TECHNICAL WORKING PARTY FOR VEGETABLES

Forty-Fifth Session
Monterey, United States of America, July 25 to 29, 2011

PREPARATORY WORKSHOP

July 24, 2011

1. INTRODUCTION TO UPOV

PROGRAM

1. Introduction to UPOV
2. Overview of the General Introduction (document TG/1/3 and TGP documents)
3. Guidance on drafting Test Guidelines (document TGP/7)

(a) Selection of characteristics

(b) Guidance on drafting characteristics
- *(i) Types of expression (QL, QN, PQ), notes and distinctness*
- *(ii) Method of observation (V/M; G/S)*
- *(iii) Asterisked, grouping and TQ characteristics*
- *(iv) Example varieties*

(c) The process for developing UPOV Test Guidelines

UPOV

The International Convention for the Protection of New Varieties of Plants

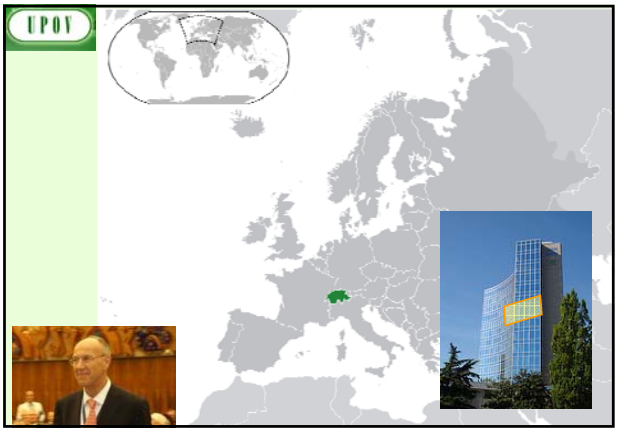
established in 1961

The International Union for the Protection of New Varieties of Plants

Union internationale pour la protection des obtentions végétales

PROGRAM

4. UPOV databases (UPOV-ROM Plant Variety Database; GENIE database)
5. The UPOV website
6. Role of UPOV Technical Working Parties (TWPs) and the BMT
7. Agenda for the TWV Session
8. Feedback



2. OVERVIEW OF THE GENERAL INTRODUCTION

(DOCUMENT TG/1/3 AND TGP DOCUMENTS)

GUIDANCE FOR DUS EXAMINATION

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)

THE CONDITIONS FOR GRANTING A BREEDER'S RIGHT

Criteria to be satisfied

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

} **"DUS"**

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

THE CONDITIONS FOR GRANTING A BREEDER'S RIGHT

Other conditions

- VARIETY DENOMINATION
- FORMALITIES
- PAYMENT OF FEES

NO OTHER CONDITIONS!

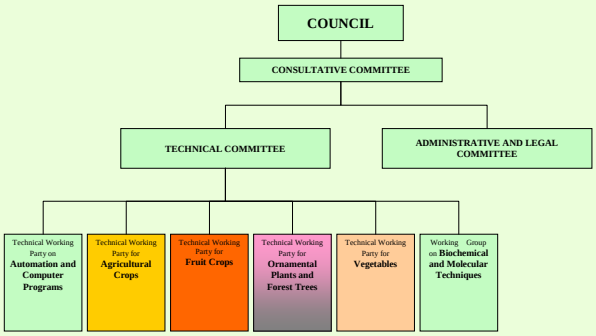
TG/1/3 General Introduction

"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	New Types of Characteristics

3. GUIDANCE ON DRAFTING TEST GUIDELINES

UPOV Structure



UPOV provides guidance by:

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

AND

- **"Test Guidelines"**
  - **Species/Crop-specific recommendations developed by crop experts**
  - **TGP/7 "Development of Test Guidelines" adopted**

TGP/7 "Development of Test Guidelines"

E

UPOV

TG/250/1
ORIGINAL: English
DATE: 2009-04-01

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

YAM

UPOV Code(s):
DIOSC_ALA; DIOSC_BAT; DIOSC_JAP

Dioscorea alata L., *Dioscorea polystachya* THUNB.; *Dioscorea japonica* THUNB.

GUIDELINES
FOR THE CONDUCT OF TESTS
FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:

Botanical name	English	French	German	Spanish
Dioscorea alata L.	Greater yam, Purple yam, Two-months' yam, Water yam, White yam, Winged yam, Yam	Grande igname, Igname ailée, Igname de Chine	Großgeflügelte Yam, Wasser-Yamswurzel	Name Mayor, Ñame de agua, Tabaco
Dioscorea polystachya THUNB.; *Dioscorea batatas* DECNE.	Chinese yam, Chinese potato, Cinnamon vine	Igname	Chinesische Yamswurzel	
Dioscorea japonica THUNB.	Japanese yam	Igname japonaise		

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

1. Introduction

2. Procedure for the Introduction and Revision of UPOV Test Guidelines

3. Guidance for Drafting Test Guidelines
   - The **TG Template**
   - **Additional Standard Wording** for the TG Template
   - **Guidance Notes** for the TG Template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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

DRAFT

[MAIN COMMON NAME]

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

"CHARACTERISTICS"

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

10 Chapters of UPOV Test Guidelines

1. Subject of the Test Guidelines
2. Material Required
3. Methods of Examination
4. Assessment of Distinctness, Uniformity and Stability
5. Grouping of Varieties and Organization of the Growing Trial
6. Introduction to the Table of Characteristics
7. **Table of Characteristics**
8. Explanation on the Table of Characteristics
9. Literature
10. Technical Questionnaire

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.

3. TEST GUIDELINES

(a) Selection of characteristics

Selection of Characteristics

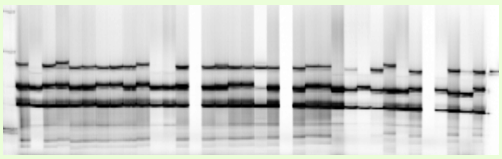
- **Yield ???**
- **Straw strength ???**

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	

Molecular Techniques?



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

3. TEST GUIDELINES

(b) Guidance on drafting characteristics

(i) Types of expression (QL, QN, PQ), notes and distinctness

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

TYPE OF EXPRESSION OF CHARACTERISTICS (QL, QN, PQ)

Types of Expression

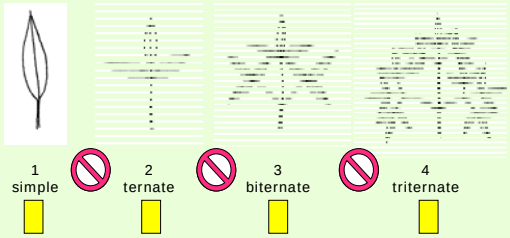
QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

Qualitative characteristic

Clematis: Leaf: type



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

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

NON-Qualitative characteristic

Anthocyanin coloration: absent / present

	Variety A	Variety B	Variety C
Environment A	○	●	○
Environment B	○	●	◐

QUALITATIVE Characteristics

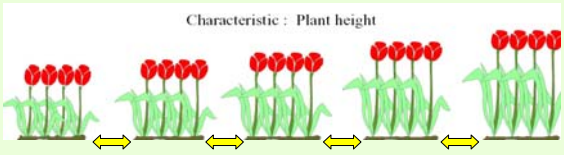
"Qualitative characteristics" are those that are **expressed in discontinuous states** (e.g. sex of plant: dioecious female (1), dioecious male (2), monoecious unisexual (3), monoecious hermaphrodite (4)).

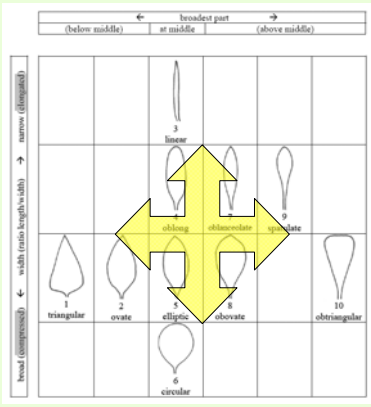
These states are self-explanatory and independently meaningful. All states are necessary to describe the full range of the characteristic, and every form of expression can be described by a single state. The order of states is not important. As a rule, the **characteristics are not influenced by environment**.

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.

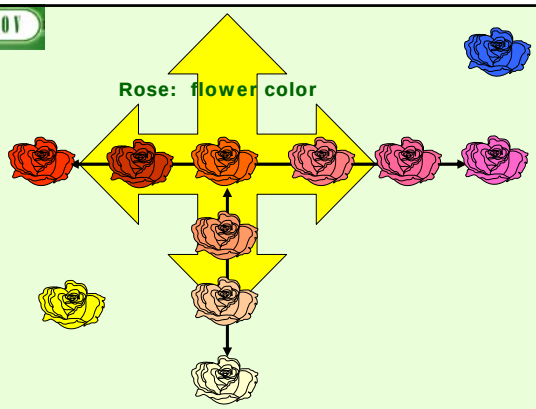
Quantitative Characteristic





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

STATES / NOTES for QL, QN ,PQ

Qualitative Characteristics

(typical example)

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
19. VG (*) (+) QL	**Inflorescence: type**					
	Type 1					1
	Type 2					2
	Type 3					3
		1 Type 1	2 Type 2	3 Type 3		

Quantitative Characteristics

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

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

Standard Range Version 3
-
3 weak
5 medium
7 strong
9 very strong

Standard Range Version 4
-
3 weak
5 medium
7 strong
-

Qualitative Characteristics

(special cases)

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

Quantitative Characteristics

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

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

Limited range

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

Condensed range

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

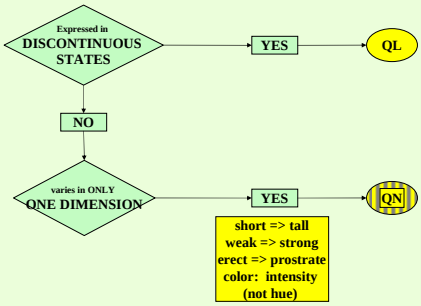
Example 2
1 e.g. absent or weak *(absent or weakly expressed)*
2 moderate (or medium) *(moderately expressed)*
3 strong *(strongly expressed)*

Pseudo-qualitative Characteristics

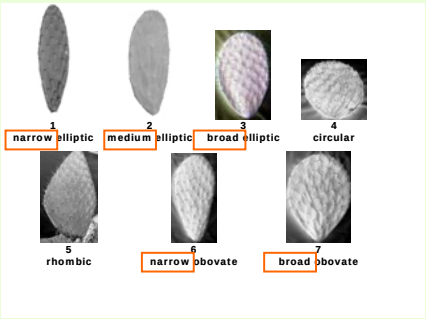
(typical examples)

	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	purpura	púrpura	6

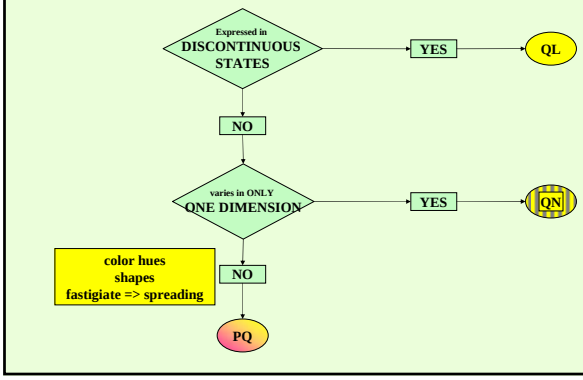
QL, QN or PQ?



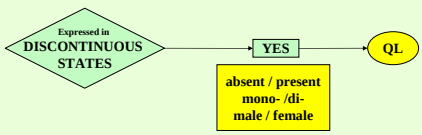
Opuntia: Shape of Cladode



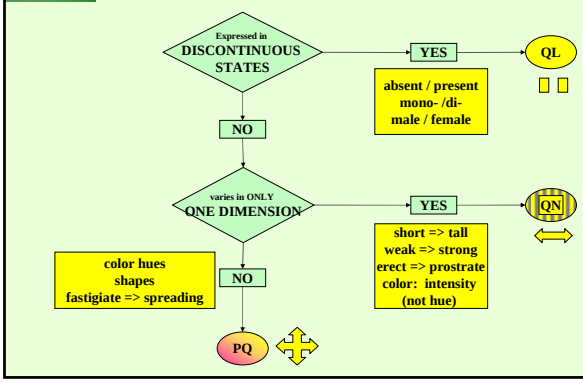
QL, QN or PQ?



QL, QN or PQ?



QL, QN or PQ?



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EXERCISE

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2.	**Leaf sheath: anthocyanin coloration**	
	absent or very weak	1
	weak	3
	medium	5
	strong	7
	very strong	9

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What type of Expression?

QL: Qualitative
QN: Quantitative
PQ: Pseudo-qualitative

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3.	**Plant: rhizomes**	
	absent	1
	present	9

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		Note/ Nota
1.	**Plant: ploidy**	
	diploid	2
	tetraploid	4
	hexaploid	6
	octoploid	8

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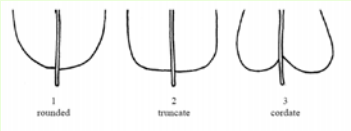
4.	**Petal: color**	
	white	1
	yellow	2
	orange	3
	red	4
	pink	5
	purple	6

5.	**Leaf blade: intensity of green color of upper side**	
	light	3
	medium	5
	dark	7

8.	**Leaf blade: profile in cross section**	
	straight or weakly concave	1
	moderately concave	2
	strongly concave	3

6.	**Leaf blade: shape of base**	
	rounded	1
	truncate	2
	cordate	3



NOTES and DISTINCTNESS
according to
TYPE OF EXPRESSION
(QL, PQ, QN)

7.	**Petal: color**	
	RHS Colour Chart (indicate reference number)	

Types of Expression

QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

QUALITATIVE Characteristics

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Types of Expression

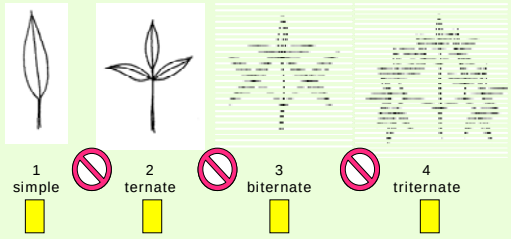
QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

Qualitative characteristic

Clematis: Leaf: type



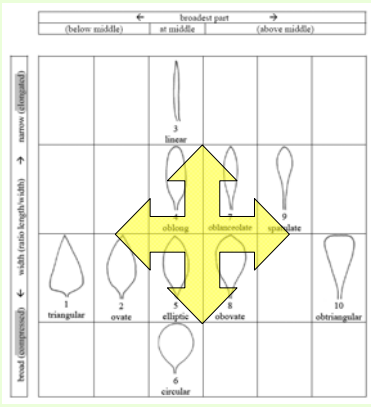
PSEUDO-QUALITATIVE Characteristics

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.

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)).



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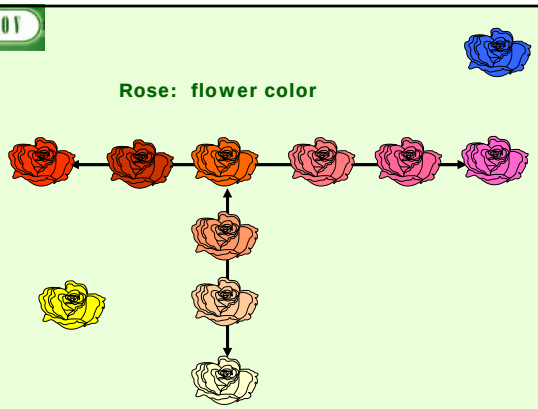
Rose: flower color



UPOV

Types of Expression

QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

UPOV

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.

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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

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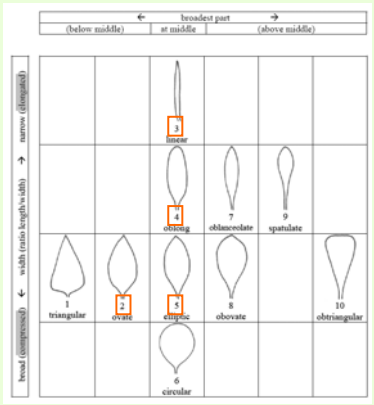

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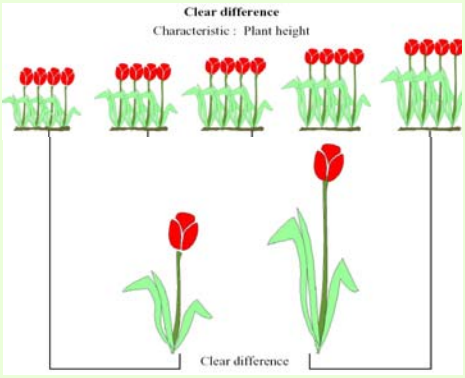
Quantitative Characteristics: **distinctness**

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

Quantitative Characteristic



TGP/9/1 "Examining Distinctness"

5.2 Approaches for assessing distinctness

5.2.1 Introduction

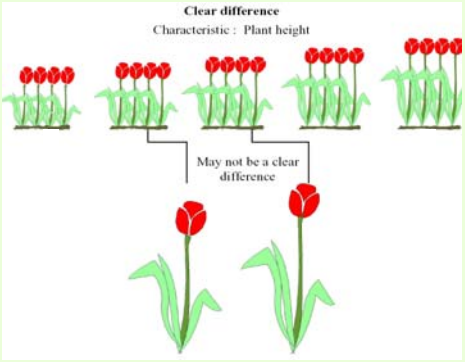
5.2.1.1 Approaches for assessment of distinctness based on the growing trial can be summarized as follows:

(a) **Side-by-side visual comparison** in the growing trial (see Section 5.2.2);

(b) **Assessment by Notes / single variety records ("Notes"):** the assessment of distinctness is based on the recorded state of expression of the characteristics of the variety (see Section 5.2.3);

(c) Statistical analysis of growing trial data:

Quantitative Characteristic



Quantitative Characteristics: distinctness

The General Introduction explains that, in the case of visually observed quantitative characteristics:

"5.5.2.2.2 **A direct comparison between two similar varieties is always recommended**, since direct pairwise comparisons are the most reliable. In each comparison, **a difference between two varieties is acceptable as soon as it can be assessed visually and could be measured, although such measurement might be impractical or require unreasonable effort**."

NOTES

versus

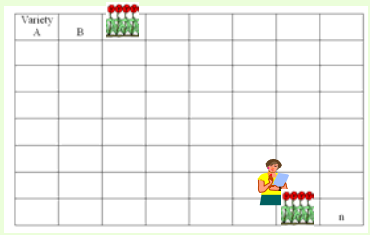
SIDE-BY-SIDE COMPARISON

(Quantitative characteristics)

TGP/9/1 "Examining Distinctness"

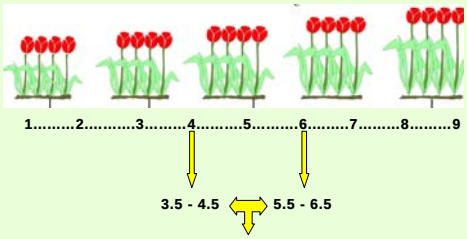
5.2.3.1.2 Where the requirements for distinctness assessment by Notes / single variety records are met it would usually also be possible to make a side-by-side visual comparison. However, in the case of assessment by Notes / single variety records, such proximity is not required, which is a particular advantage where the growing trial contains a large number of varieties and where there are limited possibilities for ensuring that all similar varieties are grouped together in the growing trial. ...

On the other hand, because the varieties are not the subject of a side-by-side visual comparison, the difference required between varieties as a basis for distinctness is, with the exception of qualitative characteristics (see below), somewhat greater.



...and comparison with descriptions in databases

"Two Note" rule...



...means at least ONE note difference!

Quantitative Characteristics: distinctness

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

Test Guidelines (TGP/7 proposed revised text)

Difference of **two Notes to represent a clear difference if** the **comparison** between two varieties is performed **at the level of Notes**:

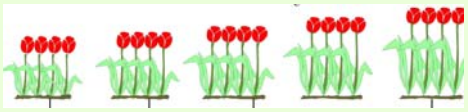
WHY?

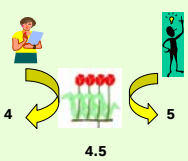
Quantitative Characteristics: distinctness

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

Test Guidelines (TGP/7 proposed revised text)

Difference of **two Notes to represent a clear difference if** the **comparison** between two varieties is performed **at the level of Notes**:





Quantitative Characteristics: distinctness

TG/233/1
Dascia/Dascie, 2007-03-28
- 9 -

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
6. (*)	(a) **Leaf blade: length**	**Limbe: longueur**	**Blattspreite: Länge**	**Limbo: longitud**		
QN	short	courte	kurz	corto	Codster, Strawberry Sundae	3
	medium	moyenne	mittel	medio	Codasure	5
	long	longue	lang	largo	Balwhislaps, Balwhiswhat	7

1 to 9 scale: **Notes 1 and 3**, **Notes 2 and 4**, Notes 3 and 5 **etc.** represent a clear difference

Quantitative Characteristics: distinctness

TG/233/1
Dianca/Dianca, 2007-03-28
- 9 -

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
5.	**Stem: anthocyanin coloration below inflorescence**	**Tige: pigmentation anthocyanique sous inflorescence**	**Trieb: Anthocyanfärbung unter dem Blütenstand**	**Tallo: pigmentación antocianica por debajo de la inflorescencia**		
QN	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Heccharm	1
	medium	moyenne	mittel	media	Hecrace	2
	strong	forte	stark	fuerte		3

1 to 3 scale: **only Notes 1 and 3** represent a clear difference

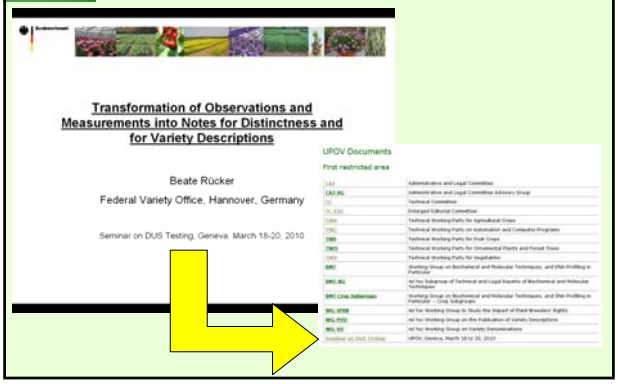
Method of Observation

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**.

Process levels other than Notes...



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*)*	**

3. TEST GUIDELINES

(b) Guidance on drafting characteristics

(ii) Method of observation (V/M; G/S)

TGP/9/1 "Examining Distinctness"

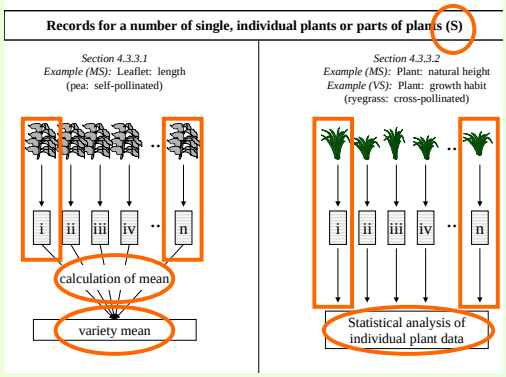
V= Visual observation

	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

Method of propagation of the variety	Type of expression of characteristic: QL (QUAL itative)	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

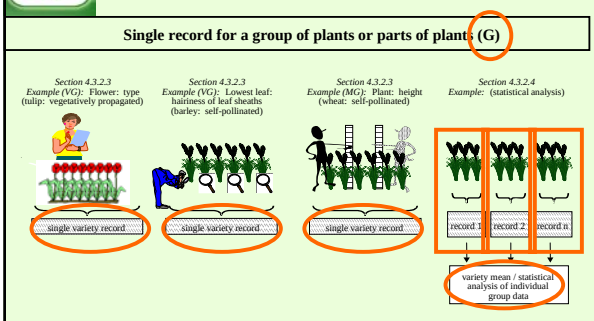
(for the purposes of distinctness)

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 …

EXERCISE



3. TEST GUIDELINES

(b) Guidance on drafting characteristics

(iii) Asterisked, grouping and TQ characteristics

Standard
Test Guidelines Characteristic

Function	Criteria
1.Characteristics that are **accepted by UPOV for examination of DUS** and from which members of the Union can select those suitable for their particular circumstances.	1.Must satisfy the criteria for use of any characteristic for DUS as set out in **Chapter 4, section 4.2**. 2.Must have been **used** to develop a variety description **by at least one member of the Union**. 3.Where there is a long list of such characteristics and, where considered appropriate, there may be an indication of the extent of use of each characteristic.

Grouping Characteristic

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Plant: growth habit (characteristic 1)
(b) Leaf blade: variegation (characteristic 11)
(c) Upper lobes of corolla: main color (characteristic 24), with the following groups:
Gr. 1: white
Gr. 2: yellow
Gr. 3: orange
Gr. 4: pink
Gr. 5: red
Gr. 6: red purple
Gr. 7: violet
Gr. 8: blue

Asterisked Characteristic

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
(*)	**Plant: growth habit**	**Plante : port**	**Pflanze: Wuchsform**	**Planta: porte**		
QN	upright	dressé	aufrecht	erecto	Imppunk	1
	semi-upright	semi dressé	halbaufrecht	semierecto	D015S-1	2
	spreading	étalé	breitwuchsig	abierto	Summem 03	3
	semi-trailing	semi-étalé	halbhängend	semirastrero	Impsaf	4
	trailing	coureux	hängend	rastrero	Organza	5

Apple: Fruit color

Asterisked Characteristic

Function	Criteria
1.Characteristics that are important **for the international harmonization of variety descriptions**.	1.Must be a characteristic included in the Test Guidelines. 2.**Should always be examined** for DUS and included in the variety description **by all members of the Union** **EXCEPT** when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate. 3.Must be useful for function 1. 4.Particular care should be taken before selection of disease resistance characteristics.

Apple: Fruit color

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 Botanical name *Malus domestica* Borkh.

1.2 Common name Apple

2. Applicant

Name

Address

Telephone No.

Relationship between functions

(a) **GROUPING CHARACTERISTICS** selected from the Table of Characteristics should, in general, **receive an asterisk** in the Table of Characteristics and be **included in the Technical Questionnaire**.

(b) **TQ CHARACTERISTICS** selected from the Table of Characteristics should, in general, **receive an asterisk** in the Table of Characteristics and be **used as grouping characteristics**. TQ characteristics are **not restricted to** those characteristics used as **grouping characteristics**;

(c) **ASTERISKED CHARACTERISTICS** are **not restricted to** those characteristics selected as **grouping or TQ characteristics**.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

Characteristics	Example Varieties	Note
5.5 Fruit: hue of over color – with bloom removed (37)		
orange red	Cox's Orange Pippin, Egremont Russet	1[ ]
pink red	Cripps Pink, Delorgue	2[ ]
red	Akane, Galaxy, Red Elstar, Regal Prince	3[ ]
purple red	Red Jonaprince, Spartan	4[ ]
brown red	Fiesta, Joburn, Lord Burghley	5[ ]
5.6 Fruit: pattern of over color (39)		
only solid flush	Red Jonaprince, Richared Delicious	1[ ]
solid flush with weakly defined stripes	Galaxy	2[ ]
solid flush with strongly defined stripes	Jonagored	3[ ]
weakly defined flush with strongly defined stripes	Gravensteiner	4[ ]
only stripes (no flush)	Helios	5[ ]
flushed and mottled	Elstar	6[ ]
flushed, striped and mottled	Jonagold	7[ ]

3. TEST GUIDELINES

(b) Guidance on drafting characteristics

(iv) Example varieties

Grouping Characteristic

Function	Criteria
characteristics in which the **documented states of expression**, even where recorded **at different locations**, can be used either individually or in combination with other such characteristics: **1. to select varieties of common knowledge that can be excluded from the growing trial** used for examination of distinctness, and/or **2. to organize the growing trial so that similar varieties are grouped together**	1.(a) Qualitative characteristics or (b) Quantitative or pseudo-qualitative characteristics which provide useful discrimination between the varieties of common knowledge from documented states of expression recorded at different locations. 2.Must be useful for functions 1 and 2. 3.Should be an **asterisked characteristic** and/or included in the **Technical Questionnaire** or application form.

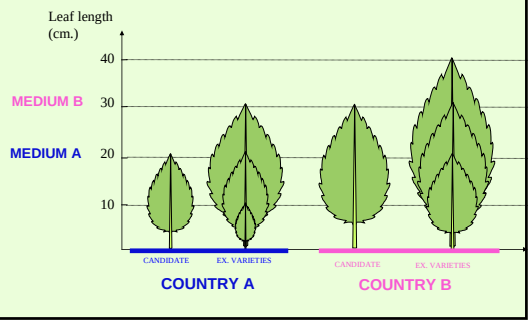
Example Varieties: the Objective

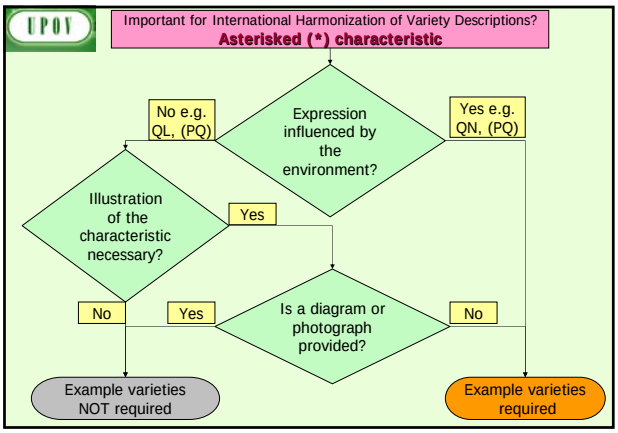
Clarify states of expression

- **Illustrate characteristics**
- **Determine the state of expression**

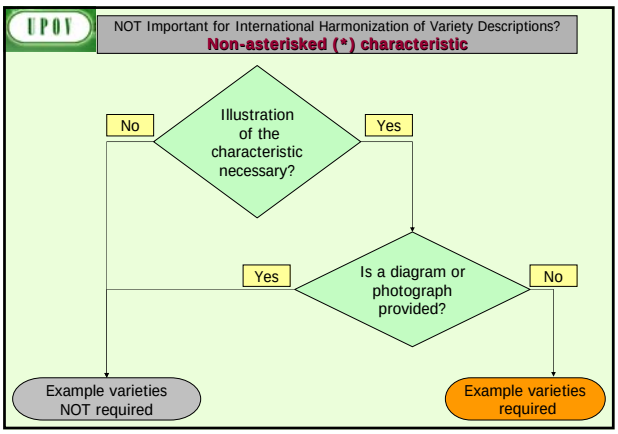
Harmonized descriptions

Example Varieties versus Measurements





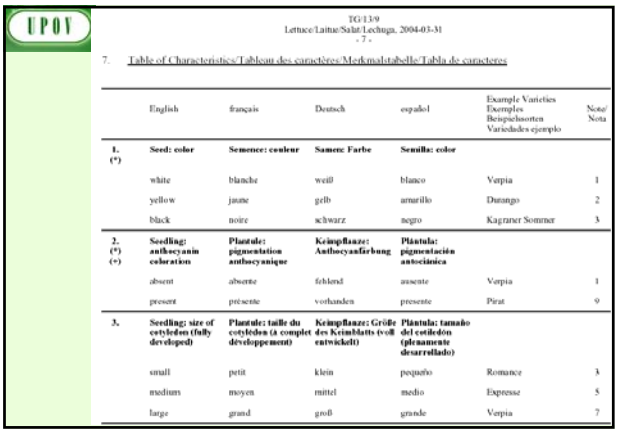
Example Varieties –the need



Example Varieties – the need

NEED

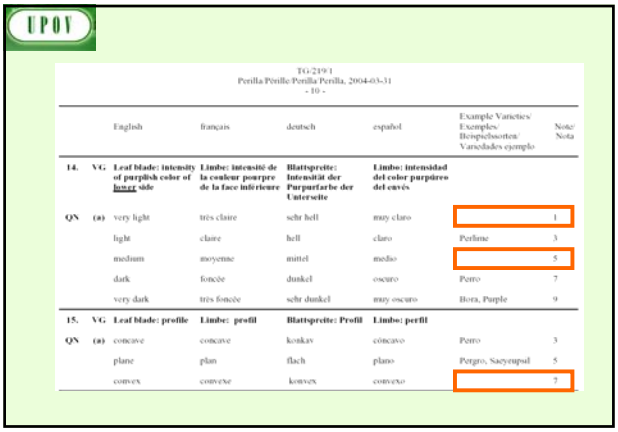
- in characteristics used to **harmonize descriptions**
- and
- which are **influenced by the environment**



TG/13/9
Lettuce/Laitue/Salat/Lechuga, 2004-03-31
- 7 -

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

	English	français	Deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
1. (*)	**Seed: color**	**Semence: couleur**	**Samen: Farbe**	**Semilla: color**		
	white	blanche	weiß	blanco	Verpia	1
	yellow	jaune	gelb	amarillo	Durango	2
	black	noire	schwarz	negro	Kagraner Sommer	3
2. (*) (+)	**Seedling: anthocyanin coloration**	**Plantule: pigmentation anthocyanique**	**Keimpflanze: Anthocyanfärbung**	**Plántula: pigmentación antocínica**		
	absent	absente	fehlend	ausente	Verpia	1
	present	présente	vorhanden	presente	Pirat	9
3.	**Seedling: size of cotyledon (fully developed)**	**Plantule: taille du cotyledon (à complet développement)**	**Keimpflanze: Größe des Keimblatts (voll entwickelt)**	**Plántula: tamaño del cotiledón (plenamente desarrollado)**		
	small	petit	klein	pequeño	Romance	3
	medium	moyen	mittel	medio	Expresse	5
	large	grand	groß	grande	Verpia	7



TG/219/1
Perilla/Pérille/Perilla/Perilla, 2004-03-31
- 10 -

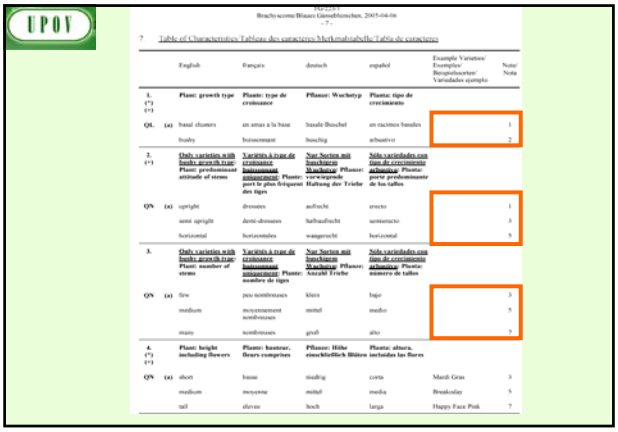
		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
14.	VG	**Leaf blade: intensity of purplish color of lower side**	**Limbe: intensité de la couleur pourpre de la face inférieure**	**Blattspreite: Intensität der Purpurfarbe der Unterseite**	**Limbo: intensidad del color purpúreo del envés**		
QN	(a)	very light	très claire	sehr hell	muy claro		1
		light	claire	hell	claro	Perilme	3
		medium	moyenne	mittel	medio		5
		dark	foncée	dunkel	oscuro	Perro	7
		very dark	très foncée	sehr dunkel	muy oscuro	Bora, Purple	9
15.	VG	**Leaf blade: profile**	**Limbe: profil**	**Blattspreite: Profil**	**Limbo: perfil**		
QN	(a)	concave	concave	konkav	cóncavo	Perro	3
		plane	plan	flach	plano	Pergro, Saeyeupul	5
		convex	convexe	konvex	convexo		7

Test Guidelines

- **264 Test Guidelines** adopted

but...

- **>2,750 genera and species** with varieties examined for PBR



Brachycome/Blaues Gänseblümchen, 2005-04-06
- 7 -

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
1. (*) (+)		**Plant: growth type**	**Plante: type de croissance**	**Pflanze: Wuchstyp**	**Planta: tipo de crecimiento**		
QL	(a)	basal clusters	en amas à la base	basale Büschel	en racimos basales		1
		bushy	buissonnant	buschig	arbustivo		2
2. (+)		**Only varieties with bushy growth type: Plant: predominant attitude of stems**	**Variétés à type de croissance buissonnant uniquement: Plante: port le plus fréquent des tiges**	**Nur Sorten mit buschigem Wachstum: Pflanze: vorherrschende Haltung der Triebe**	**Sólo variedades con tipo de crecimiento arbustivo: Planta: porte predominante de los tallos**		
QN	(a)	upright	dressées	aufrecht	erecto		1
		semi upright	demi-dressées	halbaufrecht	semierecto		3
		horizontal	horizontales	waagerecht	horizontal		5
3.		**Only varieties with bushy growth type: Plant: number of stems**	**Variétés à type de croissance buissonnant uniquement: Plante: nombre de tiges**	**Nur Sorten mit buschigem Wachstum: Pflanze: Anzahl Triebe**	**Sólo variedades con tipo de crecimiento arbustivo: Planta: número de tallos**		
QN	(a)	few	peu nombreuses	klein	bajo		3
		medium	moyennement nombreuses	mittel	medio		5
		many	nombreuses	groß	alto		7
4. (*) (+)		**Plant: height including flowers**	**Plante: hauteur, fleurs comprises**	**Pflanze: Höhe einschließlich Blüten**	**Planta: altura, incluidas las flores**		
QN	(a)	short	basse	niedrig	corta	Mardi Gras	3
		medium	moyenne	mittel	media	Breakoday	5
		tall	élevée	hoch	larga	Happy Face Pink	7

Test Guidelines

- **264 Test Guidelines** adopted
- Further **58 to be discussed** in 2011
  - 37 new Test Guidelines
  - 15 Revisions
  - 6 Partial revisions
    (29 "final" draft stage)

3. TEST GUIDELINES (document TGP/7)

(c) The process for developing UPOV Test Guidelines

PRIORITY for UPOV Test Guidelines

PRIORITY for species or crops with high:

- number of **authorities** receiving PBR applications;
- number of **PBR applications**;
- number of **foreign applications** received by UPOV members;
- **economic importance**;
- level of **breeding activity**

EXAMPLE (New Test Guidelines)

Test Guidelines: ***Plantus magnifica*** **L.**
(Common name: Alpha)

Technical Working Party: **TWX**

TWX (2005):	Alpha (proj.**1**)
TWX (2006):	Alpha (proj.**2**)
TWX (2007):	Alpha (proj.**3**)
Enlarged Editorial Committee (2008):	Alpha (proj.**4**)
Technical Committee (2008):	Alpha (proj.**5**)
Final adopted document (2008):	**TG/500/1**

Plant Variety Database

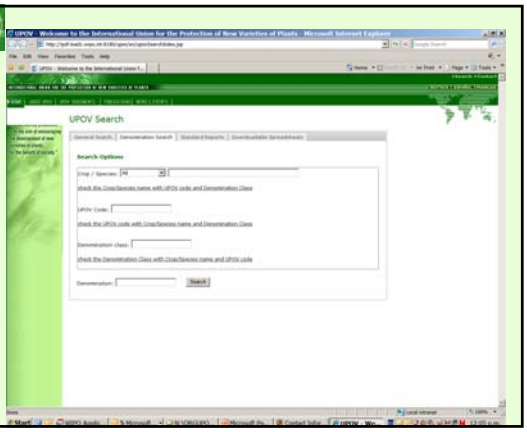
Freely accessible
on the UPOV website
during 2011

4. UPOV DATABASES

Article 20 of the 1991 Act (Variety denominations)

(2) [*Characteristics of the* ***denomination***]

In particular, it **must be different from every denomination** which designates, in the territory of any Contracting Party, **an existing variety** of the same plant species or of a closely related species.



GENIE Database

(Genus / species)

5. THE UPOV WEBSITE

GENIE Database

Variety denomination related information

Protection offered by UPOV members

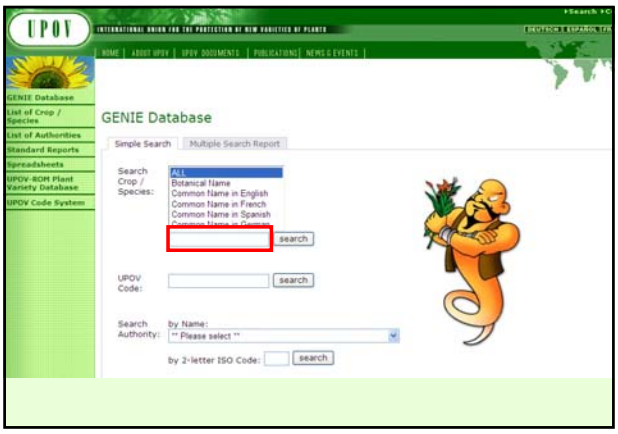
DUS information

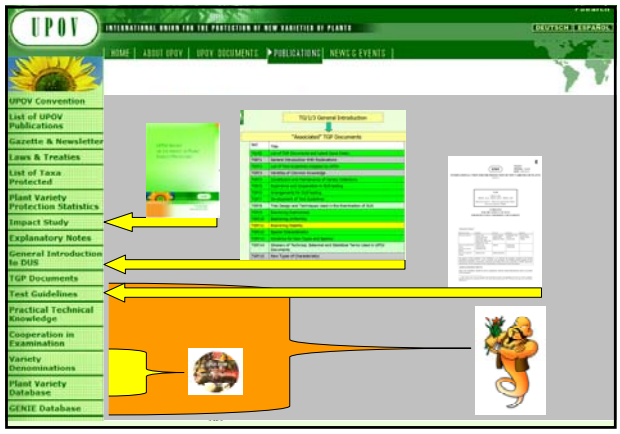
- UPOV Test Guidelines
- practical experience of UPOV (document TC/44/4)
- cooperation in DUS examination (document C/41/5)

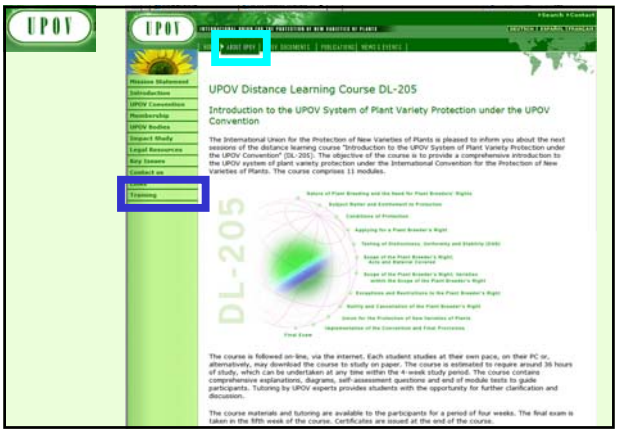
UPOV Website

http://www.upov.int

(e-mail: upov.mail@upov.int)







UPOV Structure

Technical Working Party on **Automation and Computer Programs**	Technical Working Party for **Agricultural Crops**	Technical Working Party for **Fruit Crops**	Technical Working Party for **Ornamental Plants and Forest Trees**	Technical Working Party for **Vegetables**	Working Group on **Biochemical and Molecular Techniques**

Test Guidelines

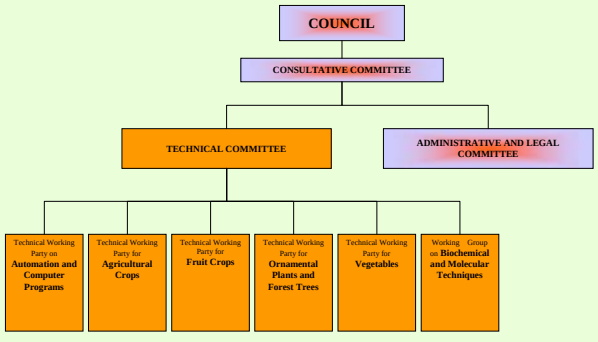
6. ROLE OF THE TECHNICAL WORKING PARTIES AND THE BMT

UPOV Structure

Technical Working Party on **Automation and Computer Programs**	Technical Working Party for **Agricultural Crops**	Technical Working Party for **Fruit Crops**	Technical Working Party for **Ornamental Plants and Forest Trees**	Technical Working Party for **Vegetables**	Working Group on **Biochemical and Molecular Techniques**

TGP documents

UPOV Structure



UPOV Structure

Technical Working Party on **Automation and Computer Programs**	Technical Working Party for **Agricultural Crops**	Technical Working Party for **Fruit Crops**	Technical Working Party for **Ornamental Plants and Forest Trees**	Technical Working Party for **Vegetables**	Working Group on **Biochemical and Molecular Techniques**

Role of the BMT

(see document BMT/12/2: Annex, page 2)
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

Role of the BMT

Raise awareness of general developments:

(see document BMT/12/2: Annex, page 2)
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;

=> BMT/12 agenda item 5

Role of the BMT

Consider the possible application of biochemical and molecular techniques in DUS testing

(see document BMT/12/2: Annex, page 2)
The BMT is a group open to DUS experts, biochemical and molecular specialists and plant breeders, whose role is to: […]

(iii) Consider the possible application of biochemical and molecular techniques in DUS testing and report its considerations to the TC;
(v) Consider initiatives from TWPs, for the establishment of crop specific subgroups […];
(vii) Receive reports from Crop Subgroups and the BMT Review Group;

=> BMT/12 agenda items 4, 6 and 12 and
=> BMT/DUS Draft 3 "Possible Use of Molecular Markers in the Examination of Distinctness, Uniformity and Stability (DUS)"

Role of the BMT

(see document BMT/12/2: Annex, page 2)
The BMT is a group open to DUS experts, biochemical and molecular specialists and plant breeders, whose role is to: […]

(viii) Provide a **forum for discussion** on the use of biochemical and molecular techniques in the consideration of **essential derivation** and **variety identification**.

=> BMT/12 agenda items 10 and 11 and
=> presentations to follow

Role of the BMT

Guidance and harmonization for a range of applications

(see document BMT/12/2: Annex, page 2)
The BMT is a group open to DUS experts, biochemical and molecular specialists and plant breeders, whose role is to: […]

(iv) If appropriate, establish guidelines for biochemical and molecular methodologies and their harmonization […];
(vi) Develop guidelines regarding the management and harmonization of databases of biochemical and molecular information, in conjunction with the TWC;

=> BMT Guidelines
=> BMT/12 agenda items 7 to 9

BMT Forum

"BREEDERS' DAY"
at BMT/12, May 11, 2010, Ottawa

Use of molecular techniques in:

- **variety identification**
- **essential derivation**

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7. AGENDA for the TWP Session

UPOV

Example TWP Session

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
[TECHNICAL WORKSHOP] (optional)	Reports on developments in PVP	TGP document development	TGP document development	Experiences with new types and species Variety denominations	Databases, Electronic application systems Exchangeable software
COFFEE	COFFEE	COFFEE	COFFEE	COFFEE	COFFEE
[TECHNICAL WORKSHOP] (optional)	Reports (Continuation) Molecular techniques	TGP document development	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Uniformity method development	Recommendations on Test Guidelines
	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
PREPARATORY WORKSHOP	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	TECHNICAL VISIT	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Future program Adoption of report
COFFEE	COFFEE	COFFEE		COFFEE	
PREPARATORY WORKSHOP	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup		Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	END OF SESSION
	Continuation	RECEPTION		Continuation	

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Example TWP Session

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
[TECHNICAL WORKSHOP] (optional)	Reports on developments in PVP	TGP document development	TGP document development	Experiences with new types and species Variety denominations	Databases, Electronic application systems Exchangeable software
COFFEE	COFFEE	COFFEE	COFFEE	COFFEE	COFFEE
[TECHNICAL WORKSHOP] (optional)	Reports (Continuation) Molecular techniques	TGP document development	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Uniformity method development	Recommendations on Test Guidelines
	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
PREPARATORY WORKSHOP	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	TECHNICAL VISIT	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Future program Adoption of report
COFFEE	COFFEE	COFFEE		COFFEE	
PREPARATORY WORKSHOP	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup		Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	END OF SESSION
	Continuation	RECEPTION		Continuation	

UPOV

AN OPPORTUNITY for TRAINING

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EXCHANGING INFORMATION

UPOV

Example TWP Session

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
[TECHNICAL WORKSHOP] (optional)	Reports on developments in PVP	TGP document development	TGP document development	Experiences with new types and species Variety denominations	Databases, Electronic application systems Exchangeable software
	COFFEE	COFFEE	COFFEE	COFFEE	COFFEE
	Reports (Continuation) Molecular techniques	TGP document development	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Uniformity method development	Recommendations on Test Guidelines
	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
PREPARATORY WORKSHOP	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	TECHNICAL VISIT	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Future program Adoption of report
	COFFEE	COFFEE		COFFEE	
	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup		Room 1: Test Guidelines subgroup Room 2: Test Guidelines subgroup	END OF SESSION
	Continuation	RECEPTION		Continuation	

TWP Venues

	TWA	TWC	TWF	TWO	TWV	BMT
1994	Spain	Israel	New Zealand	Australia	UK	France
1995	Germany	Poland	UK	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	Kenya	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
	May 24-28	June 28 - July 2	Sept. 27 - Oct. 1	Sept. 20 - 24	July 5 - 9	May 11 - 13

8. FEEDBACK

THANK YOU