Technical Working Party on Automation and Computer Programs (TWC)

Thirty-first Session

PREPARATORY WORKSHOP

Seoul, Republic of Korea
June 3, 2013

PROGRAM

1. Introduction to UPOV and the role of UPOV Technical Working Parties (TWPs)
2. Overview of DUS Trials and Test Guidelines
    a) Method of observation and types of record (MS, MG, VS, VG);
    b) Types of expression (QL, PQ, QN) and types of scales of data
3. Methods used for DUS data analysis and development of variety descriptions
    a) Methods of management used in the DUS examination for transformation of observations and measurements into notes for distinctness for variety descriptions
    [presentations by Japan and Korea]
    b) Methods used for DUS trial design and data analysis
    [presentations by France and United Kingdom]
4. Image analysis
5. UPOV Website
6. Agenda for the TWC Session
7. Feedback from participants

1. INTRODUCTION TO UPOV AND THE ROLE OF UPOV TECHNICAL WORKING PARTIES (TWPs)

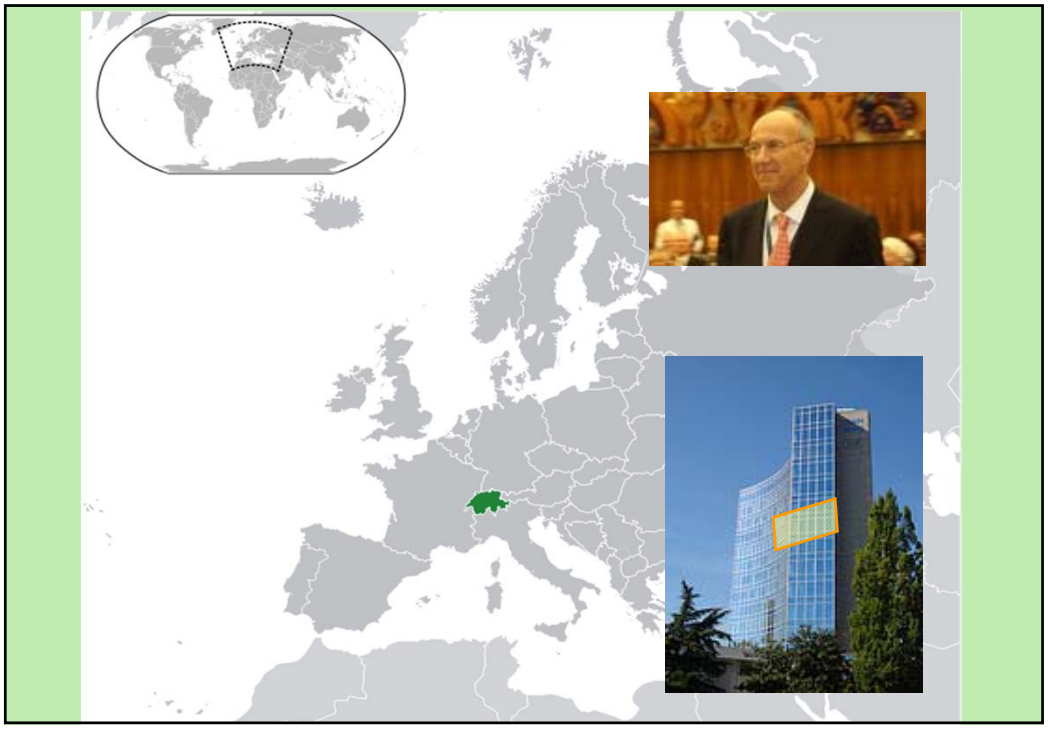
UPOV: INDEPENDENT INTERGOVERNMENTAL ORGANIZATION

The International Convention for the Protection of New Varieties of Plants

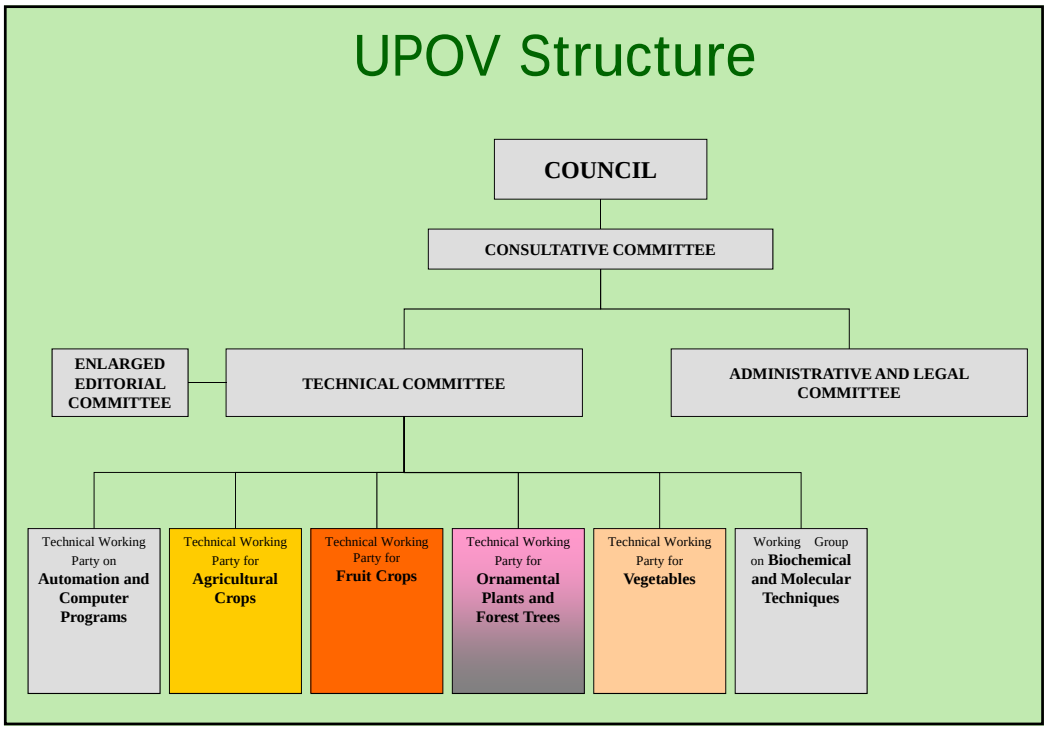
established in 1961

The International Union for the Protection of New Varieties of Plants

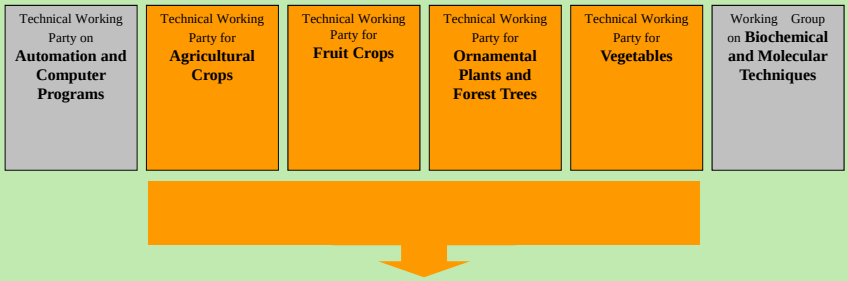
Union internationale pour la protection des obtentions végétales



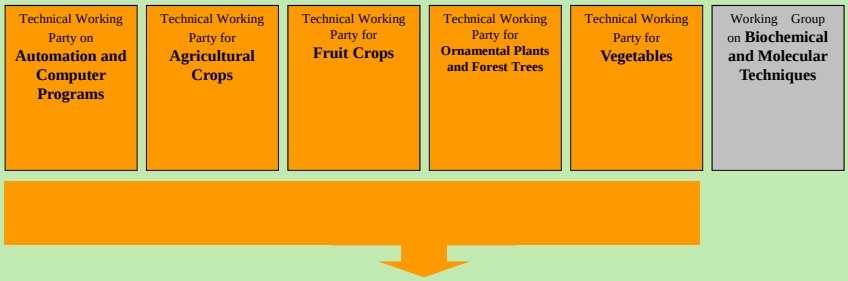
UPOV Structure



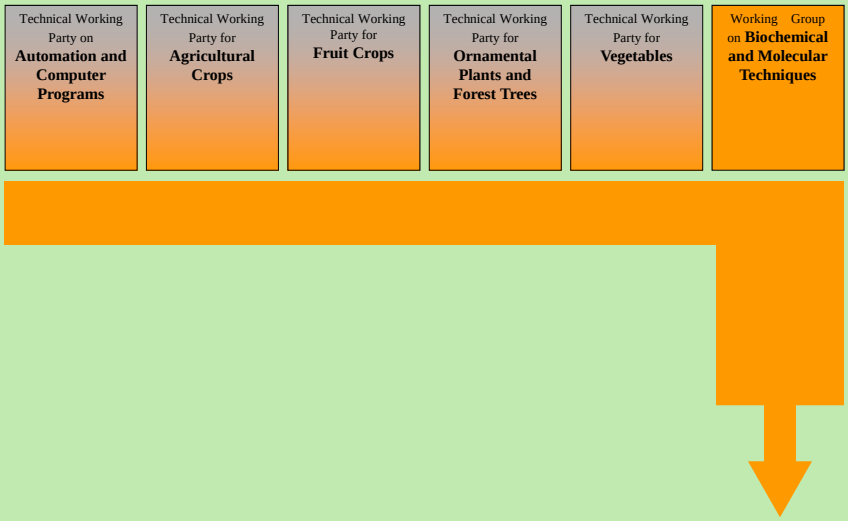
UPOV Structure



UPOV Structure



UPOV Structure



Role of the BMT

The BMT is a group open to DUS experts, biochemical and molecular specialists and plant breeders, whose role is to:

- **(i) Review general developments in biochemical and molecular techniques;**
- **(ii) Maintain an awareness of relevant applications of biochemical and molecular techniques in plant breeding;**
- **(iii) Consider the possible application of biochemical and molecular techniques in DUS testing and report its considerations to the TC;**
- **(iv) If appropriate, establish guidelines for biochemical and molecular methodologies and their harmonization […];**
- **(v) Consider initiatives from TWPs, for the establishment of crop specific subgroups […];**
- **(vi) Develop guidelines regarding the management and harmonization of databases of biochemical and molecular information, in conjunction with the TWC;**
- **(vii) Receive reports from Crop Subgroups and the BMT Review Group;**
- **(viii) Provide a forum for discussion on the use of biochemical and molecular techniques in the consideration of essential derivation and variety identification.**

2. OVERVIEW OF DUS TRIALS AND TEST GUIDELINES (TGs) (document TG/1/3 and TGP documents)

THE CONDITIONS FOR GRANTING A BREEDER'S RIGHT

Criteria to be satisfied

- NOVELTY

- **D**ISTINCTNESS
- **U**NIFORMITY
- **S**TABILITY

} **"DUS"**

THE CONDITIONS FOR GRANTING A BREEDER'S RIGHT

Other conditions

- VARIETY DENOMINATION
- FORMALITIES
- PAYMENT OF FEES

NO OTHER CONDITIONS!

Guidance for DUS Examination

facilitates:

BEST PRACTICE (based on experience)

=> good decisions

=> good definition of the object of protection (strong protection)

=> efficiency in method of examination (learn from the best)

HARMONIZATION

=> efficiency

- mutual acceptance of DUS reports (minimize cost of examination for individual authorities)
- mutual recognition of variety descriptions (all parties speak the same "language")
- simple and cheap system for applicants (minimize cost for breeders)

UPOV provides guidance by:

- The "General Introduction" (TG/1/3)
  - General technical principles
  - Organization of DUS Testing
  - Associated "TGP" Documents (e.g. statistical methods)

= version 3

TG/1/3 General Introduction

"Associated" TGP Documents

Ref.	Title
TG/00	List of TGP Documents and Latest Issue Dates
TGP/1	General Introduction With Explanations
TGP/2	List of Test Guidelines Adopted by UPOV
TGP/3	Varieties of Common Knowledge
TGP/4	Constitution and Maintenance of Variety Collections
TGP/5	Experience and Cooperation in DUS testing
TGP/6	Arrangements for DUS testing
TGP/7	Development of Test Guidelines
TGP/8	Trial Design and Techniques Used in the Examination of DUS
TGP/9	Examining Distinctness
TGP/10	Examining Uniformity
TGP/11	Examining Stability
TGP/12	Special Characteristics
TGP/13	Guidance for New Types and Species
TGP/14	Glossary of Technical, Botanical and Statistical Terms Used in UPOV Documents
TGP/15	Guidance on the Use of Biochemical and Molecular Markers in the Examination of Distinctness, Uniformity and Stability (DUS)

"CHARACTERISTICS"

- **may have direct commercial relevance**
  - **Flower color (ornamental)**
  - **Fruit color**
- **but commercial relevance NOT required**
  - **Leaf shape**

Selection of Characteristics

The basic requirements that a characteristic should fulfill before it is used for DUS testing or producing a variety description are that its expression (TG/1/3: Section 4.2.1) :

(a) **results from a given genotype** or combination of genotypes;

(b) is sufficiently **consistent and repeatable** in a **particular environment**;

(c) exhibits sufficient **variation between varieties** to be able to establish distinctness;

(d) is capable of **precise definition and recognition**;

(e) allows **uniformity requirements** to be fulfilled;

(f) allows **stability requirements** to be fulfilled, meaning that it produces consistent and repeatable results after repeated propagation or, where appropriate, at the end of each cycle of propagation.

Selection of Characteristics

- **Yield ???**
- **Straw strength ???**

Etc.

Selection of Characteristics

Criteria	Fruit: color	Leaf: shape	Yield
(a) results from a given genotype or combination of genotypes	Yes	Yes	
(b) sufficiently consistent and repeatable in a particular environment	Yes	Yes	
(c) exhibits sufficient variation between varieties to be able to establish distinctness	Yes	Yes	
(d) is capable of precise definition and recognition	Yes	Yes	
(e) allows uniformity requirements to be fulfilled	Yes	Yes	
(f) allows stability requirements to be fulfilled	Yes	Yes	
Commercial value	Yes	No	
ACCEPTABILITY	Yes	Yes	

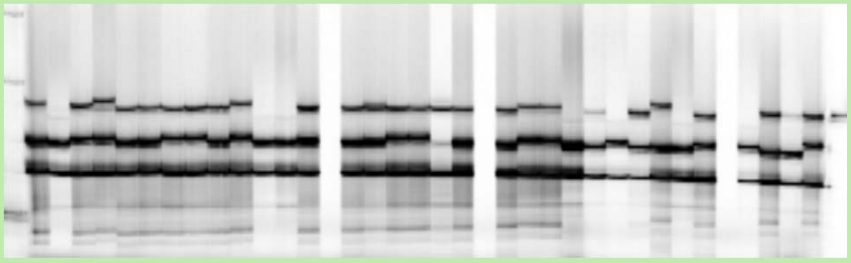
Selection of Characteristics

Criteria	Fruit: color	Leaf: shape	Yield
(a) results from a given genotype or combination of genotypes	Yes	Yes	Yes
(b) sufficiently consistent and repeatable in a particular environment	Yes	Yes	(No)
(c) exhibits sufficient variation between varieties to be able to establish distinctness	Yes	Yes	???
(d) is capable of precise definition and recognition	Yes	Yes	(No)
(e) allows uniformity requirements to be fulfilled	Yes	Yes	???
(f) allows stability requirements to be fulfilled	Yes	Yes	???
Commercial value	Yes	No	Yes
ACCEPTABILITY	Yes	Yes	No

Special Characteristics: Disease Resistance

Criteria	Disease Resistance
(a) results from a given genotype or combination of genotypes	*Knowledge of nature of genetic control of resistance is important
(b) sufficiently consistent and repeatable in a particular environment	*Standardize conditions (greenhouse / laboratory) & methodology *Standardize inoculum *Ring-test
(c) exhibits sufficient variation between varieties to be able to establish distinctness	*Susceptible / Resistant OR varying degrees of resistance?
(d) is capable of precise definition and recognition	*Define and recognize races and strains
(e) allows uniformity requirements to be fulfilled	see above
(f) allows stability requirements to be fulfilled	see above
	Difficult and expensive

Molecular Techniques?



a) Method of observation and types of records (MS, MG, VS, VG)

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.	VG	**Plant: density of foliage**	**Plante : densité du feuillage**	**Pflanze: Dichte des Laubes**	**Planta: densidad del follaje**		
QN	(a)	sparse	faible	locker	escasa	Ise-imo	3
		medium	moyenne	mittel	media	Morimoto-imo	5
		dense	dense	dicht	densa	Gankumijika-taisho	7
2.	VG	**Plant: number of branches**	**Plante : nombre de ramifications**	**Pflanze: Anzahl Triebe**	**Planta: número de ramas**		
QN	(a)	few	petit	gering	bajo	Ise-imo	3
		medium	moyen	mittel	medio	Fusaougi	5
		many	grand	groß	alto	Segoshi-2	7

Method of Observation

M: Measurement:

an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.);

V: Visual observation:

includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts).

"Visual" observation refers to the sensory observations of the expert and, therefore, also includes smell, taste and touch.

TGP/9/1 “Examining Distinctness”

	Type of expression of characteristic		
Method of propagation of the variety	QL (QUAL itatative)	PQ (PSEUDO qualitative)	QN (QUANT itative)
Vegetatively propagated, self-pollinated	*Notes (VG)*	*Notes (VG)* *Side-by-side (VG)*	*Notes (VG/MG/MS)* *Side-by-side (VG)* *Statistics (MG/MS)*
Cross-pollinated	*Notes (VG)* *Statistics (VS*)*	*Notes (VG)* *Side-by-side (VG)* *Statistics (VS*)*	*Statistics ([MG]/MS/VS)* *Side-by-side (VG)* *Notes (VG/MG/MS)*
Hybrids	*Notes (VG)* *Statistics (VS*)*	*Notes (VG)* *Side-by-side (VG)* *Statistics (VS*)*	**

TGP/9/1 “Examining Distinctness”

V= Visual observation

	Type of expression of characteristic		
Method of propagation of the variety	QL (QUAL itatative)	PQ (PSEUDO qualitative)	QN (QUANT itative)
Vegetatively propagated, Self-pollinated	*Notes (VG)*	*Notes (VG)* *Side-by-side (VG)*	*Notes (VG/MG/MS)* *Side-by-side (VG)* *Statistics (MG/MS)*
Cross-pollinated	*Notes (VG)* *Statistics (VS*)*	*Notes (VG)* *Side-by-side (VG)* *Statistics (VS*)*	*Statistics ([MG]/MS/VS)* *Side-by-side (VG)* *Notes (VG/MG/MS)*
Hybrids	*Notes (VG)* *Statistics (VS*)*	*Notes (VG)* *Side-by-side (VG)* *Statistics (VS*)*	**

TGP/9/1 “Examining Distinctness”

V= Visual observation or
M= Measurement

	Type of expression of characteristic		
Method of propagation of the variety	QL (QUAL itatative)	PQ (PSEUDO qualitative	QN (QUANT itative)
Vegetatively propagated, self-pollinated	*Notes (VG)*	*Notes (VG)* *Side-by-side (VG)*	*Notes (VG/MG/MS)* *Side-by-side (VG)* *Statistics (MG/MS)*
Cross-pollinated	*Notes (VG)* *Statistics (VS*)*	*Notes (VG)* *Side-by-side (VG)* *Statistics (VS*)*	*Statistics ([MG]/MS/VS)* *Side-by-side (VG)* *Notes (VG/MG/MS)*
Hybrids	*Notes (VG)* *Statistics (VS*)*	*Notes (VG)* *Side-by-side (VG)* *Statistics (VS*)*	**

Type of Record
(for the purposes of distinctness)

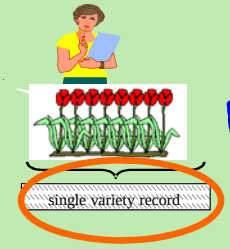
G: **single record** for a variety, or a **GROUP of plants** or parts of plants;

In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

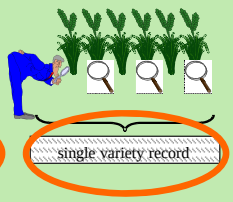
S: **records** for a number of **SINGLE**, individual **plants** or parts of plants ...

Single record for a group of plants or parts of plants (G)

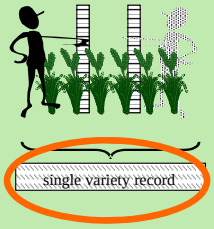
Section 4.3.2.3
Example (VG): Flower: type
(tulip: vegetatively propagated)



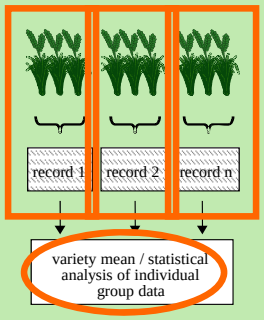
Section 4.3.2.3
Example (VG): Lowest leaf: hairiness of leaf sheaths
(barley: self-pollinated)



Section 4.3.2.3
Example (MG): Plant: height
(wheat: self-pollinated)

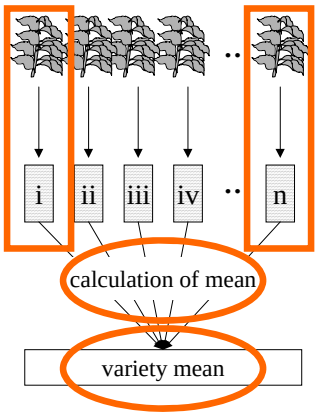


Section 4.3.2.4
Example: (statistical analysis)

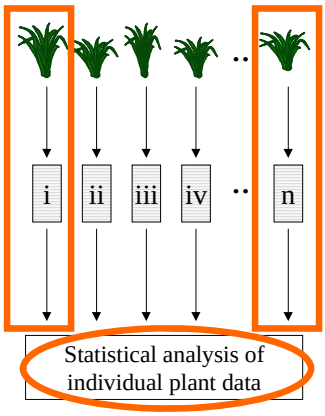


Records for a number of single, individual plants or parts of plants (S)

Section 4.3.3.1
Example (MS): Leaflet: length
(pea: self-pollinated)



Section 4.3.3.2
Example (MS): Plant: natural height
Example (VS): Plant: growth habit
(ryegrass: cross-pollinated)



EXERCISE

b) Types of expression of characteristics (QL, PQ, QN) and types of scales of data

TYPES OF EXPRESSION OF CHARACTERISTICS

(QL, QN, PQ)

Types of Expression

QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

Char. No.	English	français	Deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. (*) (+)	**Plant: growth habit**	**Plante : port**	**Pflanze: Wuchsform**	**Planta: porte**		
QN	upright	dressé	aufrecht	erecto	Inuppink	1
	semi-upright	semi dressé	halbaufrecht	semierecto	D0158-1	2
	spreading	étalé	breitwüchsig	abierto	Sumnem 03	3
	semi-trailing	semi-étalé	halbhängend	semirrastrero	Inupsaf	4
	trailing	coureux	hängend	rastrero	Organza	5
2. (+)	**Plant: height**	**Plante : hauteur**	**Pflanze: Höhe**	**Planta: altura**		
QN	short	basse	niedrig	baja	Yateye	3
	medium	moyenne	mittel	media	D0158-1	5
	tall	haute	hoch	alta	Inuppink	7

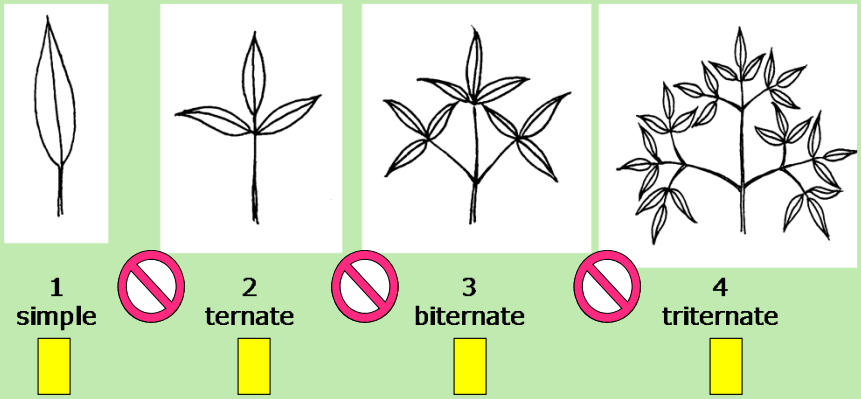
QUALITATIVE Characteristics

"Qualitative characteristics" are those that are **expressed in discontinuous states** (e.g. sex of plant: dioecious female (1), dioecious male (2), monoecious unisexual (3), monoecious hermaphrodite (4)).

These states are self-explanatory and independently meaningful. All states are necessary to describe the full range of the characteristic, and every form of expression can be described by a single state. The order of states is not important. As a rule, the **characteristics are not influenced by environment**.

Qualitative characteristic

Clematis: Leaf: type



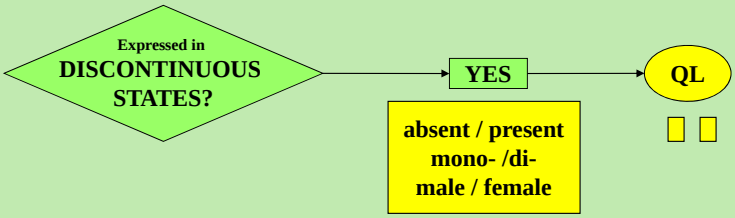
Qualitative (QL) characteristic?

Anthocyanin coloration: QL (=absent / present)?

NO!

	Variety A	Variety B	Variety C
Environment A	absent	present	absent
Environment B	absent	present	present

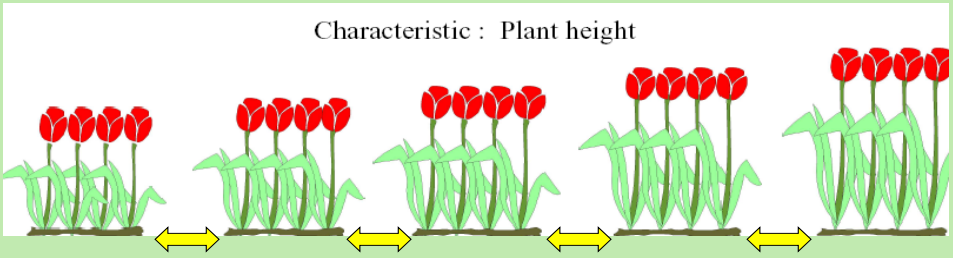
QL, QN or PQ?



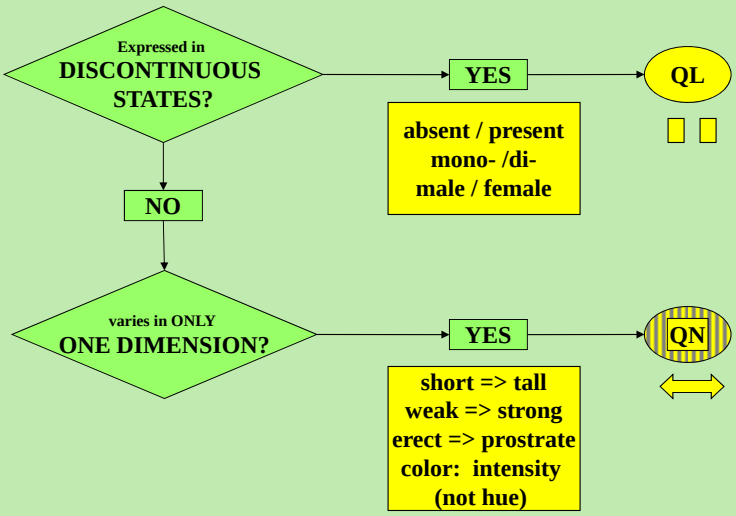
QUANTITATIVE Characteristics

"Quantitative characteristics" are those where the expression covers the full range of variation from one extreme to the other. The **expression can be recorded on a one-dimensional, continuous or discrete, linear scale**. The range of expression is divided into a number of states for the purpose of description (e.g. length of stem: very short (1), short (3), medium (5), long (7), very long (9)). The division seeks to provide, as far as is practical, an even distribution across the scale. The Test Guidelines do not specify the difference needed for distinctness. The states of expression should, however, be meaningful for DUS assessment.

Quantitative Characteristic



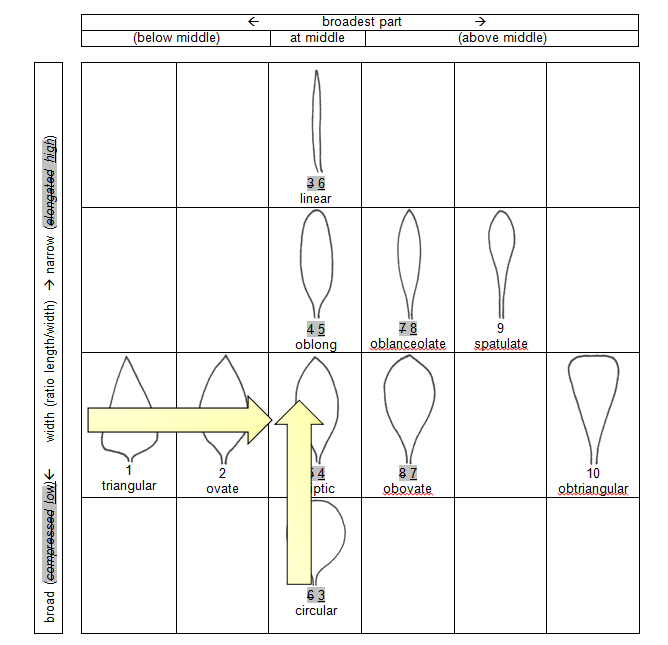
QL, QN or PQ?

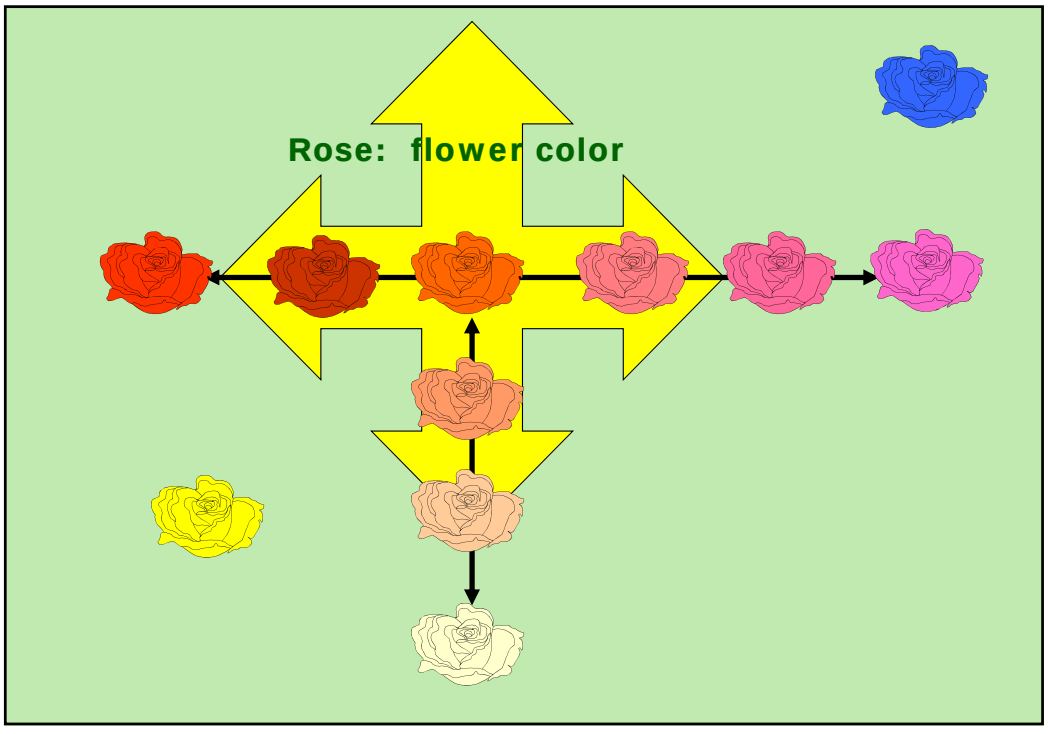


PSEUDO-QUALITATIVE Characteristics

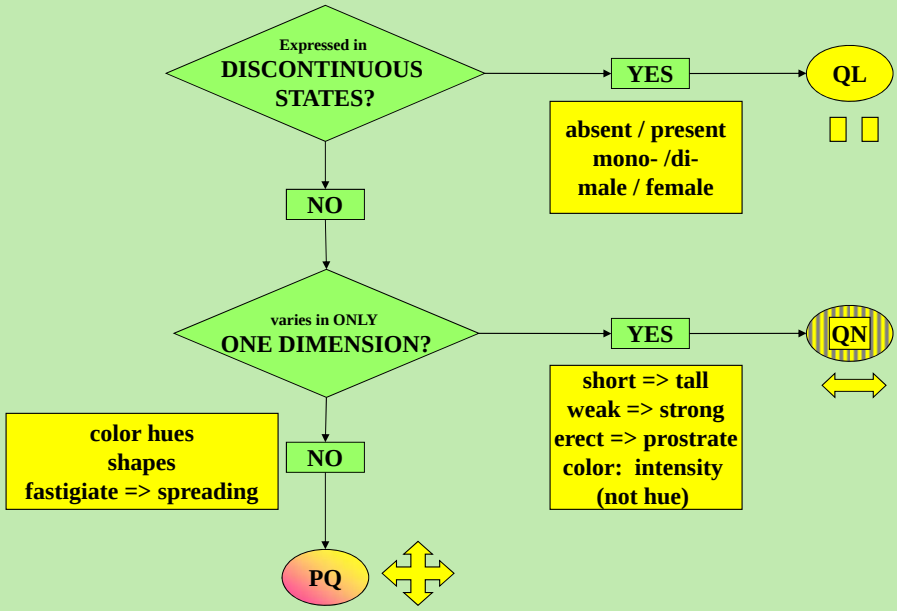
In the case of "pseudo-qualitative characteristics," the **range of expression is at least partly continuous, but varies in more than one dimension** (e.g. shape: ovate (1), elliptic (2), circular (3), obovate (4)) and cannot be adequately described by just defining two ends of a linear range. In a similar way to qualitative (discontinuous) characteristics – hence the term "pseudo-qualitative" – each individual state of expression needs to be identified to adequately describe the range of the characteristic.

Example


broadest part
(below middle)
at middle
(above middle)
broad (compressed, low) ← width (ratio length/width) → narrow (elongated, high)
3 6
linear
4 5
oblong
7 8
oblanceolate
9
spatulate
1
triangular
2
ovate
8 7
obovate
10
obtriangular
6 3
circular


Rose: flower color

QL, QN or PQ?



EXERCISE

Types of scales of data (QL, PQ, QN)

Types of Expression

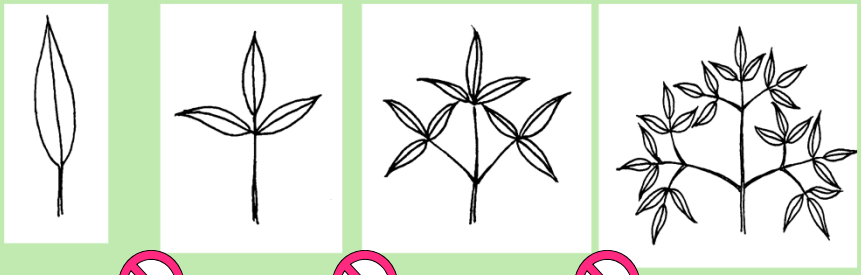
QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

Qualitative characteristic

Clematis: Leaf: type



1 simple

2 ternate

3 biternate

4 triternate

Qualitative Characteristics (special cases)

Char No.	Method of Examination	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. (*)	**MS C**	**Plant: ploidy**					
QL		diploid					2
		tetraploid					4
3. (*)	**VG**	**Stem: anthocyanin coloration**					
QL		absent				Gumpoong	1
		present				Chunpoong, Gopoong	9

Qualitative Characteristics: **distinctness**

In qualitative characteristics, the difference between two varieties may be considered clear if one or more characteristics have expressions that fall into **two different states in the Test Guidelines**. Varieties should not be considered distinct for a qualitative characteristic if they have the same state of expression.

(e.g. sex of plant: dioecious female (1), dioecious male (2), monoecious unisexual (3), monoecious hermaphrodite (4)).

Types of Expression

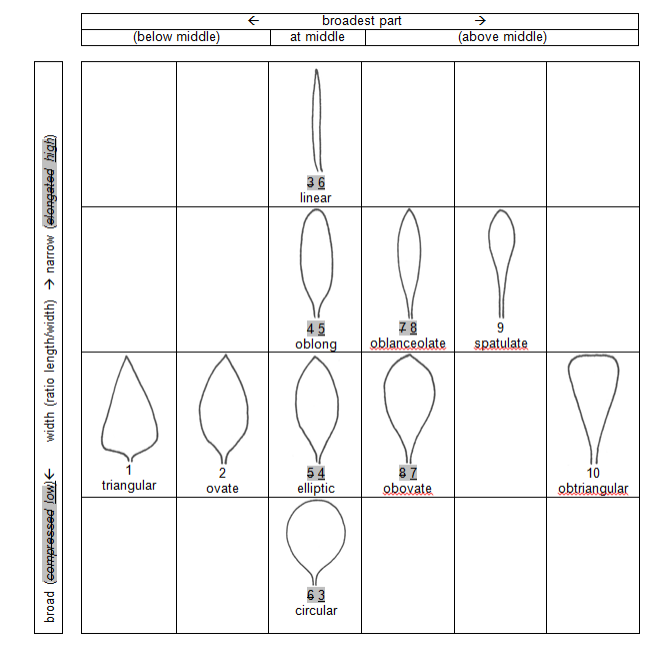
QL: QUALITATIVE

QN: QUANTITATIVE

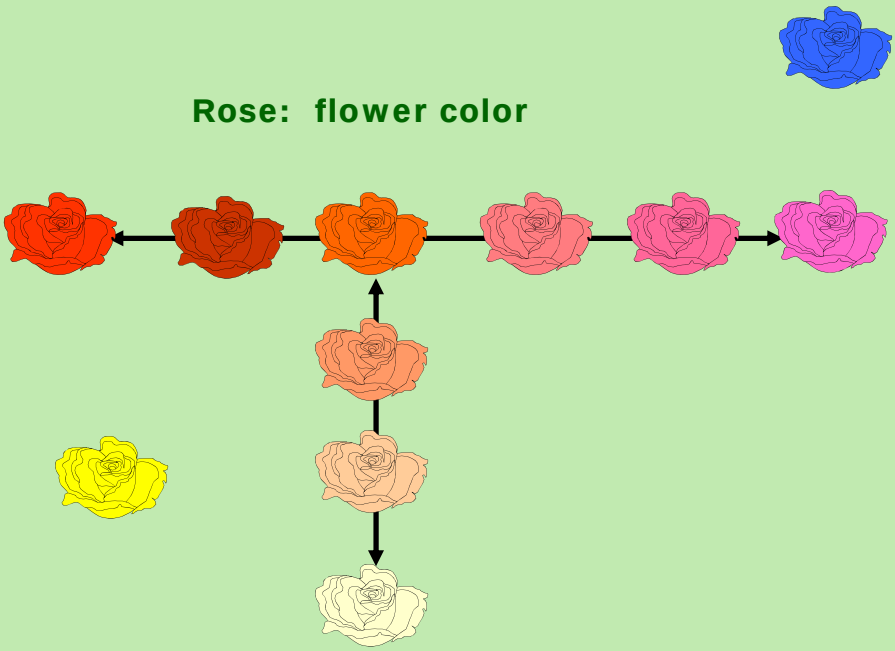
PQ: PSEUDO-QUALITATIVE

PSEUDO-QUALITATIVE Characteristics

In the case of "pseudo-qualitative characteristics," the **range of expression is at least partly continuous, but varies in more than one dimension** (e.g. shape: ovate (1), elliptic (2), circular (3), obovate (4)) and cannot be adequately described by just defining two ends of a linear range. In a similar way to qualitative (discontinuous) characteristics – hence the term "pseudo-qualitative" – each individual state of expression needs to be identified to adequately describe the range of the characteristic.



Rose: flower color

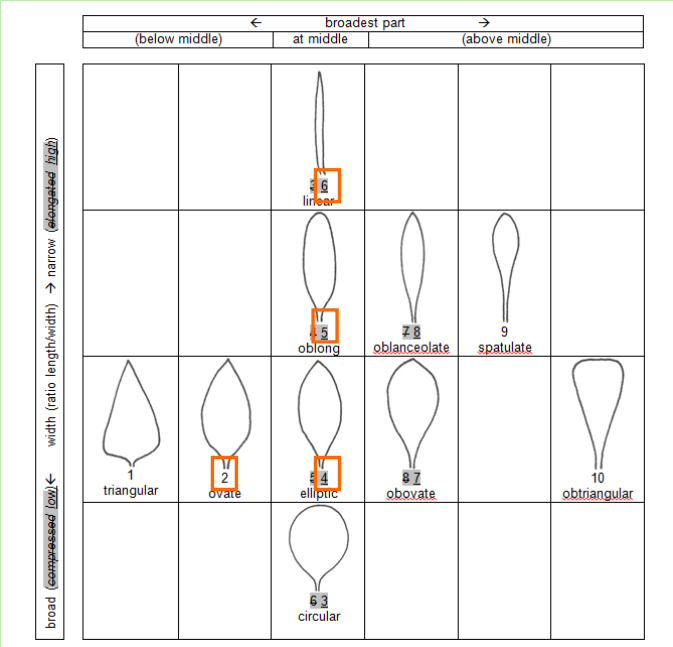


PSEUDO-QUALITATIVE Characteristics (typical examples)

	24. (+) Flower: color of the center	Fleur: couleur du centre	Farbe der Mitte	Flor: color del centro	
PQ	green	vert	grün	verde	1
	yellow	jaune	gelb	amarillo	2
	orange	orange	orange	naranja	3
	pink	rose	rosa	rosa	4
	red	rouge	rot	rojo	5
	purple	pourpre	purpurn	púrpura	6

Pseudo-Qualitative Characteristics: **distinctness**

A different state in the Test Guidelines may not be sufficient to establish distinctness (see also section 5.5.2.3). However, in certain circumstances, varieties described by the same state of expression may be clearly distinguishable.



Types of Expression

QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

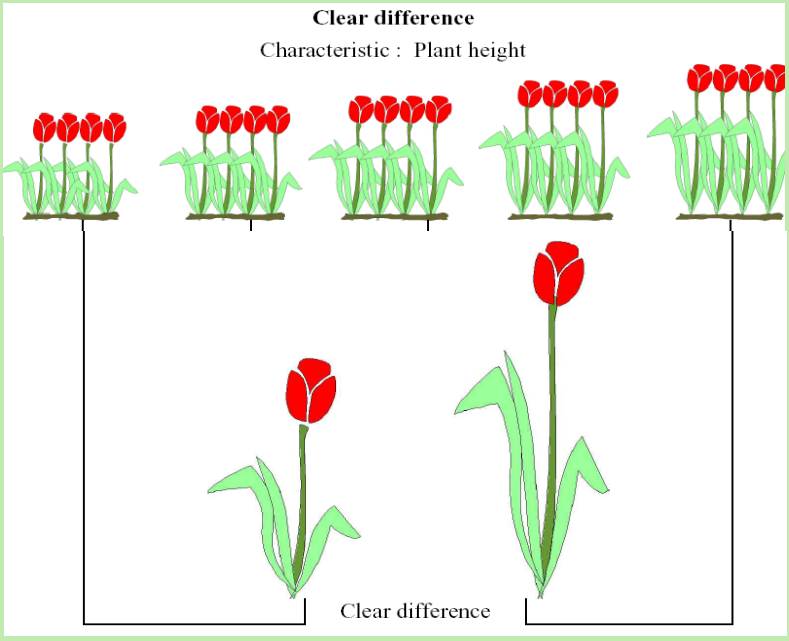
QUANTITATIVE Characteristics

"Quantitative characteristics" are those where the expression covers the full range of variation from one extreme to the other. The **expression can be recorded on a one-dimensional, continuous or discrete, linear scale**. The range of expression is divided into a number of states for the purpose of description (e.g. length of stem: very short (1), short (3), medium (5), long (7), very long (9)). The division seeks to provide, as far as is practical, an even distribution across the scale. The Test Guidelines do not specify the difference needed for distinctness. The states of expression should, however, be meaningful for DUS assessment.

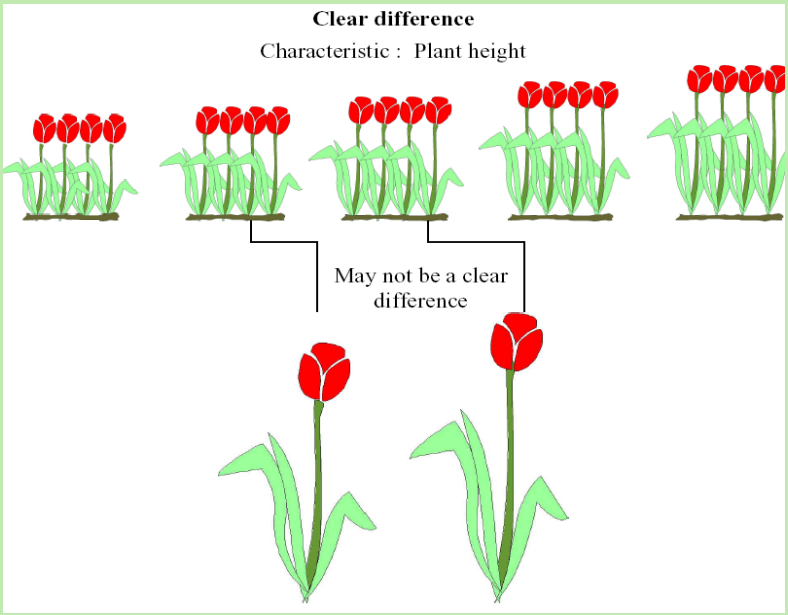
Quantitative Characteristics: **distinctness**

Quantitative characteristics are considered for distinctness according to the method of observation and the features of propagation of the variety concerned...

Quantitative Characteristic



Quantitative Characteristic



Quantitative Characteristics (1-9)

weak/strong
short/long
small/large

Note	State
1	very weak (or: absent or very weak)
2	very weak to weak
3	**weak**
4	weak to medium
5	**medium**
6	medium to strong
7	**strong**
8	strong to very strong
9	very strong

Note	State
1	very small (or: absent or very small)
2	very small to small
3	**small**
4	small to medium
5	**medium**
6	medium to large
7	**large**
8	large to very large
9	very large

Quantitative Characteristics (1-9)

Standard Range Version 1	**Standard Range Version 2**	**Standard Range Version 3**	**Standard Range Version 4**
1 very weak (or: absent or very weak)	1 very weak (or: absent or very weak)	-	-
3 weak	3 weak	3 weak	3 weak
5 medium	5 medium	5 medium	5 medium
7 strong	7 strong	7 strong	7 strong
9 very strong	-	9 very strong	-

Quantitative Characteristics (1-9)

State	Example 1 **Size relative to:**	Example 2 **Angle:**	Example 3 **Position:**	Example 4 **Length in relation to:**
1	**much smaller**	**very acute**	**at base**	**equal**
3	moderately smaller	moderately acute	one quarter from base	slightly shorter
5	**same size**	**right angle**	**in middle**	**moderately shorter**
7	moderately larger	moderately obtuse	one quarter from apex end	much shorter
9	**much larger**	**very obtuse**	**at apex**	**very much shorter**

Quantitative Characteristics (at least 3 notes)

Example 2	
1	e.g. absent or weak *(absent or weakly expressed)*
2	moderate (or medium) *(moderately expressed)*
3	strong *(strongly expressed)*

State	Example 1 **Stem: attitude**
1	erect
3	semi-erect
5	prostrate

3. Methods used for DUS data analysis and development of variety description

Presentations by experts from:
Korea
Japan
United Kingdom
France

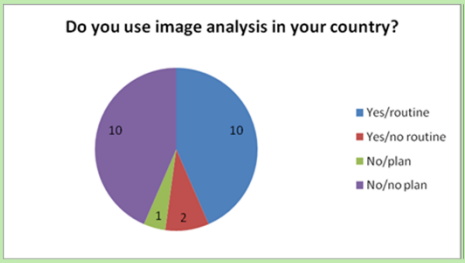
4. Image analysis

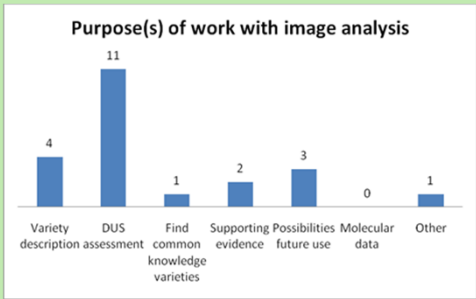
Survey on Image analysis

- A questionnaire on image analysis was sent to the UPOV members in April 2012. The aim of the questionnaire was to gain insight in the frequency and way of use of image analysis in the different member states.
- The questionnaire was returned by 21 UPOV members.

<Summary of the result>

1. USE AND PURPOSE OF IMAGE ANALYSIS





Survey on Image analysis (cont.)

<Summary of the result>

2. CROPS AND CHARACTERISTICS

1. Barley	1. Rape
2. Brassica crops	2. Red clover
3. Brussels sprouts	3. Rice
4. Carrot	4. Running beans
5. Field bean	5. Rye
6. Flax	6. Seeds/grains various crops
7. Fodder radish	7. Sugar Beet (cotyledon)
8. French bean	8. Watercress
9. Impatiens	9. Wheat
10. Maize	10. White mustards
11. Oats	11. Willow (leaves)
12. Oilseed rape	
13. Onion	
14. Ornamentals	
15. Parsnip	
16. Pea	
17. Pelargonium	

3. OTHERS

- 8 respondents use a camera, 5 respondents use a scanner (two respondents use both options). All use a regular PC or workstation.
- Every UPOV member has its own software system. Most respondents use commercially available software or open source software which they have adopted themselves.
- All respondents use some form of calibration for determining the size of an object. In general the lighting conditions are also standardized and verified. Color calibration is not mentioned.

Development of new section of document TGP/8 on image analysis

The TWC, at its thirtieth session, held in 2012, agreed that a draft for New Section - Examining Characteristics Using Image Analysis for document TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability" should be prepared [...] for the TWP sessions in 2013.

The experts responsible for drafting the new section proposed that the first draft be presented only to the TWC in 2013, and not to the other Technical Working Parties (TWPs) to be held in 2013.

The TWC is invited to consider the first draft of the new section "Examining Characteristics Using Image Analysis" for document TGP/8, as presented in the **Annex to document TWC/31/20 Add.** .

→ To be discussed in agenda item 5 (9).

5. The UPOV Website

Overview on:

- GENIE Database
- PLUTO Database
- Other available resources

GENIE Database
(Genus / species)

78

GENIE Database

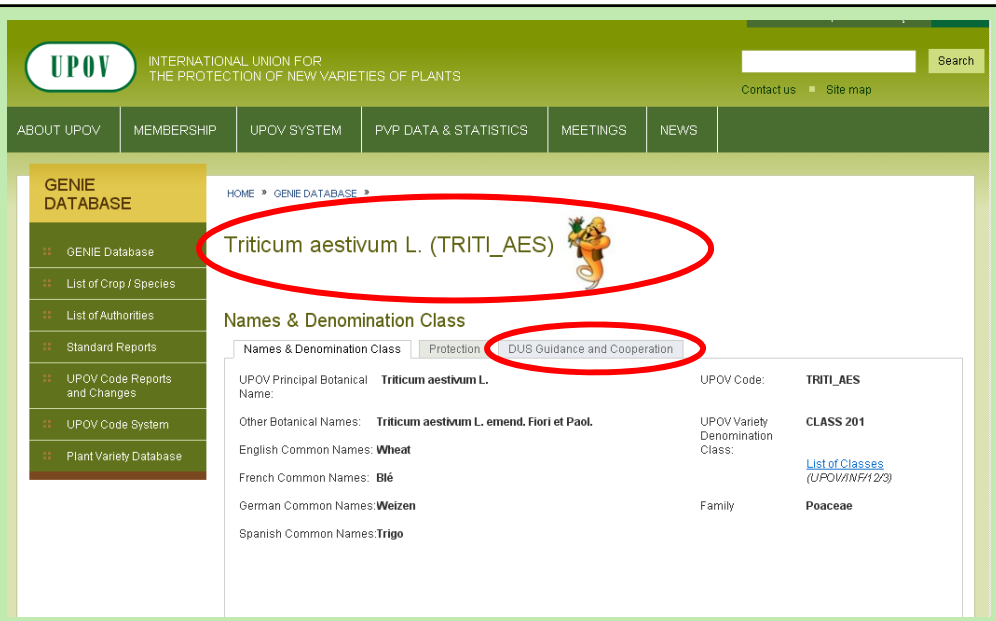
Variety denomination related information

Protection offered by UPOV members

DUS information

- **UPOV Test Guidelines**
- **practical experience (UPOV members)**
- **cooperation in DUS examination**

79



80

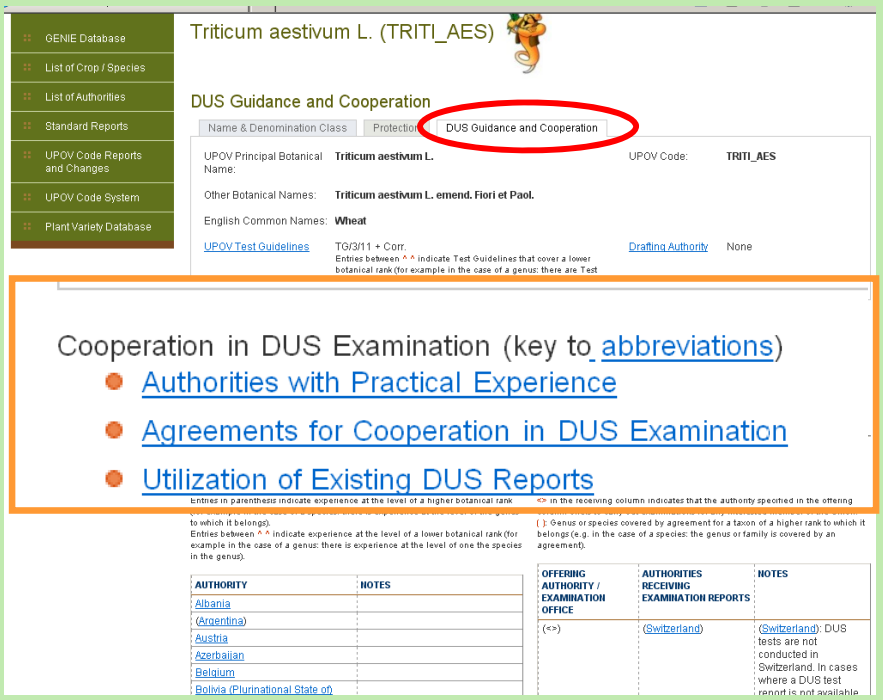
Triticum aestivum L. (TRITI_AES)

DUS Guidance and Cooperation

Names & Denomination Class | Protection | DUS Guidance and Cooperation

UPOV Principal Botanical Name:	**Triticum aestivum L.**
Other Botanical Names:	**Triticum aestivum L. emend. Fiori et Paol.**
English Common Names:	**Wheat**
UPOV Test Guidelines	Wheat (TG/3/11 + Corr.)

81



82

Triticum aestivum L. (TRITI_AES)

Authorities with Practical Experience

Entries in **parenthesis** indicate experience at the level of a higher botanical rank (for example in the case of a species: there is experience at the level of the genus to which it belongs).

Authority	Notes
Albania	
(Argentina)	
Austria	
Azerbaijan	
Belgium	
Bolivia	
(Canada)	
Canada	
China	
Croatia	
Czech Republic	
Denmark	
European Community (Community Plant	

etc.

83

Triticum aestivum L. (TRITI_AES)

Agreements for Cooperation in DUS Examination

o: Where the entry in the "offering" column is preceded by "o", this indicates an examination office which has been designated in the territory concerned by the receiving authority in the second column
<> in the "receiving" column indicates that the authority specified in the "offering" column offers to carry out examinations for any interested member of the Union.
( ): Genus or species covered by agreement for a taxon of a higher rank to which it belongs (e.g. in the case of a species: the genus or family is covered by an agreement).

Offering Authority / Examination Office	Authority Receiving Examination Reports	Notes
oAustria	European Community (Community Plant Variety Office (CPVO))	
Belgium	European Community (Community Plant Variety Office (CPVO))	
oBelgium	European Community (Community Plant Variety Office (CPVO))	
Bolivia	No assigned receiving authority	
Czech Republic	Romania Slovakia Slovenia	Romania: Winter varieties only Slovakia: Spring wheat

84

Triticum aestivum L. (TRITI_AES)

Utilization of Existing DUS Reports

"<>" (utilizing) indicates that the authority specified in "providing" column will, in general, provide existing DUS reports to any member of the Union.
"<>" (providing) indicates that the authority specified in the "utilizing" column will, in general, utilize existing DUS reports provided by any member of the Union.
( ): Genus or species covered by agreement for a taxon of a higher rank to which it belongs (e.g. in the case of a species: the genus or family is covered by an agreement).

Utilizing Authority	Providing Authority / Examination Office	Notes
(<>)	(Australia)	
(<>)	(Canada)	
(<>)	(European Community (Community Plant Variety Office (CPVO)))	
(<>)	(Uruguay)	
(<>)	(Germany)	
(Australia)	(<>)	
Austria	Slovenia	
Croatia	Austria	

85

Triticum aestivum L. (TRITI_AES)

Utilization of Existing DUS Reports

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(<>)	(Australia)	
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(<>)	(Uruguay)	
(<>)	(Germany)	
(Australia)	(<>)	
Austria	Slovenia	

Triticum aestivum L. (TRITI_AES)

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(<>)	(Australia)	
(<>)	(Canada)	
(<>)	(European Community (Community Plant Variety Office (CPVO)))	
(<>)	(Uruguay)	
(<>)	(Germany)	
(Australia)	(<>)	
Austria	Slovenia	

87

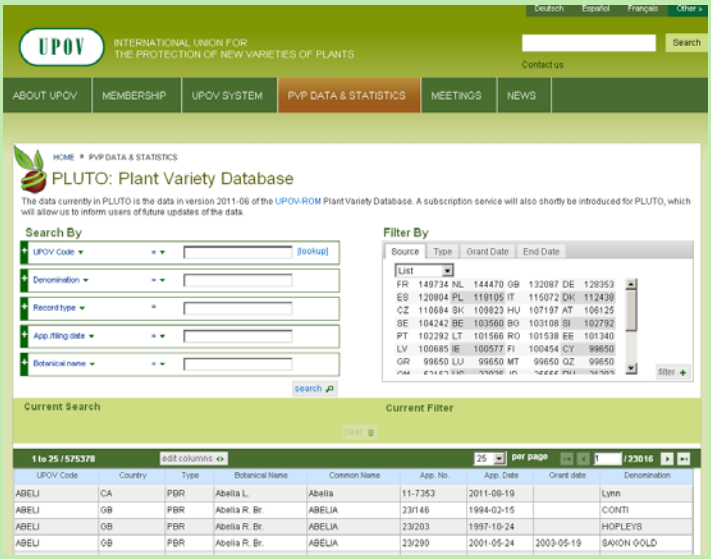
Triticum aestivum L. (TRITI_AES)

Utilization of Existing DUS Reports

Utilizing Authority	Providing Authority / Examination Office	Notes
(<>)	(Australia)	
(<>)	(Canada)	
(<>)	(European Community (Community Plant Variety Office (CPVO)))	
(<>)	(Uruguay)	
(<>)	(Germany)	
(Australia)	(<>)	
Austria	Slovenia	
Croatia	Austria	
Croatia	France	
Croatia	Hungary	
Czech Republic	Poland	
Denmark	France Germany Netherlands United Kingdom	

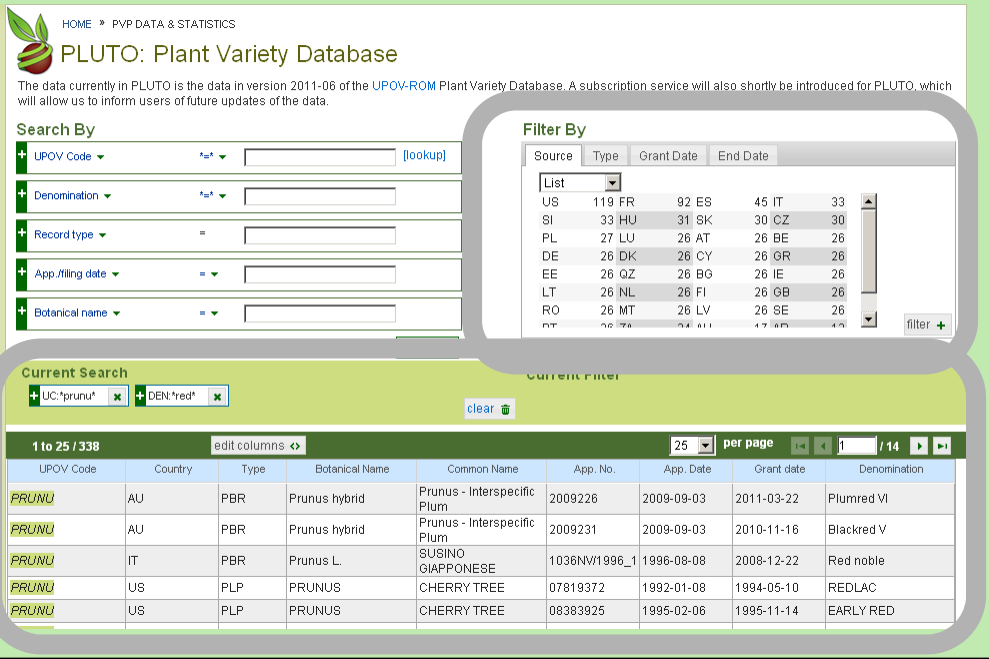
88

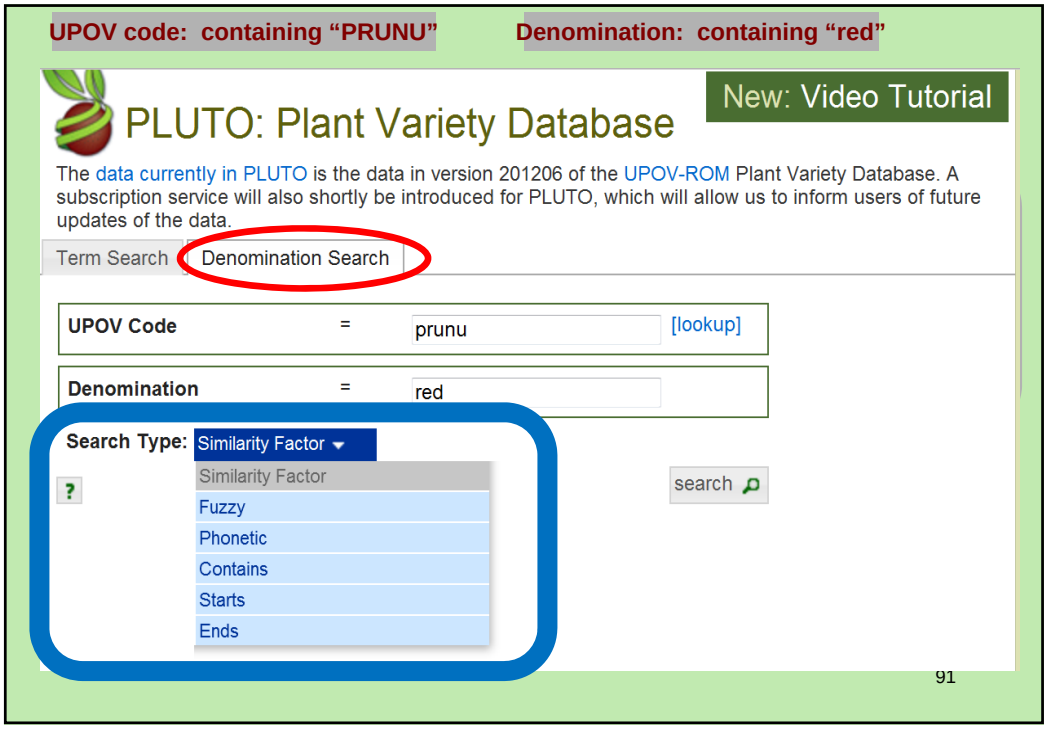
Plant Variety Database: PLUTO



89

UPOV code: containing "PRUNU" **Denomination: containing "red"**




UPOV code: containing “PRUNU”
Denomination: containing “red”
PLUTO: Plant Variety Database
New: Video Tutorial
The data currently in PLUTO is the data in version 201206 of the UPOV-ROM Plant Variety Database. A subscription service will also shortly be introduced for PLUTO, which will allow us to inform users of future updates of the data.
Term Search
Denomination Search
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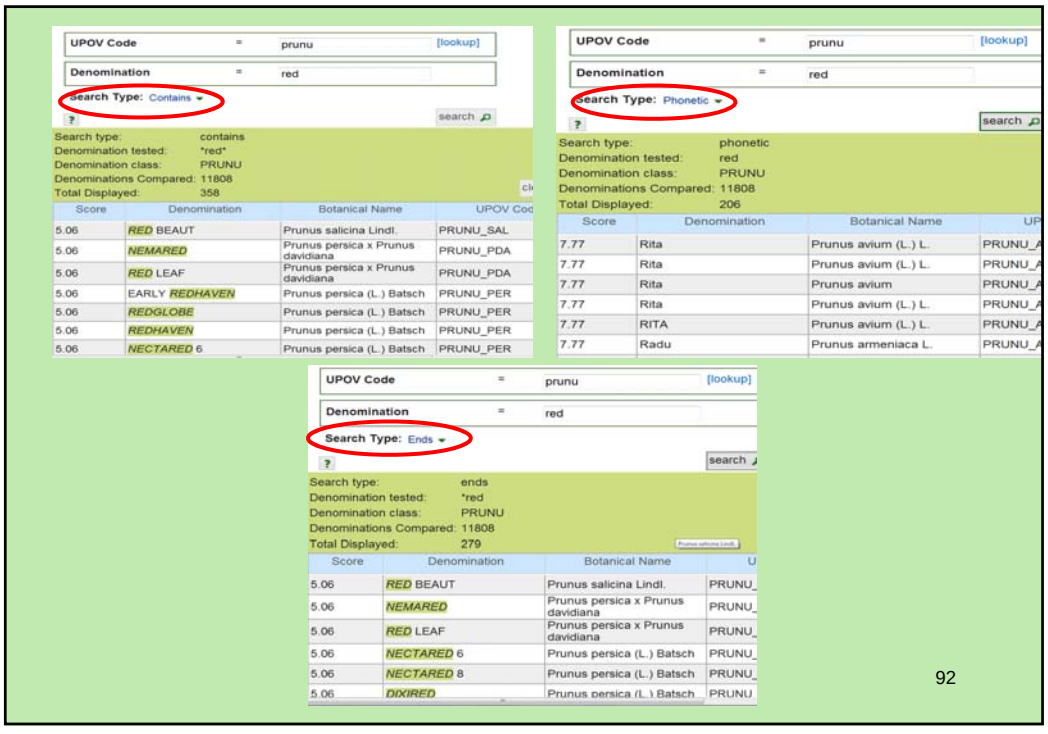
Denomination = red
Search Type: Similarity Factor
Similarity Factor
Fuzzy
Phonetic
Contains
Starts
Ends
search
91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search
Search type: contains
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Denomination class: PRUNU
Denominations Compared: 11808
Total Displayed: 358
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5.06 | RED BEAUT | Prunus salicina Lindl. | PRUNU_SAL
5.06 | NEMARED | Prunus persica x Prunus davidiana | PRUNU_PDA
5.06 | RED LEAF | Prunus persica x Prunus davidiana | PRUNU_PDA
5.06 | EARLY REDHAVEN | Prunus persica (L.) Batsch | PRUNU_PER
5.06 | REDGLOBE | Prunus persica (L.) Batsch | PRUNU_PER
5.06 | REDHAVEN | Prunus persica (L.) Batsch | PRUNU_PER
5.06 | NECTARED 6 | Prunus persica (L.) Batsch | PRUNU_PER
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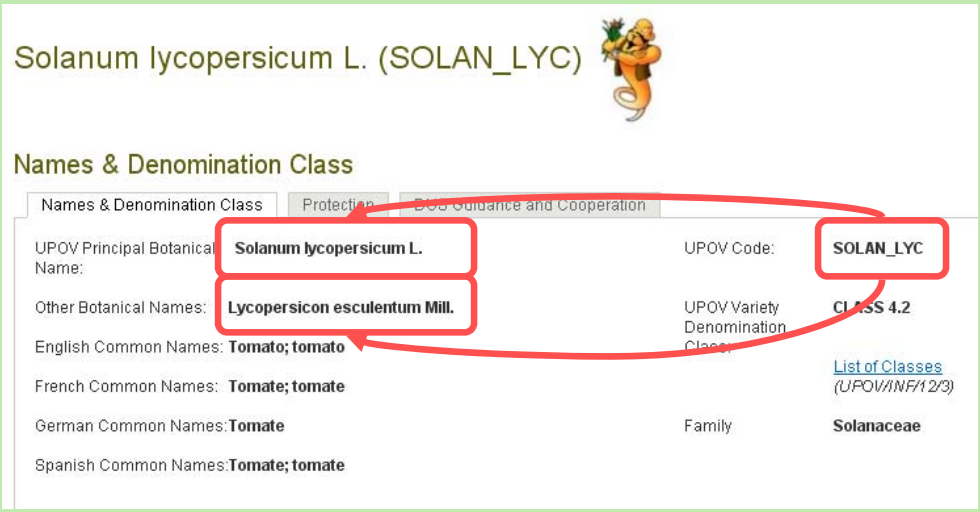
Denomination = red
Search Type: Phonetic
search
Search type: phonetic
Denomination tested: red
Denomination class: PRUNU
Denominations Compared: 11808
Total Displayed: 206
Score | Denomination | Botanical Name
7.77 | Rita | Prunus avium (L.) L.
7.77 | Rita | Prunus avium (L.) L.
7.77 | Rita | Prunus avium
7.77 | Rita | Prunus avium (L.) L.
7.77 | RITA | Prunus avium (L.) L.
7.77 | Radu | Prunus armeniaca L.
UPOV Code = prunu [lookup]
Denomination = red
Search Type: Ends
search
Search type: ends
Denomination tested: *red
Denomination class: PRUNU
Denominations Compared: 11808
Total Displayed: 279
Score | Denomination | Botanical Name
5.06 | RED BEAUT | Prunus salicina Lindl.
5.06 | NEMARED | Prunus persica x Prunus davidiana
5.06 | RED LEAF | Prunus persica x Prunus davidiana
5.06 | NECTARED 6 | Prunus persica (L.) Batsch
5.06 | NECTARED 8 | Prunus persica (L.) Batsch
5.06 | DIXIRED | Prunus persica (L.) Batsch
92

Role of the UPOV Code

...eliminating problems of botanical synonyms



93

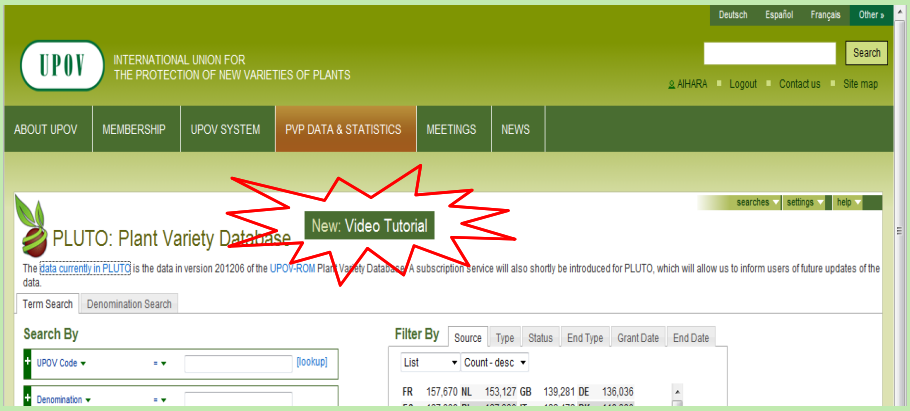
Article 20

(3) [*Registration of the denomination*]

- denomination shall be submitted by the breeder to the authority.
- if it does not satisfy the requirements, the authority shall refuse to register it
- denomination shall be registered by the authority at the same time as the breeder's right is granted.

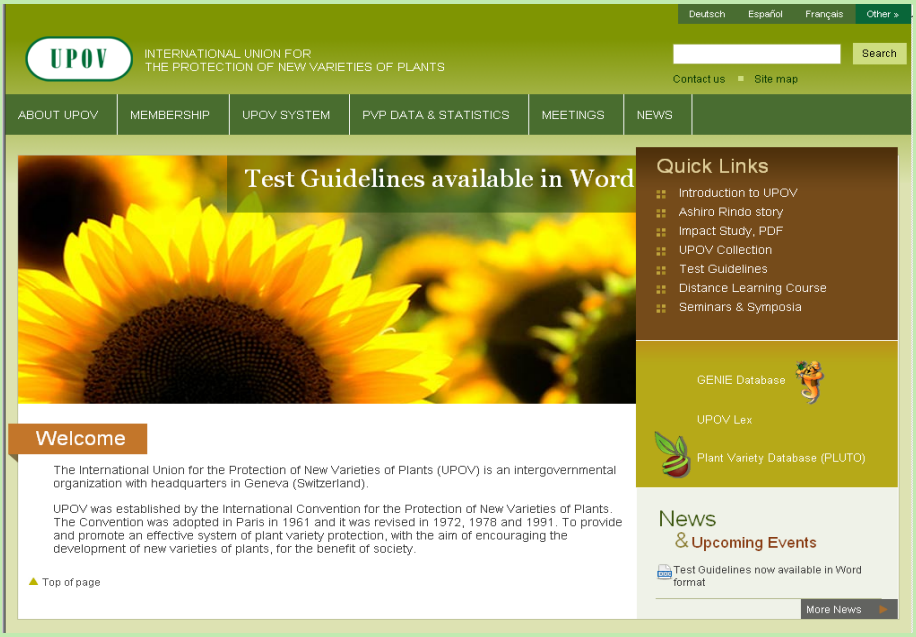
94

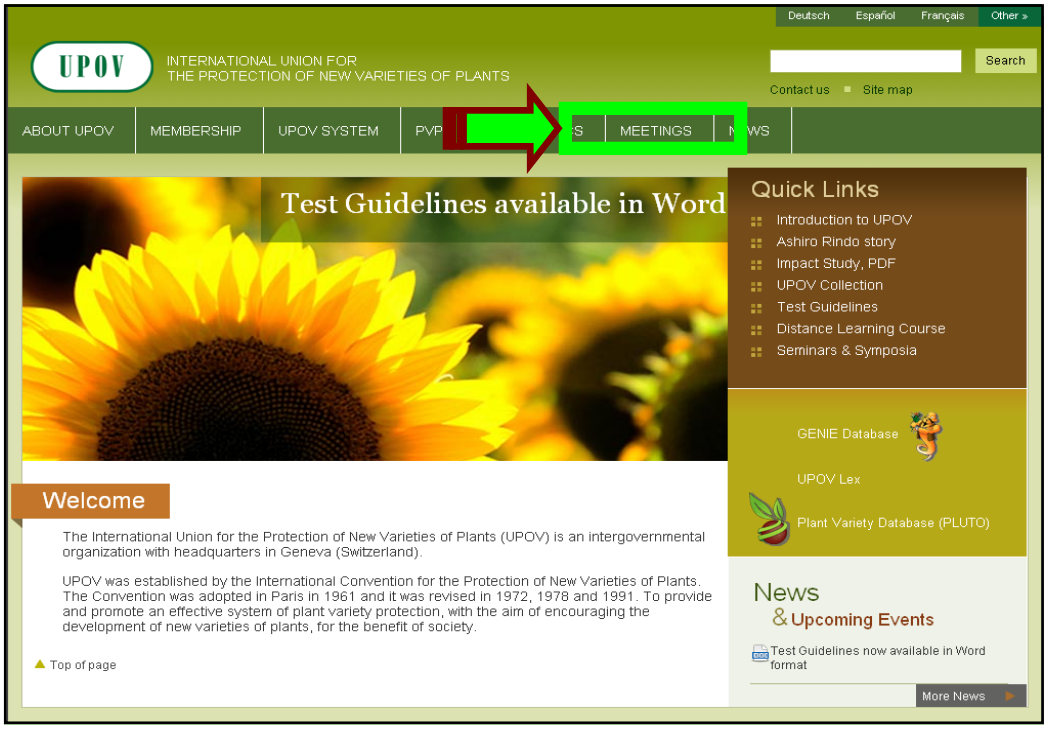
Video Tutorial of PLUTO



95

http://www.upov.int

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Seminars & Symposia
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UPOV Lex
Plant Variety Database (PLUTO)
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The International Union for the Protection of New Varieties of Plants (UPOV) is an intergovernmental organization with headquarters in Geneva (Switzerland).
UPOV was established by the International Convention for the Protection of New Varieties of Plants. The Convention was adopted in Paris in 1961 and it was revised in 1972, 1978 and 1991. To provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society.
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Test Guidelines now available in Word format
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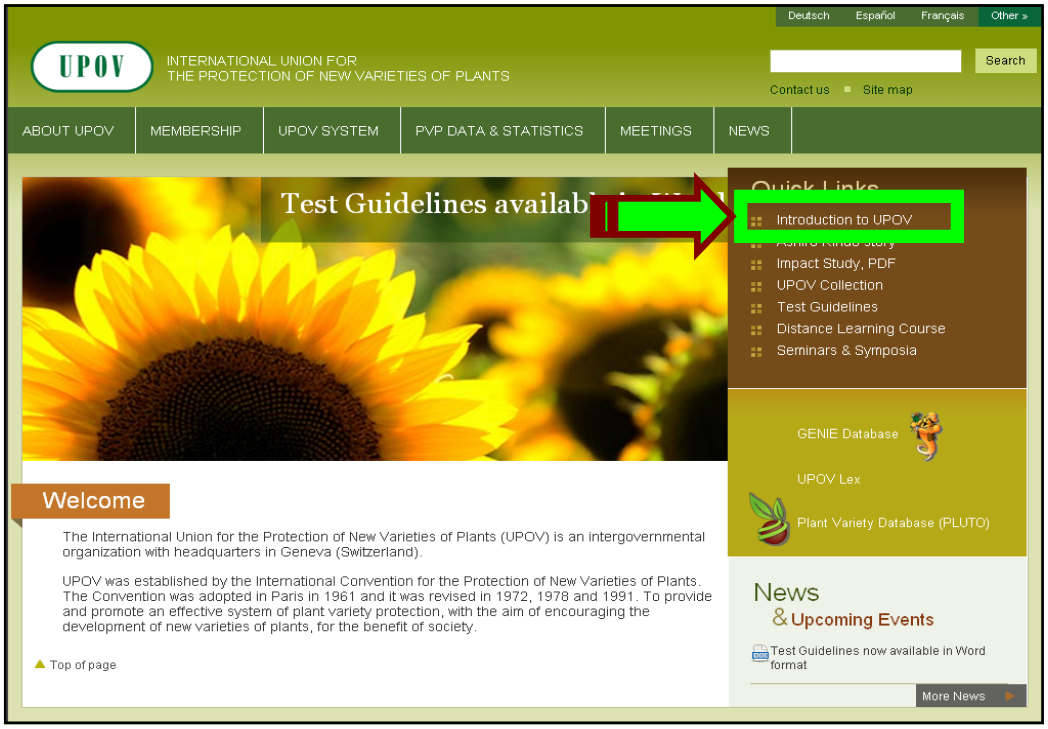
Council (C)
Technical Committee (TC)
Enlarged Editorial Committee
Technical Working Party for Fruit Crops
Technical Working Party for Vegetables (TWV)
Open access (except Consultative Committee)
98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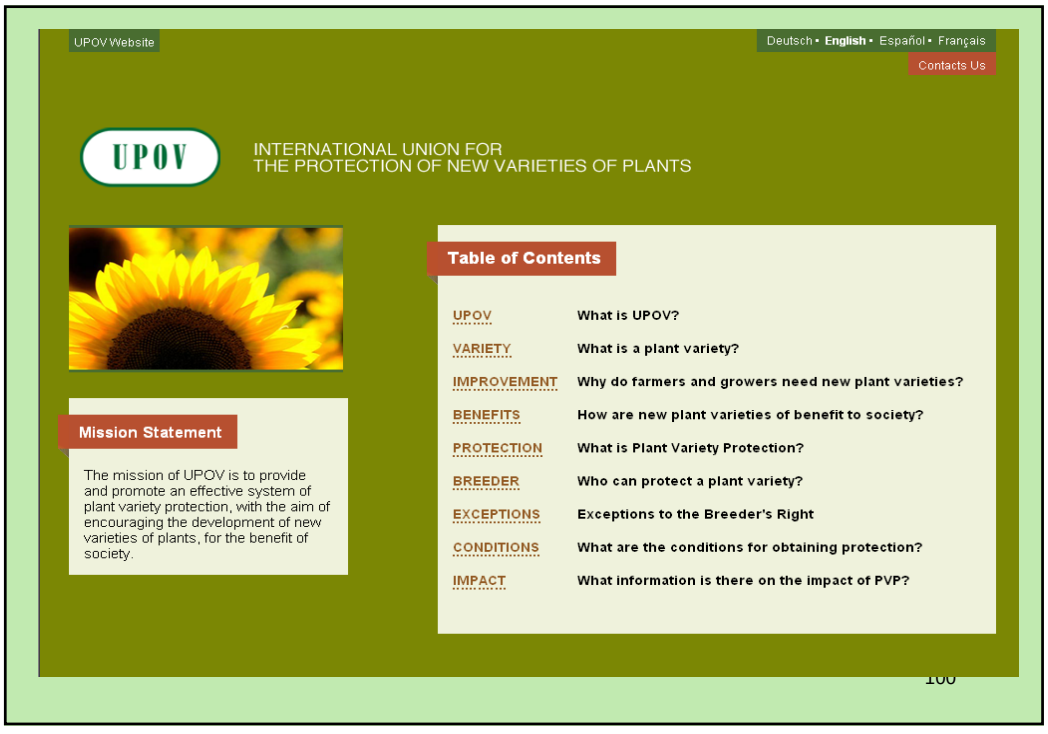
UPOV Website
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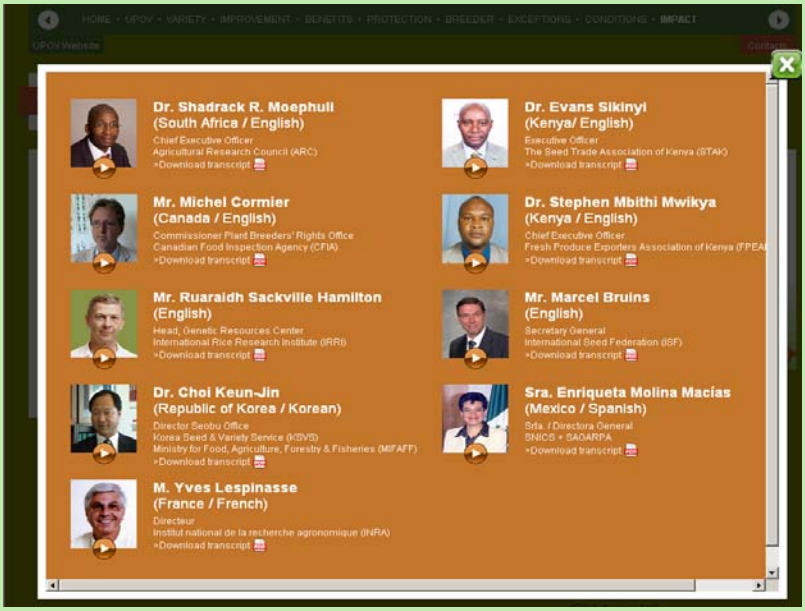
UPOV
INTERNATIONAL UNION FOR
THE PROTECTION OF NEW VARIETIES OF PLANTS
Mission Statement
The mission of UPOV is to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society.
Table of Contents
UPOV What is UPOV?
VARIETY What is a plant variety?
IMPROVEMENT Why do farmers and growers need new plant varieties?
BENEFITS How are new plant varieties of benefit to society?
PROTECTION What is Plant Variety Protection?
BREEDER Who can protect a plant variety?
EXCEPTIONS Exceptions to the Breeder's Right
CONDITIONS What are the conditions for obtaining protection?
IMPACT What information is there on the impact of PVP?
100


Dr. Shadrack R. Moephuli
(South Africa / English)
Chief Executive Officer
Agricultural Research Council (ARC)
>Download transcript
Dr. Evans Sikinyi
(Kenya/ English)
Executive Officer
The Seed Trade Association of Kenya (STAK)
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Mr. Ruaraidh Sackville Hamilton
(English)
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International Rice Research Institute (IRRI)
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Mr. Marcel Bruins
(English)
Secretary General
International Seed Federation (ISF)
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Directeur
Institut national de la recherche agronomique (INRA)
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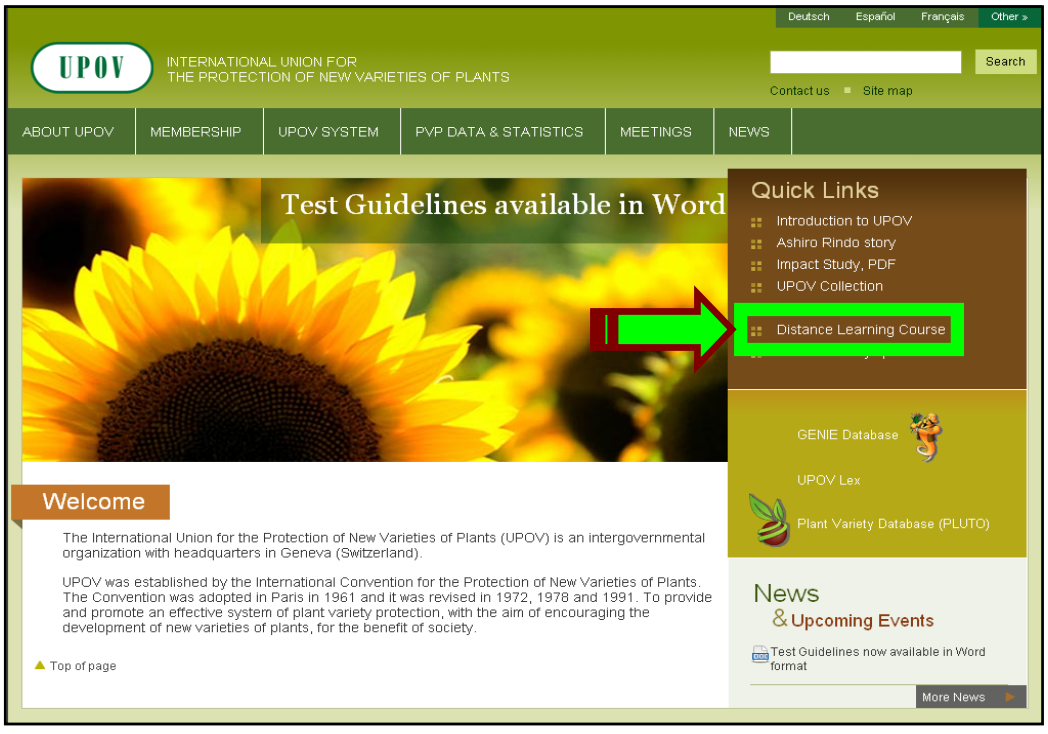
101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UPOV
INTERNATIONAL UNION FOR
THE PROTECTION OF NEW VARIETIES OF PLANTS
Search
Contact us
Site map
ABOUT UPOV
MEMBERSHIP
UPOV SYSTEM
PVP DATA & STATISTICS
MEETINGS
NEWS
Test Guidelines available in Word
Quick Links
Introduction to UPOV
Ashiro Rindo story
Impact Study, PDF
UPOV Collection
Distance Learning Course
GENIE Database
UPOV Lex
Plant Variety Database (PLUTO)
Welcome
The International Union for the Protection of New Varieties of Plants (UPOV) is an intergovernmental organization with headquarters in Geneva (Switzerland).
UPOV was established by the International Convention for the Protection of New Varieties of Plants. The Convention was adopted in Paris in 1961 and it was revised in 1972, 1978 and 1991. To provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society.
Top of page
News
& Upcoming Events
Test Guidelines now available in Word format
More News

DL-205

Introduction to the UPOV System of Plant Variety Protection under the UPOV Convention

Course dates 2013

Session I

Study period: May 13 to June 16, 2013
Final exam: June 10 to 16, 2013

Session II scheduled in Autumn/Winter 2013

On-line registration is available between February 1 to March 31, 2013. After March 31, registration will no longer be possible.
For Category 1 and 2 participants, all endorsements must be provided by May 1, 2013.

Registrations can be made in three different categories:

Category 1:
Government officials of members of the Union nominated by the relevant representative to the UPOV Council
No fee

Category 2:
Officials of observer States / intergovernmental organizations nominated by the relevant representative to the UPOV Council
(One non-fee paying student per State / intergovernmental organization;
Additional students: CHF1,000 per student)

Category 3:
Others
Fee: CHF1,000

103

DL-305 (future course)

Examination of applications for plant breeders' rights

SECTION I ADMINISTRATION OF PLANT BREEDERS' RIGHTS

Module 1: The Plant Breeder's Right's Office
Module 2: Administration of applications

SECTION II ENTITLEMENT

Module 3: Entitlement to file an application

SECTION III NOVELTY

Module 4: Examining Novelty

SECTION IV DUS EXAMINATION

Module 5: Introduction to the DUS examination
Module 6: Variety collections
Module 7: Examining Distinctness
Module 8: Examining Uniformity
Module 9: Examining Stability
Module 10: Trial Design and Data Analysis
Module 11: Approaches and cooperation in DUS examination

SECTION V VARIETY DENOMINATION

Module 12: Examining the variety denomination

SECTION VI PUBLICATION OF INFORMATION AND DECISIONS

Module 13: Information to be published
Module 14: Proposed decisions and Objections
Module 15: Decisions
Module 16: Situations which may arise after the grant of PBR

104

6. Agenda for the 31st session of the TWC

Provisional Time Schedule — Ver. 3.1_May 29

31th session of the Technical Working Party on Automation and Computer Programs (TWC) and its preparatory workshop – Seoul, June 3 and 4 to 7, 2013

	Monday / June 3	Tuesday / June 4	Wednesday / June 5	Thursday / June 6	Friday / June 7
09.00	Setup	1. Opening 2. Adoption of the agenda (TWC/31/1 Rev.) 3. Short reports on developments in PVP (TWC/31/31 Prov., TWC/31/27*)	*TGP/8 (cont.)* iii) TWC/31/16 iv) TWC/31/17 v) TWC/31/18	11. Development of COY / *TGP/8 (ii)* (TWC/31/15 Corr., 15 Add.) > Adrian(GB)	WebEx (MX) c) Exchangeable software (cont.) (TWC/31/30) 12. Guidance for Drafters of TGs (TWC/31/24)
	10:00	4. Molecular Techniques (TWC/31/2)			
10:30	Prep Workshop	COFFEE	COFFEE	COFFEE	COFFEE
11:00		5. TGP documents (TWC/31/3, 3 Add.) *Revision of TGP/7 (Development of TGs)* i) TWC/31/9 ii) TWC/31/10 iii)TWC/31/11	*TGP/8 (cont.)* vi) TWC/31/19 viii)TWC/31/23 Rev. > Kristian(DK) *TGP/14 (Glossary of Terms)* i) TWC/31/21	7. Variety Denominations (TWC/31/4) 8. Data Loggers (TWC/31/28 Rev.)	13. Next Session 14. Future Program 15. Report 16. Closing
12.45	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
14.00	Prep Workshop (cont.)	iv)TWC/31/12 v) TWC/31/13 *Revision of TGP/8 (Trial Design and Tech used in DUS exam)* i) TWC/31/14	TECHNICAL VISIT (Seoul Agricultural Technology Center)	6. Information and databases a) UPOV Information databases (TWC/31/5**) PLUTO Video Tutorial b) Variety description databases (TWC/31/6, 25)	**14:00** **END OF SESSION** Geneva: -7h00 CPVO (Jean) /DE (Uwe and Thomas): -7h00 MX (Eduardo): -14h00 *All the WebEx sessions will be recorded.*
15.30	COFFEE	COFFEE		COFFEE	
16.00	Prep Workshop (cont.) **17:30**	WebEx (CPVO, DE) *TGP/8 (cont.)* / 9. Image Analysis vii)TWC/31/20, 20 Add. > Jean (WebEx) 10. Uniformity assessment a) Off-types (TWC/31/22) b) Testing Uniformity of apple varieties arising from mutation (TWC/31/26) **18:00**	**18:00**	WebEx (CPVO, DE) d) Electronic Application Systems (TWC/31/8) c) Exchangeable software (TWC/31/7, 29) **17:30**	

EXCHANGING INFORMATION

TWP Venues

	TWA	TWC	TWF	TWO	TWV	BMT
1994	Spain	Israel	New Zealand	Australia	United Kingdom	France
1995	Germany	Poland	United Kingdom	Netherlands	Netherlands	Netherlands
1996	Greece	Germany	Israel	Israel	Czech Rep.	
1997	Uruguay	Hungary	Netherlands	Denmark	Spain	United Kingdom
1998	France	Belgium	Australia	New Zealand	Poland	USA
1999	Canada	Finland	Slovakia	Czech Rep.	Germany	
2000	Sweden	Ukraine	Hungary	Hungary	France	France
2001	Mexico	Czech Rep.	Spain	Japan	Italy	Germany
2002	Brazil	Mexico	Argentina	Ecuador	Japan	
2003	Japan	Denmark	Canada	Canada	Netherlands	Japan
2004	Poland	Japan China (workshop)	Germany	Germany	Rep. of Korea	
2005	New Zealand	Canada	Japan	Rep. of Korea	Slovakia	USA
2006	China	Kenya	Brazil	Brazil	Mexico	Rep. of Korea
2007	Hungary	Romania	Rep. of Korea	China	Kenya	
2008	South Africa	Rep. of Korea	Portugal	Netherlands	Poland	Spain
2009	Rep. of Korea	USA	France	European Union	China	
2010	Croatia	European Union	Mexico	Mexico	Bulgaria	Canada
2011	Brazil	Geneva - UPOV	Japan	Japan	USA	Brazil
2012	France	Rep. Moldova	China	Rep. of Korea	Netherlands	

7. FEEDBACK FROM PARTICIPANTS

From TC/49/10:

Survey to seek views on improving the effectiveness of the Preparatory Workshops

10. In conjunction with the survey of participants at the TWP session in 2013 (see document TC/49/3 "Matters arising from the Technical Working Parties") it is proposed to conduct a survey of participants in the preparatory workshop in 2013, with a view to seeking improvements to the effectiveness of the Preparatory Workshops

[See document TC/49/41 Report on Conclusions, paragraph 21]

THANK YOU