

TECHNICAL WORKING PARTY FOR VEGETABLES

Forty-Sixth Session

PREPARATORY WORKSHOP

near the city of Venlo, Netherlands
June 10, 2012

PROGRAM

1. Introduction to UPOV
2. Overview of the General Introduction
(document TG/1/3 and TGP documents)
3. Guidance on drafting Test Guidelines (document TGP/7)
 - (a) Selection of characteristics
 - (b) Guidance on drafting characteristics
 - (i) *Types of expression (QL, QN, PQ), notes and distinctness*
 - (ii) *Method of observation (V/M; G/S)*
 - (iii) *Asterisked, grouping and TQ characteristics*
 - (iv) *Example varieties*
 - (c) The process for developing UPOV Test Guidelines

PROGRAM

4. Situation in UPOV Concerning the possible use of Molecular Techniques in the DUS Examination
5. UPOV databases
(UPOV-ROM Plant Variety Database; GENIE database)
6. The UPOV website
7. Role of UPOV Technical Working Parties (TWPs) and the BMT
8. Agenda for the TWV Session
9. Feedback

1. INTRODUCTION TO UPOV

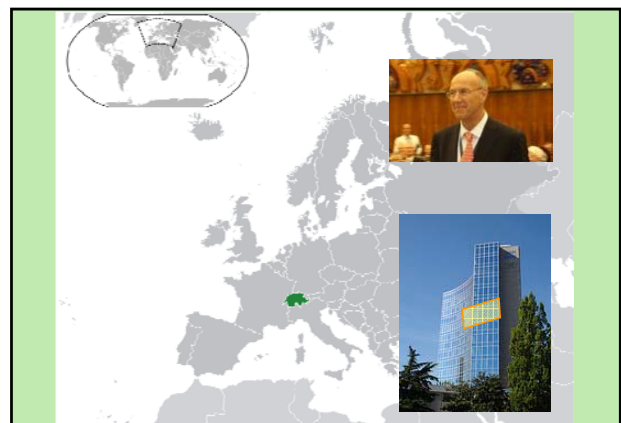
UPOV: INDEPENDENT INTERGOVERNMENTAL ORGANIZATION

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**



2. OVERVIEW OF THE GENERAL INTRODUCTION

(DOCUMENT TG/1/3 AND TGP DOCUMENTS)

GUIDANCE FOR DUS EXAMINATION

THE CONDITIONS FOR GRANTING A BREEDER'S RIGHT

Criteria to be satisfied

• NOVELTY

• **DISTINCTNESS**

• **UNIFORMITY**

• **STABILITY**



"DUS"

THE CONDITIONS FOR GRANTING A BREEDER'S RIGHT

Other conditions

- VARIETY DENOMINATION
- FORMALITIES
- PAYMENT OF FEES

NO OTHER CONDITIONS!

Guidance for DUS Examination

facilitates:

BEST PRACTICE (based on experience)

- => good decisions
- => good definition of the object of protection (strong protection)
- => efficiency in method of examination (learn from the best)

HARMONIZATION

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

UPOV provides guidance by:

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

= version 3

TG/1/3 General Introduction

"Associated" TGP Documents

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

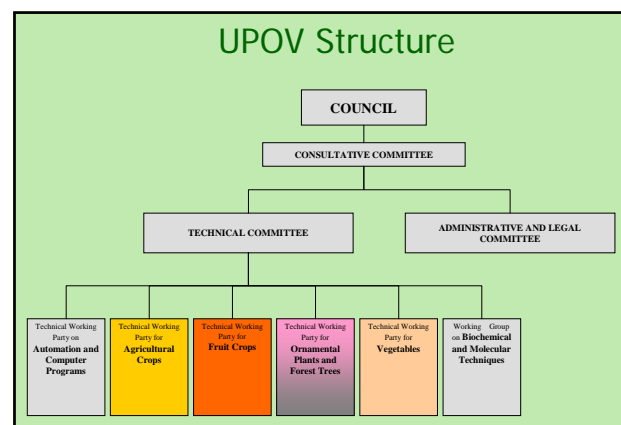
3. GUIDANCE ON DRAFTING TEST GUIDELINES

UPOV provides guidance by:

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

AND

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



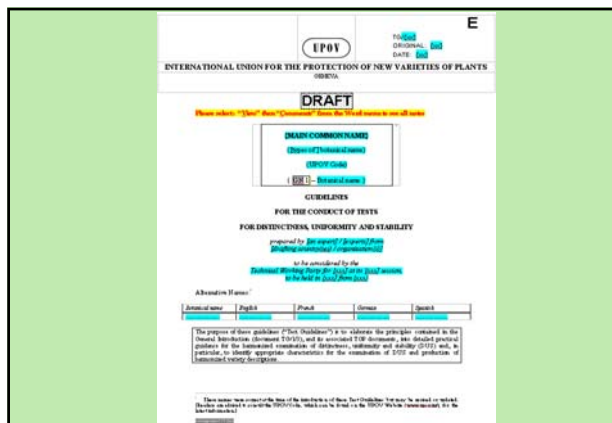
TGP/7 “Development of Test Guidelines”

1. Introduction

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

3. Guidance for Drafting Test Guidelines

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



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

3. TEST GUIDELINES

(a) 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

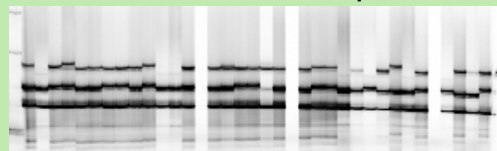
| Criteria | Fruit: color | Leaf: shape | Yield |
|--|-----------------|----------------|-------|
| (a) results from a given genotype or combination of genotypes | Yes | Yes | Yes |
| (b) sufficiently consistent and repeatable in a particular environment | Yes | Yes | (No) |
| (c) exhibits sufficient 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?



3. TEST GUIDELINES

(b) Guidance on drafting characteristics

(i) Types of expression (QL, QN, PQ), 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. (*) QN | Plant: growth habit | Plante : port | Pflanze: Wuchsform | Planta: porte | | |
| | upright | dressé | aufrecht | erecto | Impatiens | 1 |
| | semi-upright | semi dressé | halbhoch | semierecto | DO150-1 | 2 |
| | spreading | étalé | breitblühend | abuelto | Sonnenstich | 3 |
| | semi-trailing | semi-étalé | halbhängend | semirastroso | Impatiens | 4 |
| | trailing | couroux | hängend | rastroso | Organza | 5 |
| 2. (*) QN | Plant: height | Plante : hauteur | Pflanze: Höhe | Planta: altura | | |
| | short | basse | niedrig | baja | Yareye | 3 |
| | medium | moyenne | mittel | media | DO150-1 | 5 |
| | tall | haute | hoch | alta | Impatiens | 7 |

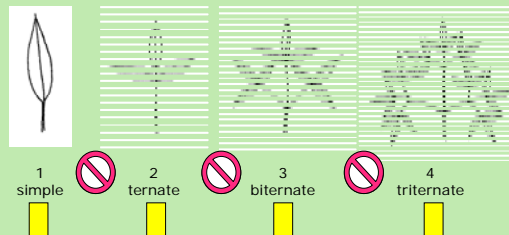
QUALITATIVE Characteristics

“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



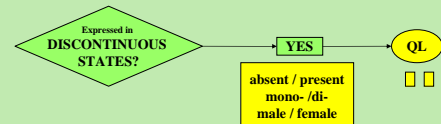
Qualitative (QL) characteristic?

Anthocyanin coloration: QL (=absent / present)?

NO!

| | Variety A | Variety B | Variety C |
|---------------|-----------|-----------|-----------|
| Environment A | absent | present | absent |
| Environment B | absent | present | present |

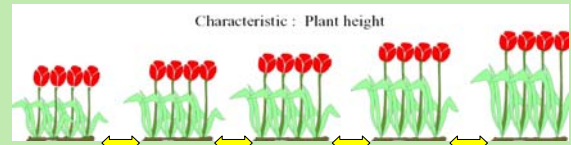
QL, QN or PQ?



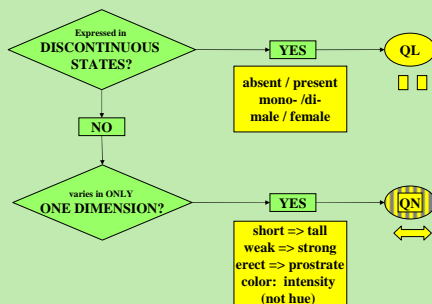
QUANTITATIVE Characteristics

“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



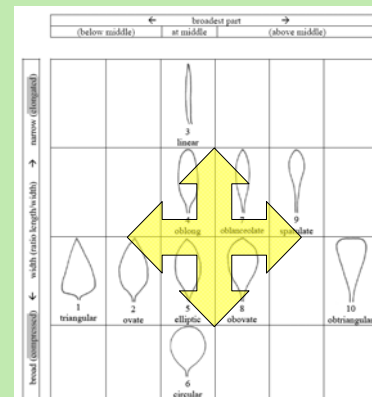
QL, QN or PQ?

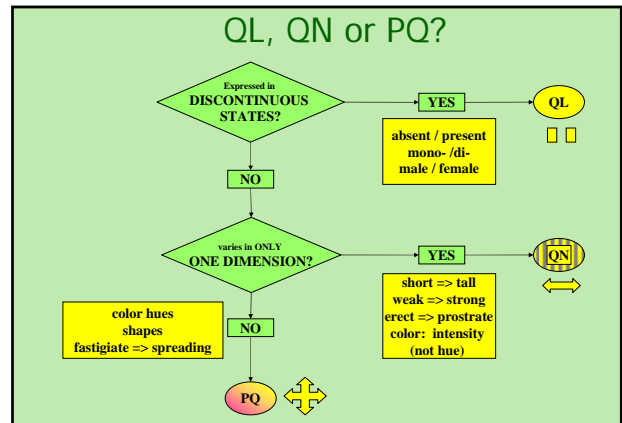
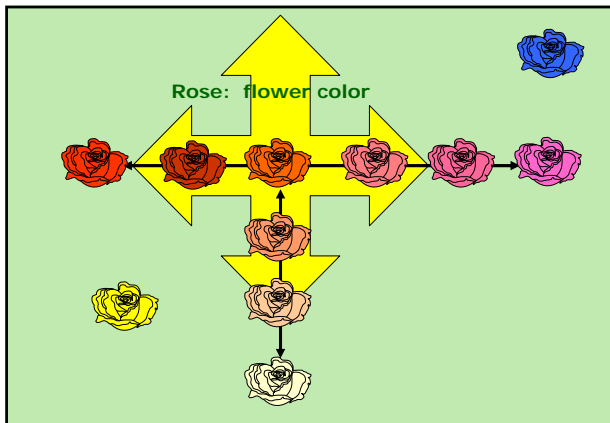


PSEUDO-QUALITATIVE Characteristics

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





EXERCISE

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

Types of Expression

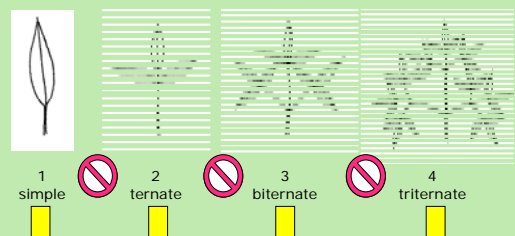
QL: QUALITATIVE

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/ Beispielsorten/ Variedades ejemplo | Note/ Nota |
|----------|------------------------------------|------------|----------|---------|---------|--|---------------|
| 1. | MS Plant: ploidy (*) | | | | | | |
| QL | | diploid | | | | | 2 |
| | | tetraploid | | | | | 4 |
| 3. | VG Stem: anthocyanin coloration | | | | | | |
| QL | | absent | | | | Gumpoong | 1 |
| | | present | | | | Champoong, 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

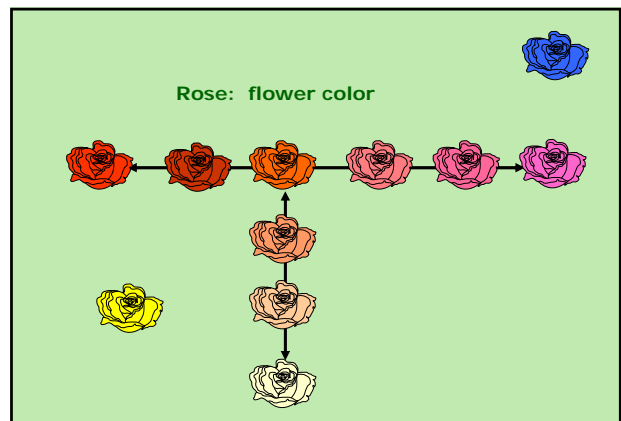
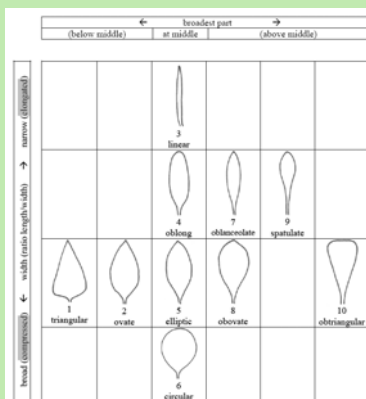
QL: QUALITATIVE

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PSEUDO-QUALITATIVE Characteristics

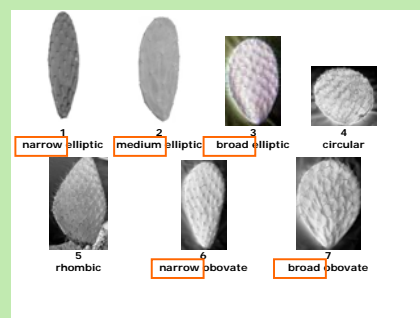
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PSEUDO-QUALITATIVE Characteristics (typical examples)

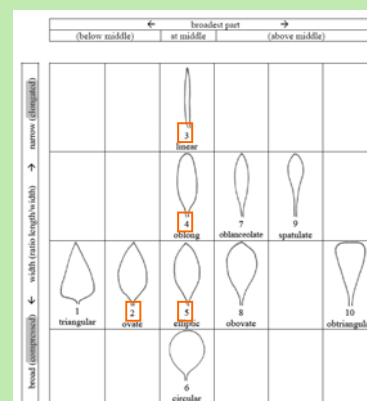
| 24. Flower: color of the center (+) | Fleur: couleur du centre | Farbe der Mitte | Flor: color del centro | |
|-------------------------------------|--------------------------|-----------------|------------------------|---|
| PQ green | vert | grün | verde | 1 |
| yellow | jaune | gelb | amarillo |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

Opuntia: Shape of Cladode



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

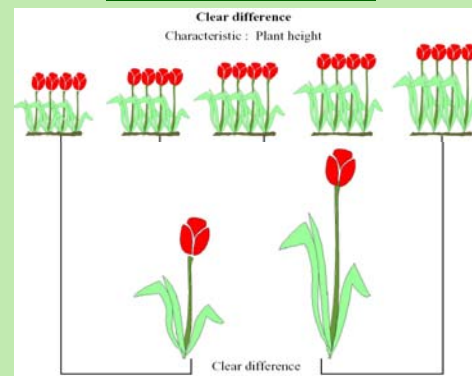
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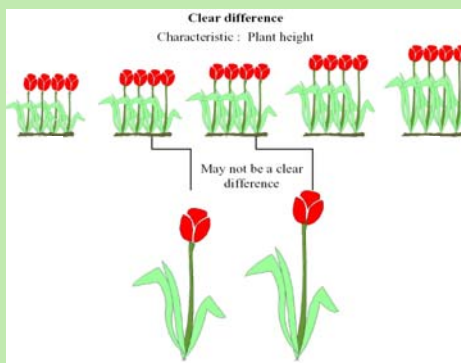
Quantitative Characteristics: distinctness

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

Quantitative Characteristic



Quantitative Characteristic



Quantitative Characteristics (1-9)

weak/strong
short/long
small/large

| Note | State | Note | State |
|------|--|------|--|
| 1 | very weak (or: absent or very weak) | 1 | very small (or: absent or very small) |
| 2 | very weak to weak | 2 | very small to small |
| 3 | weak | 3 | small |
| 4 | weak to medium | 4 | small to medium |
| 5 | medium | 5 | medium |
| 6 | medium to strong | 6 | medium to large |
| 7 | strong | 7 | large |
| 8 | strong to very strong | 8 | large to very large |
| 9 | very strong | 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 | Example 2 | Example 3 | Example 4 |
|-------|--------------------|-------------------|---------------------------|------------------------|
| | Size relative to: | Angle: | Position: | 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 <i>(absent or weakly expressed)</i> |
| 2 | moderate (or medium) <i>(moderately expressed)</i> |
| 3 | strong <i>(strongly expressed)</i> |

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

| 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**.

[illegible]

12

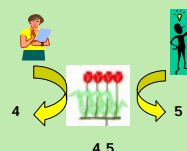
Quantitative Characteristics: distinctness

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

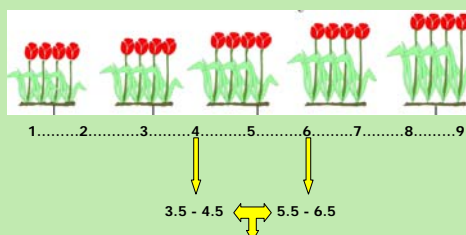
Test Guidelines (TGP/7 proposed revised text)

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

WHY?



"Two Note" rule...



...means at least ONE note difference!

Quantitative Characteristics: distinctness

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

Test Guidelines (TGP/7 proposed revised text)

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

Quantitative Characteristics: distinctness

| TG 233-1 Dianthus Dianthus, 2007-03-28 - 9 - | | | | | |
|--|------------------------|-----------------|--------------------|-----------------|--|
| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo |
| 6. (*) | (a) Leaf blade: length | Limbe: longueur | Blattspitze: Länge | Limbo: longitud | |
| QN | short | courte | kurz | corto | Codion, Strawberry Sandbar |
| | medium | moyenne | mittel | medio | Codisace |
| | long | longue | lang | largo | Balschulapa, Balschulapa |
| | | | | | Note |
| | | | | | Nota |

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 Dianthus Dianthus, 2007-03-28 - 9 - | | | | | |
|--|--|---|---|---|--|
| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo |
| 5. | Stem: anthocyanin coloration below inflorescence | Tige: pigmentation anthocyanique sous inflorescence | Trieb: Anthocyanfärbung unter dem Blütenstand | Tallo: pigmentación antocianica por debajo de la inflorescencia | |
| QN | absent or weak | absente ou faible | fehlernd oder gering | ausente o débil | Heccharm |
| | medium | moyenne | mittel | media | Hecrace |
| | strong | forte | stark | fuerte | |
| | | | | | Note |
| | | | | | Nota |

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

Process levels other than Notes...

Transformation of Observations and Measurements into Notes for Distinctness and for Variety Descriptions

Beate Rücker
Federal Variety Office, Hannover, Germany
Seminar on DUS Testing, Geneva, March 18-20, 2010

UPOV Documents

First restricted area

| Document | Content |
|-----------|---|
| UPOV 1991 | International Union for the Protection of New Varieties of Plants |
| UPOV 1993 | International Union for the Protection of New Varieties of Plants |
| UPOV 1994 | International Union for the Protection of New Varieties of Plants |
| UPOV 1995 | International Union for the Protection of New Varieties of Plants |
| UPOV 1996 | International Union for the Protection of New Varieties of Plants |
| UPOV 1997 | International Union for the Protection of New Varieties of Plants |
| UPOV 1998 | International Union for the Protection of New Varieties of Plants |
| UPOV 1999 | International Union for the Protection of New Varieties of Plants |
| UPOV 2000 | International Union for the Protection of New Varieties of Plants |
| UPOV 2001 | International Union for the Protection of New Varieties of Plants |
| UPOV 2002 | International Union for the Protection of New Varieties of Plants |
| UPOV 2003 | International Union for the Protection of New Varieties of Plants |
| UPOV 2004 | International Union for the Protection of New Varieties of Plants |
| UPOV 2005 | International Union for the Protection of New Varieties of Plants |
| UPOV 2006 | International Union for the Protection of New Varieties of Plants |
| UPOV 2007 | International Union for the Protection of New Varieties of Plants |
| UPOV 2008 | International Union for the Protection of New Varieties of Plants |
| UPOV 2009 | International Union for the Protection of New Varieties of Plants |
| UPOV 2010 | International Union for the Protection of New Varieties of Plants |
| UPOV 2011 | International Union for the Protection of New Varieties of Plants |
| UPOV 2012 | International Union for the Protection of New Varieties of Plants |
| UPOV 2013 | International Union for the Protection of New Varieties of Plants |
| UPOV 2014 | International Union for the Protection of New Varieties of Plants |
| UPOV 2015 | International Union for the Protection of New Varieties of Plants |
| UPOV 2016 | International Union for the Protection of New Varieties of Plants |
| UPOV 2017 | International Union for the Protection of New Varieties of Plants |
| UPOV 2018 | International Union for the Protection of New Varieties of Plants |
| UPOV 2019 | International Union for the Protection of New Varieties of Plants |
| UPOV 2020 | International Union for the Protection of New Varieties of Plants |
| UPOV 2021 | International Union for the Protection of New Varieties of Plants |
| UPOV 2022 | International Union for the Protection of New Varieties of Plants |
| UPOV 2023 | International Union for the Protection of New Varieties of Plants |
| UPOV 2024 | International Union for the Protection of New Varieties of Plants |
| UPOV 2025 | International Union for the Protection of New Varieties of Plants |
| UPOV 2026 | International Union for the Protection of New Varieties of Plants |
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| UPOV 2028 | International Union for the Protection of New Varieties of Plants |
| UPOV 2029 | International Union for the Protection of New Varieties of Plants |
| UPOV 2030 | International Union for the Protection of New Varieties of Plants |
| UPOV 2031 | International Union for the Protection of New Varieties of Plants |
| UPOV 2032 | International Union for the Protection of New Varieties of Plants |
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| UPOV 2096 | International Union for the Protection of New Varieties of Plants |
| UPOV 2097 | International Union for the Protection of New Varieties of Plants |
| UPOV 2098 | International Union for the Protection of New Varieties of Plants |
| UPOV 2099 | International Union for the Protection of New Varieties of Plants |
| UPOV 2100 | International Union for the Protection of New Varieties of Plants |

3. TEST GUIDELINES

(b) Guidance on drafting characteristics

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

TG/250/1
Yam/Name/Yamwuzel/Name, 2009-04-01
- 7 -

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

| | English | français | deutsch | español | Example Varieties/ Exemples/ Beispielvarietäten/ Variedades ejemplo | Note/ Note |
|--------|---------------------------|----------------------------------|----------------------------|------------------------------|--|---------------|
| 1. VG | Plant: density of foliage | Plante : densité de feuillage | Pflanze: Dichte des Laubes | Planta: densidad del follaje | | |
| QN (a) | sparse | faible | locker | escasa | Ite-amo | 3 |
| | medium | moyenne | mittel | media | Morimoto-amo | 5 |
| | dense | dense | dicht | densa | Ginkungjika-tsisho | 7 |
| 2. VG | Plant: number of branches | Plante : nombre de ramifications | Pflanze: Anzahl Triebe | Planta: número de ramas | | |
| QN (a) | few | petit | gering | bajo | Ite-amo | 3 |
| | medium | moyen | mittel | medio | Fusougi | 5 |
| | many | grand | groß | alto | Segoda-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 itative) | PQ (PSEUDO qualitative) | QN (QUANT itative) |
| Vegetatively propagated, self-pollinated | Notes (VG) | Notes (VG) Side-by-side (VG) | Notes (VG/MG/MS) Side-by-side (VG) Statistics (MG/MS) |
| Cross-pollinated | Notes (VG) Statistics (VS*) | Notes (VG) Side-by-side (VG) Statistics (VS*) | Statistics (IMG)/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 itative) | PQ (PSEUDO qualitative) | QN (QUANT itative) |
| Vegetatively propagated, self-pollinated | Notes (VG) | Notes (VG) Side-by-side (VG) | Notes (VG/MG/MS) Side-by-side (VG) Statistics (MG/MS) |
| Cross-pollinated | Notes (VG) Statistics (VS*) | Notes (VG) Side-by-side (VG) Statistics (VS*) | Statistics (IMG)/MS/VS Side-by-side (VG) Notes (VG/MG/MS) |
| Hybrids | Notes (VG) Statistics (VS*) | Notes (VG) Side-by-side (VG) Statistics (VS*) | ** |

TGP/9/1 "Examining Distinctness"

**V = Visual observation or
M = Measurement**

| Method of propagation of the variety | Type of expression of characteristic | | |
|--|--------------------------------------|---|--|
| | OL (QUAL itative) | PQ (PSEUDO qualitative) | ON (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') | ** |

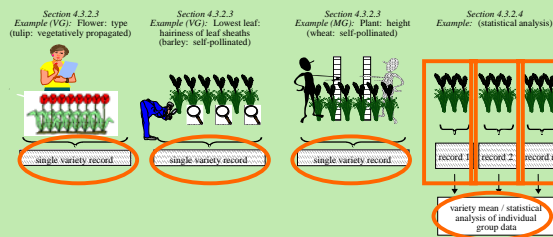
Type of Record (for the purposes of distinctness)

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

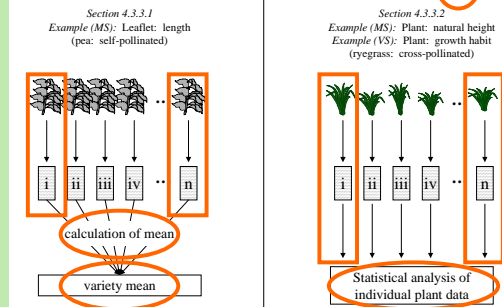
In most cases, "G" provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

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)



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



EXERCISE

3. TEST GUIDELINES

(b) Guidance on drafting characteristics

(iii) *Asterisked, grouping and TQ characteristics*

Standard Test Guidelines Characteristic

| Function | Criteria |
|---|---|
| 1.Characteristics that are accepted by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances. | <p>1.Must satisfy the criteria for use of any characteristic for DUS as set out in Chapter 4, section 4.2.</p> <p>2. Must have been used to develop a variety description by at least one member of the Union.</p> <p>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.</p> |

Asterisked Characteristic

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

| Char. No. | English | français | Deutsch | español | Example Varieties Exemples Ejemplos Ejemplos | Note/ Nota |
|-----------|---------------------|---------------|--------------------|---------------|---|------------|
| | Plant: growth habit | Plante : port | Pflanze: Wuchsform | Planta: porte | | |
| Q8 | upright | dressé | aufrecht | erecto | Impatiens | 1 |
| | semi-upright | semi dressé | halbaufrecht | semierecto | D0158-1 | 2 |
| | spreading | étalé | breitwüchsig | abierto | Summum 03 | 3 |
| | semi-trailing | semi-étalé | halbhängend | semirastroso | Impatiens | 4 |
| | trailing | coureux | hängend | rastroso | Organza | 5 |

Asterisked Characteristic

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

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 | <i>Malus domestica</i> 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 Fruit: hue of over color – with bloom removed (37) | | |
| orange red | Cox's Orange Pippin, Egremont Russet | 1[] |
| pink red | Cripps Pink, Delbarque | 2[] |
| red | Akane, Galaxy, Red Elstar, Royal Prince | 3[] |
| purple red | Red Joannice, Spartan | 4[] |
| brown red | Fiesta, Joban, Lord Burglady | 5[] |
| 5.6 Fruit: pattern of over color (38) | | |
| only solid flush | Red Joannice, Richard Delicious | 1[] |
| solid flush with weakly defined stripes | Galaxy | 2[] |
| solid flush with strongly defined stripes | Jonagold | 3[] |
| weakly defined flush with strongly defined stripes | Gravenstein | 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-quantitative 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. TEST GUIDELINES

(b) Guidance on drafting characteristics

(iv) Example varieties

TG119
Lettuce/Laine/Salat/Lediga, 2004-03-31
-7-

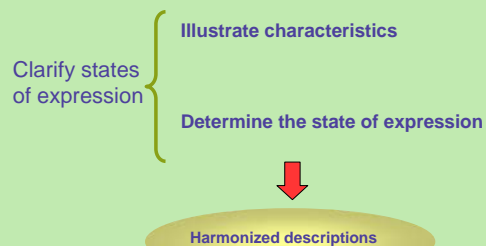
7. Table of Characteristics/ Tableau des caractères/ Merkmalstabelle/ Tabla de caracteres

| | English | français | Deutsch | español | Example Varieties Exemples Beispielsorten Variedades ejemplos | Note/ Nota |
|---------------|--|---|---|--|--|---------------|
| 1. (*) | Seed: color | Semence: couleur | Samen: Farbe | Semilla: color | | |
| | white | blanche | weiß | blanco | Varpia | 1 |
| | yellow | jaune | gelb | amarillo | Durango | 2 |
| | black | noir | schwarz | negro | Kagraner Sommer | 3 |
| 2. (*) | Seedling: anthocyanin coloration | Plantelet: anthocyanine coloration | Keimflanze: Anthocyannfärbung | Plántula: pigmentación antocianica | | |
| | absent | absente | fehlt/nd | ausente | Varpia | 1 |
| | present | présente | vorhanden | presente | Pirat | 9 |
| 3. | Seedling: size of cotyledon (fully developed) | Plantelet: taille du cotyledon (à complet développement) | Keimflanze: Größe des Keimblatts (voll entwickelt) | Plántula: tamaño del cotiledón (plumanteo desarrollado) | | |
| | small | petit | klein | pequeño | Romance | 3 |
| | medium | moyen | mittel | medio | Expresse | 5 |
| | large | grand | groß | grande | Varpia | 7 |

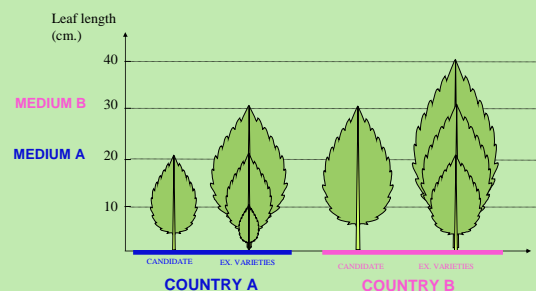
| TIG 219-1 Perilla Perilla Perilla, 2004-03-31 - 10 - | | | | | |
|---|--|---|---|--|---------------|
| English | français | deutsch | español | Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo | Note/ Nota |
| 14. VG. Leaf blade: intensity of purplish color of lower side | Limbe: intensité de la couleur pourpre de la face inférieure | Blattspreite: Intensität der Purpurfarbe der Unterseite | Limbo: intensidad del color púrpura del envés | | |
| QN (00) very light | très claire | sehr hell | muy claro | | 1 |
| light | claire | hell | claro | Perline | 3 |
| medium | moyenne | mittel | medio | | 5 |
| dark | foncée | dunkel | oscuro | Pero | 7 |
| very dark | très foncée | sehr dunkel | muy oscuro | Bora, Purple | 9 |
| 15. VG. Leaf blade: profile | Limbe: profil | Blattspreite: Profil | Limbo: perfil | | |
| QN (00) concave | concave | konkav | cóncavo | Pero | 3 |
| plane | plan | flach | plano | Petgro, Sacropul | 5 |
| convex | convexe | konvex | convexo | | 7 |

| TIG 219-1 Brachycome Brachycome Brachycome, 2007-04-04 - 7 - | | | | | |
|--|----------------------------|--------------------|-----------------------------|--|---------------|
| English | français | deutsch | español | Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo | Note/ Nota |
| 6. PL. Plant growth type | Plante: type de croissance | Pflanze: Wuchsform | Planta: tipo de crecimiento | | |
| QL (00) basal clusters | en amas à la base | basale Büschel | en racimos basales | | 1 |
| basal | basal | basal | basal | | 2 |
| 2. PL. Plant growth type | Plante: type de croissance | Pflanze: Wuchsform | Planta: tipo de crecimiento | | |
| PL. Plant growth type | Plante: type de croissance | Pflanze: Wuchsform | Planta: tipo de crecimiento | | |
| QN (00) upright | dressée | aufrecht | erecto | | 1 |
| semi upright | demi-dressée | halbaufrecht | semierecto | | 3 |
| horizontal | horizontales | wagerecht | horizontal | | 5 |
| 3. PL. Plant growth type | Plante: type de croissance | Pflanze: Wuchsform | Planta: tipo de crecimiento | | |
| PL. Plant growth type | Plante: type de croissance | Pflanze: Wuchsform | Planta: tipo de crecimiento | | |
| QN (00) low | peu constituée | klein | bajo | | 1 |
| medium | moyennement constituée | mittel | medio | | 3 |
| tall | très constituée | groß | alto | | 5 |
| 4. PL. Plant height | Plante: hauteur | Pflanze: Höhe | Planta: altura | | |
| PL. Plant height | Plante: hauteur | Pflanze: Höhe | Planta: altura | | |
| QN (00) short | basse | niedrig | corta | Mardi Gras | 1 |
| medium | moyenne | mittel | media | Brachydar | 3 |
| tall | élevée | hoch | larga | Happy Face Pink | 5 |

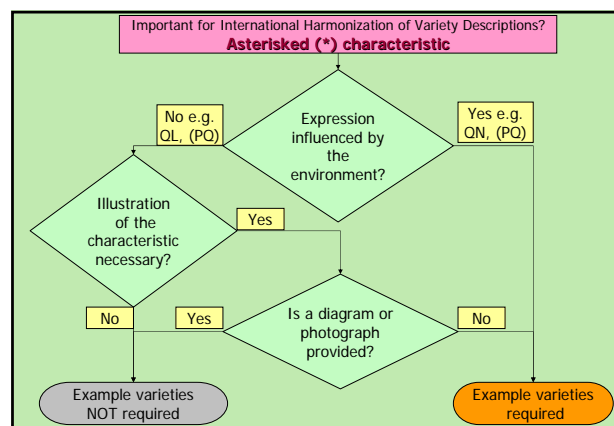
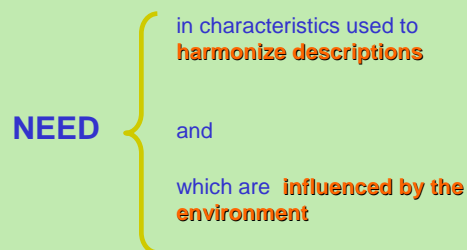
Example Varieties: the Objective

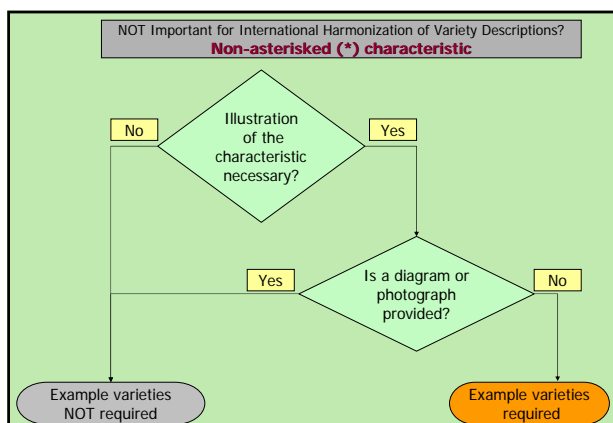


Example Varieties versus Measurements



Example Varieties – the need





3. TEST GUIDELINES (document TGP/7)

(c) The process for developing UPOV Test Guidelines

Genera and Species

- **>3,000 genera and species** with varieties examined for PBR
- **>2,700 genera and species** for which UPOV members have practical DUS experience
- **281 Test Guidelines** adopted

Note: **281 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**)

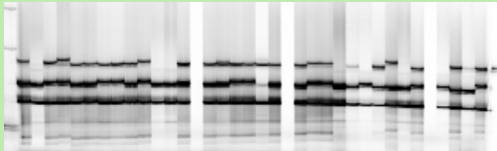
Technical Working Party: **TWX**

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

4. Situation in UPOV Concerning the possible use of **Molecular Techniques** in the DUS Examination



Molecular Techniques?



Legal and other considerations

- Conformity with the UPOV Convention
- Potential impact on the strength of protection

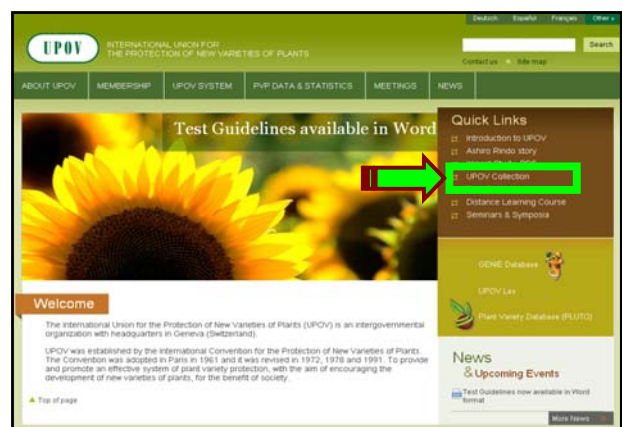
Technical considerations

- Reliability and robustness of techniques
- Accessibility of the technology
- Harmonization of methodologies
- Cost of examination
- Implications for breeders (e.g. cost and time involved for new uniformity requirements)

Harmonized approach

Harmonization

- ⇒ facilitates cooperation in DUS testing
e.g. purchase of DUS reports
- ⇒ internationally recognized variety descriptions (effective protection)



POSSIBLE APPLICATION MODELS

MODELS WITH A POSITIVE ASSESSMENT

- Characteristic-specific molecular markers
- Combining phenotypic and molecular distances in the management of variety collections
- [Calibrated molecular distances in the management of variety collections]

MODELS WITHOUT A POSITIVE ASSESSMENT

- Use of molecular marker characteristics

POSSIBLE APPLICATION MODELS

MODELS WITH A POSITIVE ASSESSMENT



Characteristic-specific molecular markers

- Combining phenotypic and molecular distances in the management of variety collections
- [Calibrated molecular distances in the management of variety collections]

MODELS WITHOUT A POSITIVE ASSESSMENT

- Use of molecular marker characteristics



Model: characteristic-specific molecular markers

Example: gene specific marker for herbicide tolerance introduced by genetic modification

View of the BMT Review Group, Technical Committee, Administrative and Legal Committee:

on the basis of the assumptions in the proposal, acceptable within the terms of the UPOV Convention and would not undermine the effectiveness of protection offered under the UPOV system



Model: characteristic-specific molecular markers

Assumptions for a gene specific marker:

- DUS examination:** same no. of plants, growing cycles, DUS criteria;
- Linkage:** ensure that the marker is a reliable predictor;
- Different markers** for same gene would be treated as different methods for examining the **same characteristic**;
- Different genes** would be treated as different methods for examining the **same characteristic**;
- Different markers** linked to **different regulatory elements** for the **same gene** would all be treated as different methods for examining the **same characteristic**.

matter for the relevant authority to consider if the assumptions are met

POSSIBLE APPLICATION MODELS

MODELS WITH A POSITIVE ASSESSMENT

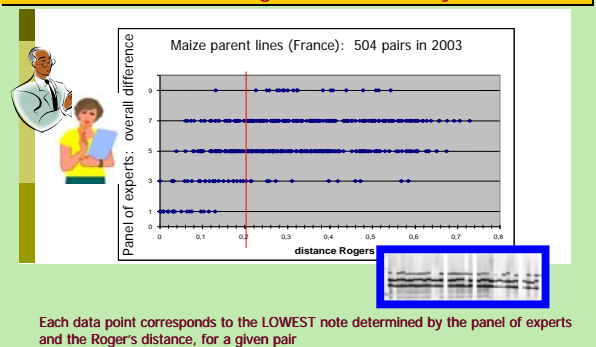
- Characteristic-specific molecular markers
- Combining phenotypic and molecular distances in the management of variety collections
- [Calibrated molecular distances in the management of variety collections]

MODELS WITHOUT A POSITIVE ASSESSMENT

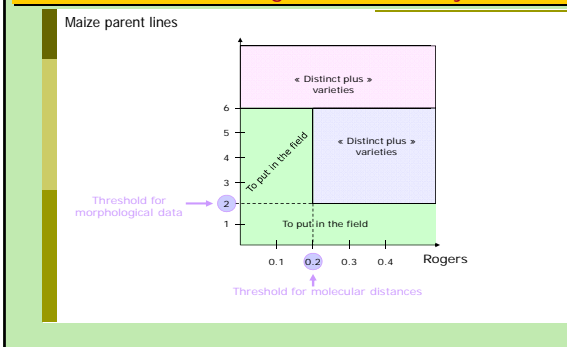
- Use of molecular marker characteristics



Model: Combining phenotypic and molecular distances in the management of variety collections



Model: Combining phenotypic and molecular distances in the management of variety collections



Model: Combining phenotypic and molecular distances in the management of variety collections



Example: maize parental lines

View of the BMT Review Group, Technical Committee, Administrative and Legal Committee:

where used for the management of variety collections, was acceptable within the terms of the UPOV Convention and would not undermine the effectiveness of protection offered under the UPOV system

POSSIBLE APPLICATION MODELS

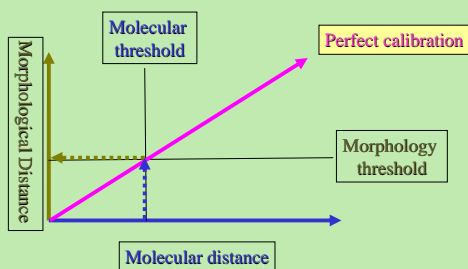
MODELS WITH A POSITIVE ASSESSMENT

- Characteristic-specific molecular markers
 - Combining phenotypic and molecular distances in the management of variety collections
- [Calibrated molecular distances in the management of variety collections]

MODELS WITHOUT A POSITIVE ASSESSMENT

- Use of molecular marker characteristics

Model: Calibrated molecular distances in the management of variety collections



Model: Calibrated molecular distances in the management of variety collections

View of the BMT Review Group, Technical Committee, Administrative and Legal Committee:

where used for the management of reference collections was, on the basis of the assumptions in the proposals, acceptable within the terms of the UPOV Convention and would not undermine the effectiveness of protection offered under the UPOV system

whilst recognizing the need to improve the relationship between morphological and molecular distances

Model: Calibrated molecular distances in the management of variety collections

Assumptions for calibration of threshold levels :

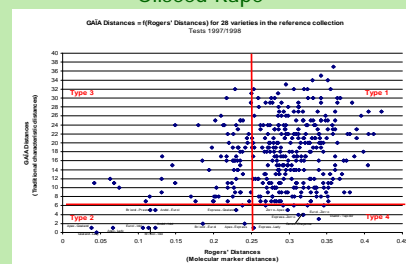
- Uniformity and Stability:**
 - [molecular] differences calculated between varieties **take into account the variation within varieties**;
 - suitable uniformity standards could be developed for molecular markers **without requiring varieties, in general, to be more uniform**
- would only be used for the establishment of a "Distinctness plus" threshold in the management of reference collections;
- would meet all the normal requirements for any characteristic to be used in the DUS examination and, in particular, would be checked to ensure they are **sufficiently consistent and repeatable**.


matter for the relevant authority to consider if the assumptions are met

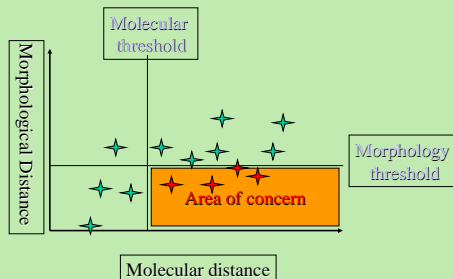
Model: Calibrated molecular distances in the management of variety collections


Example: ?

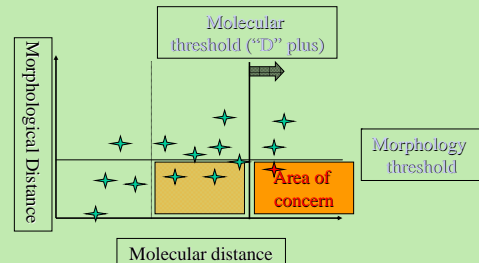
Oilseed Rape



 **Model: Calibrated molecular distances in the management of variety collections**
Example: ?



 **Model: Calibrated molecular distances in the management of variety collections**
Example: ?



POSSIBLE APPLICATION MODELS

MODELS WITH A POSITIVE ASSESSMENT

- Characteristic-specific molecular markers
- Combining phenotypic and molecular distances in the management of variety collections
- [Calibrated molecular distances in the management of variety collections]

MODELS WITHOUT A POSITIVE ASSESSMENT

- Use of molecular marker characteristics

Model: Use of molecular marker characteristics

View of the BMT Review Group, Technical Committee, Administrative and Legal Committee:

- no consensus on the acceptability of the Option 3 proposals within the terms of the UPOV Convention and no consensus on whether they would undermine the effectiveness of protection offered under the UPOV system.
- concerns were raised that, in these proposals, using this approach, it might be possible to use a limitless number of markers to find differences between varieties. The concern was also raised that differences would be found at the genetic level which were not reflected in morphological characteristics




Harmonized approach

Harmonization

- ⇒ facilitates cooperation in DUS testing
e.g. purchase of DUS reports
- ⇒ internationally recognized variety descriptions (effective protection)

POSSIBLE APPLICATION MODELS

MODELS WITH A POSITIVE ASSESSMENT

-  Characteristic-specific molecular markers
-  Combining phenotypic and molecular distances in the management of variety collections
-  [Calibrated molecular distances in the management of variety collections]

MODELS WITHOUT A POSITIVE ASSESSMENT

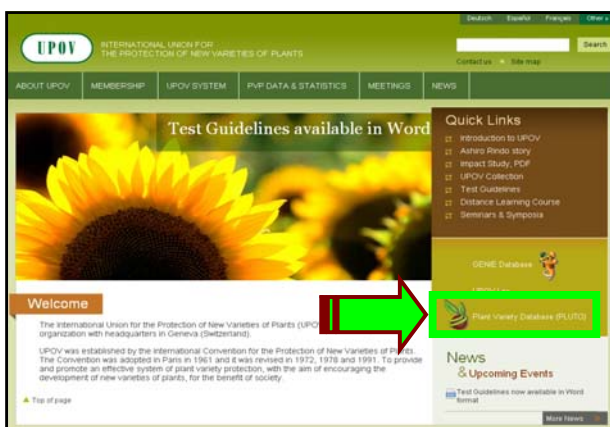
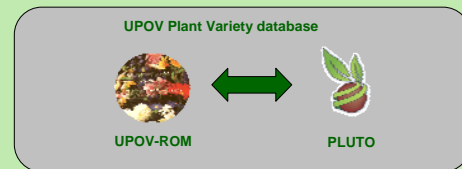
- Use of molecular marker characteristics

5. UPOV DATABASES

Article 20 of the 1991 Act (Variety denominations)

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

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



GENIE Database (Genus / species)



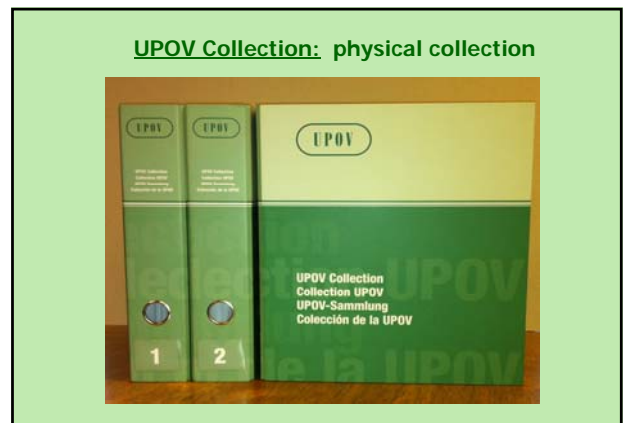
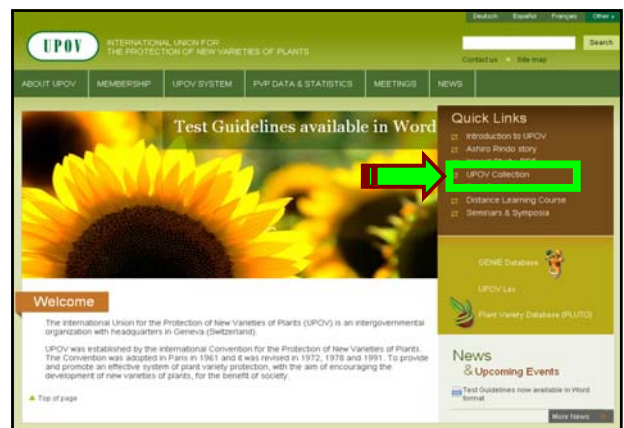
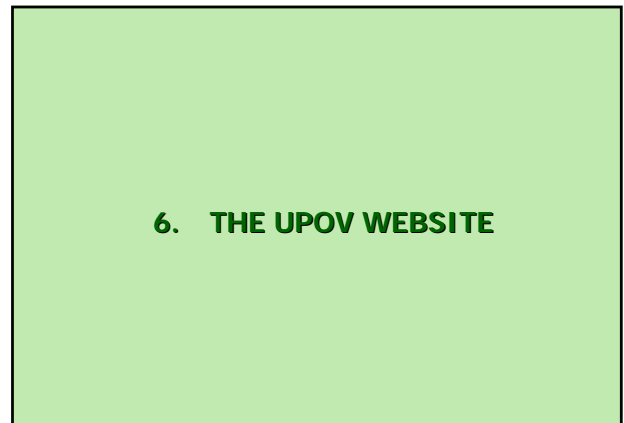
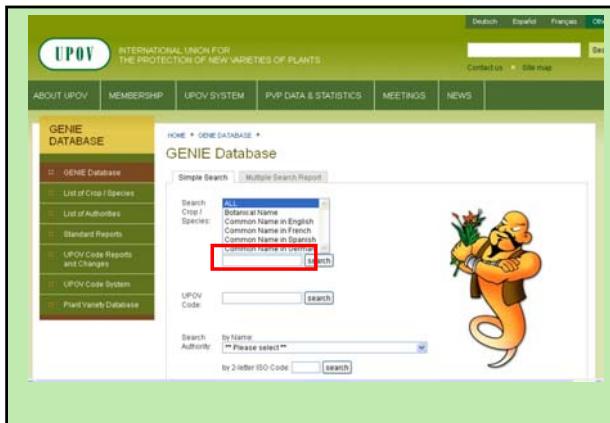
GENIE Database



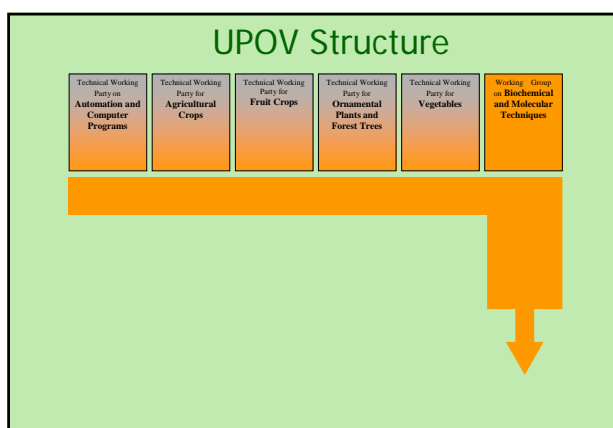
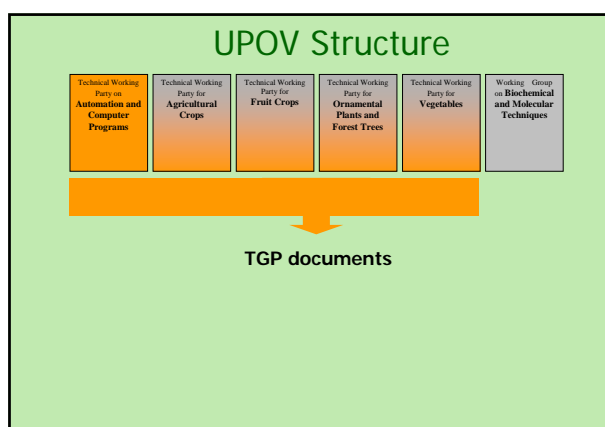
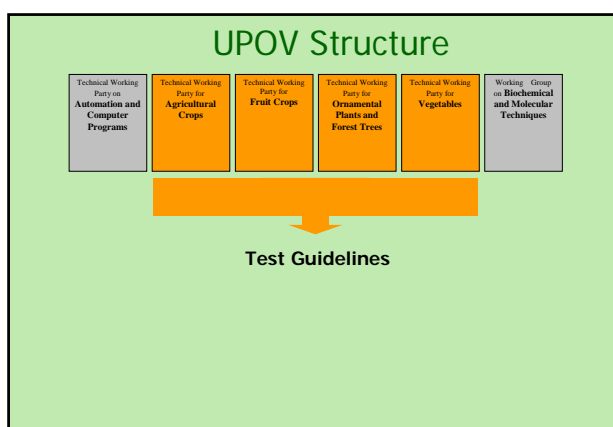
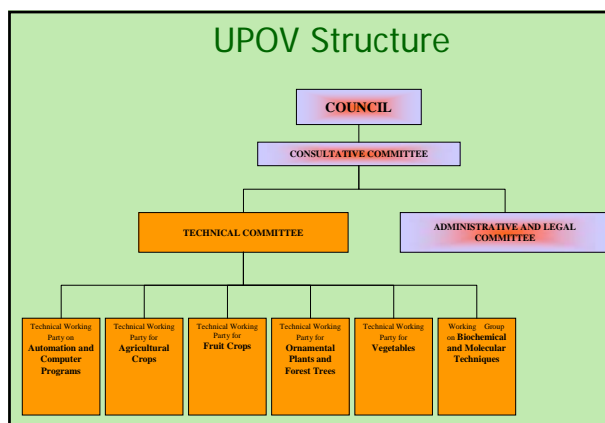
Variety denomination related information
Protection offered by UPOV members

DUS information

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



7. ROLE OF THE TECHNICAL WORKING PARTIES AND THE BMT



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.

8. AGENDA
for the
TWP Session

| Example TWP Session | | | | | | | | | |
|---------------------------------|--|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|---|------------------------------------|--|
| Sunday | Monday | | Tuesday | | Wednesday | | Thursday | | Friday |
| [TECHNICAL WORKSHOP] (optional) | Reports on developments in PVP | | TOP document development | | TOP 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 | | TOP document development | | Room.1 Test Guidelines subgroup | Room.2 Test Guidelines subgroup | Uniformity method development | | Recommendations on Test Guidelines |
| PREPARATORY WORKSHOP | LUNCH | | LUNCH | | LUNCH | | LUNCH | | LUNCH |
| | 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 | | |
| 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 | END OF SESSION |
| | Continuation | | RECEPTION | | | | Continuation | | |

EXCHANGING INFORMATION

| Example TWP Session | | | | | | | | | | |
|------------------------------------|--|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|---|------------------------------------|--|--------------------------------------|
| Sunday | Monday | | Tuesday | | Wednesday | | Thursday | | Friday | |
| [TECHNICAL WORKSHOP] (optional) | Reports on developments in PVP | | TOP document development | | TOP 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 | | TOP document development | | Room.1 Test Guidelines subgroup | Room.2 Test Guidelines subgroup | Uniformity method development | | Recommendations on Test Guidelines | |
| 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 | | |
| 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 | END OF SESSION |
| | COFFEE | | COFFEE | | | | | COFFEE | | |
| | Continuation | | RECEPTION | | | Continuation | | | | |

AN OPPORTUNITY
for
TRAINING

Example TWP Session

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

TWP Venues

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

8. FEEDBACK

THANK YOU