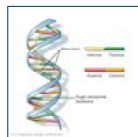
- **Limited (living) reference collection:**
 - World (common knowledge): over 4000 varieties
 - EU catalogue: 1400 varieties
 - NL operational collection: 350 varieties
- **Limited coverage of database**
 - morphological descriptions (EU coverage: 30-40 %)
 - photodatabase (EU coverage: 30-40%)
- **Limitations due to:**
 - quarantine regulations
 - distribution of bulk samples (tubers)
 - maintenance – annual, technical (diseases), economical
- **Variation of morphological data:**
 - diverse origins of variety descriptions
 - see: www.upov.org: TWA/34/13 – add 2 (2005)
 - quality and origin of tubers.
 - year-, location- and observer-effects

Reference collection of potato



- Collection of living plant material
- Database with variety descriptions
- Photodatabase
- Limited coverage and (partly) unreliable
- Can DUS testing of potato be improved by expanding the reference collection with DNA profiles ?

Reference collection of potato



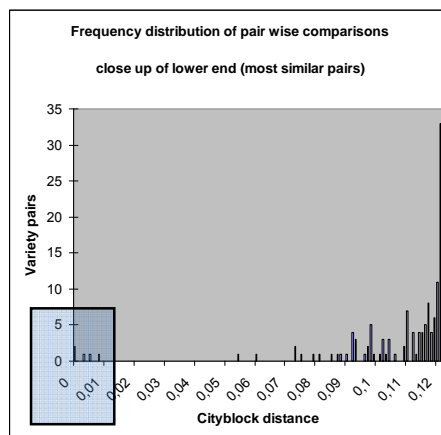
- Expanding the reference collection of potato with DNA profiles:
- Relationship between morphological data and molecular data ?

Morphological distance

Material:

- 183 varieties
 - Validated variety descriptions:
 - Field trial and lightsprout test in 2010.
 - Individual characteristics observed (TG/23/6)
 - All visual observations (VG)
 - Scored by DUS expert
 - Validated DNA profiles available

Morphological distance

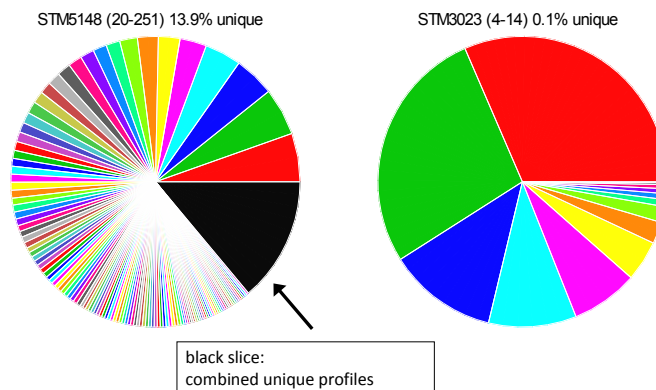


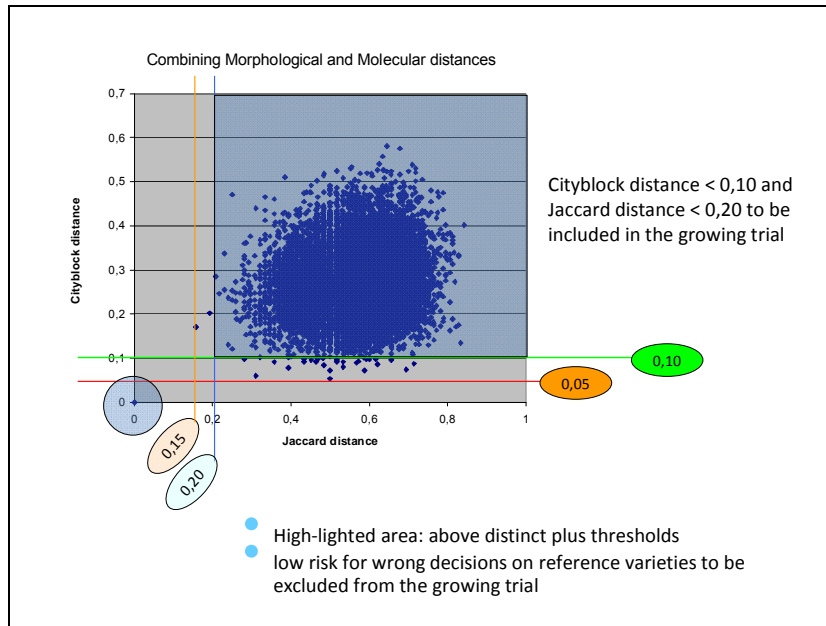
- Cityblock distance:
- Lightsprout and field characteristics
- 183 varieties
- 16.653 combinations
- 5 pairs (7 varieties) nearly 0
- (0 = similar; 1 = different)

Molecular distance

- SSR database (NL/GB) of 900 varieties in total
 - samples collected from (NL/PL/DE/GB) reference collections
 - samples obtained from breeders/maintainers
- Over 200 varieties with samples from more than 1 source
- Most varieties analysed in 2 labs (NL and GB)
- Many varieties 2 profiles per lab (GB)
- In case of anomalies/doubts: variety re-sampled
- => in total almost 3000 profiles scored
- For more details, see: BMT/11/9 and BMT/11/10

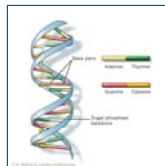
Molecular profiles (900 varieties)





Proposed model for potato:

- Variety collection consisting of:
 - Living reference collection
 - Variety descriptions (locally validated)
 - Lightsprout Photo database
 - SSR database.



Proposed model for potato:

- **DUS testing based on morphological observations:**
 - **First year:**
 - start of season: lightsprout test (including photograph) and DNA profiling
 - main season: morphological observations of field characteristics
 - **End of first year:**
 - DUS decision based on morphological data (threshold for distinctness)
 - Supported by information from DNA database to check for potential 'missing' close varieties
 - **Second year testing continued for selected candidate varieties only:**
 - candidate-reference pairs below distinct plus level (cityblock distance < 0,1)
 - including reference varieties selected from DNA database (Jaccard < 0,2).



Proposed model for potato:

- **Reduced testing period compensated by added value molecular profile:**
 - Significant expansion of reference collection (potentially expanded with SSR databases of cooperative DNA labs)
 - Detection of most similar reference varieties (Jaccard distance < 0,2)
 - Morphological observation supported by information from molecular profile.
 - Spin-off for identification purposes (based on original identity sample)

