TECHNICAL WORKING PARTY FOR FRUIT CROPS

Forty-Seventh Session

PREPARATORY WORKSHOP

Angers, France, November 13, 2016

PROGRAM

1. Introduction to UPOV and the role of UPOV Technical Working Parties (TWPs)
2. Overview of the General Introduction (document TG/1/3 and TGP documents)
   - Characteristics as the Basis for DUS Examination and Selection of Characteristics
3. Guidance on drafting Test Guidelines (document TGP/7)
   a) Subject of the Test Guidelines, Material Required and Method of Examination;
   b) Method of Observation (MS, MG, VS, VG);
   c) Types of Expression (QL, PQ, QN), notes and distinctness;
   d) Shape and Color Characteristics;
   e) Example Varieties;
   f) The process for developing UPOV Test Guidelines, including: TG Template; Additional Standard Wording; and Guidance Notes;
4. Agenda for the TWP Session
5. Feedback from participants

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

UPOV: INDEPENDENT INTERGOVERNMENTAL ORGANIZATION

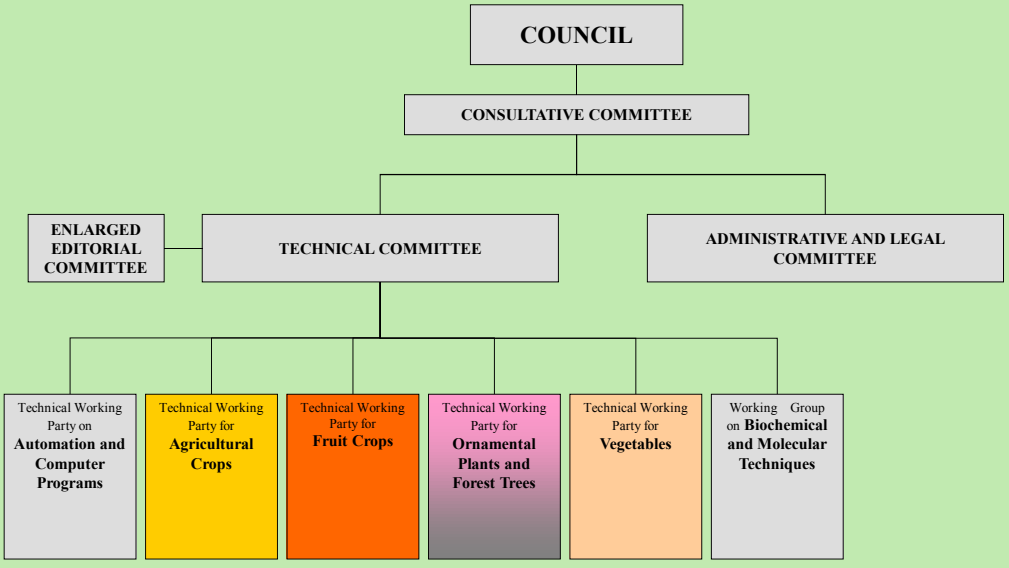
The International Convention for the Protection of New Varieties of Plants

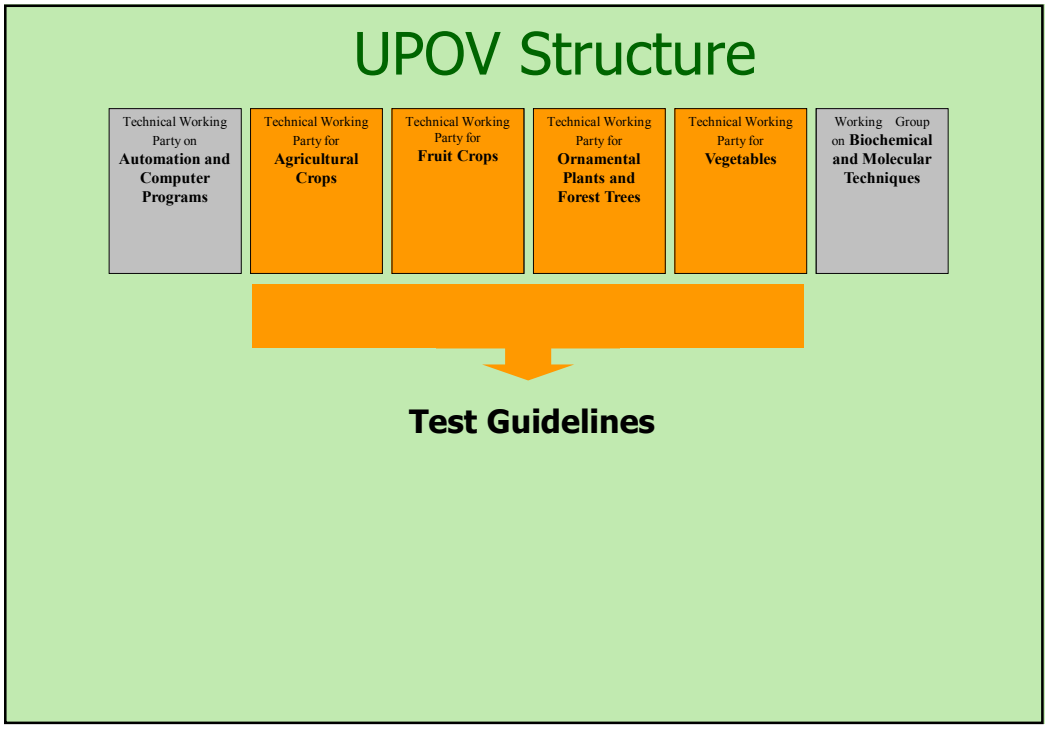
established in 1961

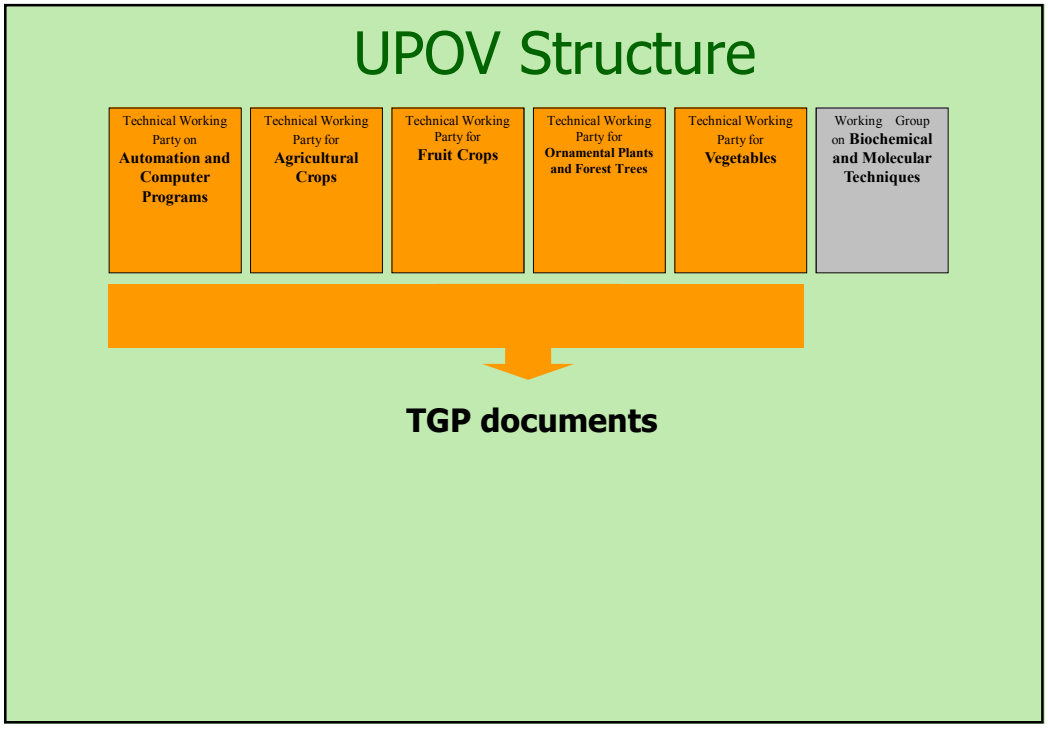
The International Union for the Protection of New Varieties of Plants

Union internationale pour la protection des obtentions végétales

UPOV Structure




UPOV Structure
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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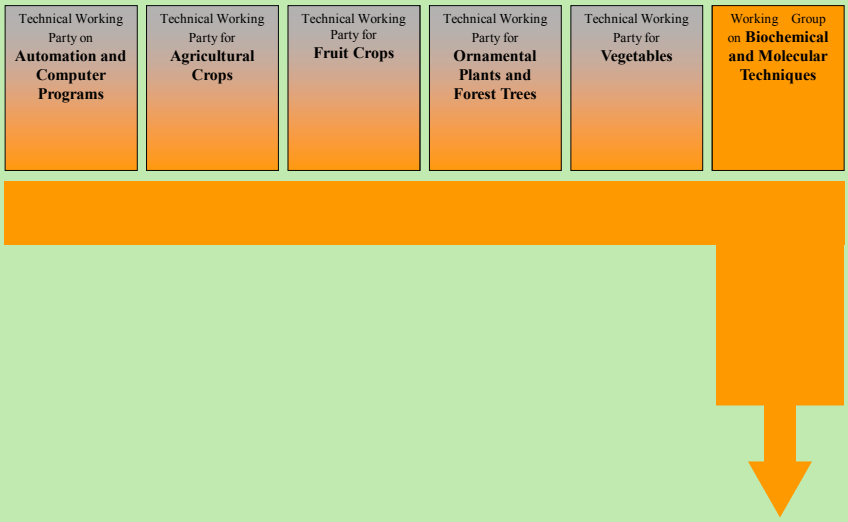
TGP documents

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 THE GENERAL INTRODUCTION (document TG/1/3 and TGP documents)

a) Characteristics as the Basis for DUS Examination

b) Selection of Characteristics

2. OVERVIEW OF THE GENERAL INTRODUCTION (document TG/1/3 and TGP documents)

a) Characteristics as the Basis for DUS Examination

b) Selection of Characteristics

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)

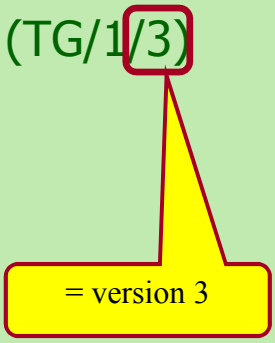
HARMONIZATION

=> 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)



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)

2. OVERVIEW OF THE GENERAL INTRODUCTION (document TG/1/3 and TGP documents)

a) Characteristics as the Basis for DUS Examination

b) Selection of Characteristics

"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	

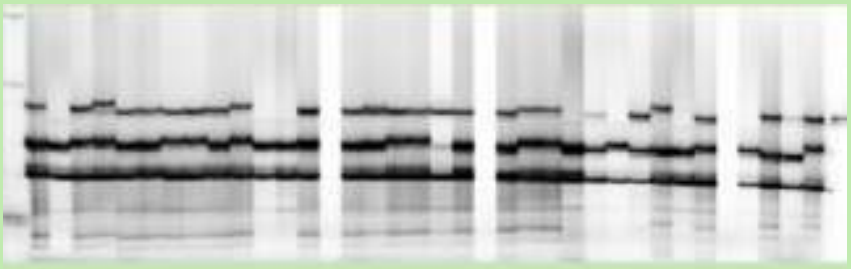
Selection of Characteristics

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?



TGP/7 :"Development of Test Guidelines"

Additional Information and guidance on 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.

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	Inuppunk	1
	semi-upright	semi dressé	halbaufrecht	semierecto	D0158-1	2
	spreading	étalé	breitwüchsig	abierto	Summem 03	3
	semi-trailing	semi-étalé	halbhängend	semirrastrero	Inupsaf	4
	trailing	coureux	hängend	rastrero	Organza	5

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.

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

Apple: Fruit color

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.

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 (97)	**Fruit: hue of over color – with bloom removed**		
	orange red	Cox's Orange Pippin, Egremont Russet	1[ ]
	pink red	Cripps Pink, Delcorf	2[ ]
	red	Akane, Galaxy, Red Elstar, Regal Prince	3[ ]
	purple red	Red Jonaprince, Spartan	4[ ]
	brown red	Fiesta, Johann, Lord Burghley	5[ ]
5.6 (99)	**Fruit: pattern of over color**		
	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)	[illegible]	5[ ]
	flushed and mottled	Elstar	6[ ]
	flushed, striped and mottled	Jonagold	7[ ]

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.

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**.

3. GUIDANCE ON DRAFTING TEST GUIDELINES (Document TGP/7)

3. GUIDANCE ON DRAFTING TEST GUIDELINES

a) Subject of the Test Guidelines, Material Required and Method of Examination

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**


E

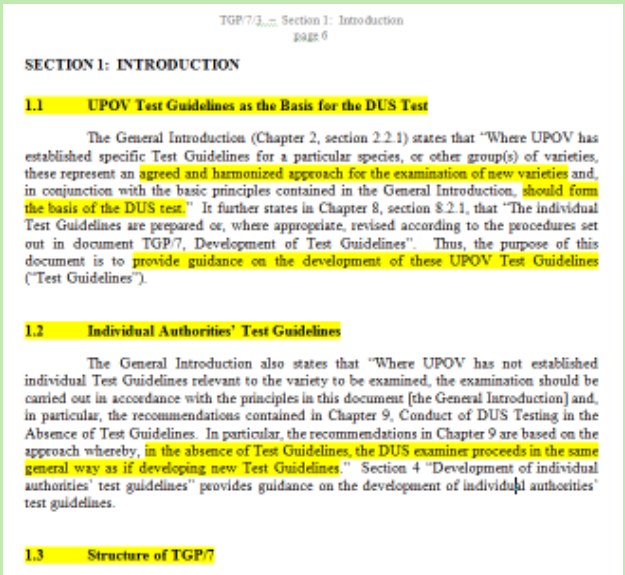
UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

TGP/7 "Development of Test Guidelines"

TGP/7 :"Development of Test Guidelines"

Section 1. Introduction



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SECTION 1: INTRODUCTION

1.1 UPOV Test Guidelines as the Basis for the DUS Test

The General Introduction (Chapter 2, section 2.2.1) states that "Where UPOV has established specific Test Guidelines for a particular species, or other group(s) of varieties, these represent an agreed and harmonized approach for the examination of new varieties and, in conjunction with the basic principles contained in the General Introduction, should form the basis of the DUS test." It further states in Chapter 8, section 8.2.1, that "The individual Test Guidelines are prepared or, where appropriate, revised according to the procedures set out in document TGP/7, Development of Test Guidelines". Thus, the purpose of this document is to provide guidance on the development of these UPOV Test Guidelines ("Test Guidelines").

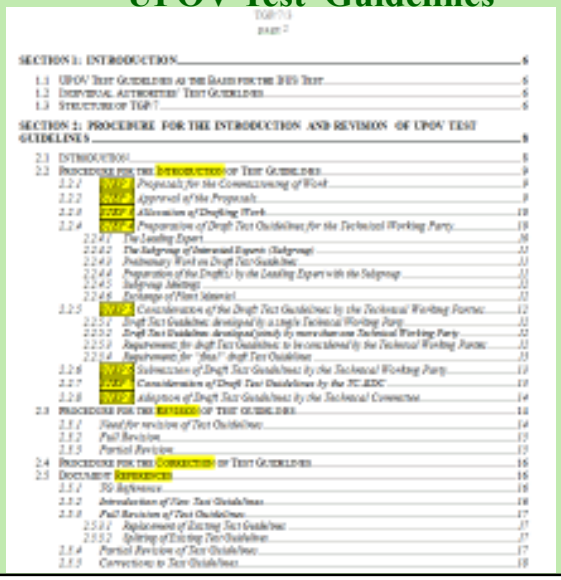
1.2 Individual Authorities' Test Guidelines

The General Introduction also states that "Where UPOV has not established individual Test Guidelines relevant to the variety to be examined, the examination should be carried out in accordance with the principles in this document [the General Introduction] and, in particular, the recommendations contained in Chapter 9, Conduct of DUS Testing in the Absence of Test Guidelines. In particular, the recommendations in Chapter 9 are based on the approach whereby, in the absence of Test Guidelines, the DUS examiner proceeds in the same general way as if developing new Test Guidelines." Section 4 "Development of individual authorities' test guidelines" provides guidance on the development of individual authorities' test guidelines.

1.3 Structure of TGP/7

TGP/7 :"Development of Test Guidelines"

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



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TGP/7 :"Development of Test Guidelines"

Section 3. Guidance for Drafting Test Guidelines

- The **TG Template**
- **Additional Standard Wording** for the TG Template
- **Guidance Notes** for the TG Template

Now available: Web-based TG Template

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

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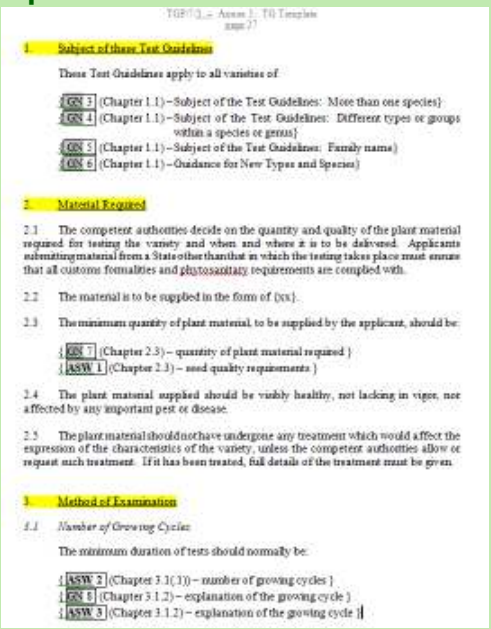

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of

{GN 3} (Chapter 1.1) – Subject of the Test Guidelines: More than one species}
{GN 4} (Chapter 1.1) – Subject of the Test Guidelines: Different types or groups within a species or genus}
{GN 5} (Chapter 1.1) – Subject of the Test Guidelines: Family name}
{GN 6} (Chapter 1.1) – Guidance for New Types and Species}

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of (xx).

2.3 The minimum quantity of plant material to be supplied by the applicant, should be:

{GN 7} (Chapter 2.3) – quantity of plant material required }
{ASW 1} (Chapter 2.3) – seed quality requirements }

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

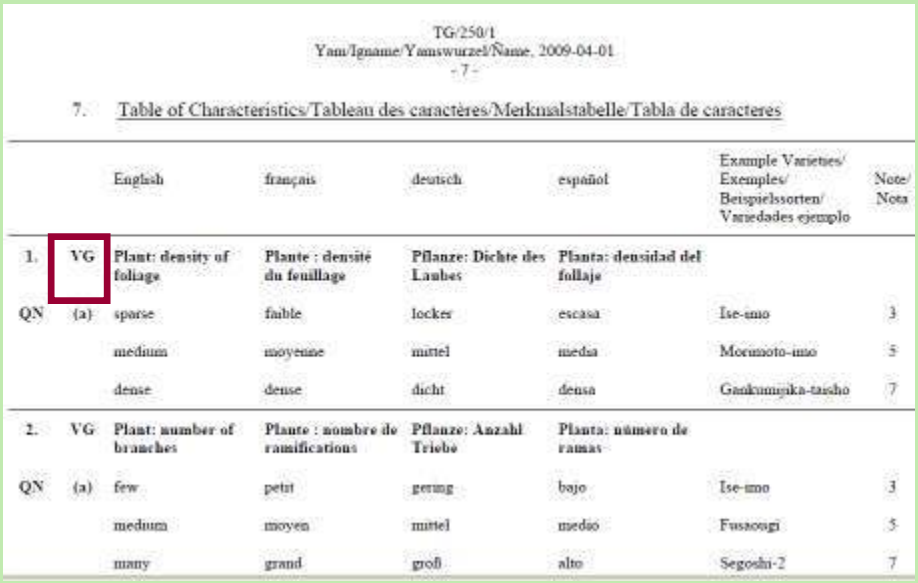
3.1 *Number of Growing Cycles*

The minimum duration of tests should normally be:

{ASW 2} (Chapter 3.1(1)) – number of growing cycles }
{GN 8} (Chapter 3.1.2) – explanation of the growing cycle }
{ASW 3} (Chapter 3.1.2) – explanation of the growing cycle }

3. GUIDANCE ON DRAFTING TEST GUIDELINES

b) Method of observation (MS, MG, VS, VG)



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Yam/Igname/Yamswurzel/Name, 2009-04-01
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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	Gaukumgika-tasho	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

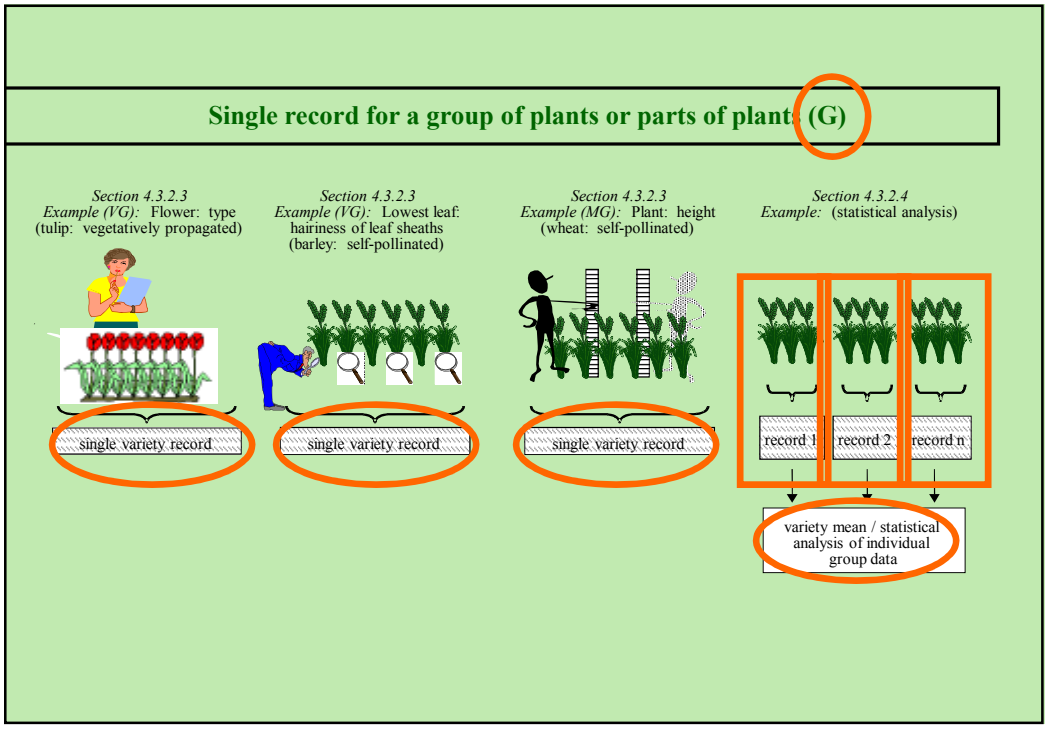
	Type of expression of characteristic		
Method of propagation of the variety	QL (QUAL itatative)	PQ (PSEUDO qualitative	QN (QUANT itative)
Vegetatively propagated, self-pollinated	*Notes (VG)*	*Notes (VG)* *Side-by-side (VG)*	*Notes (VG/MG/MS)* *Side-by-side (VG)* *Statistics (MG/MS)*
Cross-pollinated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

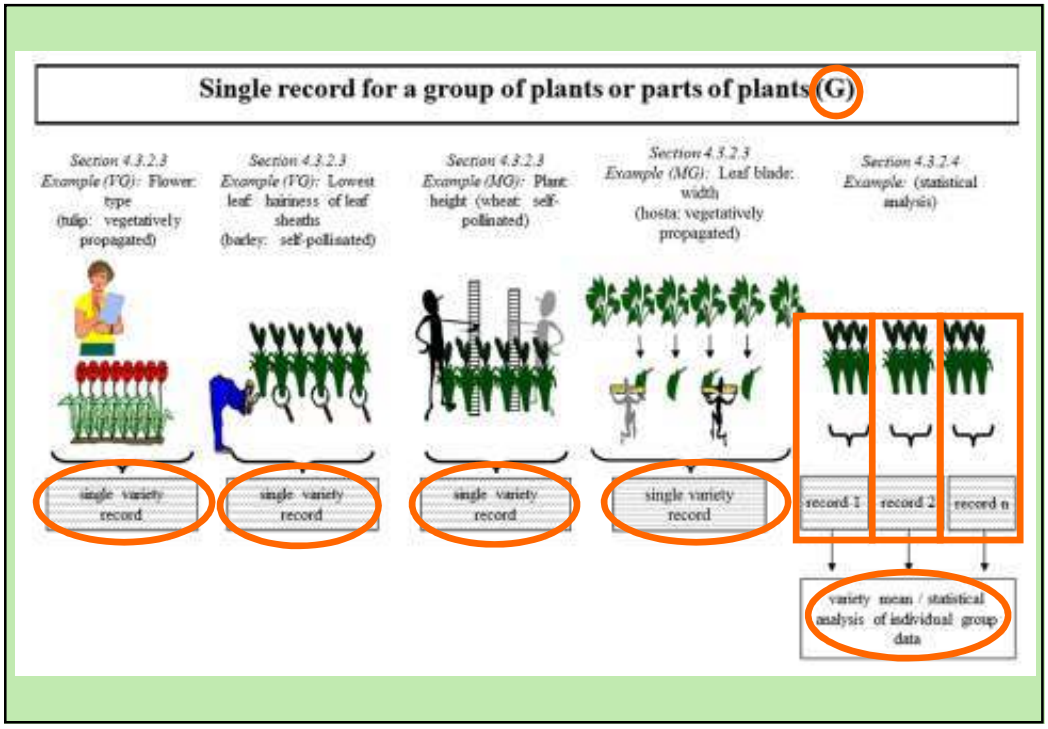
Type of Record
(for the purposes of distinctness)

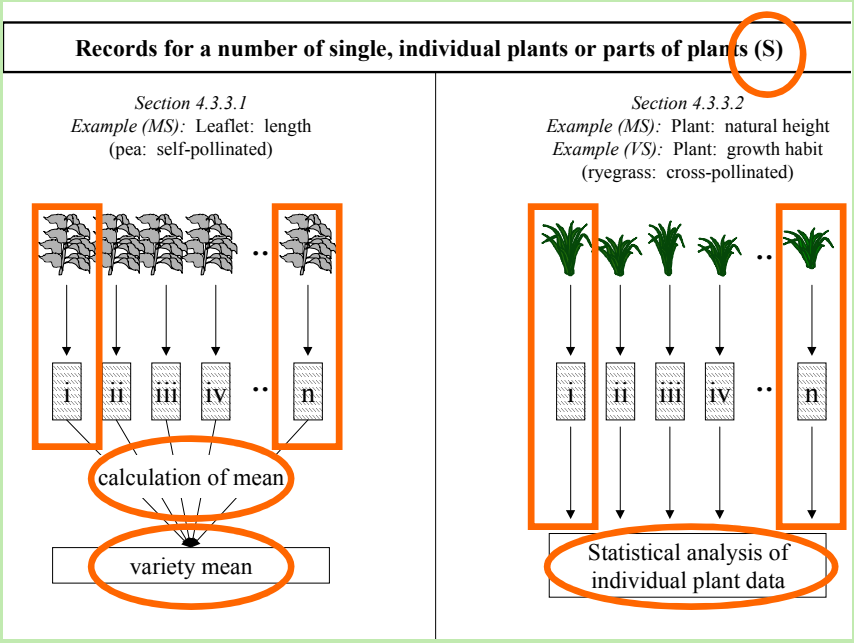
G: **single record** for a variety, or a **GROUP of plants** or parts of plants;

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)
single variety record
Section 4.3.2.3
Example (VG): Lowest leaf: hairiness of leaf sheaths
(barley: self-pollinated)
single variety record
Section 4.3.2.3
Example (MG): Plant: height
(wheat: self-pollinated)
single variety record
Section 4.3.2.4
Example: (statistical analysis)
record 1
record 2
record n
variety mean / statistical analysis of individual group data


Single record for a group of plants or parts of plants (G)
Section 4.3.2.3
Example (VG): Flower: type
(tulip: vegetatively propagated)
single variety record
Section 4.3.2.3
Example (VG): Lowest leaf: hairiness of leaf sheaths
(barley: self-pollinated)
single variety record
Section 4.3.2.3
Example (MG): Plant: height (wheat: self-pollinated)
single variety record
Section 4.3.2.3
Example (MG): Leaf blade: width
(hosta: vegetatively propagated)
single variety record
Section 4.3.2.4
Example: (statistical analysis)
record 1
record 2
record n
variety mean / statistical analysis of individual group data


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)
i
ii
iii
iv
n
calculation of mean
variety mean
Section 4.3.3.2
Example (MS): Plant: natural height
Example (VS): Plant: growth habit
(ryegrass: cross-pollinated)
i
ii
iii
iv
n
Statistical analysis of individual plant data

EXERCISE

3. GUIDANCE ON DRAFTING TEST GUIDELINES

c) Types of Expression (QL, PQ, QN), notes and distinctness;

TYPE 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 Beispielsorten Variedades ejemplo	Note/ Nota
1. (*) (+)	**Plant: growth habit**	**Plante : port**	**Pflanze: Wuchsform**	**Planta: porte**		
QN	upright	dressé	aufrecht	erecto	Iroppink	1
	semi-upright	semi dressé	halbaufrecht	semierecto	D0158-1	2
	spreading	étalé	breitwüchsig	abierto	Sunaura 03	3
	semi-trailing	semi-traîné	halbhängend	semirastrero	Iropraf	4
	trailing	couvert	hängend	rastrero	Orgunza	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	Iroppink	7

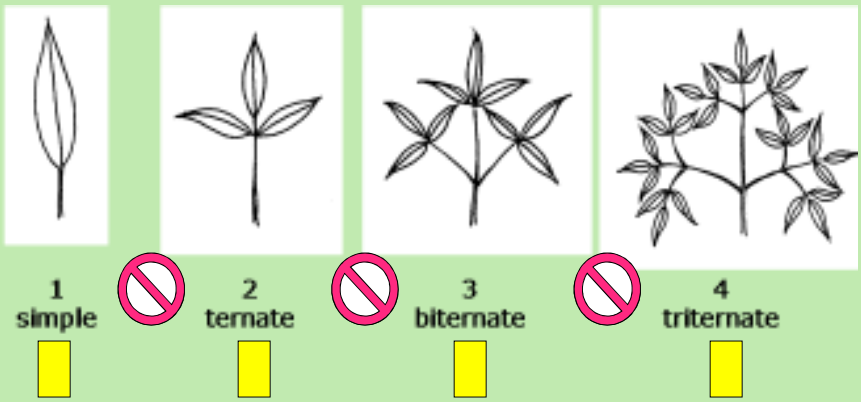
QUALITATIVE Characteristics

"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



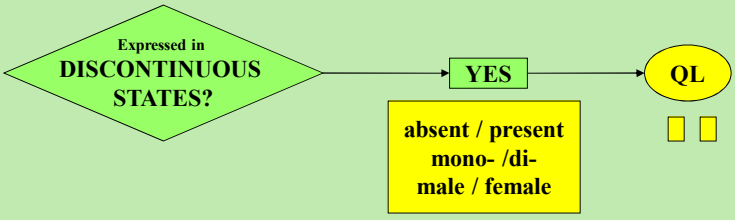
Qualitative (QL) characteristic?

Anthocyanin coloration: QL (=absent / present)?

NO!

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

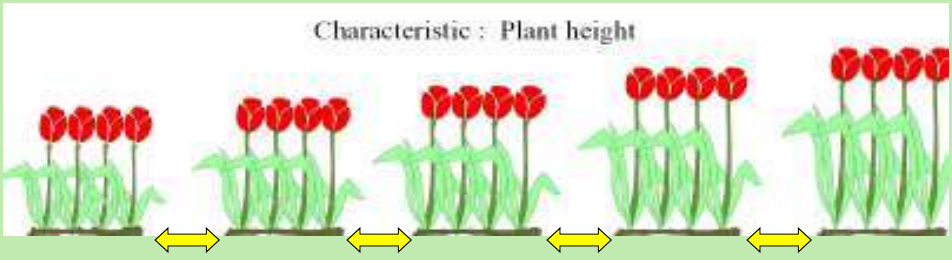
QL, QN or PQ?



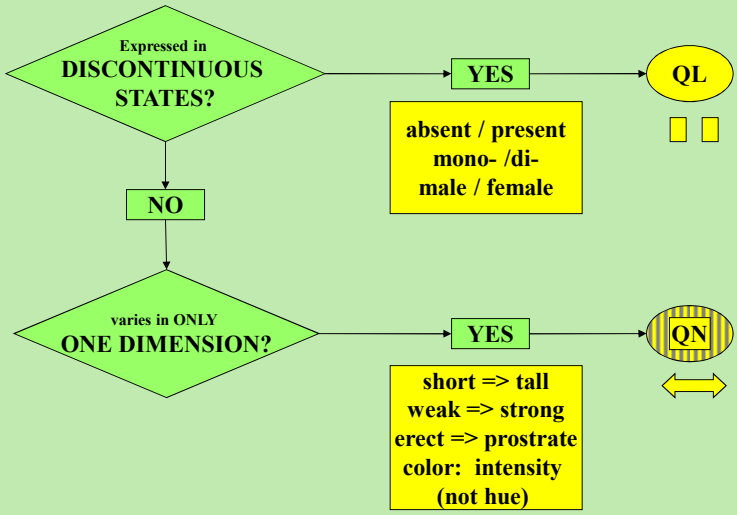
QUANTITATIVE Characteristics

"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



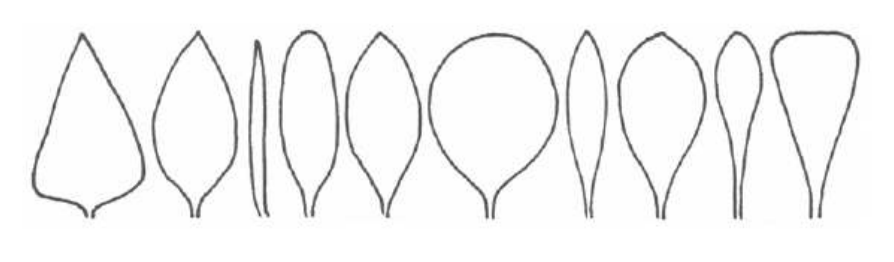
QL, QN or PQ?

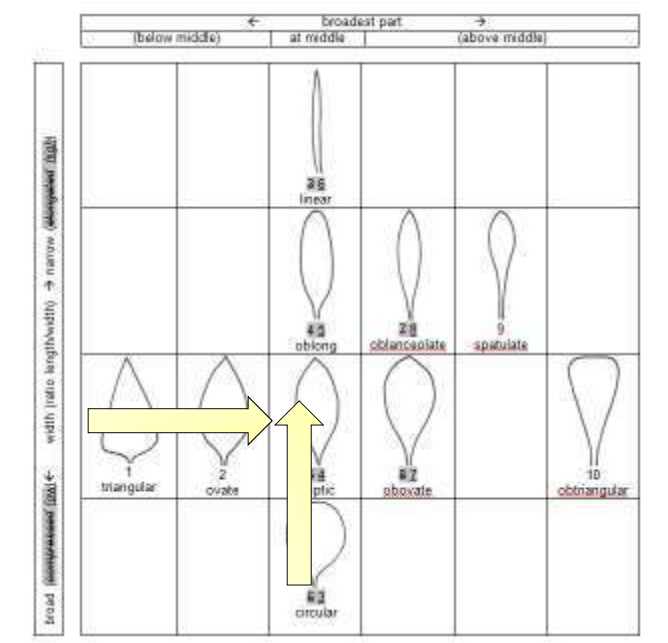


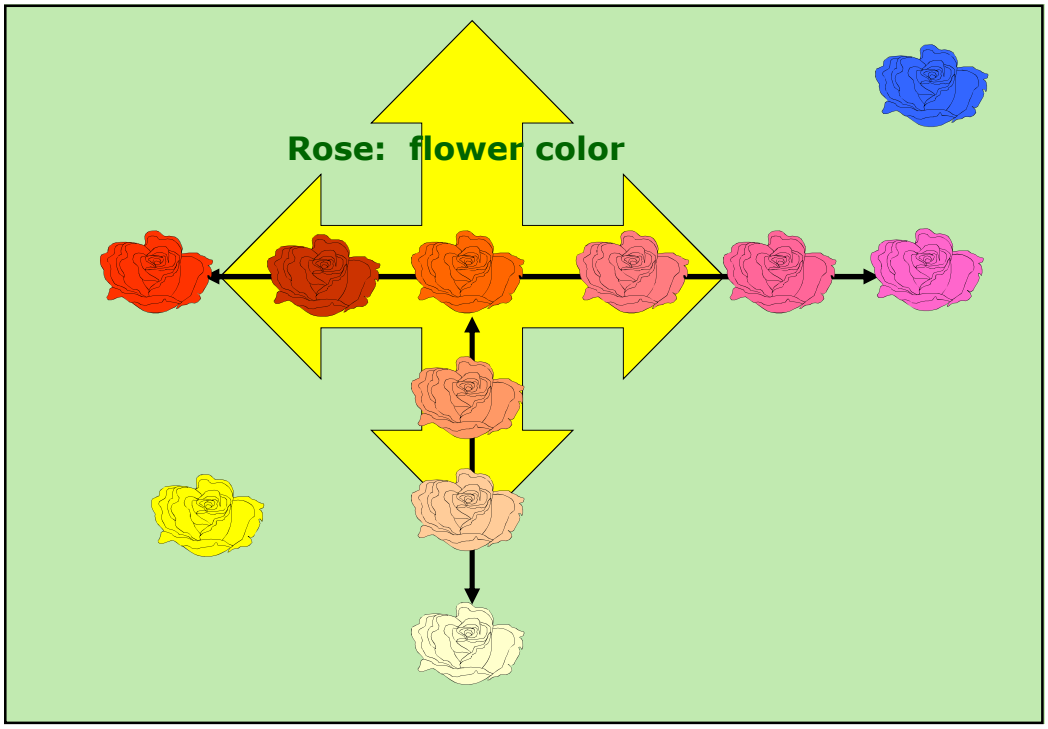
PSEUDO-QUALITATIVE Characteristics

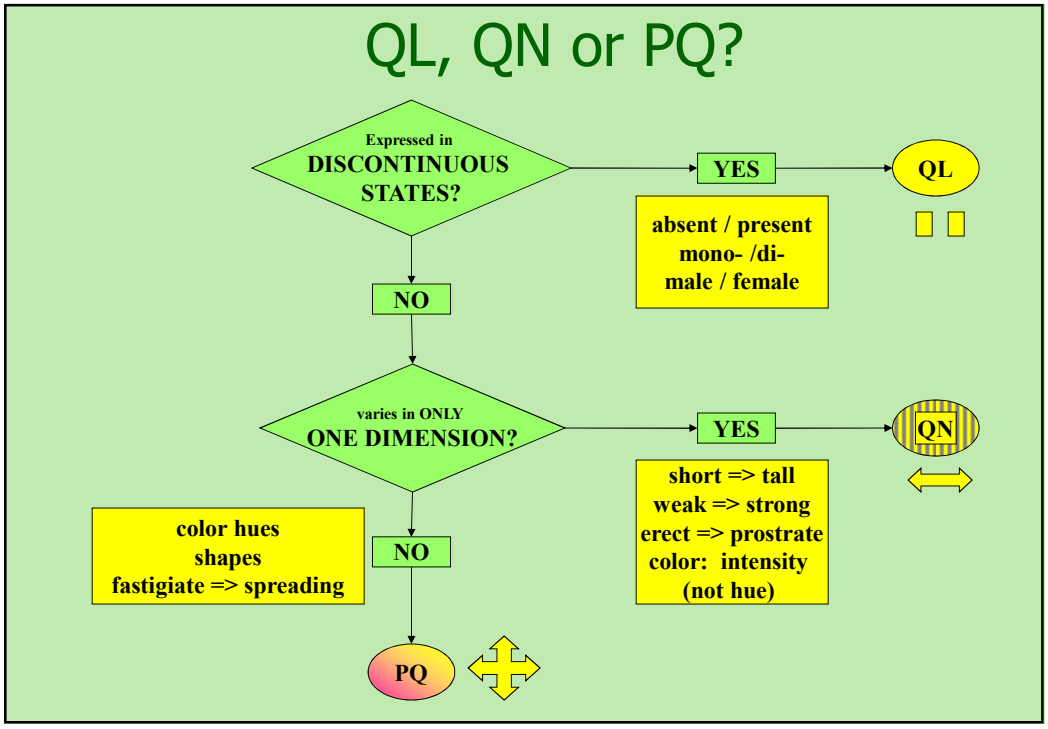
In the case of "pseudo-qualitative characteristics," the **range of expression is at least partly continuous, but varies in more than one dimension** (e.g. shape: ovate (1), elliptic (2), circular (3), obovate (4)) and cannot be adequately described by just defining two ends of a linear range. In a similar 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)
width (ratio length/width) → narrow
broad ←
linear
oblong
oblanceolate
spatulate
triangular
ovate
elliptic
obovate
obtriangular
circular


Rose: flower color


QL, QN or PQ?
Expressed in
DISCONTINUOUS
STATES?
YES
QL
absent / present
mono- /di-
male / female
NO
varies in ONLY
ONE DIMENSION?
YES
QN
short => tall
weak => strong
erect => prostrate
color: intensity
(not hue)
color hues
shapes
fastigiate => spreading
NO
PQ

EXERCISE

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

Types of Expression

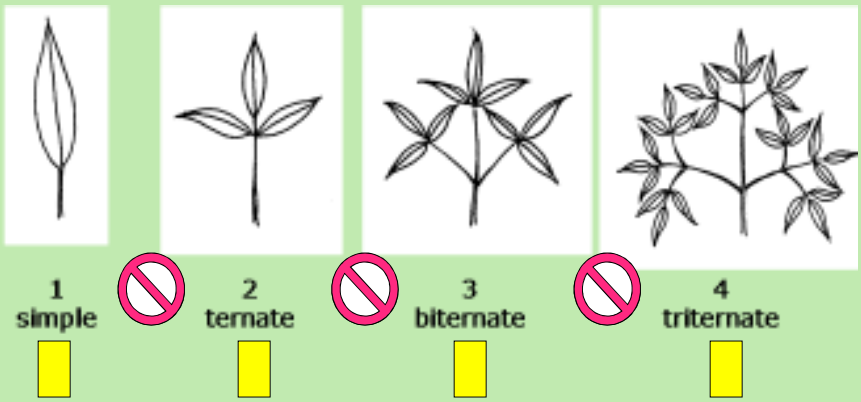
QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

Qualitative characteristic

Clematis: Leaf: type



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

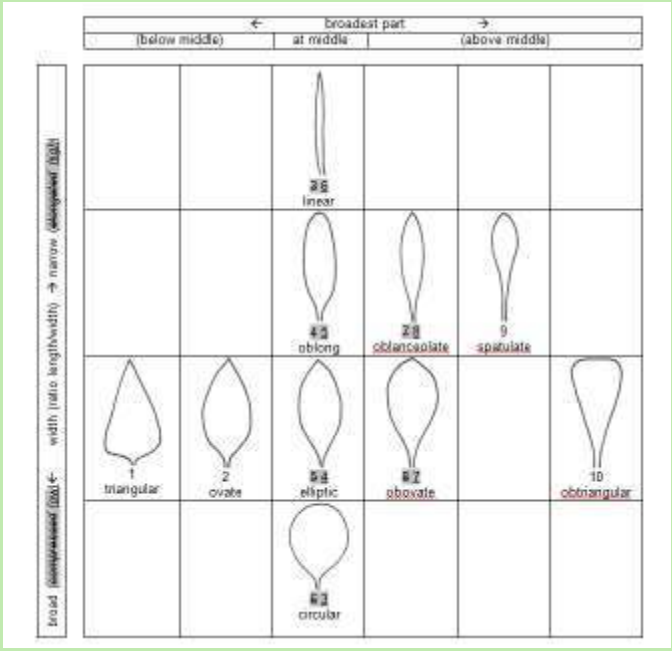
QL: QUALITATIVE

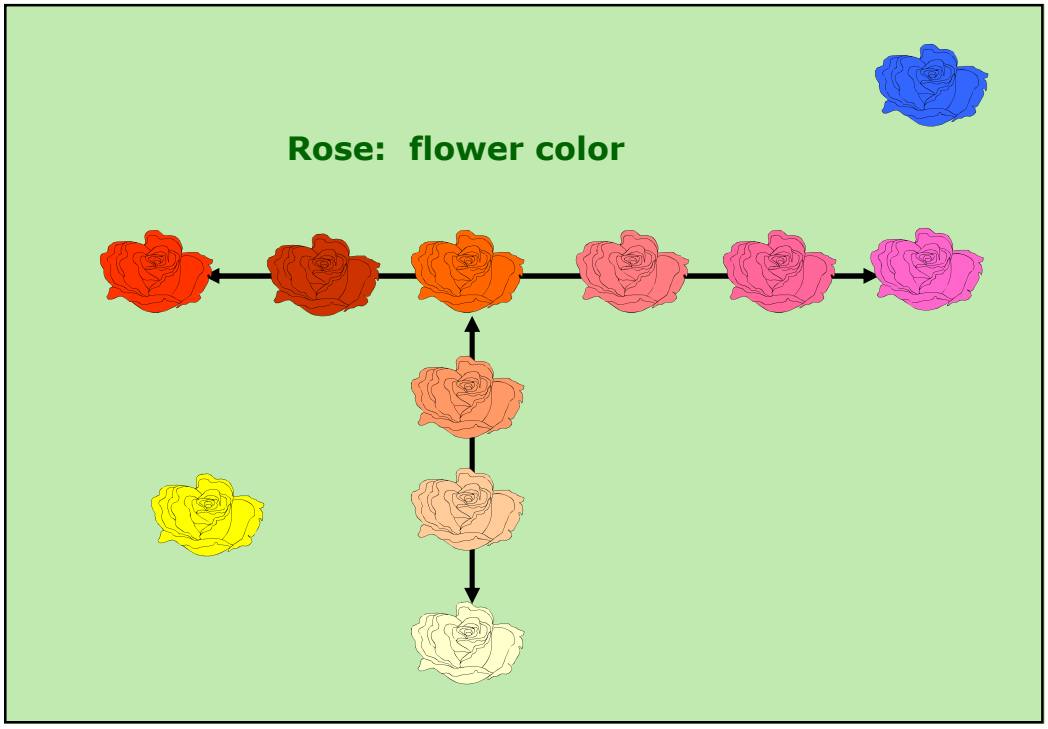
QN: QUANTITATIVE

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.


broadest part
(below middle)
at middle
(above middle)
width (ratio length/width)
broad
narrow
linear
oblong
oblanceolate
spatulate
triangular
ovate
elliptic
obovate
obtriangular
circular

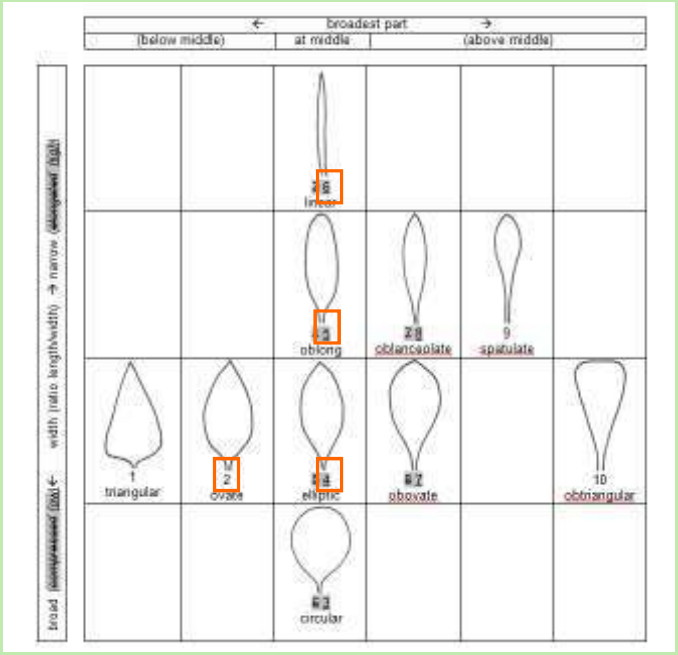

Rose: flower color

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

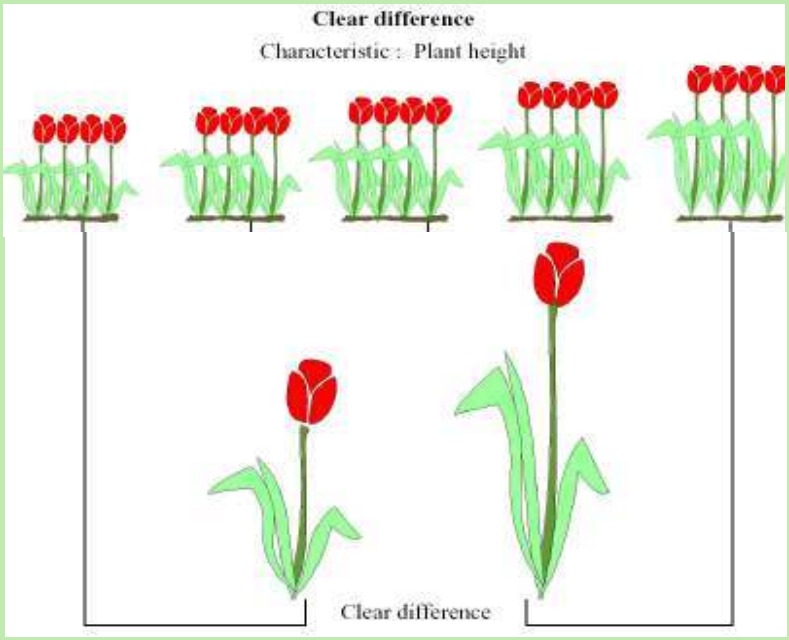
QUANTITATIVE Characteristics

"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.

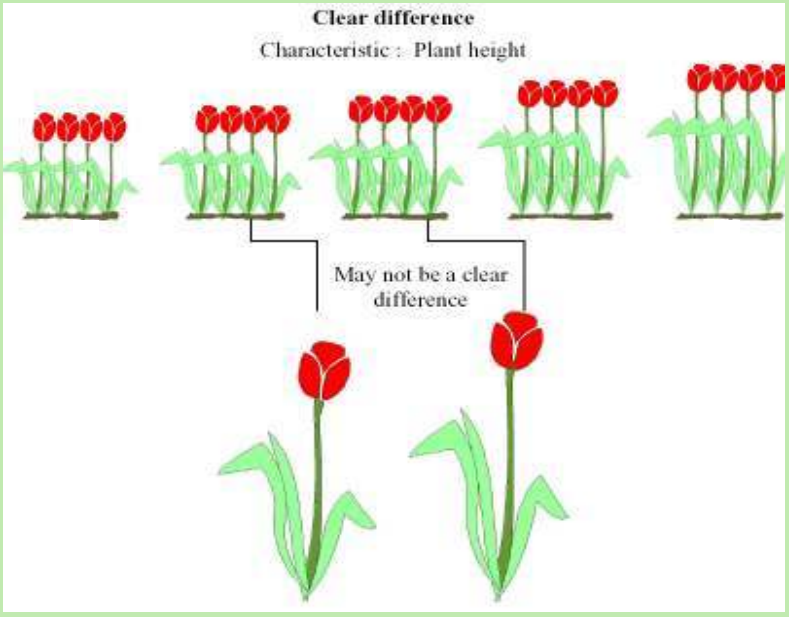
Quantitative Characteristics: distinctness

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
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
-

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

NOTES
versus
SIDE-BY-SIDE COMPARISON

(Quantitative characteristics)

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 Characteristics: **distinctness**

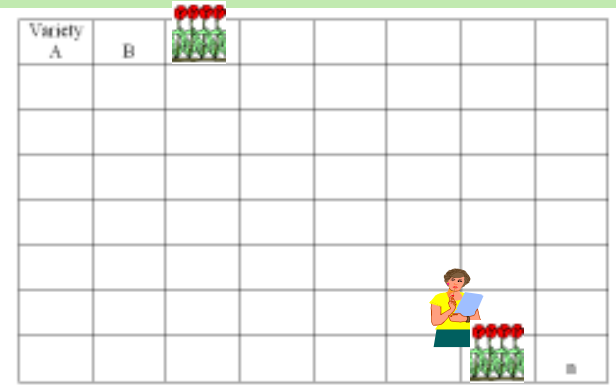
The General Introduction explains that, in the case of visually observed quantitative characteristics:

"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**."

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

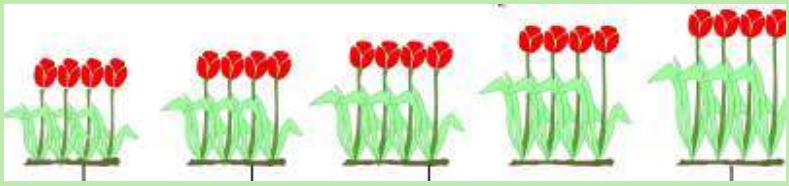
Quantitative Characteristics: **distinctness**

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

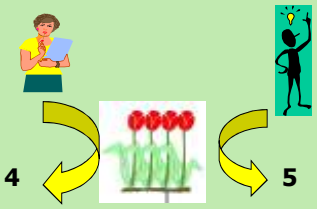
Test Guidelines (TGP/7 proposed revised text)

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

WHY?

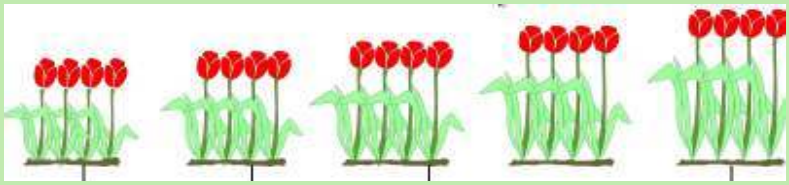


1.....2.....3.....4.....5.....6.....7.....8.....9



4.5

"Two Note" rule…



1.....2.....3.....4.....5.....6.....7.....8.....9

3.5 - 4.5 ⟷ 5.5 - 6.5

…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**:

Quantitative Characteristics: distinctness

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

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

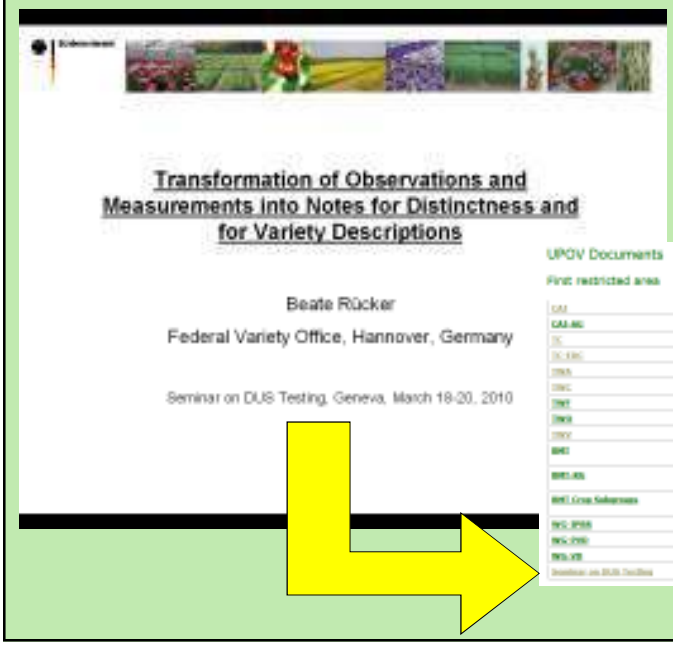
Quantitative Characteristics: **distinctness**

TG/233/1
Diascia/Diascie, 2007-03-28
- 9 -

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	**Stem: anthocyanin coloration below inflorescence**	**Tige: pigmentation anthocyanique sous inflorescence**	**Trieb: Anthocyanfärbung unter dem Blütenstand**	**Tallo: pigmentación antociánica 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

Process levels other than Notes…



3. GUIDANCE ON DRAFTING TEST GUIDELINES

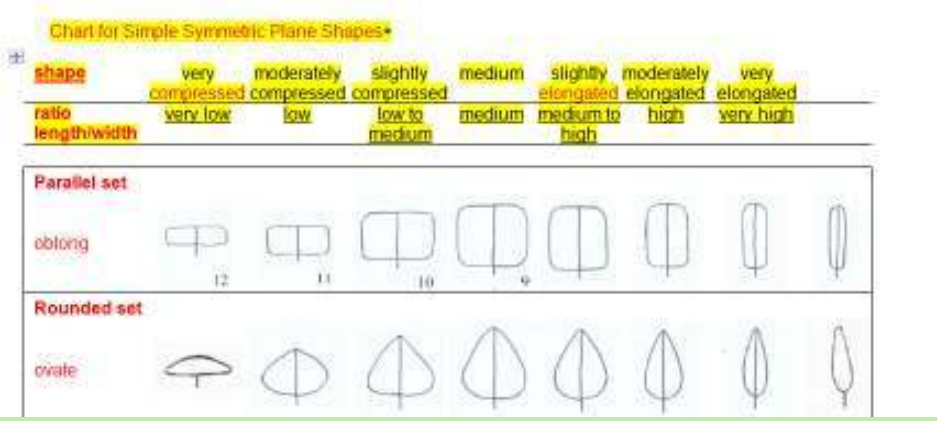
d) Shape and Color Characteristics

TGP/14: Shape

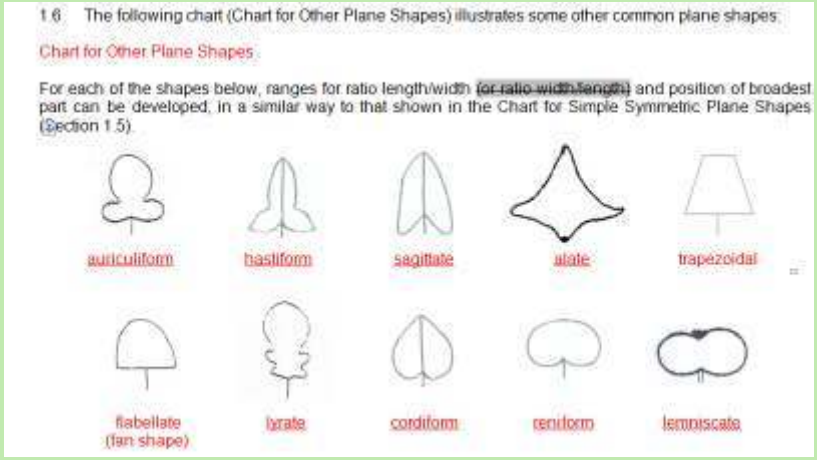
Characteristics related to shape, could use the following:

- Overall shape: e.g. ovate (1), elliptic (2), circular (3), obovate (4)…
- Individual components of shape
  - Ratio length/ width (from low to high)
  - Postion of broadest part
  - Shape of base
  - Shape of apex
  - Lateral outline

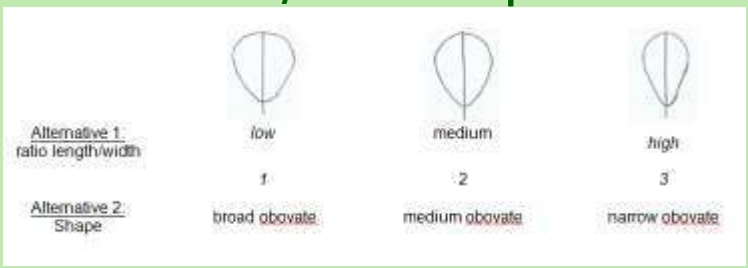
TGP/14: Shape

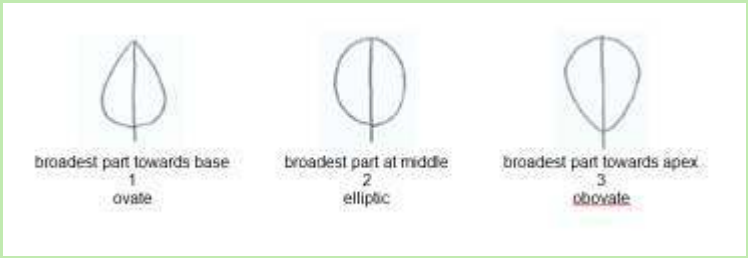


TGP/14: Shape

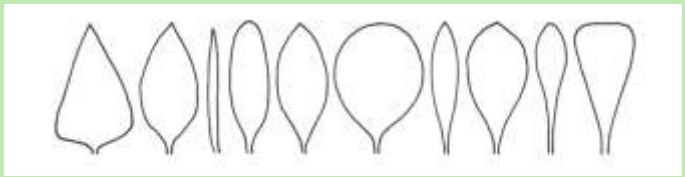


TGP/14: Shape





TGP/14: Shape

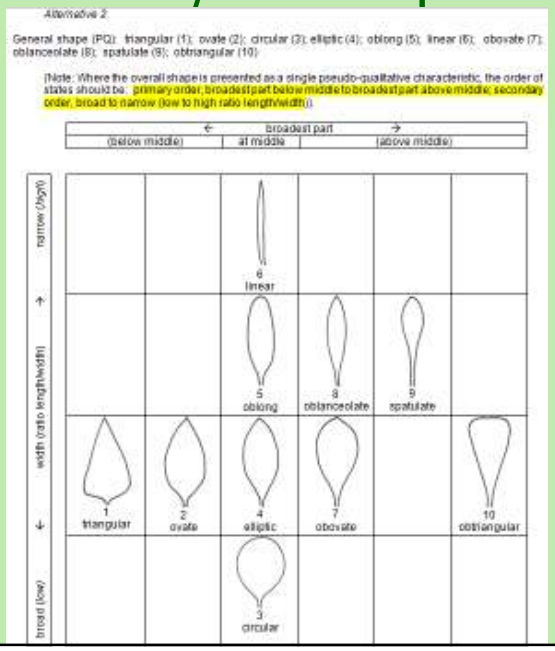


Alternative 1

(a) position of broadest part (QN):
e.g. strongly towards base (1); moderately towards base (3); at middle (5); moderately towards apex (7); strongly towards apex (9)

(b) ratio length/width (QN):
e.g. very low (1); low (3); medium (5); high (7); very high (9);

TGP/14: Shape



TGP/14: Color

	state of expression	example
level of precision: low	single color	yellow, orange, red
	color range	(a) yellow, yellow orange, orange, orange red, red (b) white, yellowish white, yellow, yellowish orange
	intensity	light yellow, medium yellow, dark yellow
high	RHS Colour Chart No.	RHS 41 B

Species?

Level of variation?

TGP/14: Color

Single color

- A single color has the lowest precision to describe the state of expression.
- Example: Flower: color: white (1); yellow (2); orange (3); red (4)

TGP/14: Color

Color range

- (a) In color combinations the second color indicates the predominant color with blending of both colors, resulting in what can look like a single color. For example in "green red" the predominant color is red and in "red green" the predominant color is green.
- Example: Flower: color: white (1); yellow white (2); yellow (3); yellow orange (4); orange (5)
- (b) The use of "ish" in color combinations indicates that there is a predominant color (e.g. yellow) together with another minor color. For example,
- yellowish, covers all colors which are predominantly yellow (would include, for example, white yellow; brown yellow; orange yellow; etc.)
- yellowish green covers all colors which are predominantly green with some yellow (would include, for example, white yellow green; brown yellow green; orange yellow green etc.)
- Example: Flower: color: whitish (1); yellowish (2); greenish (3)

TGP/14: Color Intensity

- Depending on the organ described, the intensity can be presented either in relation to a single color or in combination with different colors (example 2).
- Example 1: Leaf: green color of upper side: light (3); medium (5); dark (9)
- Example 2: Flower: color: white (1); light yellow (2); medium yellow (3); dark yellow (4); orange (5)

TGP/14: Color Color Chart

- The "RHS Colour Chart" because of its worldwide availability.
  - 5 editions of this color chart, dating from 1966, 1986, 1995, 2001 and 2007.
  - Reference number of the RHS color, color name and edition of the chart to be mentioned.
  - UPOV names for colors in ANNEX.
  - Other color charts might also be appropriate.
- "Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background".
- Observations should not be made in direct sunlight. The observations should be made on a cloudy day with sufficient light intensity, or in a shaded area.

Allocation of UPOV Color Groups for each RHS Color in RHS Reference order

RHS COLORS (RHS COLOUR CHART, EDITIONS 1986, 1995, 2001 AND 2007)
BY UPOV COLOR GROUPS

UPOV roup No.	No. RHS	English	français	deutsch	español
11	001A	yellow	jaune	gelb	amarillo
5	001B	yellow green	vert-jaune	gelbgrün	verde amarillento
5	001C	yellow green	vert-jaune	gelbgrün	verde amarillento
5	001D	yellow green	vert-jaune	gelbgrün	verde amarillento
11	002A	yellow	jaune	gelb	amarillo
11	002B	yellow	jaune	gelb	amarillo
5	002C	yellow green	vert-jaune	gelbgrün	verde amarillento
5	002D	yellow green	vert-jaune	gelbgrün	verde amarillento
11	003A	yellow	jaune	gelb	amarillo
11	003B	yellow	jaune	gelb	amarillo
11	003C	yellow	jaune	gelb	amarillo
5	003D	yellow green	vert-jaune	gelbgrün	verde amarillento
11	004A	yellow	jaune	gelb	amarillo
11	004B	yellow	jaune	gelb	amarillo
5	004C	yellow green	vert-jaune	gelbgrün	verde amarillento
10	004D	light yellow	jaune clair	hellgelb	amarillo claro
11	005A	yellow	jaune	gelb	amarillo
11	005B	yellow	jaune	gelb	amarillo
11	005C	yellow	jaune	gelb	amarillo
10	005D	light yellow	jaune clair	hellgelb	amarillo claro
11	006A	yellow	jaune	gelb	amarillo
11	006B	yellow	jaune	gelb	amarillo
11	006C	yellow	jaune	gelb	amarillo
10	006D	light yellow	jaune clair	hellgelb	amarillo claro
11	007A	yellow	jaune	gelb	amarillo
11	007B	yellow	jaune	gelb	amarillo
11	007C	yellow	jaune	gelb	amarillo
11	007D	yellow	jaune	gelb	amarillo

TGP/14: Color

Order of states of expression

- normally presented in the following order: white, green, yellow, orange, pink, red, purple, violet, blue, brown, black
- chronological appearance of the color (e.g. as the fruit ripens)

TGP/14: Color

APPROACHES TO DESCRIBE COLORS AND COLOR PATTERNS

- depends on the number of colors…
- the types of color distribution…
- and the number of color patterns possible for the species concerned.

TGP/14: Color

Approach according to the size of the surface area

- (a) only a few colors, a few types of color distribution and a few patterns to be described,
- the colors are described according to the size of the surface area they cover

TGP/14: Color
Approach according to tissue layers

- one layer is covering the other:
- (a) Ground color (not always the largest surface area):
  - (i) the first color to appear chronologically.
  - (ii) has a continuous dispersion across the surface.
- (b) Over color (not always occupying the smallest surface area):
  - a second color, such as a flush, spots or blotches developed over time.

APPLE – TG/14/9

35. (*)		Fruit: ground color	
PQ	(f)	not visible	1
		whitish yellow	2
		yellow	3
		whitish green	4
		yellow green	5
		green	6

37. (*)		Fruit: hue of over color – with bloom removed	
PQ	(f)	orange red	1
		pink red	2
		red	3
		purple red	4
		brown red	5

Phalaenopsis (TG/213/2(proj.7))

Petal: ground color – RHS Colour Chart 155A - white
Petal: over color – RHS Colour Chart 83A – dark violet

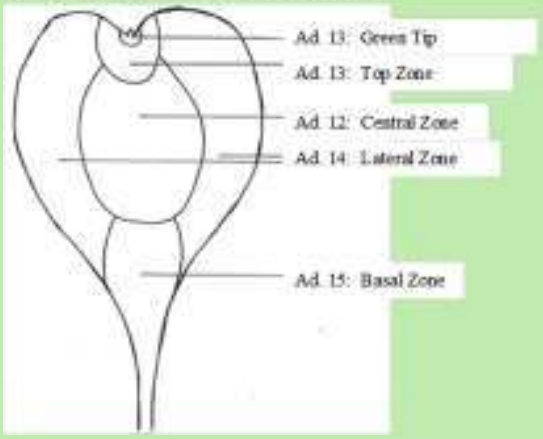
TGP/14: Color

Approach according to defined parts of an organ

- (a) If the different parts of a plant organ can have different colors, the color of these different parts can be described separately.
- Example:
  - Petal: color of margin
  - Petal: color of middle zone
  - Petal: color of base
- (b) When an organ has one color with different intensities, the parts of the organ which are lighter or darker could be described as follows:
- Example:
  - Ray floret: color distribution on upper side:
    - lighter towards base (1); even (2); lighter towards apex (3)

TGP/14: Color

Ad. 12: Outer tepal: main color of **central** zone
Ad. 13: Outer tepal: main color of **top** zone (green tip excluded)
Ad. 14: Outer tepal: main color of **lateral** zone
Ad. 15: Outer tepal: main color of **basal** zone



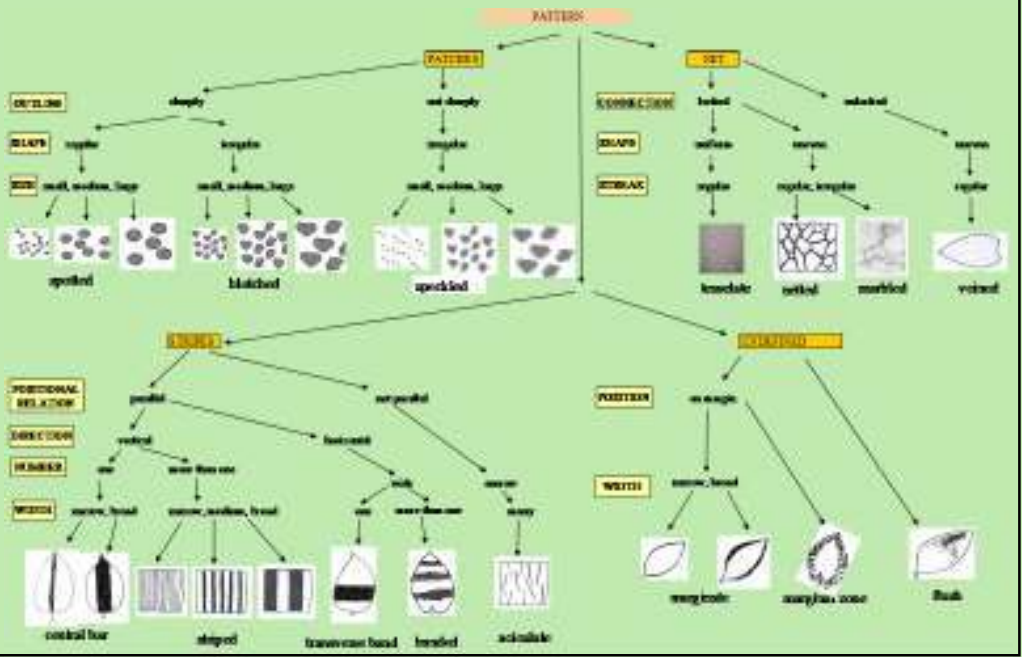
Approach according to the RHS Colour Chart number ("Lisbon" approach)

- All colors of the plant part concerned are assessed using the RHS Colour Charts first.
- The color should first be described, followed by:
  - area,
  - distribution,
  - Pattern
  - conspicuousness of the color (if necessary).
- The same sequence should be followed for color two, color three and so on. I

Heuchera and Heucherella (TG/280/1)

- **36. Leaf blade: color one – RHS Colour Chart – Yellow-Green 144C**
- **37. Leaf blade: color one: distribution – marginal zone (7)**
- **38. Leaf blade: color one: pattern – solid or nearly solid (5)**
- **39. Leaf blade: color one: total area – very small to small (2)**
- 40. Leaf blade: color two – RHS Colour Chart – Greyed-Orange 176B
- 41: Leaf blade: color two: distribution – along veins (2)
- 42: Leaf blade: color two: pattern – solid or nearly solid (5)
- 43: Leaf blade: color two: total area – small (3)
- **44: Leaf blade: color three – RHS Colour Chart – Greyed-Orange 177D but more grey**
- **45: Leaf blade: color three: distribution – between veins in intermediate zone (6)**
- **46: Leaf blade: color three: pattern – solid or nearly solid (5)**
- **47: Leaf blade: color three: total area – large (7)**
- 48: Leaf blade: color four – RHS Colour Chart – not applicable
- 49: Leaf blade: color four: distribution – none (1)
- 50: Leaf blade: color four: pattern – not applicable
- 51: Leaf blade: color four: total area – not applicable

TGP/14: Color

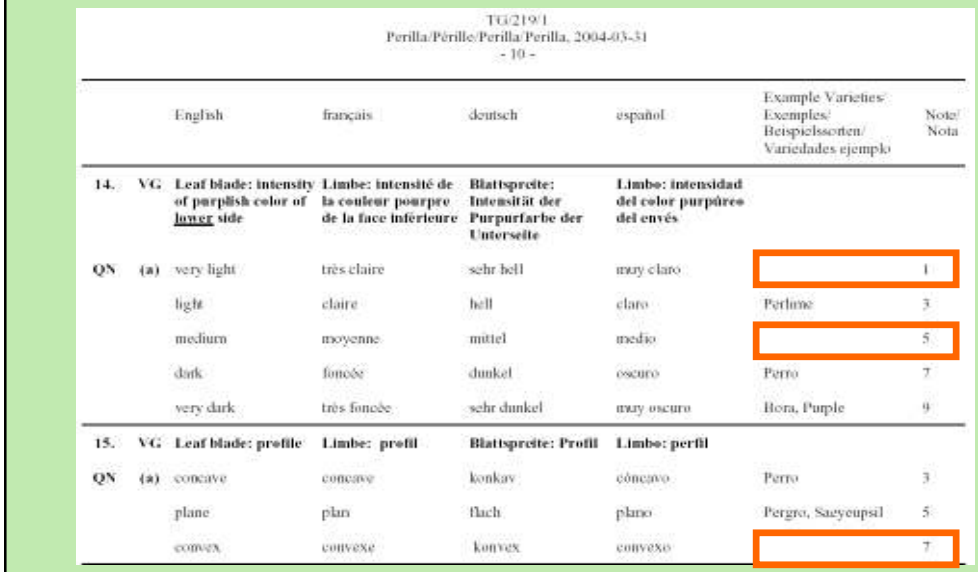


3. GUIDANCE ON DRAFTING TEST GUIDELINES

e) Example Varieties

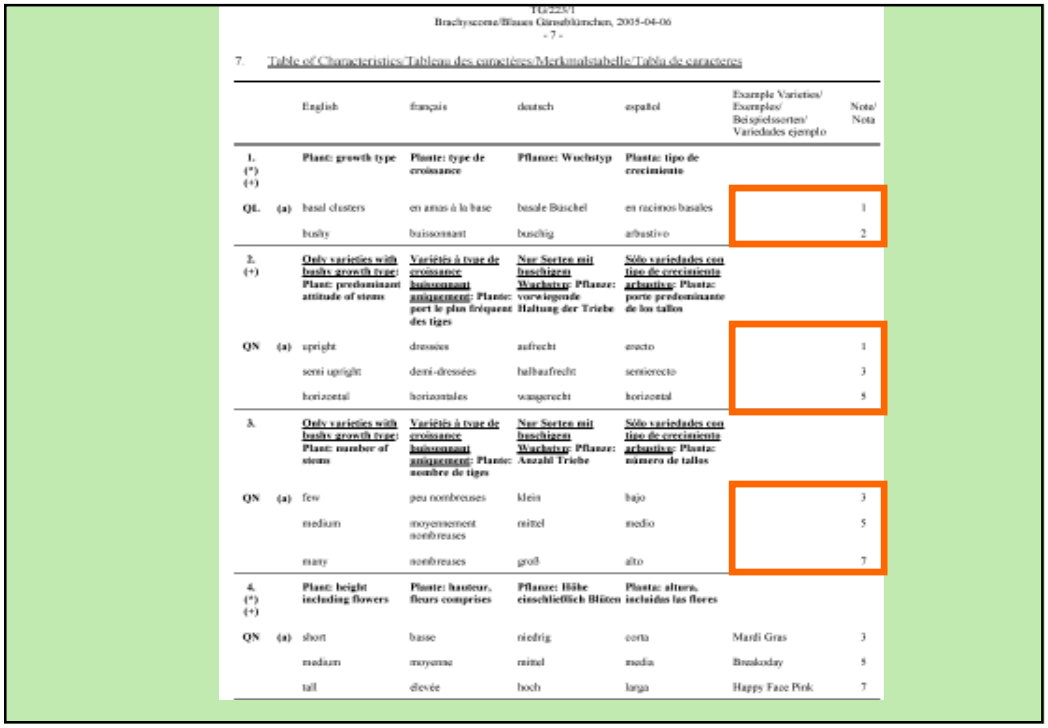
7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

	English	français	Deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
1. (*)	**Seed: color**	**Semences: 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 antociánica**		
	absent	absente	fehlend	ausente	Verpia	1
	present	présente	vorhanden	presente	Pirat	9
3.	**Seedling: size of cotyledon (fully developed)**	**Plantule: taille du cotylédon (à complet développement)**	**Keimpflanze: Größe des Keimblatts (voll entwickelt)**	**Plántula: tamaño del cotiledón (plenamente desarrollado)**		
	small	petit	klein	pequeño	Romanco	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/ Beispielssorten/ 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	Perlume	3
		medium	moyenne	mittel	medio		5
		dark	foncée	dunkel	oscuro	Perro	7
		very dark	très foncée	sehr dunkel	muy oscuro	Hora, 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, Saeyeupsil	5
		convex	convexe	konvex	convexo		7



TG/223/1
Brachyscome/Blauen Gänseblümchen, 2005-04-06
- 7 -

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ 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 Wachstyp: Pflanze: vorwiegende 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 Wachstyp: 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	Breakaday	5
		tall	élevée	hoch	larga	Happy Face Pink	7

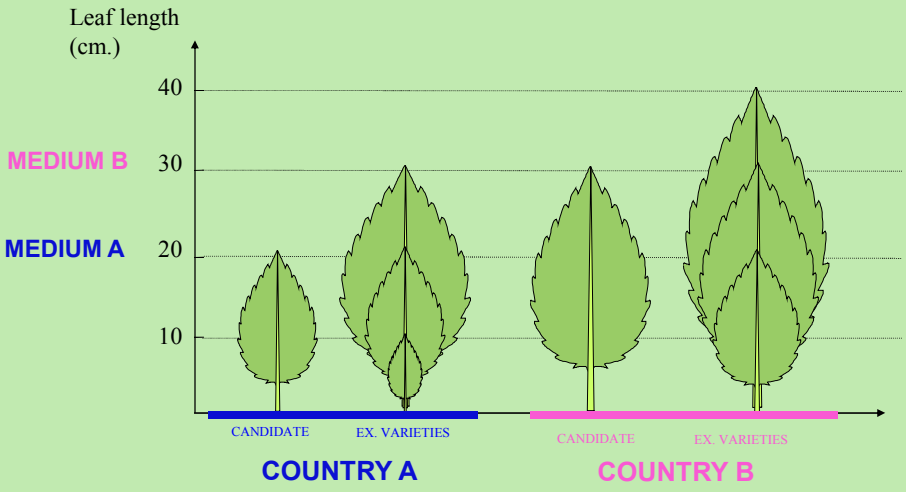
Example Varieties: the Objective

Clarify states of expression

- Illustrate characteristics
- Determine the state of expression

→ Harmonized descriptions

Example Varieties versus Measurements



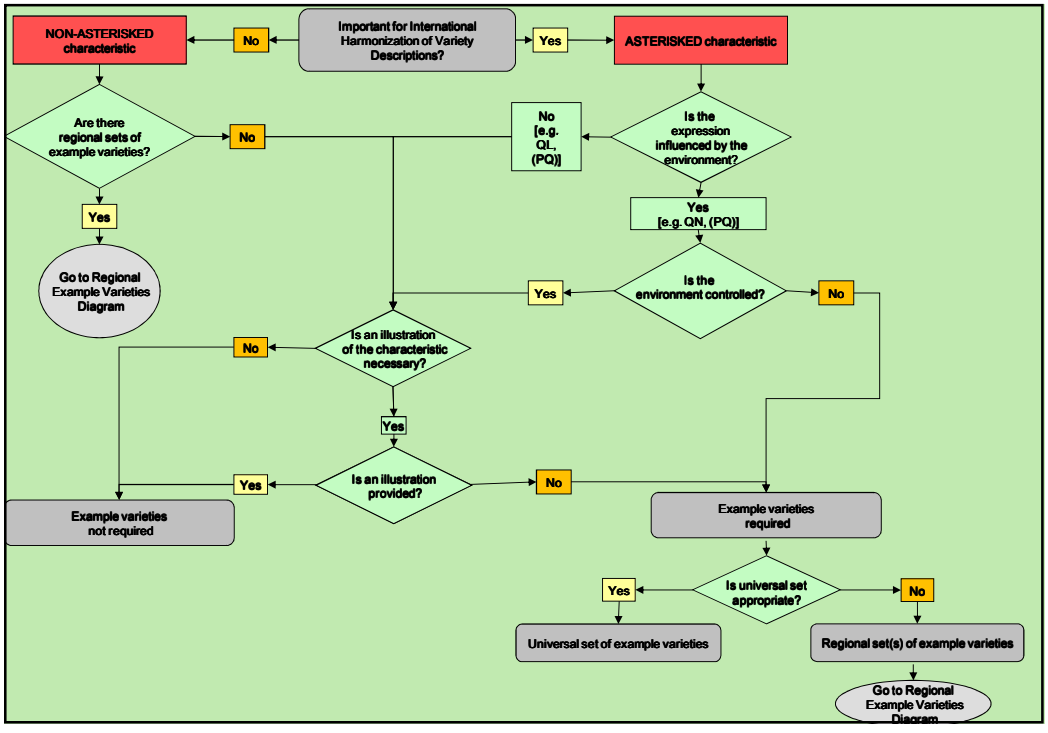
Example Varieties – the need

NEED

in characteristics used to **harmonize descriptions**

and

which are **influenced by the environment**



3. GUIDANCE ON DRAFTING TEST GUIDELINES

f) The process for developing UPOV Test Guidelines, including: TG Template; Additional Standard Wording; and Guidance Notes;

Genera and Species

- **>3,450 genera and species** with varieties examined for PBR
- **>3,305 genera and species** for which UPOV members have practical DUS experience
- **313 Test Guidelines** adopted

Note: **313 Test Guidelines estimated to cover 90% of PBR-related varieties in UPOV Plant Variety Database**

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 (2013):	Alpha (proj.**1**)
TWX (2014):	Alpha (proj.**2**)
TWX (2015):	Alpha (proj.**3**)
Enlarged Editorial Committee (2016):	Alpha (proj.**4**)
Technical Committee (2016):	Alpha (proj.**5**)
Final adopted document (2016):	**TG/500/1**

4. AGENDA for the TWP Session

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	END OF SESSION
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	
	Continuation	RECEPTION		Continuation	

EXCHANGING INFORMATION

AN OPPORTUNITY
for
TRAINING

TECHNICAL WORKING PARTY FOR FRUIT CROPS

Forty-Seventh Session

PREPARATORY WORKSHOP

Angers, France, November 14 to 18, 2016

PROGRAM

1. Introduction to UPOV and the role of UPOV Technical Working Parties (TWPs)
2. Overview of the General Introduction (document TG/1/3 and TGP documents)
   - Characteristics as the Basis for DUS Examination and Selection of Characteristics
3. Guidance on drafting Test Guidelines (document TGP/7)
   a) Subject of the Test Guidelines, Material Required and Method of Examination;
   b) Method of Observation (MS, MG, VS, VG);
   c) Types of Expression (QL, PQ, QN), notes and distinctness;
   d) Shape and Color Characteristics;
   e) Example Varieties;
   f) The process for developing UPOV Test Guidelines, including: TG Template; Additional Standard Wording; and Guidance Notes;
4. Agenda for the TWP Session
5. Feedback from participants

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

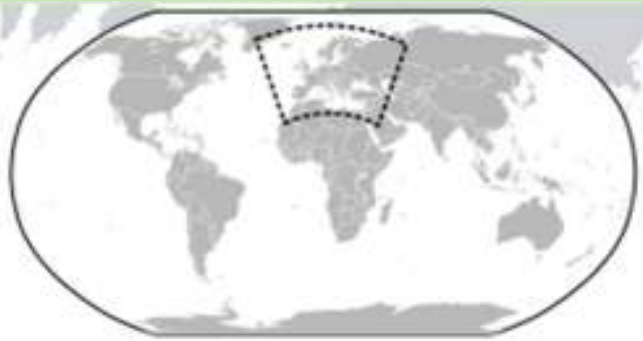
UPOV: INDEPENDENT INTERGOVERNMENTAL ORGANIZATION

The International Convention for the Protection of New Varieties of Plants

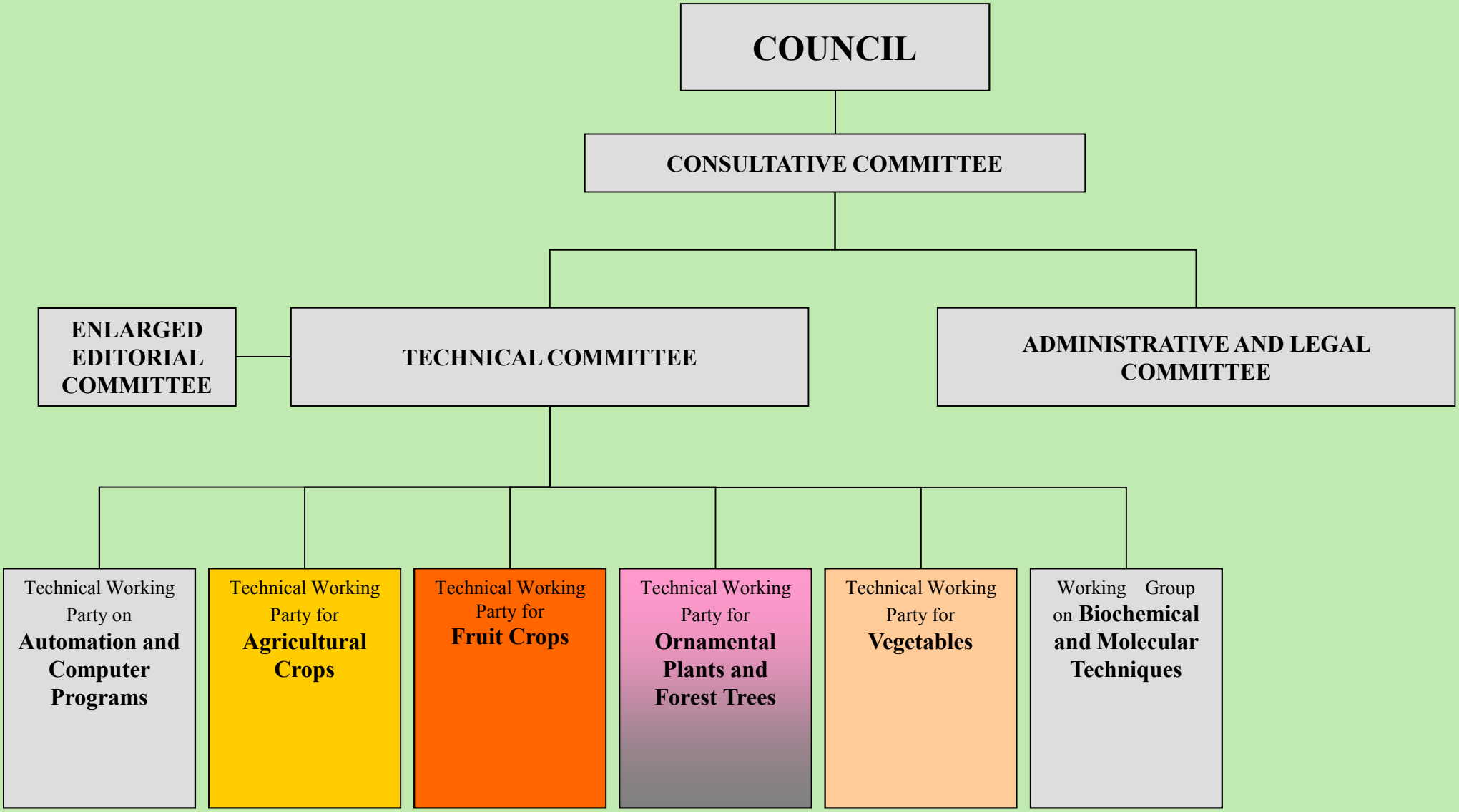
established in 1961

The International Union for the Protection of New Varieties of Plants

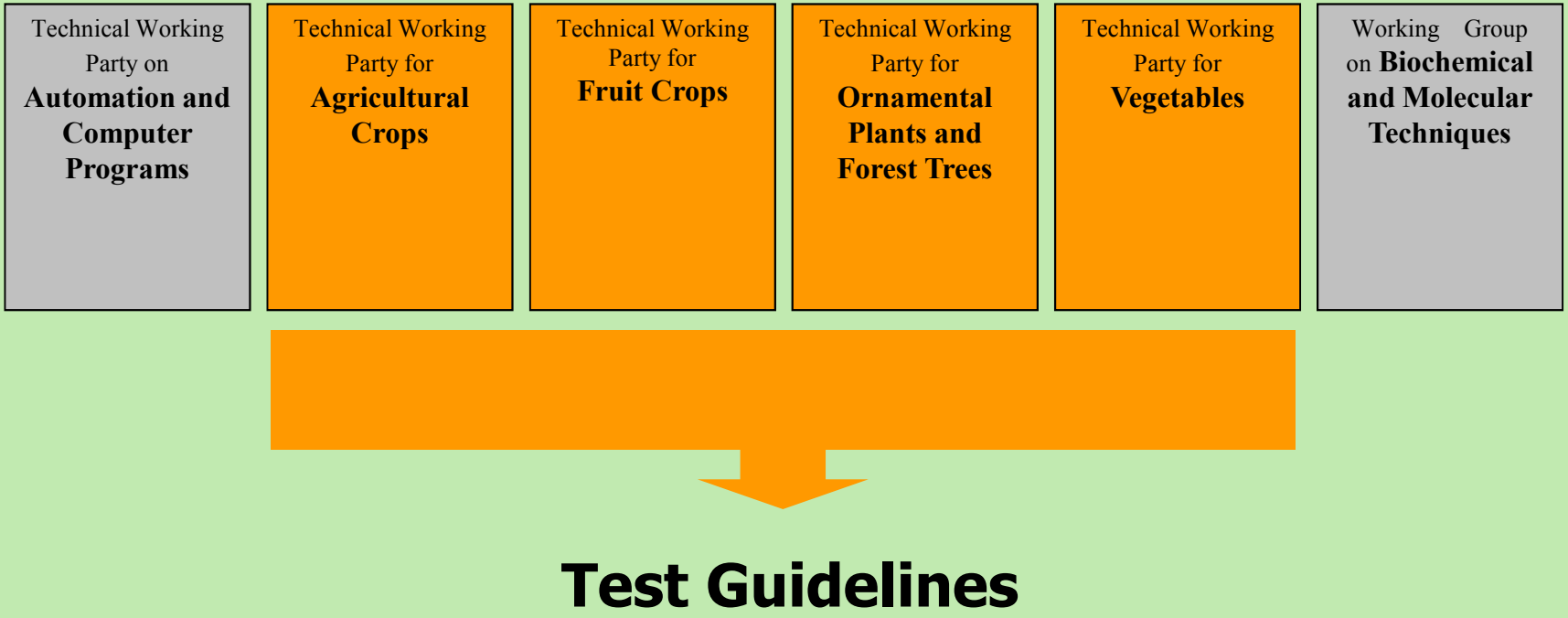
Union internationale pour la protection des obtentions végétales



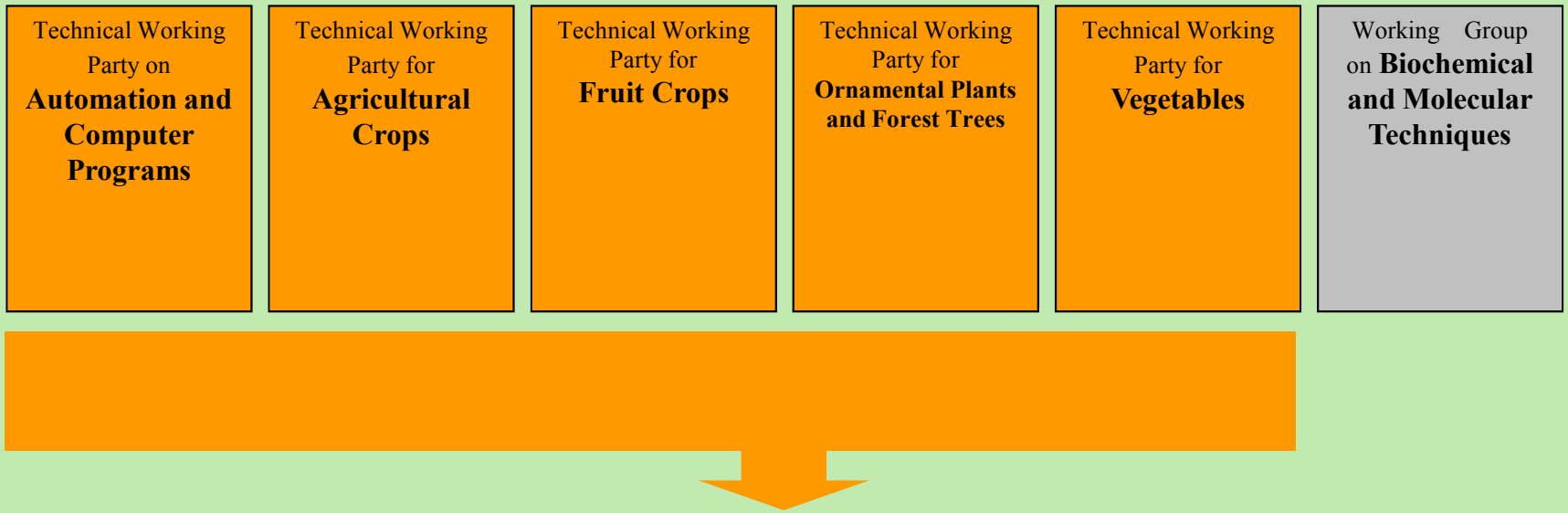
UPOV Structure



UPOV Structure

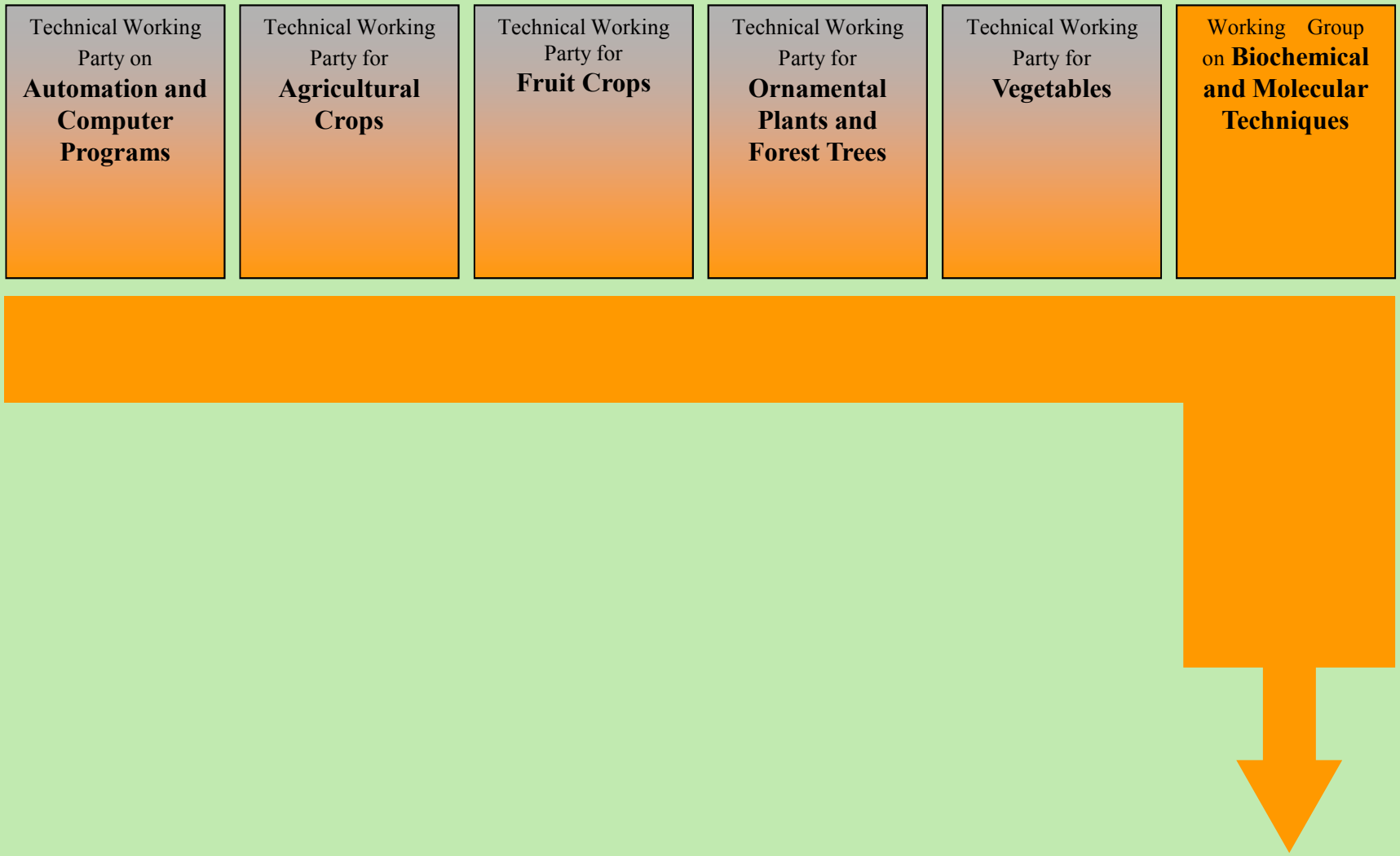


UPOV Structure



TGP documents

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 THE GENERAL INTRODUCTION (document TG/1/3 and TGP documents)

a) Characteristics as the Basis for DUS Examination

b) Selection of Characteristics

2. OVERVIEW OF THE GENERAL INTRODUCTION (document TG/1/3 and TGP documents)

a) Characteristics as the Basis for DUS Examination

b) Selection of Characteristics

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)

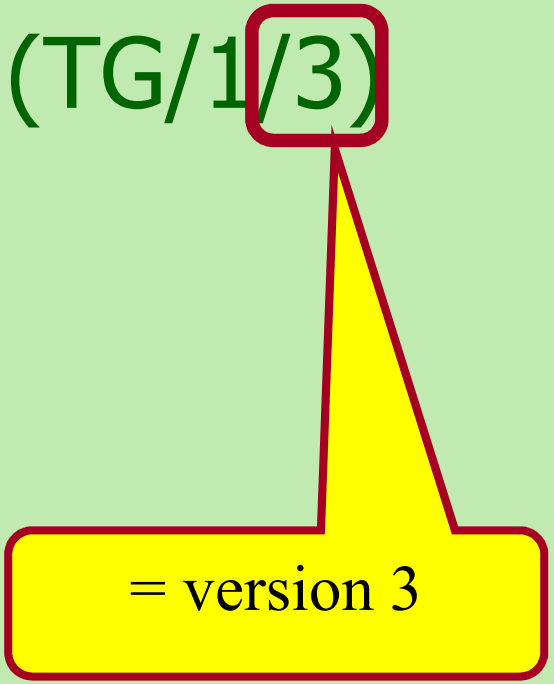
HARMONIZATION

=> 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)



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)

2. OVERVIEW OF THE GENERAL INTRODUCTION (document TG/1/3 and TGP documents)

a) Characteristics as the Basis for DUS Examination

b) Selection of Characteristics

"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	

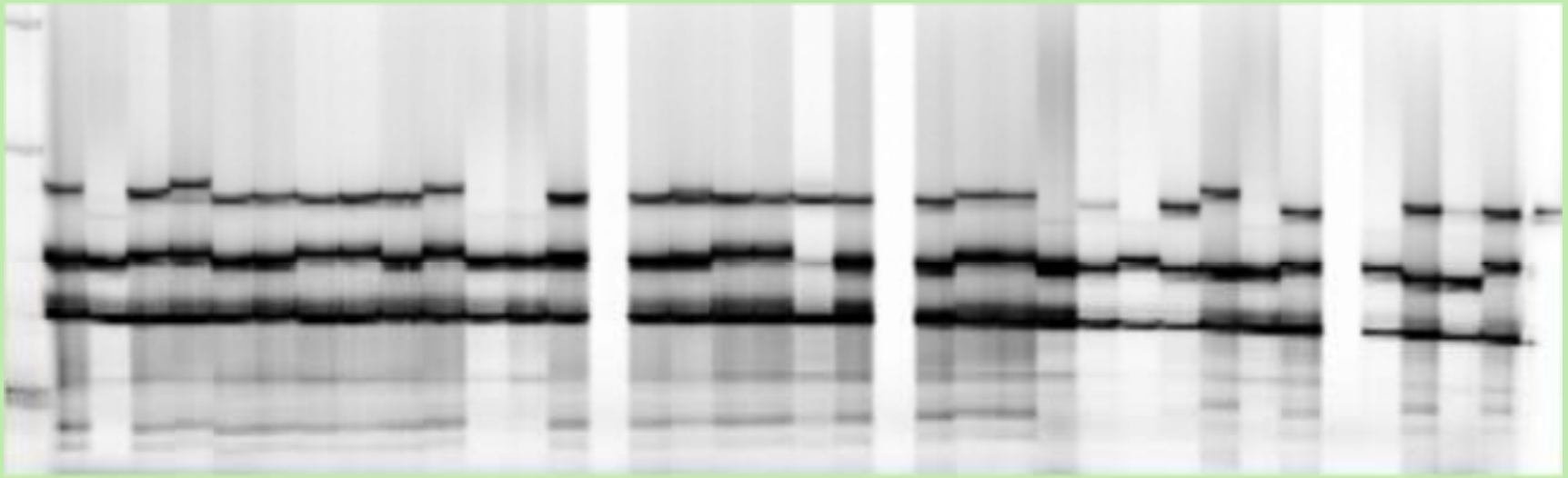
Selection of Characteristics

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?



TGP/7 :"Development of Test Guidelines"

Additional Information and guidance on 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.

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
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

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.

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

Apple: Fruit color

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.	

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 (37)	**Fruit: hue of over color – with bloom removed**		
	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 (39)	**Fruit: pattern of over color**		
	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[ ]

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.

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.**

3. GUIDANCE ON DRAFTING TEST GUIDELINES (Document TGP/7)

3. GUIDANCE ON DRAFTING TEST GUIDELINES

a) Subject of the Test Guidelines, Material Required and Method of Examination

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**

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:
DIOSC_ALA; DIOSC_BAT; DIOSC_JAP

Dioscorea alata L.; *Dioscorea polystachya* Turcz.; *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, Guyana arrowroot, Ten-months yam, Water yam, White yam, Winged yam, Yam	Grande igname, Igname ailée, Igname de Chine	Geflügelter Yam, Wasser-Yamswurzel	Name blanco, Name de agua, Tabera
Dioscorea polystachya Turcz., *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.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

TGP/7
"Development of Test Guidelines"

TGP/7 :"Development of Test Guidelines"

Section 1. Introduction

SECTION 1: INTRODUCTION

1.1 UPOV Test Guidelines as the Basis for the DUS Test

The General Introduction (Chapter 2, section 2.2.1) states that "Where UPOV has established specific Test Guidelines for a particular species, or other group(s) of varieties, these represent an agreed and harmonized approach for the examination of new varieties and, in conjunction with the basic principles contained in the General Introduction, should form the basis of the DUS test." It further states in Chapter 8, section 8.2.1, that "The individual Test Guidelines are prepared or, where appropriate, revised according to the procedures set out in document TGP/7, Development of Test Guidelines". Thus, the purpose of this document is to provide guidance on the development of these UPOV Test Guidelines ("Test Guidelines").

1.2 Individual Authorities' Test Guidelines

The General Introduction also states that "Where UPOV has not established individual Test Guidelines relevant to the variety to be examined, the examination should be carried out in accordance with the principles in this document [the General Introduction] and, in particular, the recommendations contained in Chapter 9, Conduct of DUS Testing in the Absence of Test Guidelines. In particular, the recommendations in Chapter 9 are based on the approach whereby, in the absence of Test Guidelines, the DUS examiner proceeds in the same general way as if developing new Test Guidelines." Section 4 "Development of individual authorities' test guidelines" provides guidance on the development of individual authorities' test guidelines.

1.3 Structure of TGP/7

TGP/7 :"Development of Test Guidelines"

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

TGP/7 :"Development of Test Guidelines"

Section 3. Guidance for Drafting Test Guidelines

- The **TG Template**
- **Additional Standard Wording** for the TG Template
- **Guidance Notes** for the TG Template

E

UPOV

TG/[xx]
ORIGINAL: [xx]
DATE: [xx]

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

DRAFT

Please select: "View" then "Comments" from the Word menu to see all notes

[MAIN COMMON NAME]
([types of] botanical name)
(UPOV Code)
(GN 1 – Botanical name)

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

prepared by [an expert] / [experts] from [drafting country(ies) / organization(s)]

to be considered by the Technical Working Party for [xxx] at its [xxx] session to be held in [xxx] from [xxx]

Alternative Names:

Botanical name	*English*	*French*	*German*	*Spanish*
.....	.....	.....	.....	.....

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.

These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int) for the latest information.]

Now available: Web-based TG Template

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

10 Chapters of UPOV Test Guidelines

1. Subject of the Test Guidelines
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7. **Table of Characteristics**
8. Explanation on the Table of Characteristics
9. Literature
10. Technical Questionnaire

10 Chapters of UPOV Test Guidelines

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of

{GN 3} (Chapter 1.1) – Subject of the Test Guidelines: More than one species}
{GN 4} (Chapter 1.1) – Subject of the Test Guidelines: Different types or groups within a species or genus}
{GN 5} (Chapter 1.1) – Subject of the Test Guidelines: Family name}
{GN 6} (Chapter 1.1) – Guidance for New Types and Species}

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of {xx}.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

{GN 7} (Chapter 2.3) – quantity of plant material required }
{ASW 1} (Chapter 2.3) – seed quality requirements }

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

The minimum duration of tests should normally be:

{ASW 2} (Chapter 3.1(.1)) – number of growing cycles }
{GN 8} (Chapter 3.1.2) – explanation of the growing cycle }
{ASW 3} (Chapter 3.1.2) – explanation of the growing cycle }

3. GUIDANCE ON DRAFTING TEST GUIDELINES

b) Method of observation (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

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

TGP/9/1 "Examining Distinctness"

V= Visual observation or
M= Measurement

Method of propagation of the variety	Type of expression of characteristic		
	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)

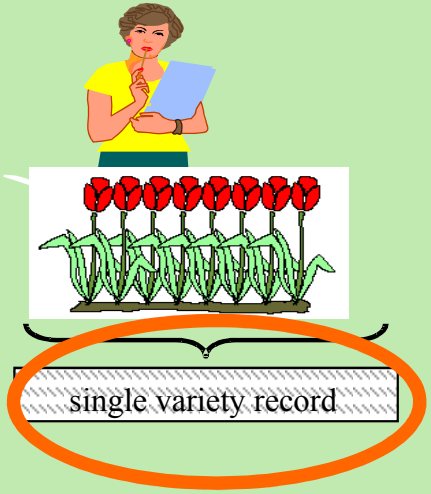
G: **single record** for a variety, or a **GROUP of plants** or parts of plants;

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.

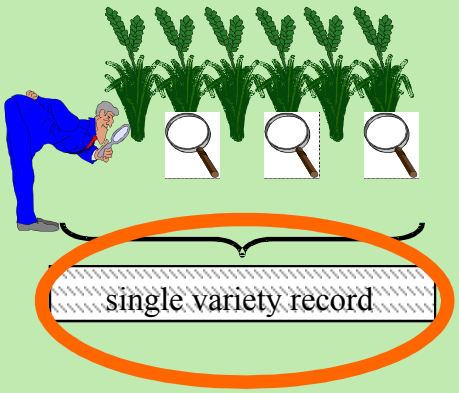
S: **records** for a number of **SINGLE**, individual **plants** or parts of plants …

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

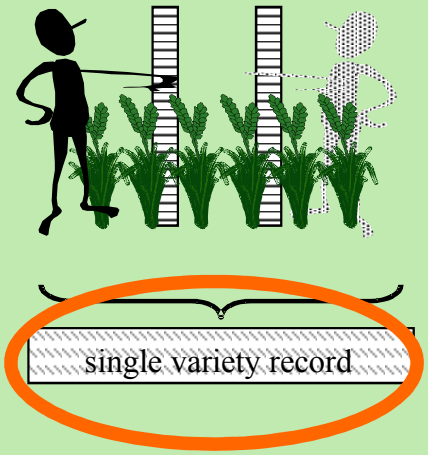
Section 4.3.2.3
Example (VG): Flower: type
(tulip: vegetatively propagated)



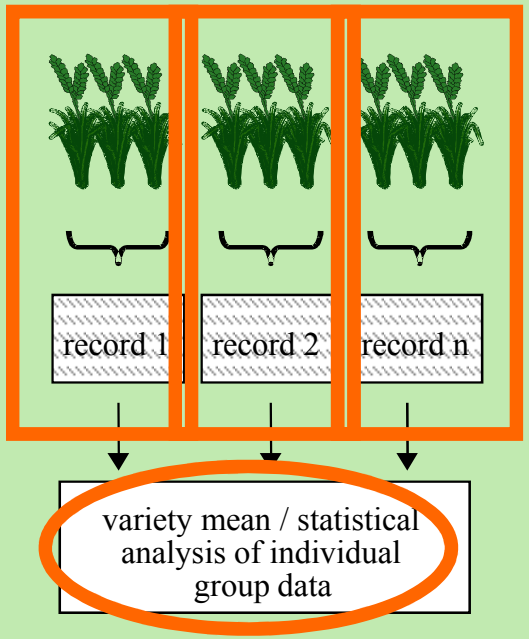
Section 4.3.2.3
Example (VG): Lowest leaf: hairiness of leaf sheaths
(barley: self-pollinated)



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

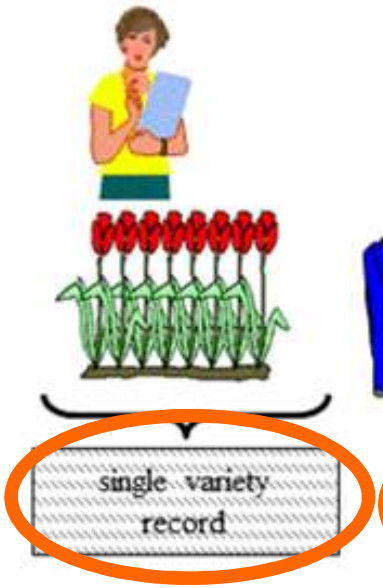


Section 4.3.2.4
Example: (statistical analysis)

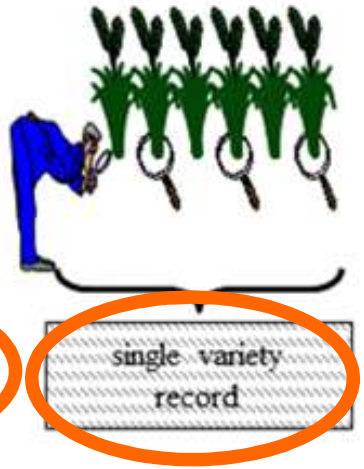


Single record for a group of plants or parts of plants (G)

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

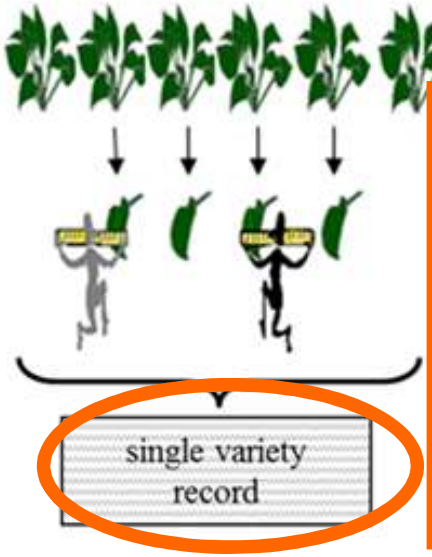


Section 4.3.2.3
Example (VG): Lowest leaf: hairiness of leaf sheaths
(barley: self-pollinated)

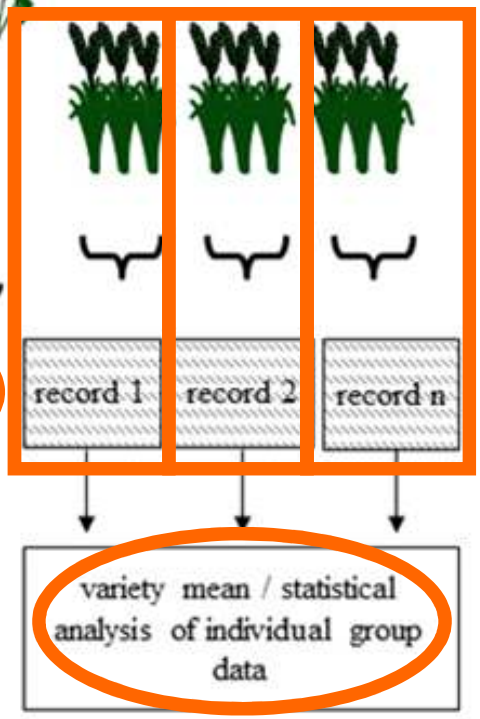


Section 4.3.2.3
Example (MG): Plant: height (wheat: self-pollinated)

Section 4.3.2.3
Example (MG): Leaf blade: width
(hosta: vegetatively propagated)

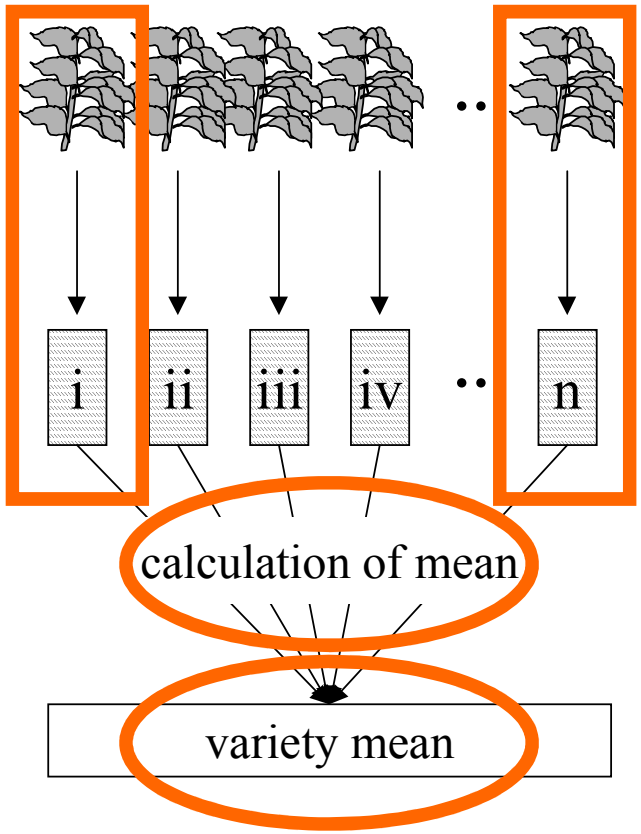


Section 4.3.2.4
Example: (statistical analysis)

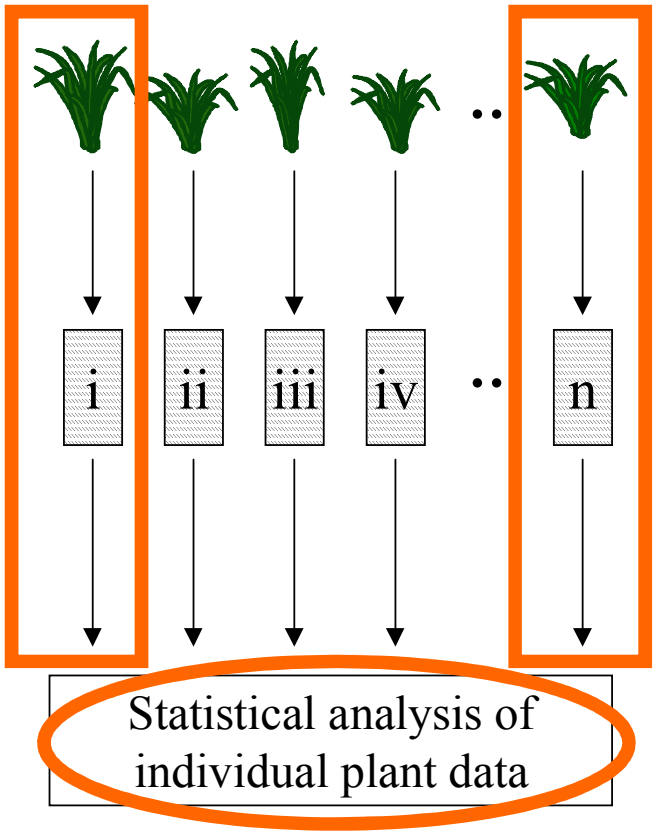


Records for a number of single, individual plants or parts of plants (S)

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

3. GUIDANCE ON DRAFTING TEST GUIDELINES

c) Types of Expression (QL, PQ, QN), notes and distinctness;

TYPE 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

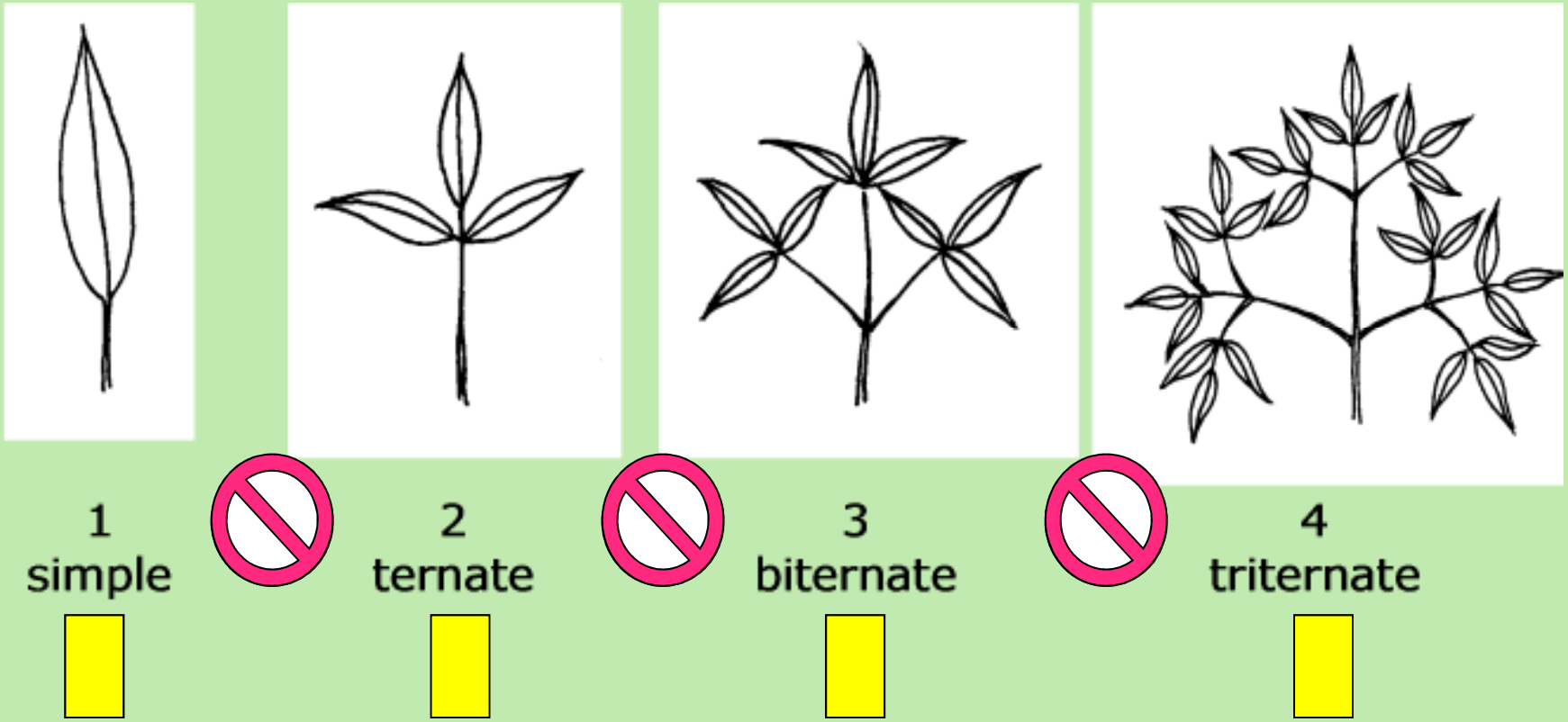
QUALITATIVE Characteristics

"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

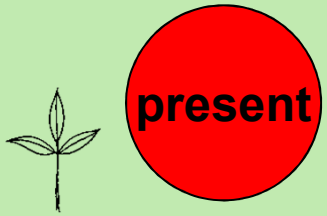
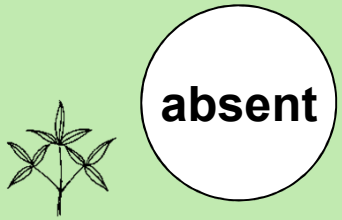
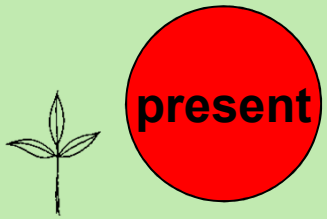
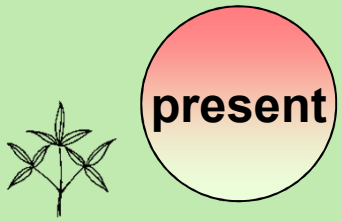
Clematis: Leaf: type



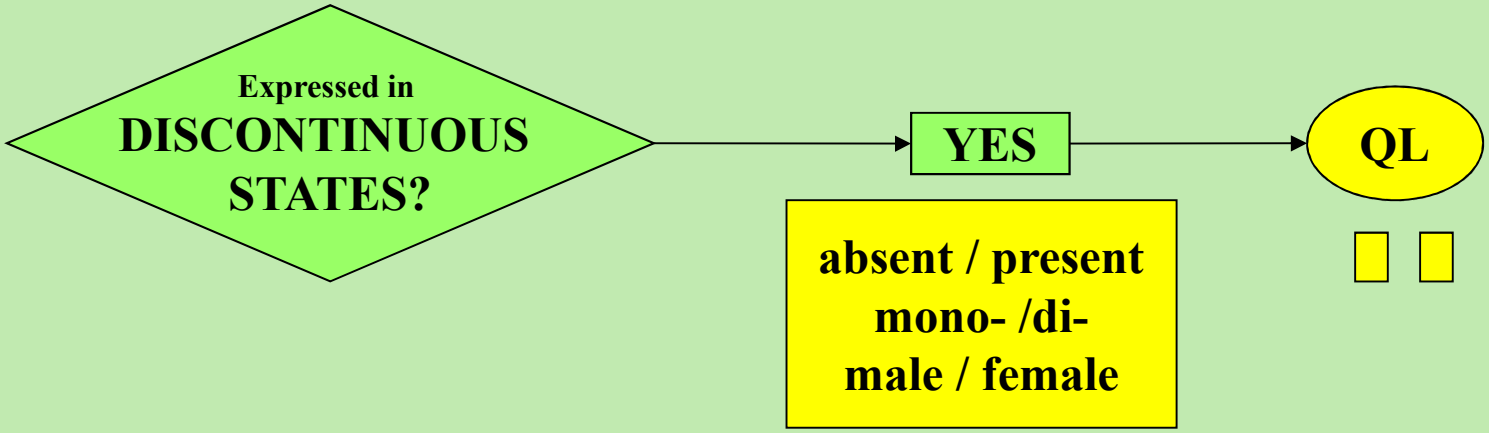
Qualitative (QL) characteristic?

Anthocyanin coloration: QL (=absent / present)?

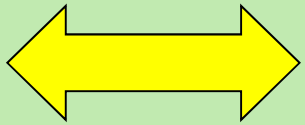
NO!

	Variety A	Variety B	Variety C
Environment A			
Environment B			

QL, QN or PQ?

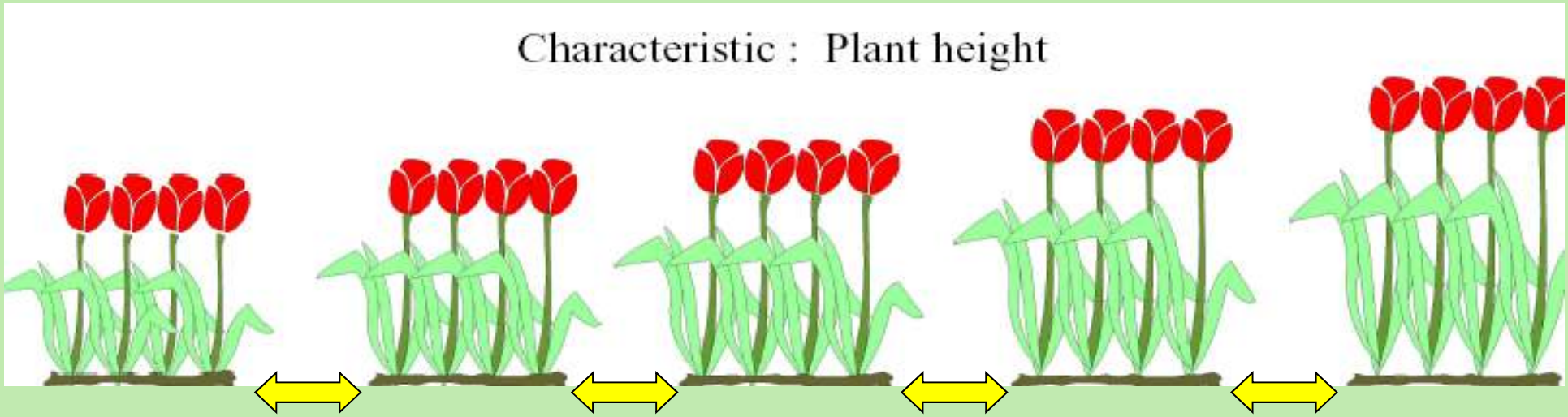

Expressed in
DISCONTINUOUS
STATES?
YES
QL
absent / present
mono- /di-
male / female

QUANTITATIVE Characteristics

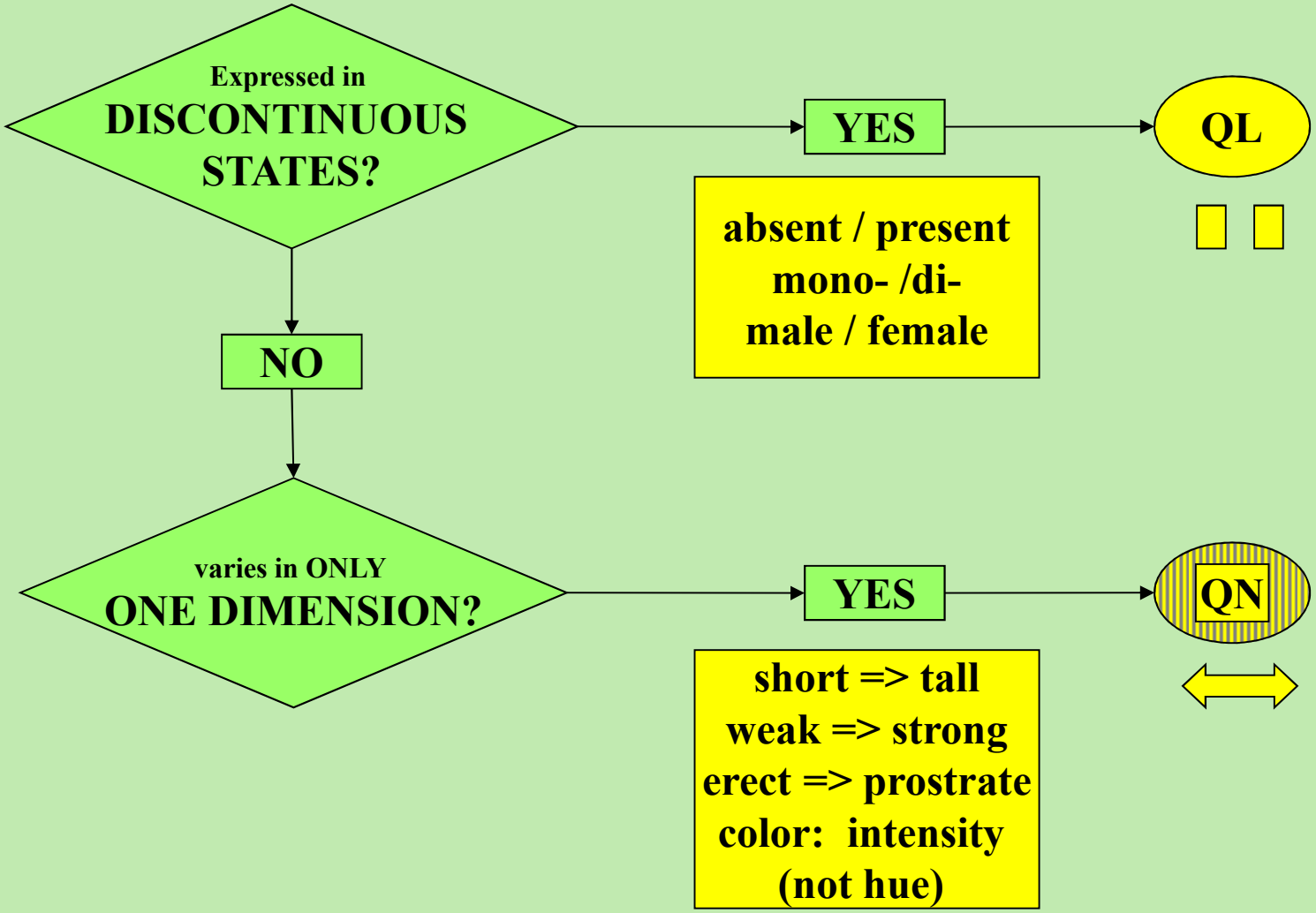


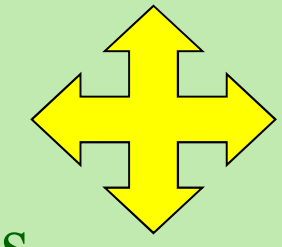
"Quantitative characteristics" are those where the expression covers the full range of variation from one extreme to the other. The **expression can be recorded on a one-dimensional, continuous or discrete, linear scale**. The range of expression is divided into a number of states for the purpose of 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?

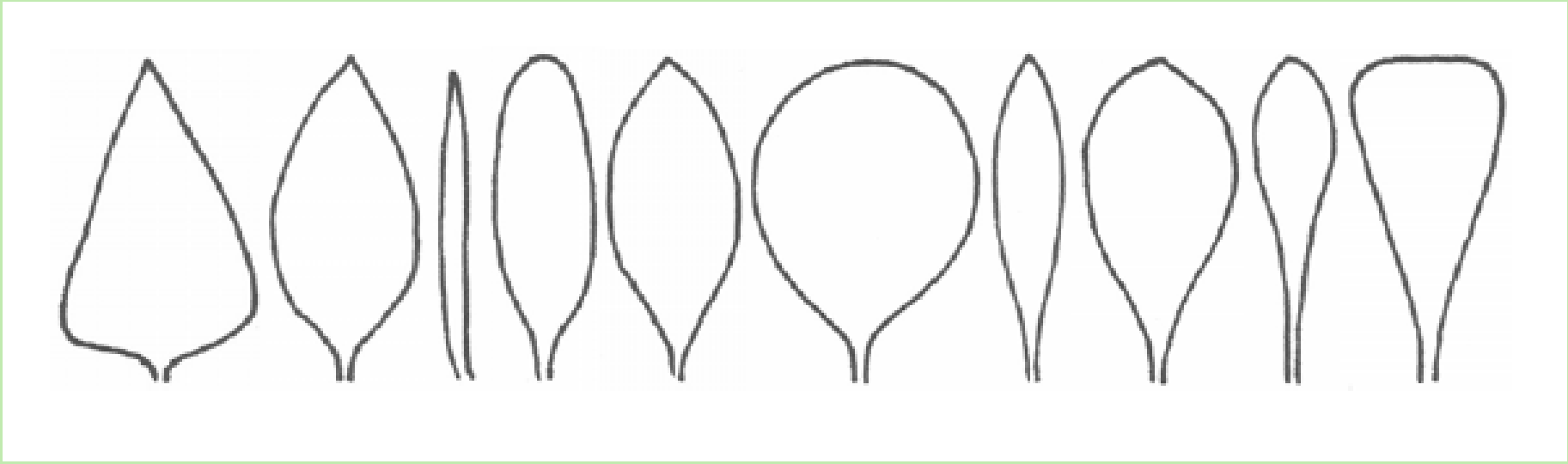

Expressed in
DISCONTINUOUS
STATES?
YES
QL
absent / present
mono- /di-
male / female
NO
varies in ONLY
ONE DIMENSION?
YES
QN
short => tall
weak => strong
erect => prostrate
color: intensity
(not hue)

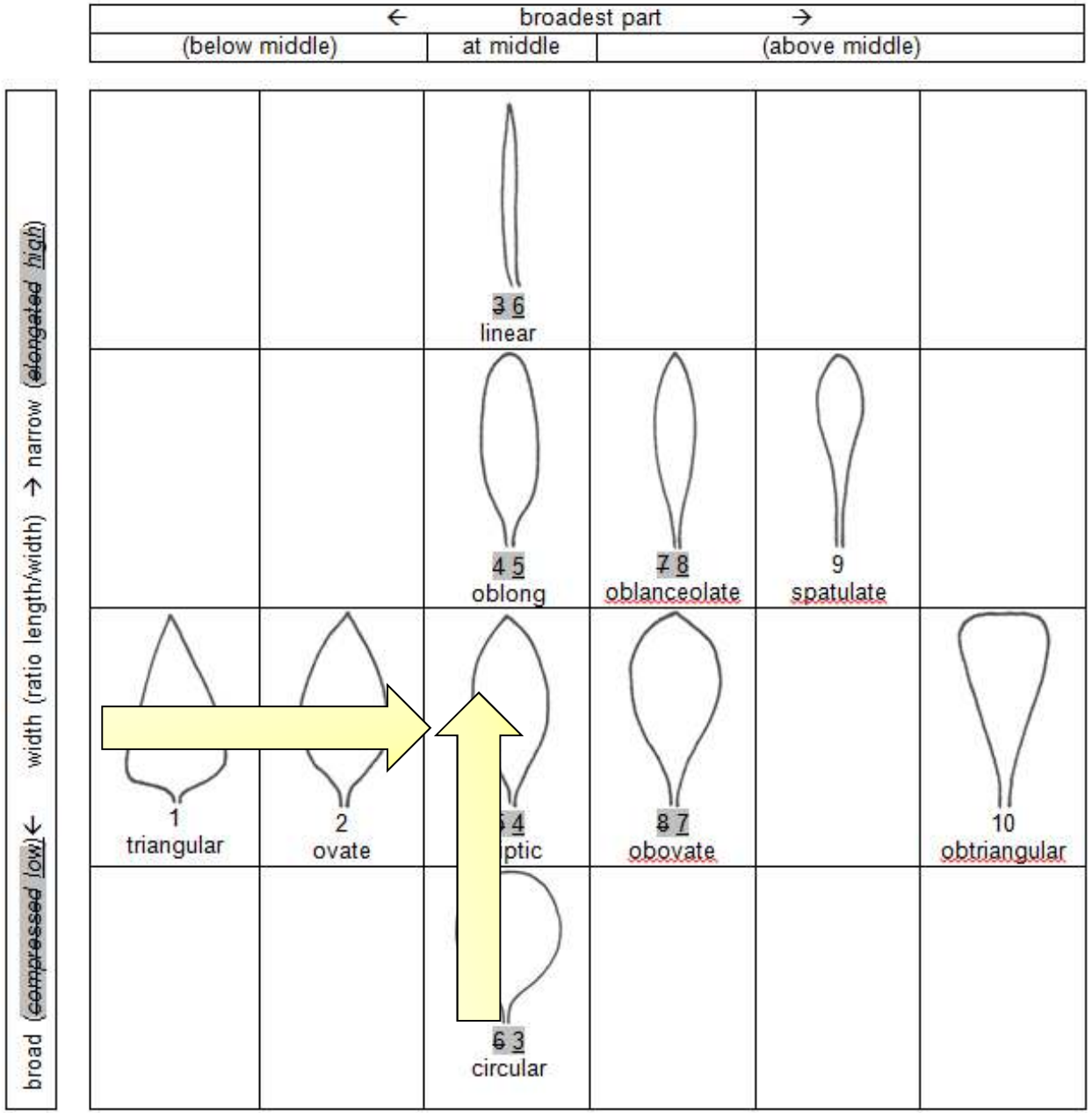


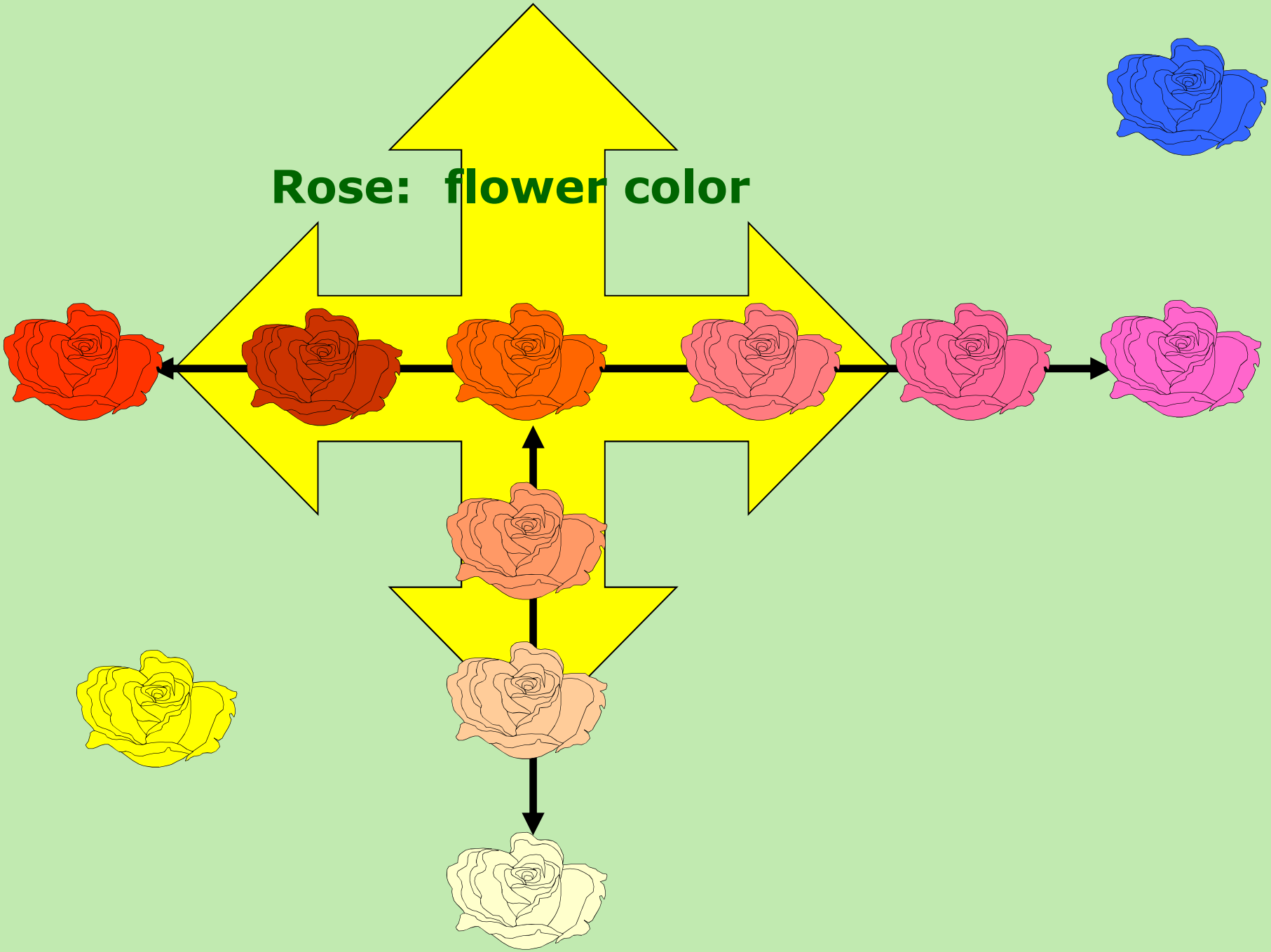
PSEUDO-QUALITATIVE Characteristics

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.

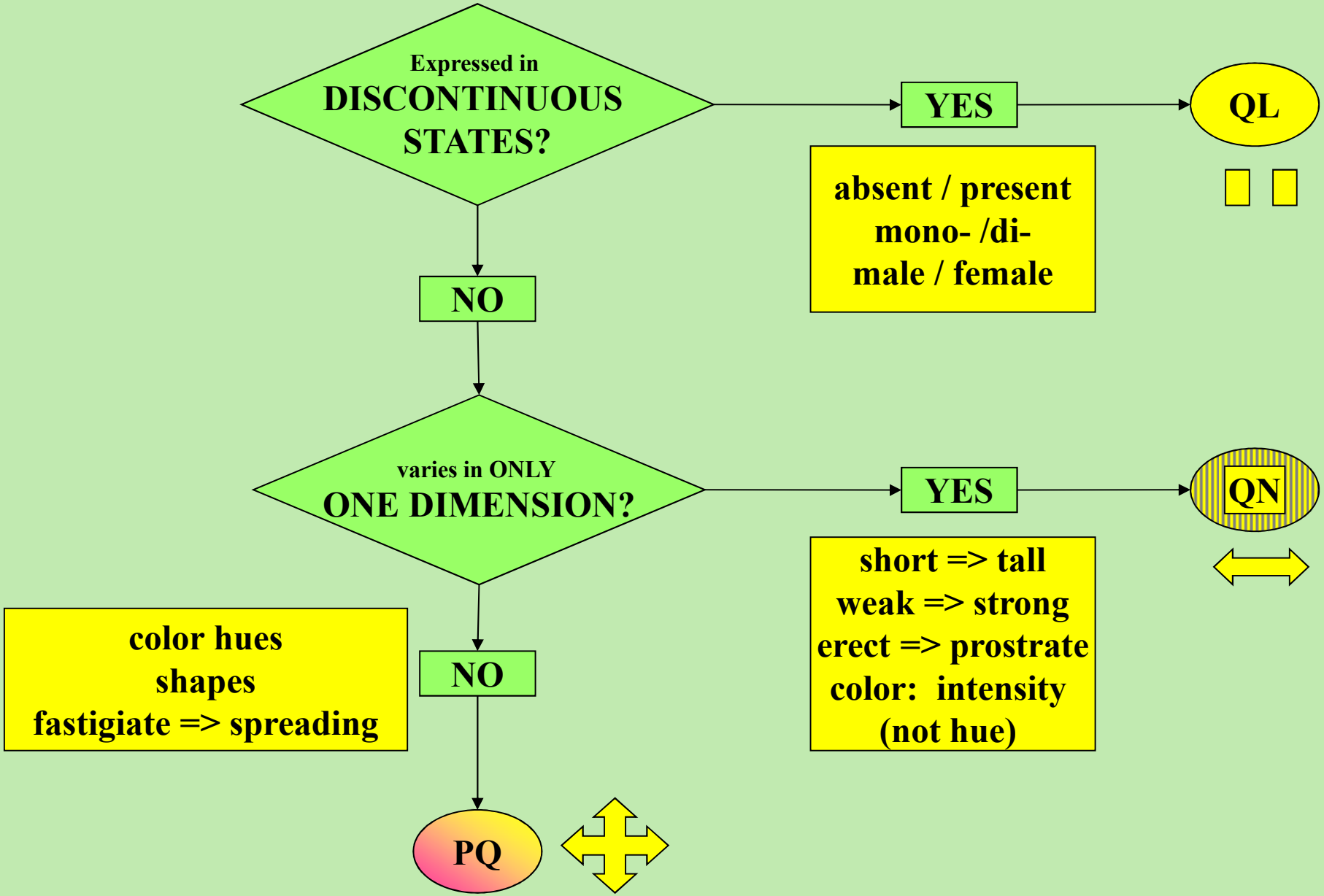
Example




← 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
~~3~~ 4
ptic
~~8~~ 7
obovate
10
obtriangular
~~6~~ 3
circular


Rose: flower color

QL, QN or PQ?


Expressed in
DISCONTINUOUS
STATES?
YES
QL
absent / present
mono- /di-
male / female
NO
varies in ONLY
ONE DIMENSION?
YES
QN
short => tall
weak => strong
erect => prostrate
color: intensity
(not hue)
color hues
shapes
fastigiate => spreading
NO
PQ

EXERCISE

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

Types of Expression

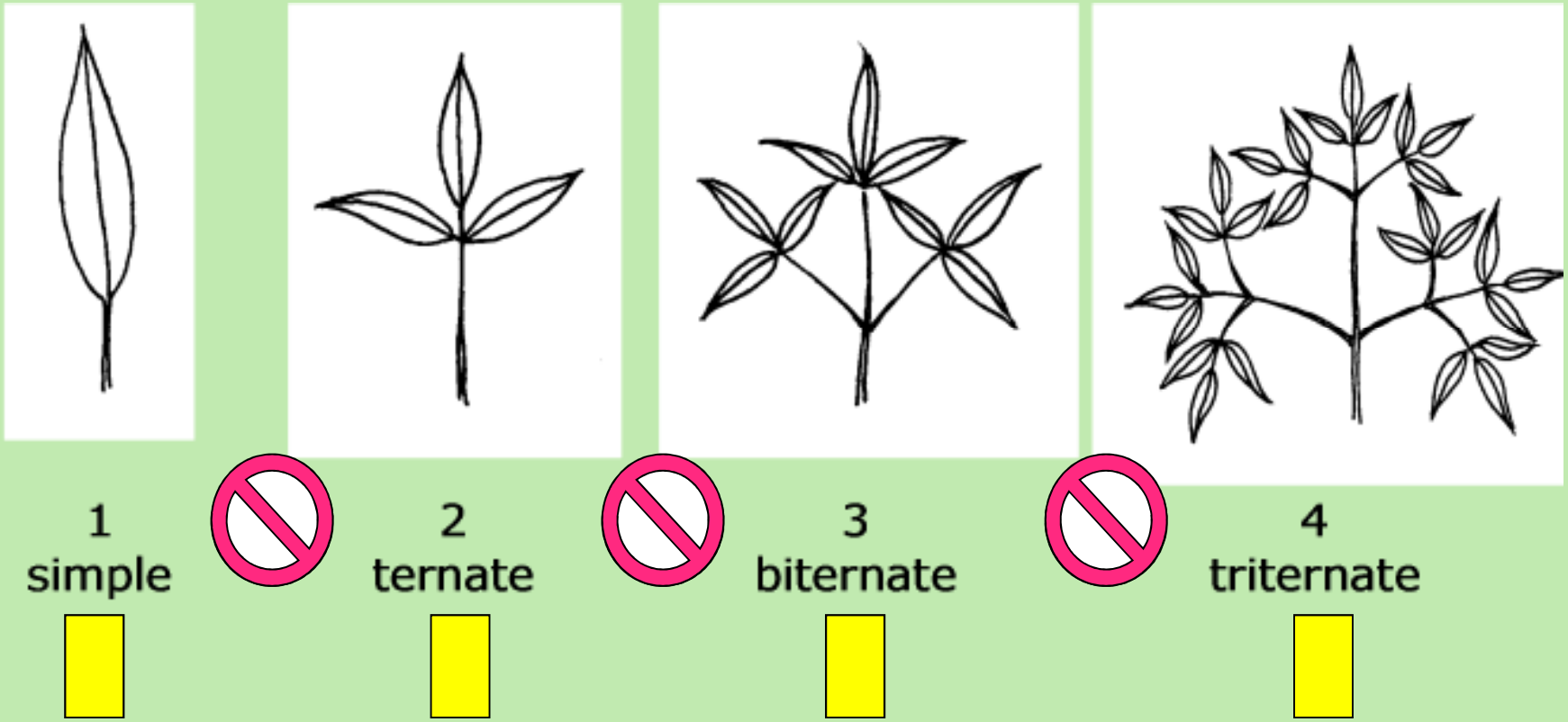
QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

Qualitative characteristic

Clematis: Leaf: type



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

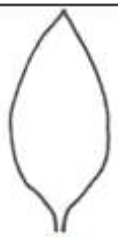
QL: QUALITATIVE

QN: QUANTITATIVE

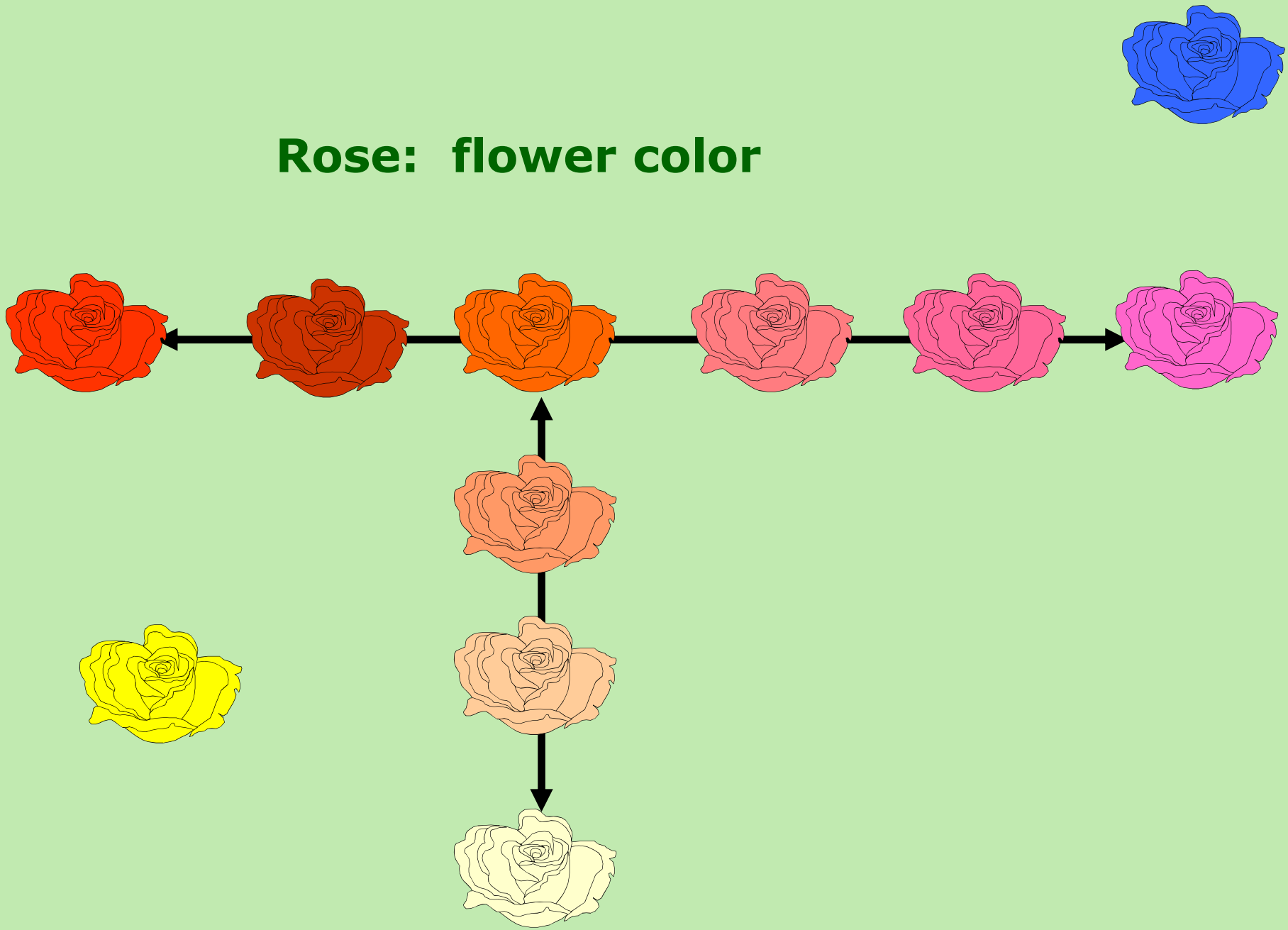
PQ: PSEUDO-QUALITATIVE

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.

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

Rose: flower color

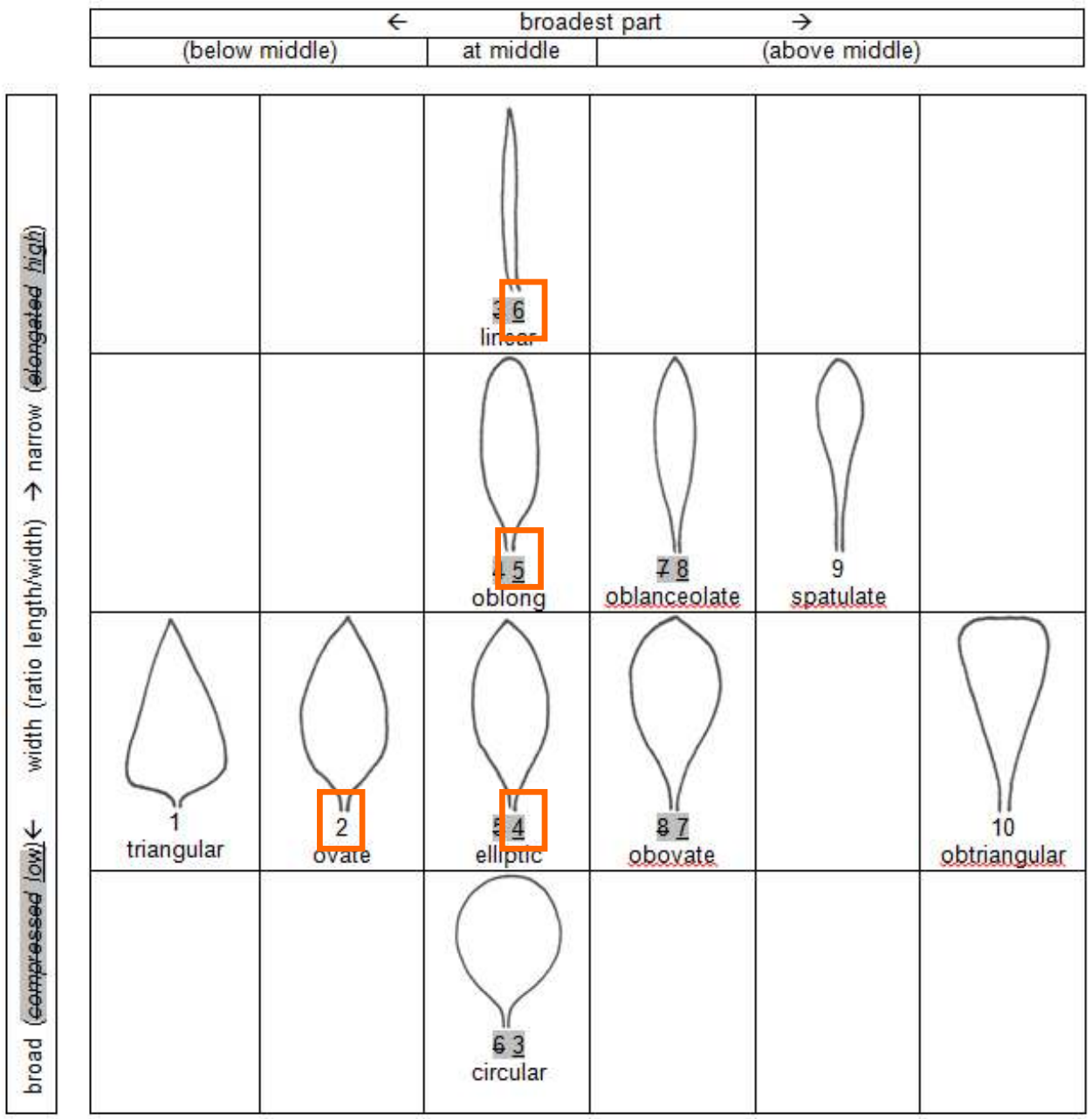


PSEUDO-QUALITATIVE Characteristics (typical examples)

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.


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

Types of Expression

QL: QUALITATIVE

QN: QUANTITATIVE

PQ: PSEUDO-QUALITATIVE

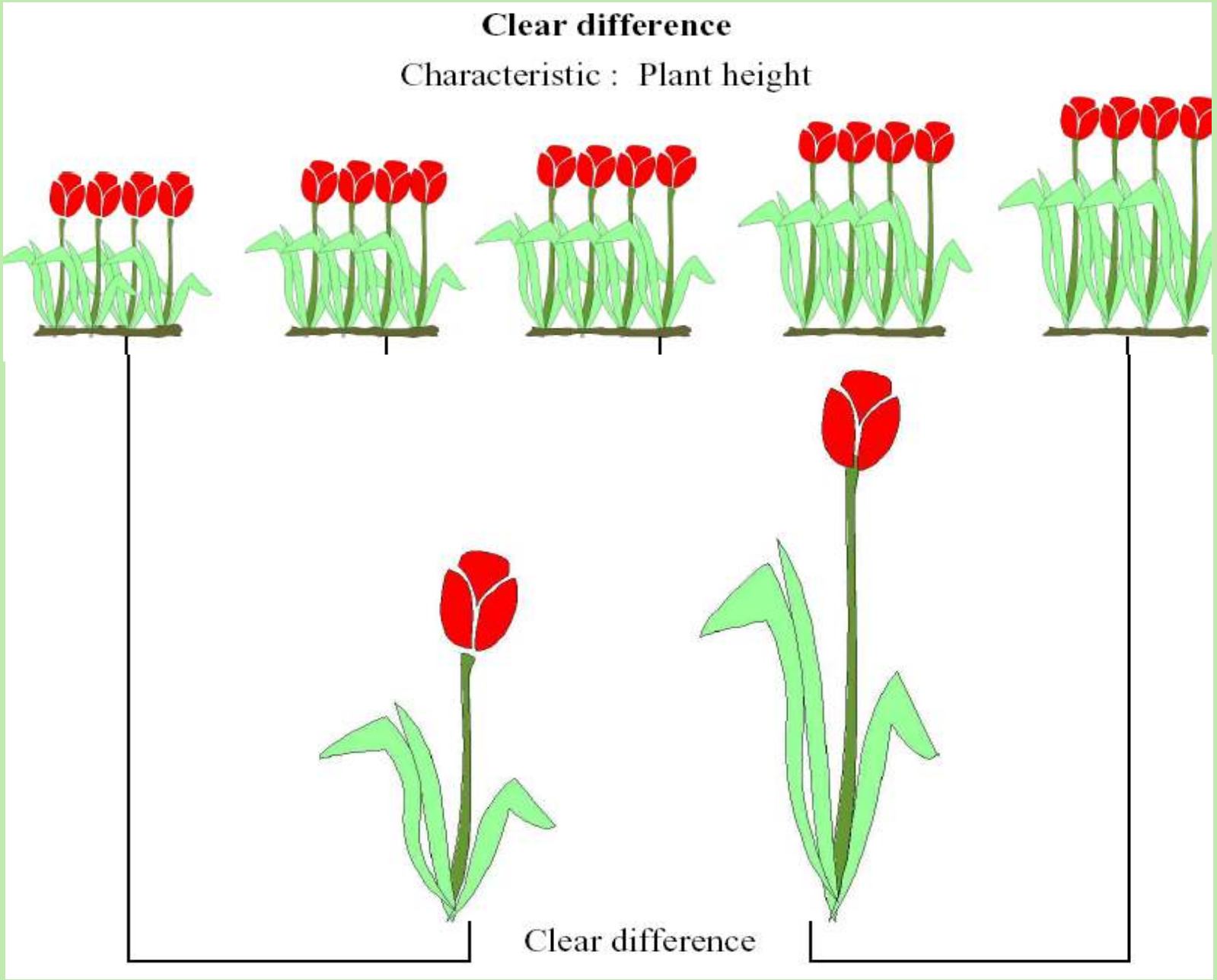
QUANTITATIVE Characteristics

"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.

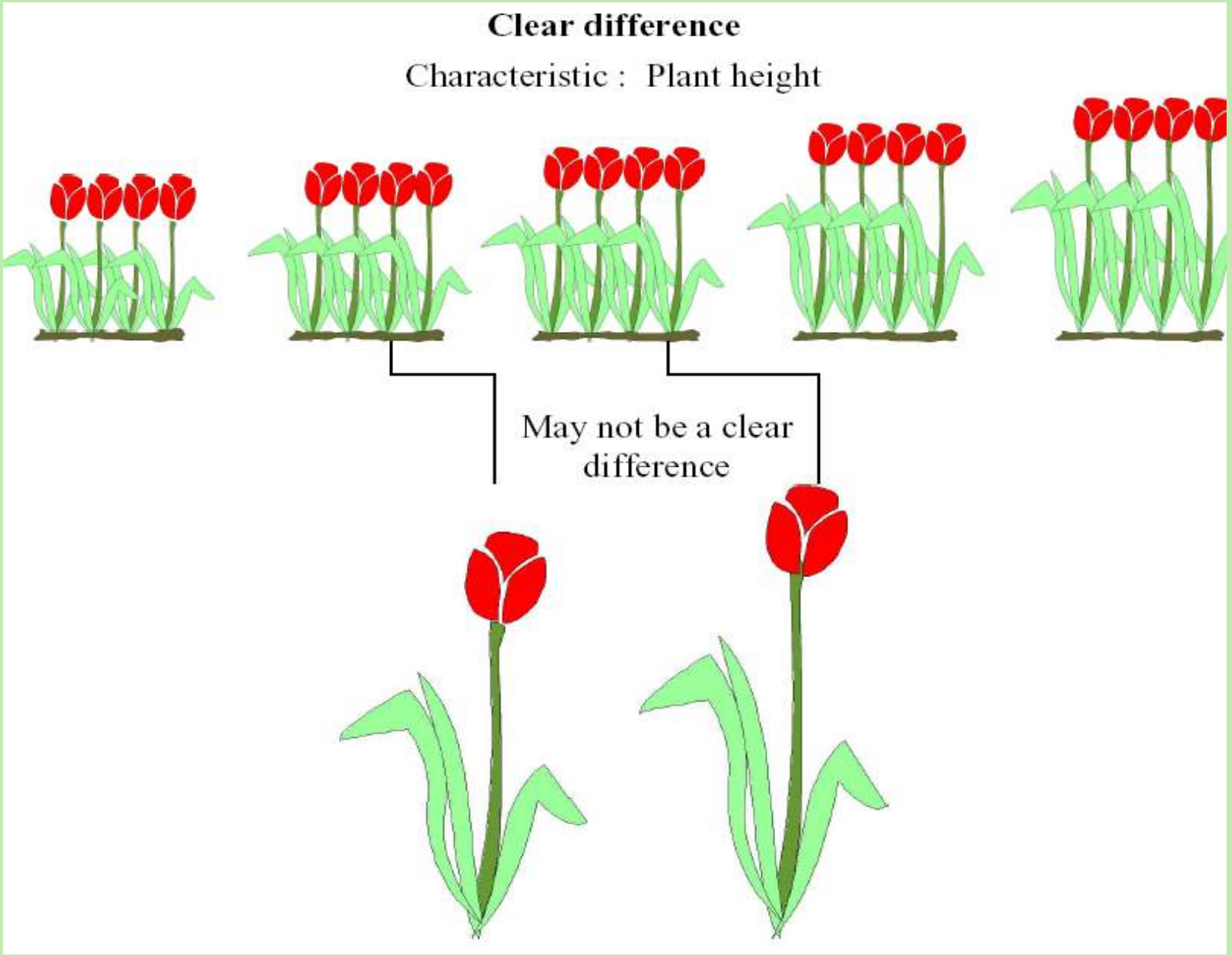
Quantitative Characteristics: **distinctness**

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

NOTES

versus

SIDE-BY-SIDE COMPARISON

(Quantitative characteristics)

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 Characteristics: **distinctness**

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

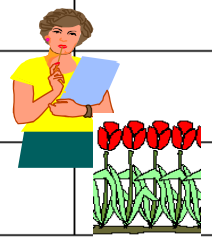
"5.5.2.2.2 **A direct comparison between two similar varieties is always recommended**, since direct pairwise comparisons are the most reliable. In each comparison, **a difference between two varieties is acceptable as soon as it can be assessed visually and could be measured, although such measurement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

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.

Variety A	B						
							n



…and comparison with descriptions in databases

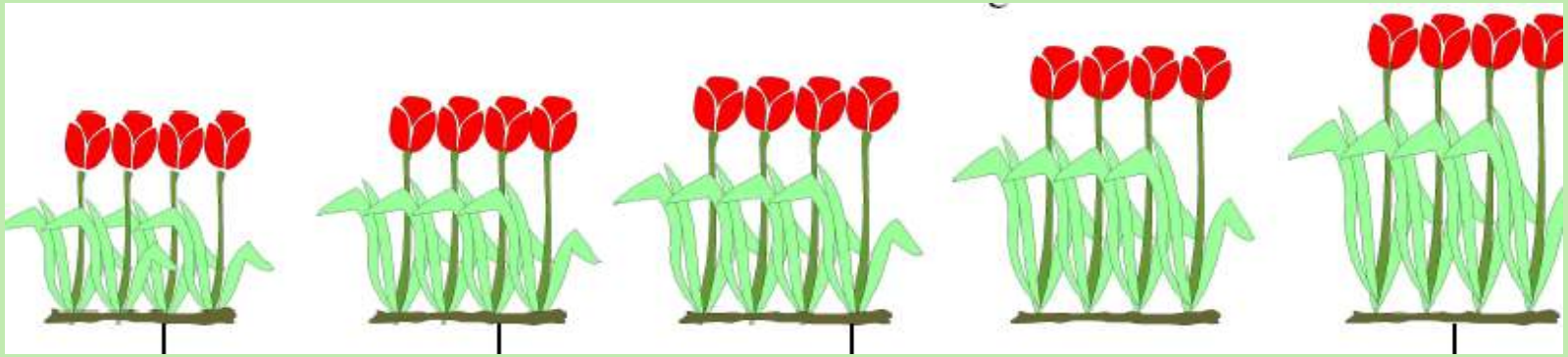
Quantitative Characteristics: **distinctness**

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

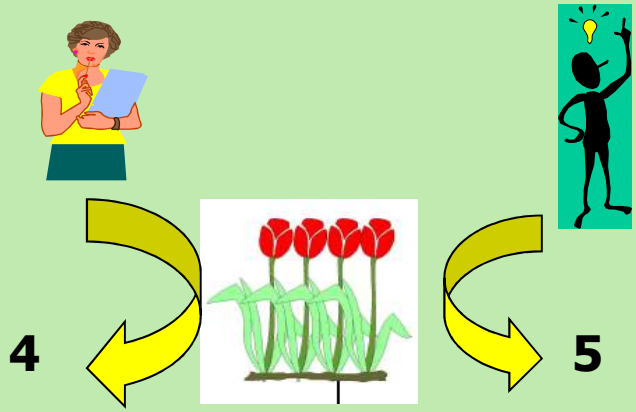
Test Guidelines (TGP/7 proposed revised text)

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

WHY?

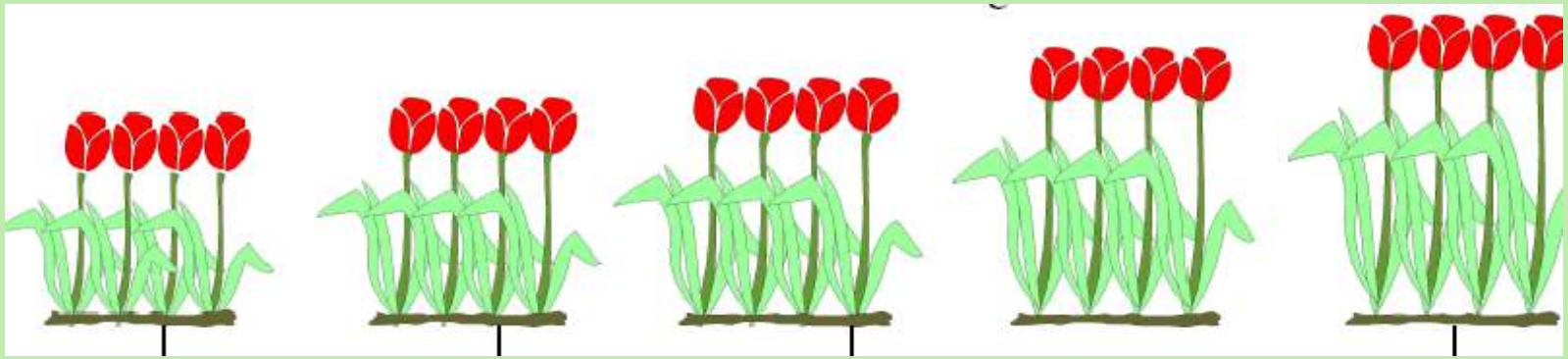


1.....2.....3.....4.....5.....6.....7.....8.....9



4.5

“Two Note” rule…



1……2……3……4……5……6……7……8……9

3.5 - 4.5 ⟷ 5.5 - 6.5

…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**:

Quantitative Characteristics: distinctness

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

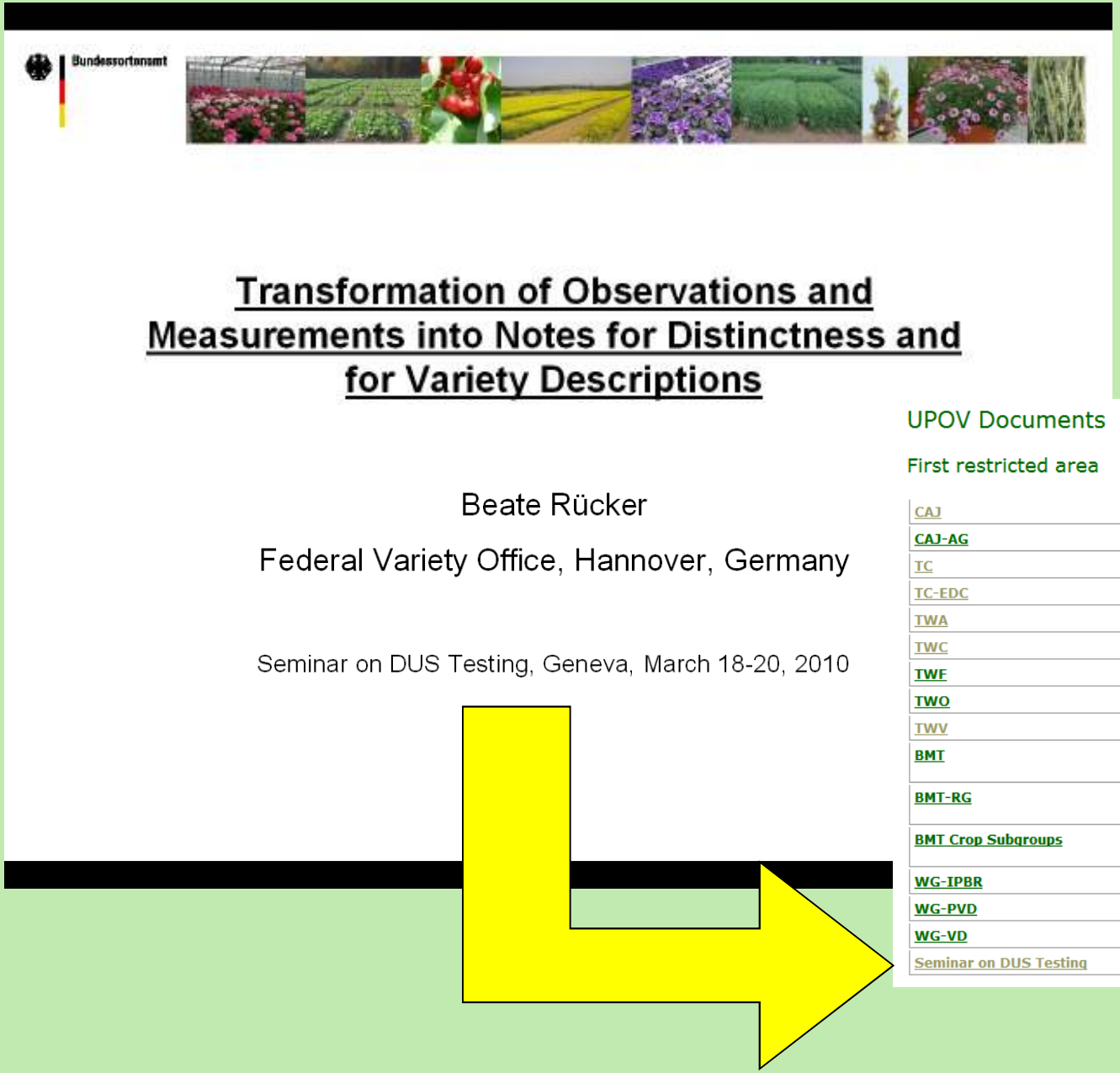
1 to 9 scale: **Notes 1 and 3**, **Notes 2 and 4**, Notes 3 and 5 **etc.** represent a clear difference

Quantitative Characteristics: distinctness

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	**Stem: anthocyanin coloration below inflorescence**	**Tige: pigmentation anthocyanique sous inflorescence**	**Trieb: Anthocyanfärbung unter dem Blütenstand**	**Tallo: pigmentación antociánica 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

Process levels other than Notes…



UPOV Documents

First restricted area

CAJ	Administrative and Legal Committee
CAJ-AG	Administrative and Legal Committee Advisory Group
TC	Technical Committee
TC-EDC	Enlarged Editorial Committee
TWA	Technical Working Party for Agricultural Crops
TWC	Technical Working Party on Automation and Computer Programs
TWF	Technical Working Party for Fruit Crops
TWO	Technical Working Party for Ornamental Plants and Forest Trees
TWV	Technical Working Party for Vegetables
BMT	Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular
BMT-RG	*Ad hoc* Subgroup of Technical and Legal Experts of Biochemical and Molecular Techniques
BMT Crop Subgroups	Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular -- Crop Subgroups
WG-IPBR	*Ad hoc* Working Group to Study the Impact of Plant Breeders' Rights
WG-PVD	*Ad hoc* Working Group on the Publication of Variety Descriptions
WG-VD	*Ad hoc* Working Group on Variety Denominations
Seminar on DUS Testing	UPOV, Geneva, March 18 to 20, 2010

3. GUIDANCE ON DRAFTING TEST GUIDELINES

d) Shape and Color Characteristics

TGP/14: Shape

Characteristics related to shape, could use the following:

- Overall shape: e.g. ovate (1), elliptic (2), circular (3), obovate (4)…
- Individual components of shape
  - Ratio length/ width (from low to high)
  - Postion of broadest part
  - Shape of base
  - Shape of apex
  - Lateral outline

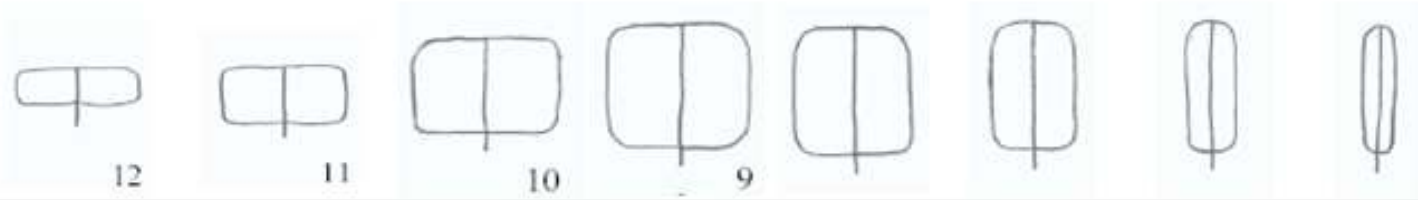
TGP/14: Shape

Chart for Simple Symmetric Plane Shapes*

shape	very compressed	moderately compressed	slightly compressed	medium	slightly elongated	moderately elongated	very elongated
ratio length/width	very low	low	low to medium	medium	medium to high	high	very high

Parallel set

oblong



Rounded set

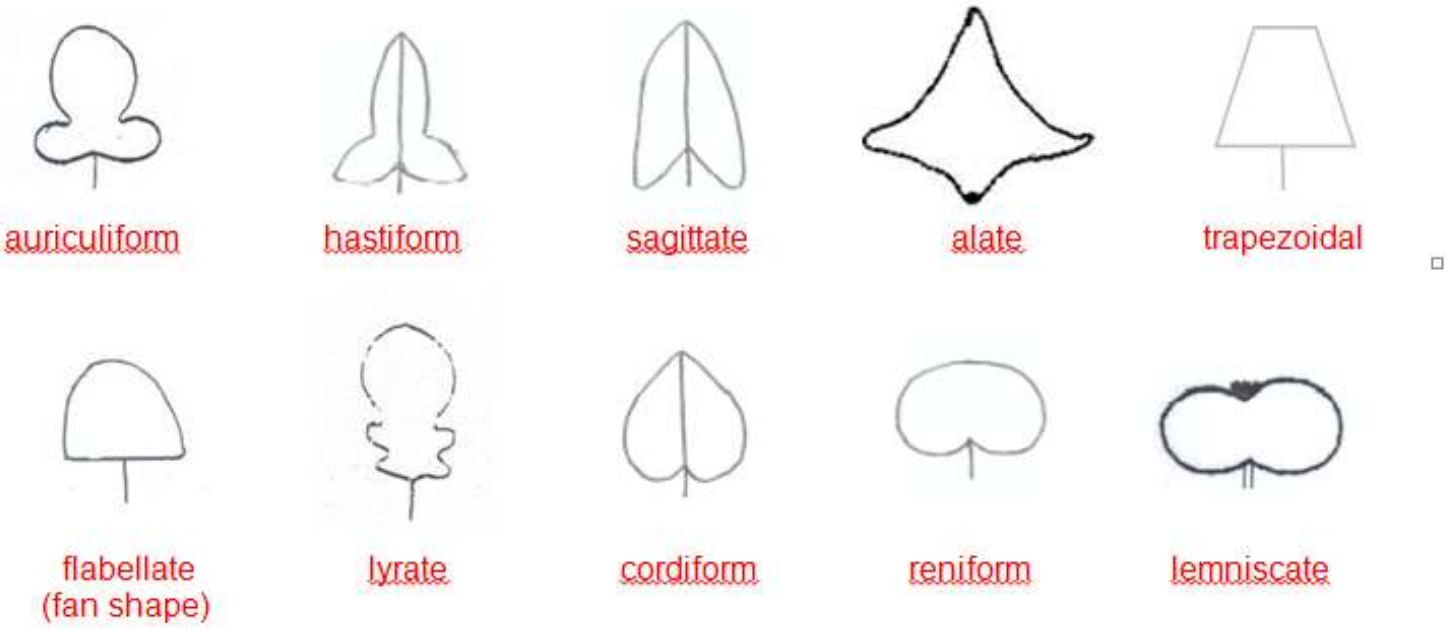
ovate

TGP/14: Shape

1.6 The following chart (Chart for Other Plane Shapes) illustrates some other common plane shapes:

Chart for Other Plane Shapes

For each of the shapes below, ranges for ratio length/width ~~(or ratio width/length)~~ and position of broadest part can be developed, in a similar way to that shown in the Chart for Simple Symmetric Plane Shapes (Section 1.5).



TGP/14: Shape

			
Alternative 1: ratio length/width	*low*	medium	*high*
	1	2	*3*
Alternative 2: Shape	broad obovate	medium obovate	narrow obovate

broadest part towards base
1
ovate

broadest part at middle
2
elliptic

broadest part towards apex
3
obovate

TGP/14: Shape

Alternative 1

(a) position of broadest part (QN):
e.g. strongly towards base (1); moderately towards base (3); at middle (5); moderately towards apex (7); strongly towards apex (9)

(b) ratio length/width (QN):
e.g. very low (1); low (3); medium (5); high (7); very high (9);

TGP/14: Shape

Alternative 2

General shape (PQ): triangular (1); ovate (2); circular (3); elliptic (4); oblong (5); linear (6); obovate (7); oblanceolate (8); spatulate (9); obtriangular (10)

(Note: Where the overall shape is presented as a single pseudo-qualitative characteristic, the order of states should be: primary order, broadest part below middle to broadest part above middle; secondary order, broad to narrow (low to high ratio length/width)).

← broadest part →		
(below middle)	at middle	(above middle)

width (ratio length/width) ↓						
narrow (*high*) ↑			6 linear			
			5 oblong	8 oblanceolate	9 spatulate	
	1 triangular	2 ovate	4 elliptic	7 obovate		10 obtriangular
broad (*low*)			3 circular			

TGP/14: Color

level of precision: low → high

state of expression	example
single color	yellow, orange, red
color range	(a) yellow, yellow orange, orange, orange red, red (b) white, yellowish white, yellow, yellowish orange
intensity	light yellow, medium yellow, dark yellow
RHS Colour Chart No.	RHS 41 B

Species?

Level of variation?

TGP/14: Color

Single color

- A single color has the lowest precision to describe the state of expression.
- Example: Flower: color: white (1); yellow (2); orange (3); red (4)

TGP/14: Color

Color range

- (a) In color combinations the second color indicates the predominant color with blending of both colors, resulting in what can look like a single color. For example in “green red” the predominant color is red and in “red green” the predominant color is green.
- Example: Flower: color: white (1); yellow white (2); yellow (3); yellow orange (4); orange (5)
- (b) The use of "ish" in color combinations indicates that there is a predominant color (e.g. yellow) together with another minor color. For example,
- yellowish, covers all colors which are predominantly yellow (would include, for example, white yellow; brown yellow; orange yellow; etc.)
- yellowish green covers all colors which are predominantly green with some yellow (would include, for example, white yellow green; brown yellow green; orange yellow green etc.)
- Example: Flower: color: whitish (1); yellowish (2); greenish (3)

TGP/14: Color Intensity

- Depending on the organ described, the intensity can be presented either in relation to a single color or in combination with different colors (example 2).

- Example 1: Leaf: green color of upper side: light (3); medium (5); dark (9)

- Example 2: Flower: color: white (1); light yellow (2); medium yellow (3); dark yellow (4); orange (5)

TGP/14: Color
Color Chart

- The "RHS Colour Chart" because of its worldwide availability.
  - 5 editions of this color chart, dating from 1966, 1986, 1995, 2001 and 2007.
  - Reference number of the RHS color, color name and edition of the chart to be mentioned.
  - UPOV names for colors in ANNEX.
  - Other color charts might also be appropriate.

- "Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background".

- Observations should not be made in direct sunlight. The observations should be made on a cloudy day with sufficient light intensity, or in a shaded area.

Allocation of UPOV Color Groups for each RHS Color in RHS Reference order

RHS COLORS (RHS COLOUR CHART, EDITIONS 1986, 1995, 2001 AND 2007)
BY UPOV COLOR GROUPS

UPOV roup No.	No. RHS	English	français	deutsch	español
11	001A	yellow	jaune	gelb	amarillo
5	001B	yellow green	vert-jaune	gelbgrün	verde amarillento
5	001C	yellow green	vert-jaune	gelbgrün	verde amarillento
5	001D	yellow green	vert-jaune	gelbgrün	verde amarillento
11	002A	yellow	jaune	gelb	amarillo
11	002B	yellow	jaune	gelb	amarillo
5	002C	yellow green	vert-jaune	gelbgrün	verde amarillento
5	002D	yellow green	vert-jaune	gelbgrün	verde amarillento
11	003A	yellow	jaune	gelb	amarillo
11	003B	yellow	jaune	gelb	amarillo
11	003C	yellow	jaune	gelb	amarillo
5	003D	yellow green	vert-jaune	gelbgrün	verde amarillento
11	004A	yellow	jaune	gelb	amarillo
11	004B	yellow	jaune	gelb	amarillo
5	004C	yellow green	vert-jaune	gelbgrün	verde amarillento
10	004D	light yellow	jaune clair	hellgelb	amarillo claro
11	005A	yellow	jaune	gelb	amarillo
11	005B	yellow	jaune	gelb	amarillo
11	005C	yellow	jaune	gelb	amarillo
10	005D	light yellow	jaune clair	hellgelb	amarillo claro
11	006A	yellow	jaune	gelb	amarillo
11	006B	yellow	jaune	gelb	amarillo
11	006C	yellow	jaune	gelb	amarillo
10	006D	light yellow	jaune clair	hellgelb	amarillo claro
11	007A	yellow	jaune	gelb	amarillo
11	007B	yellow	jaune	gelb	amarillo
11	007C	yellow	jaune	gelb	amarillo
11	007D	yellow	jaune	gelb	amarillo

TGP/14: Color

Order of states of expression

- normally presented in the following order: white, green, yellow, orange, pink, red, purple, violet, blue, brown, black
- chronological appearance of the color (e.g. as the fruit ripens)

TGP/14: Color

APPROACHES TO DESCRIBE COLORS AND COLOR PATTERNS

- depends on the number of colors…
- the types of color distribution…
- and the number of color patterns possible for the species concerned.

TGP/14: Color

Approach according to the size of the surface area

- (a) only a few colors, a few types of color distribution and a few patterns to be described,
- the colors are described according to the size of the surface area they cover

TGP/14: Color
Approach according to tissue layers

- one layer is covering the other:

- (a) Ground color (not always the largest surface area):
  - (i) the first color to appear chronologically.
  - (ii) has a continuous dispersion across the surface.

- (b) Over color (not always occupying the smallest surface area):
  - a second color, such as a flush, spots or blotches developed over time.

APPLE – TG/14/9

35. (*)		Fruit: ground color	
PQ	(f)	not visible	1
		whitish yellow	2
		yellow	3
		whitish green	4
		yellow green	5
		green	6

37. (*)		Fruit: hue of over color – with bloom removed	
PQ	(f)	orange red	1
		pink red	2
		red	3
		purple red	4
		brown red	5

Phalaenopsis (TG/213/2(proj.7))

Petal: ground color – RHS Colour Chart 155A - white
Petal: over color – RHS Colour Chart 83A – dark violet

TGP/14: Color

Approach according to defined parts of an organ

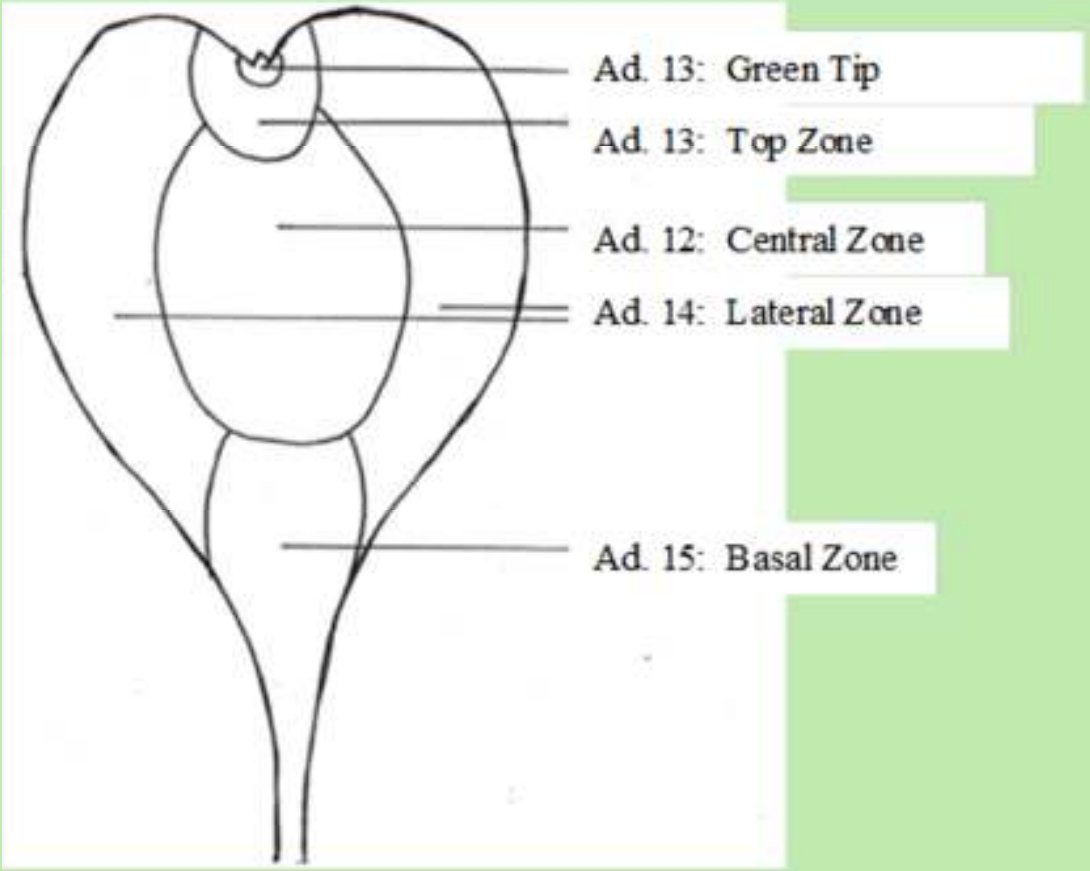
- (a) If the different parts of a plant organ can have different colors, the color of these different parts can be described separately.
- Example:
  - Petal: color of margin
  - Petal: color of middle zone
  - Petal: color of base

- (b) When an organ has one color with different intensities, the parts of the organ which are lighter or darker could be described as follows:

- Example:
  - Ray floret: color distribution on upper side:
    - lighter towards base (1); even (2); lighter towards apex (3)

TGP/14: Color

Ad. 12: Outer tepal: main color of **central** zone
Ad. 13: Outer tepal: main color of **top** zone (green tip excluded)
Ad. 14: Outer tepal: main color of **lateral** zone
Ad. 15: Outer tepal: main color of **basal** zone



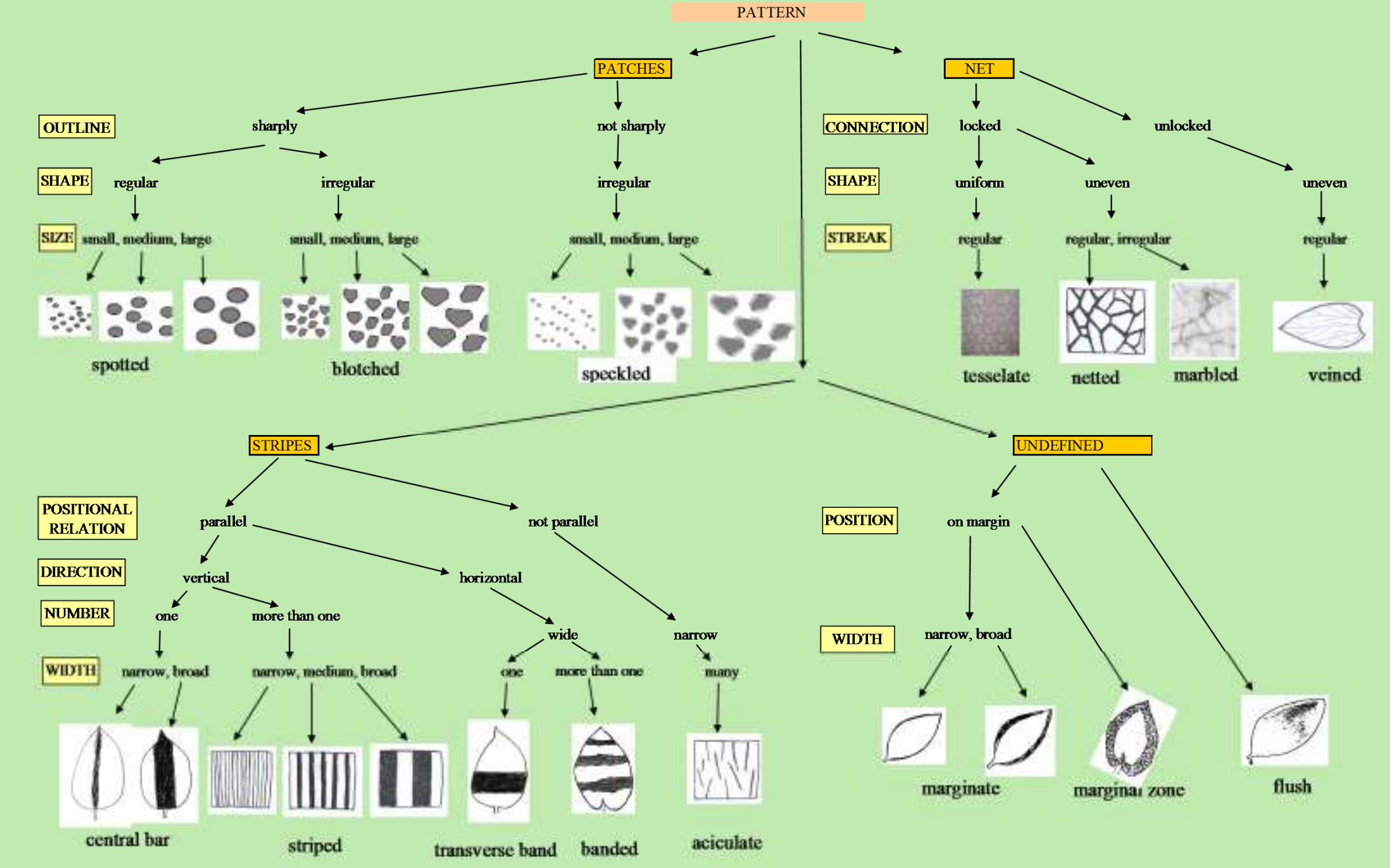
Approach according to the RHS Colour Chart number ("Lisbon" approach)

- All colors of the plant part concerned are assessed using the RHS Colour Charts first.
- The color should first be described, followed by:
  - area,
  - distribution,
  - Pattern
  - conspicuousness of the color (if necessary).
- The same sequence should be followed for color two, color three and so on. I

Heuchera and Heucherella (TG/280/1)

- **36. Leaf blade: color one – RHS Colour Chart – Yellow-Green 144C**
- **37. Leaf blade: color one: distribution – marginal zone (7)**
- **38. Leaf blade: color one: pattern – solid or nearly solid (5)**
- **39. Leaf blade: color one: total area – very small to small (2)**
- 40. Leaf blade: color two – RHS Colour Chart – Greyed-Orange 176B
- 41: Leaf blade: color two: distribution – along veins (2)
- 42: Leaf blade: color two: pattern – solid or nearly solid (5)
- 43: Leaf blade: color two: total area – small (3)
- **44: Leaf blade: color three – RHS Colour Chart – Greyed-Orange 177D but more grey**
- **45: Leaf blade: color three: distribution – between veins in intermediate zone (6)**
- **46: Leaf blade: color three: pattern – solid or nearly solid (5)**
- **47: Leaf blade: color three: total area – large (7)**
- 48: Leaf blade: color four – RHS Colour Chart – not applicable
- 49: Leaf blade: color four: distribution – none (1)
- 50: Leaf blade: color four: pattern – not applicable
- 51: Leaf blade: color four: total area – not applicable

TGP/14: Color


PATTERN
PATCHES
NET
OUTLINE
sharply
not sharply
CONNECTION
locked
unlocked
SHAPE
regular
irregular
irregular
SHAPE
uniform
uneven
uneven
SIZE
small, medium, large
small, medium, large
small, medium, large
STREAK
regular
regular, irregular
regular
spotted
blotched
speckled
tesselate
netted
marbled
veined
STRIPES
UNDEFINED
POSITIONAL RELATION
parallel
not parallel
POSITION
on margin
DIRECTION
vertical
horizontal
NUMBER
one
more than one
wide
narrow
WIDTH
narrow, broad
narrow, median, broad
one
more than one
many
WIDTH
narrow, broad
central bar
striped
transverse band
banded
aciculate
marginate
marginal zone
flush

3. GUIDANCE ON DRAFTING TEST GUIDELINES

e) Example Varieties

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

	English	français	Deutsch	español	Example Varieties Exemples Beispielssorten 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 antociánica**		
	absent	absente	fehlend	ausente	Verpia	1
	present	présente	vorhanden	presente	Pirat	9
3.	**Seedling: size of cotyledon (fully developed)**	**Plantule: taille du cotylédon (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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ 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	Perlime	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, Saeyeupsil	5
		convex	convexe	konvex	convexo		7

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ 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 Wuchstyp: Pflanze: vorwiegende 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 Wuchstyp: 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

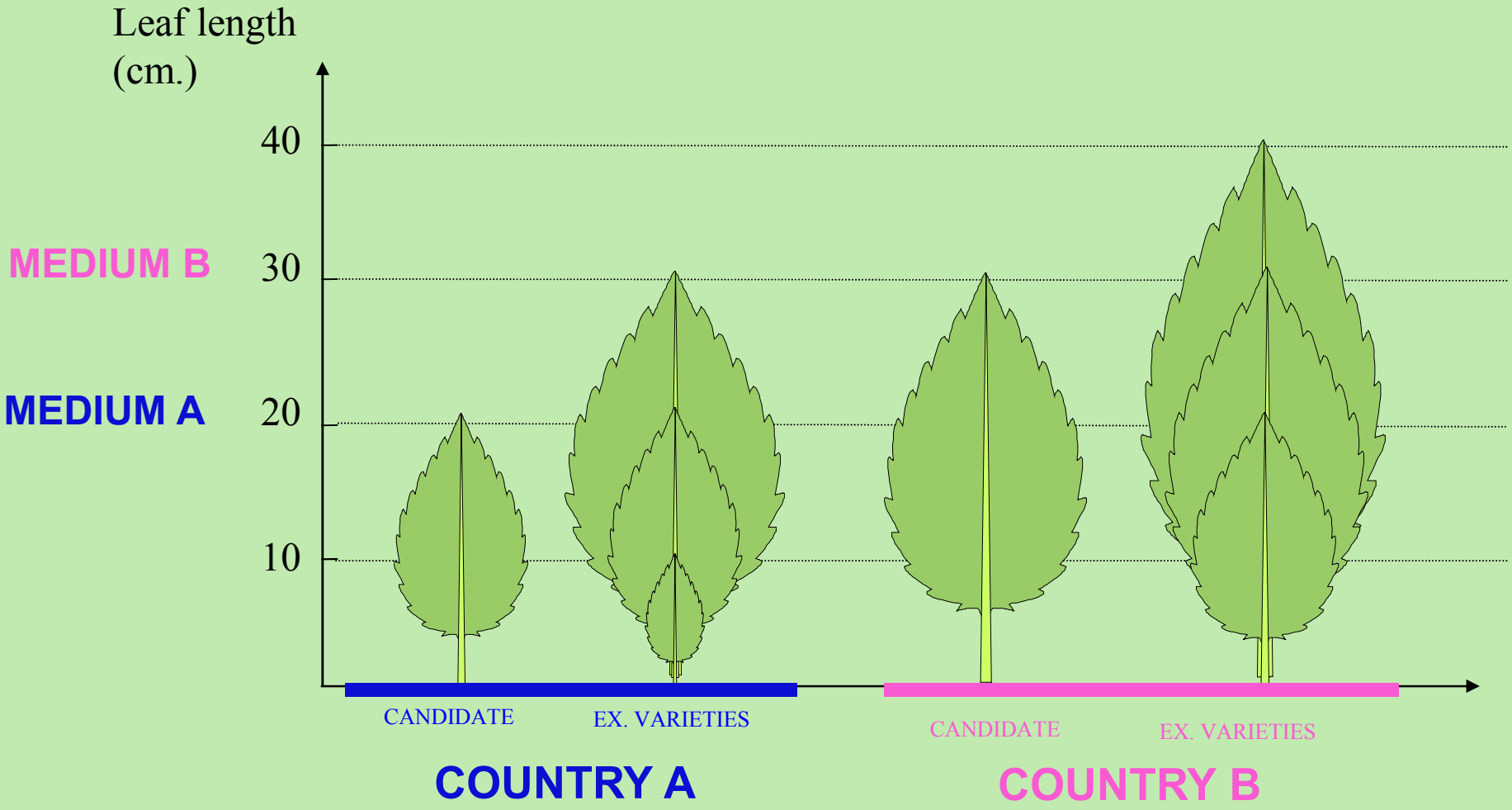
Example Varieties: the Objective

Clarify states of expression

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

Harmonized descriptions

Example Varieties versus Measurements



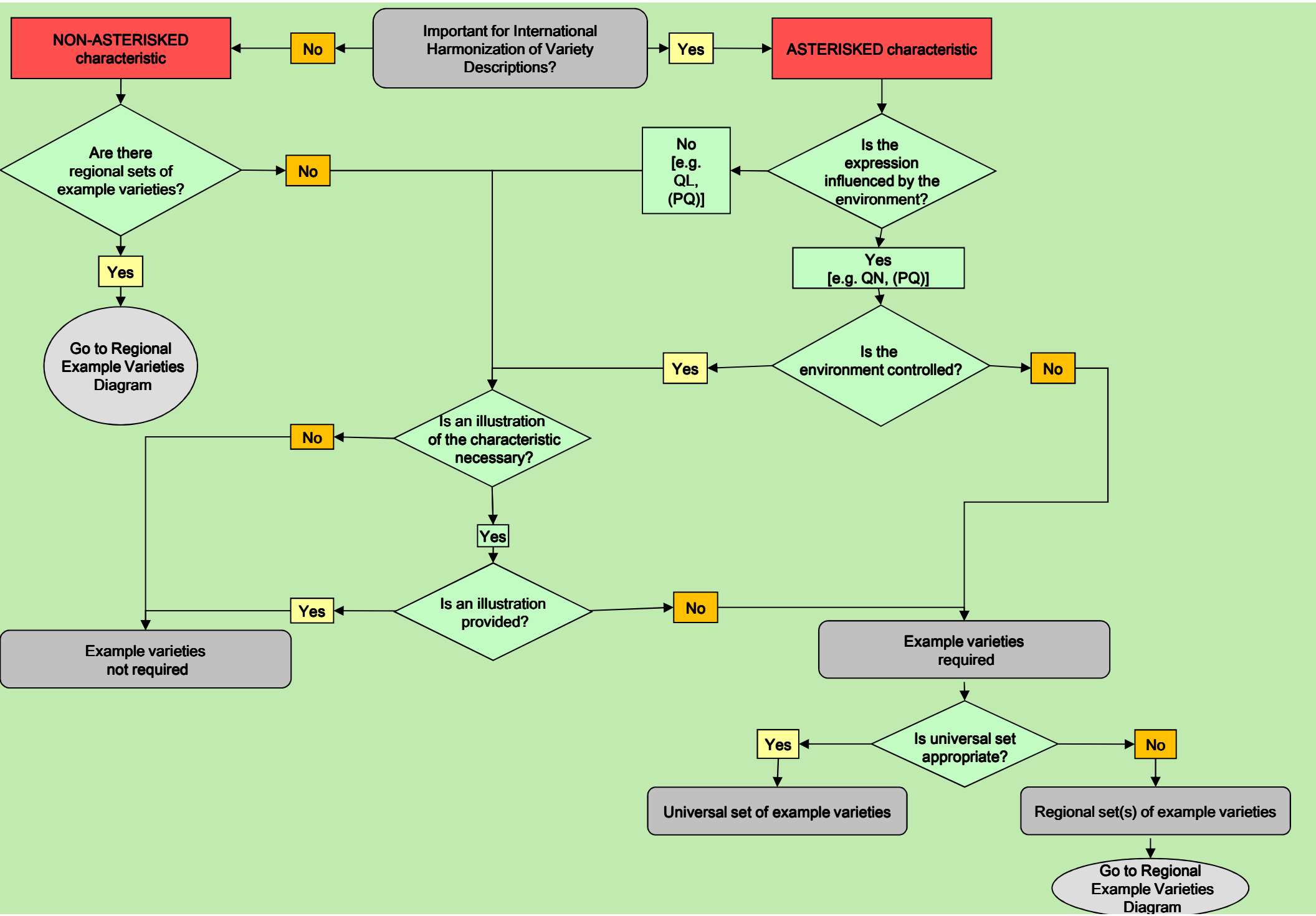
Example Varieties – the need

NEED

in characteristics used to **harmonize descriptions**

and

which are **influenced by the environment**


Important for International Harmonization of Variety Descriptions?
No
NON-ASTERISKED characteristic
Yes
ASTERISKED characteristic
Are there regional sets of example varieties?
No
No [e.g. QL, (PQ)]
Is the expression influenced by the environment?
Yes
Go to Regional Example Varieties Diagram
Yes [e.g. QN, (PQ)]
Is the environment controlled?
Yes
No
Is an illustration of the characteristic necessary?
No
Yes
Is an illustration provided?
Yes
No
Example varieties not required
Example varieties required
Is universal set appropriate?
Yes
No
Universal set of example varieties
Regional set(s) of example varieties
Go to Regional Example Varieties Diagram

3. GUIDANCE ON DRAFTING TEST GUIDELINES

f) The process for developing UPOV Test Guidelines, including: TG Template; Additional Standard Wording; and Guidance Notes;

Genera and Species

- **>3,450 genera and species** with varieties examined for PBR

- **>3,305 genera and species** for which UPOV members have practical DUS experience

- **313 Test Guidelines** adopted

Note: **313 Test Guidelines estimated to cover 90% of PBR-related varieties in UPOV Plant Variety Database**

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 (2013):	Alpha (proj.**1**)
TWX (2014):	Alpha (proj.**2**)
TWX (2015):	Alpha (proj.**3**)
Enlarged Editorial Committee (2016):	Alpha (proj.**4**)
Technical Committee (2016):	Alpha (proj.**5**)
Final adopted document (2016):	**TG/500/1**

4. AGENDA for the TWP Session

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	**END OF SESSION**
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	
	Continuation	**RECEPTION**		Continuation	

EXCHANGING INFORMATION

AN OPPORTUNITY
for
TRAINING