



TC/37/10

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DRAFT TPG/7: “DEVELOPMENT OF TEST GUIDELINES”

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INTRODUCTION

1. The purpose of this document is to provide guidance on the development of standardized UPOV Test Guidelines and it is aimed at the drafters of UPOV and National Test Guidelines. UPOV has prepared, as Annex I, a standard template “TG/Template” as the starting point for the development of Test Guidelines.
2. The TG/Template contains the minimum standard wording, which is appropriate for all Test Guidelines. Drafters of Test Guidelines should start with the TG/Template (Annex I) and refer to the detailed guidance (Prefixed with “*Guidance:*”) set out below where this is indicated in TG/Template. In this way, the template can be completed or further elaborated, according to the circumstances of the varieties to be covered by the particular Test Guidelines. Additional standard wording (Prefixed with “*Standard wording...*”) in this document is marked between “...” and can be copied directly into the Test Guidelines where it is appropriate. The section numbering in this document coincides with the numbering in the template document “TG/Template” for ease of reference. It should be noted that the TG/Template standard wording is not reproduced in the sections below.
3. The standard wording is preferred, wherever possible, because this greatly reduces the editorial work in considering Test Guidelines. For example, certain terms have already been translated into all the UPOV languages in an agreed way and the original reference texts are more likely to be available to UPOV users. If standard wording is not used in Test Guidelines it will be highlighted by a # symbol to alert the Technical Working Party, Editorial Committee and Technical Committee accordingly and perhaps lead to the extension or modification of this document. **[Note: this will only come into operation with the electronic version of TG/Template]**
4. In cases where specific standard wording is not provided, drafters should refer to Annex II which provides some other recognized UPOV terms. It should be noted that, in general, the use of abbreviations should be avoided in drafting Test Guidelines.
5. The individual Test Guidelines are prepared in a number of Technical Working Parties specialized in different types of plants (Agricultural Crops, Fruit Crops, Ornamental Plants and Forest Trees, Vegetables). Once completed, the draft is sent for comments to the international professional organizations and to important institutions working in the field of the species concerned. On the basis of the comments received, the Draft Test Guidelines are finalized by the Technical Working Party concerned and presented to the Technical Committee for final adoption and publication. Details of the process for introducing or revising Test Guidelines are set out in Annex III. Document TGP/2 contains a list of all Test Guidelines adopted by UPOV.
6. This document is, hereafter, set out in the order of the title page and ten chapters corresponding to those found in TG/Template (Annex I). **At this point readers should go to TG/Template as the starting point and refer to the following text where advised in the TG/Template.**

TITLE PAGE

Main Common Name:	<i>Guidance:</i> To be presented in all UPOV languages (bold capital letters)
[Types of] Latin Name:	<i>Guidance:</i> [types of] section to be completed where the coverage of the Latin name is wider than the coverage of the Test Guidelines (Latin name in italics)
UPOV Code:	<i>Guidance:</i> (To be developed)
Alternative Latin Names:	<i>Guidance:</i> All known alternative Latin names to be presented (using UPOV code when established)
Alternative Common Names:	<i>Guidance:</i> All well-known alternative common names, in UPOV languages, to be presented (using UPOV code when established)

1. SUBJECT OF THESE GUIDELINES

Standard wording:

“These Test Guidelines apply to all varieties of [insert “UPOV Code; [types of] [Latin name]”” – as specified on the title page.

Guidance: In some cases it is also considered helpful to identify the family (not in italics).

Guidance: Separate Test Guidelines are usually drawn up for each species. It may however be considered necessary to include two or more species, a whole genus or even a larger unit in one Test Guidelines document. Alternatively, different groups inside a species can be dealt with in different Test Guidelines if they can be clearly separated, either botanically or by other clear grouping characteristics.

Standard wording where appropriate:

“Basis for Differentiating Varieties of the Same Species Not Covered by These Test Guidelines”

Guidance: The Test Guidelines should state the basis for differentiating varieties of the same species not covered by these Test Guidelines.

[Standard wording for different options may be developed.]

Standard wording where appropriate:

“Basis for Differentiating Varieties Covered by Different Sets of Example Varieties”

Guidance: The Test Guidelines should explain characteristics which allow distinctness for varieties covered by the different sets of example varieties (e.g. Winter/Spring) or should state if there is a possibility of overlap i.e. some varieties which need to be considered for distinctness against varieties covered by different sets of example varieties.

[Standard wording for different options may be developed.]

2. MATERIAL REQUIRED

2.1

2.2 *Guidance:* This should specify in what form the material should be provided e.g. seed, cuttings etc...

[List of standard possibilities to be developed]

2.3 *Guidance:* The formula should be presented in full, as in the table, to ensure transparency of the basis for determining the quantity of material required.

Guidance: The thousand seed weight should be that provided by ISTA, where possible, and the maximum thousand seed weight should be used where a range is given.

2.4 *Standard wording where appropriate:*

(a) Germination capacity of seed

“The germination capacity of the seed should be sufficient for the conduct of a satisfactory examination of the variety and for satisfactory storage of a reference sample.”

(b) Health of submitted material

“In particular, the submitted plant material must be free from [insert as appropriate]”.

2.5

3. CONDUCT OF TESTS

3.1 *Guidance:* Refer to TG/1/3 [ref.] (currently document TC/37/9, Chapter 5.3.3.1) for general guidance and to Test Guidelines covering similar types of varieties.

[Further, more detailed guidelines may be developed.]

3.2

3.3 *Standard wording:*

“Each test should include a total of [x] plants which should be divided between [y] replicates.”

[Guidelines to be developed]

3.4

4. METHODS AND OBSERVATIONS

4.1 Number of Plants / Parts of Plants to be Examined by Measuring, Weighing or Counting

4.1.1 *Standard wording:*

“Unless otherwise indicated, all observations determined by measurement, weighing or counting should be made on [x] plants or [y] parts taken from each of [x] plants.”

[Guidelines to be developed]

4.1.2

4.2 Distinctness

4.2.1 Consistency:

Standard wording:

“It is generally recommended that the growing trials are conducted over [x] growing cycle(s) **[as specified in 3.1]** to ensure that any differences in a characteristic are consistent.”

Standard wording where appropriate:

“In the case of **[e.g. disease resistance test]** it is recommended that the characteristic(s) should be examined.” **[Standard wording options to be developed]**

4.2.2 Clear differences:

4.2.2.1 *Standard wording where appropriate:* for Test Guidelines covering hybrid varieties:

“TG/1/3 [ref] [currently document TC/37/9, Chapter 5.3.3.2] sets out guidance for the possible use of parental formulae in the examination of DUS of hybrid varieties.”

4.2.2.2 *Standard wording where appropriate:* The following wording (a)/(b) should be used as appropriate for the Test Guidelines concerned:

(a) [In cases where there is very little variation within varieties]

“Guidance on the interpretation of the observations for the assessment of distinctness without the application of statistical methods is provided in TG/1/3 [ref] [currently document TC/37/9, Chapter 5.4]”

(b) “Guidance on the interpretation of the observations for the assessment of distinctness with the application of statistical methods is provided in TG/1/3 Chapter [ref.. – currently Chapter 5.5 of document TC/37/9].”

Standard wording where appropriate: where measured characteristics are included in the Test Guidelines:

(i) “Self-Pollinated and Vegetatively Propagated Varieties

Varieties can be considered clearly distinguishable if the difference between them exceeds the Least Significant Difference (LSD) at a probability level of [x] with the same sign over a period of [y], even if they are described by the same state of expression.”

[Guidelines to be produced in TGP/9 “Examining Distinctness]

(ii) “Cross-Pollinated Varieties

[Standard wording to be developed and guidelines to be produced in TGP/9 “Examining Distinctness”]”

4.3 Uniformity

Standard wording where appropriate:

(a) Self-Pollinated and Vegetatively Propagated Varieties

“The acceptable number of off-types tolerated in a sample size of **[number specified in section 4.1 of Test Guidelines]** is [x] on the basis of a population standard of [y] and an acceptance probability of [z].” **[Guidance to be developed in TGP/10]**

(b) Cross-Pollinated Varieties

“In the case of measured characteristics the COYU relative uniformity standard is [x].” **[Guidance to be developed in TGP/10]**

(c) Hybrid Varieties

“Single-Cross Hybrid Varieties Resulting from Inbred Parent Lines

The acceptable number of off-types tolerated is [x] on the basis of a population standard of [y] and an acceptance probability of [z]. **[Guidance to be developed in TGP/10.]**

An additional tolerance for the occurrence of self-pollinated inbred parent plants in a sample size of **[number specified in section 4.1 of Test Guidelines]** is **[u].**”
[Guidance to be developed in TGP/10]

“Single-Cross Hybrid Varieties Not Resulting Exclusively From Inbred Parent Lines

“In the case of measured characteristics the COYU relative uniformity standard is **[x].**”
[Guidance to be developed in TGP/10]

“Multiple-Cross Hybrid Varieties

The uniformity requirements for multiple-cross hybrid varieties are as follows:

- (i) If the heredity of a clear-cut segregating characteristic is known, it is required to behave in the predicted manner.
- (ii) If the heredity of the characteristic is not known, it is treated in the same way as other cross-pollinated varieties, i.e. in the case of measured characteristics the COYU relative uniformity standard is **[x].** **[Guidance to be developed in TGP/10]**
- (iii) An additional tolerance for the occurrence of self-pollinated inbred parent plants in a sample size of **[number specified in section 4.1 of Test Guidelines]** is **[y].**”
[Guidance to be developed in TGP/10]

4.4 Stability

Standard wording where appropriate:

“Hybrid varieties:

The stability of a hybrid variety may also be assessed by examination of the uniformity and stability of its parent lines in addition to the hybrid variety itself.”

Further guidance on the examination of stability may be considered in document TGP/11, “Examining Stability.”

Standard wording where appropriate:

“4.5 Timing of Observation of Clustered Characteristics

All observations on the **[flowers, fruit etc..]** should be made **[at the time of full opening etc...].**” **[Guidance to be developed]**

Standard wording where appropriate:

“4.6 Observation of Color”

“4.6.1 Visual Observation by Eye

Because daylight varies, color determinations made against a colour 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 British Standard 950, Part I. These determinations should be made with the plant part placed against a white background.”

“4.6.2 Observation by Colorimeter

[To be drafted]”

5. GROUPING OF VARIETIES IN THE GROWING TRIAL

5.1

5.2

5.3 *Guidance:* Provide the following information to be obtained from the table of characteristics

Standard wording:

[Characteristic number] [Heading of Characteristic]

Guidance: These characteristics must satisfy the criteria for Grouping Characteristics set out in TG/1/3 [ref] [currently Chapter 4.8 of document TC/37/9]

6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS

6.1 Categories of Characteristics Included in the Table of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Guidance: These characteristics must satisfy the criteria for Standard Test Guidelines Characteristics set out in TG/1/3 [ref] [currently Chapter 4.8 of document TC/37/9]

6.1.2 Asterisked Characteristics

Guidance: These characteristics must satisfy the criteria for Asterisked Characteristics set out in TG/1/3 [ref] [currently Chapter 4.8 of document TC/37/9]

6.1.3 Grouping Characteristics

6.2 States of Expression and Corresponding Notes

6.3 Types of Expression

6.4 Example Varieties

Guidance: [guidelines to be developed on when to establish different sets of example varieties and how to format the TG's to provide separate sets of example varieties]

Guidance: For quantitative characteristics, example varieties should—as far as possible—be given, at least for a few states of expression (e.g. 3, 5, 7). The minimum requirement is that states 3, 5, 7 should be indicated in the Test Guidelines but if it is required to list example varieties for one or both extremes, then states 1, 3, 5, 7 or 3, 5, 7, 9 or 1, 3, 5, 7, 9 are to be indicated. Experts very seldom decide to include example varieties for even states as well but in this case the full range of states 1, 2, 3, 4, 5, 6, 7, 8, 9 should be listed.

6.5 Legend:

7. TABLE OF CHARACTERISTICS

Box 1

Line 1 *Guidance:*

Sequential number of characteristic: 1, 2, 3.....

The order of characteristics should be as follows:

(a) Botanical order: The characteristics in the Table of Characteristics should follow the botanical order as follows: grain (seed submitted), seedling, plant (e.g. growth habit), root, root system or other subterranean organs, stem, leaf (blade, petiole, stipule), inflorescence, flower (calyx, sepal, corolla, petal, stamen, pistil), fruit, grain (harvested). This order may, however, be applied with some flexibility. If considered useful by the experts, a characteristic of a part of a higher organ may be connected with other characteristics of the lower organ, if appropriate. Therefore, the characteristic: “Flower; number of petals” could be placed, if so desired, next to other characteristics of the petal and not necessarily next to other characteristics of the flower, or it may even follow the chronological order of recording.

(b) Order of suborgans inside an organ: The order normally starts with characteristics of the whole organ followed by those of its parts (e.g. base, margin) followed by suborgans starting with the larger parts and followed by

smaller parts (e.g. inflorescence, flower, stamen, anther, pollen or starting with the outer/lower parts followed by the inner/higher parts (e.g. inflorescence, calyx, corolla)).

(c) Exceptions: In cases where all units of a suborgan are concerned, which would be in reality a characteristic of the next higher organ (e.g.: Flower: arrangement of petals; flower: number of styles), it would normally be placed before the characteristics of the suborgans. It could, however, remain together with the characteristics of the suborgan concerned (e.g.: “Flower: arrangement of petals” could remain together with the other characteristics on the petal and “Flower; number of styles” could remain together with the other characteristics on the styles).

(d) Order of type of observation: Within the above order, the following subdivision has been adopted for the characteristics of the plant as a whole or the various organs of the plant: attitude, height, length, width, size, shape, color, other details (such as surface, etc., and individual parts of the organ such as base, apex and margin).

Line 2 Type of characteristic: (-), (*), (G)

Guidance: See Chapter 6.1

Line 3	Type of expression of characteristic	(QL), (PQ), (QN)
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Guidance: Guidance is provided in TG/1/3 Chapter [ref] [currently Chapter 4.4 of document TC/37/9] and Part 1 of Annex II.

Line 4 Material to be examined: (A), (B), (C)

Line 5 Method of observation: (M), (VG), (VS)

Guidance: [this must be categorized according to the method for examining D and U by statistical methods – i.e. counting, measuring, weighing - guidance to be provided by TWC]

Box 2

Box 3

Guidance: Description of characteristic in appropriate language according to following format:

Heading of a characteristic: A characteristic normally starts by mentioning the plant or, alternatively, the plant part (organ) concerned, followed, after a colon, by the organ or, alternatively, the suborgan or the specialty to be observed (e.g. “Plant: number of flowers” or “Flower: width of petal” or “Petal: color of margin.” The heading of a characteristic should be worded precisely and, if possible, be self-contained to be understood and clear without the knowledge of

the states. The states should also be made more easily understood without the full text of the characteristic, irrespective of whether the overall text of the characteristic may appear inelegant from a purely linguistic point of view. For example, the word “presence of” or “intensity of” could be added, even if the first state would read “absent” or “absent or very weak”. This applies particularly to cases where not only the absence/presence is to be listed as a characteristic but where a number of criteria are of importance with regard to a single organ, such as number, size, length, width, density, color, etc.. In the case of two or more characteristics where there is only one difference (e.g. lower or upper side of blade) to be observed, the part that differs should be underlined (e.g. “lower side”, or “upper side”).

Splitting a characteristic: Characteristics should be split into two or more characteristics where this is helpful and in particular, because of the rules on distinctness, where it is possible to identify a separate qualitative characteristic. It is essential that independent characteristics should be split to avoid confusion. For example, in Pea, marbling and anthocyanin spotting of the testa should be separated.

Standard terms: Annex II, Part 2, provides a list of standardized terms which should be used for the specified types of characteristic. If a standardized term is not used in this part of the table it will be highlighted by a # symbol to alert the TWP, Editorial Committee and TC accordingly and perhaps lead to the extension or modification of Annex II. **[Note: this will only come into operation with the electronic version of TG/Template]**

Order of states of expression inside a characteristic: Insofar as it is possible to impose an order on the expressions inside a characteristic, the smaller, lesser or lower expressions should be assigned the lower Note. The order of states should as far as possible be:

- from weak to strong,
- from light to dark ,
- from low to high,
- from narrow to broad.

In the case of colors the chronological appearance of the color (e.g. as the fruit ripens) may also be used. The same sequence should be used for organs with similar states within a single document (e.g. color of leaf and color of stem).

In the case of shape characteristics the order should as a general rule be from the lesser expression to the higher or greater expression. Shapes of apex should go from pointed to rounded or from raised to depressed.

Absence/presence: In characteristics with the states “absent, present” “absent” means total absence on all plants, e.g. of asymmetric leaves, “present” means some leaves on a plant are affected.

Repetitions of words inside states: Instead of repeating a word in the states, it should be used only once after the wording of the heading of the characteristics, e.g. instead of “Leaf blade: color of upper side: light green (3), medium green

(5), dark green (7) it should read “Leaf blade: green color of upper side: light (3), medium (5), dark (7).”

Hyphen (-): In the English wording there should be no hyphen for the connection of the words (narrow acute, yellowish green, greenish yellow, etc.). In English yellow - green with a space before and after the hyphen would mean yellow to green while yellow-green without spaces would mean yellowish green. This differentiation cannot be made in other languages and, to avoid confusion in translation into other languages, hyphens should not be used.

Numbers: Numbers lower than 10 should be spelled out. Higher numbers should be indicated numerically.

Box 4

Guidance: See section 6.4 in both this and TG/Template (Annex I) for guidance

Guidance: For quantitative characteristics, example varieties should—as far as possible—be given, at least for a few states of expression (e.g. 3, 5, 7).

Box 5

Guidance: The format of notes for the states of expression of a characteristic is, in general, related to the type of expression of the characteristic, i.e. whether it is a qualitative, quantitative or pseudo-qualitative characteristic. There is no absolutely rigid rule but the aim is to provide some consistency in the approach to the wide range of characteristics and varieties which are covered by UPOV Test Guidelines. The following guidelines are developed on this basis:

Qualitative characteristics

The states are given Notes (numbers) starting with one, except in the case of ploidy, where—in order to avoid confusion—the number of chromosome sets is accepted as the Note (e.g. diploid (2), tetraploid (4)).

Qualitative characteristics are presented by consecutive numbers according to the state, starting with Note 1 and often with no upper limit, for example:

<u>Plant: sex</u>	<u>Note</u>
dioecious female	(1)
dioecious male	(2)
monoecious unisexual	(3)
monoecious hermaphrodite	(4)

In alternative observations, where there is a clear-cut separation between complete absence and presence, the state “absent” is given by Note 1 and the state “present” Note 9. This is a special form of a truly qualitative characteristic and should only be used in cases where a clear, genetically based absence can be observed. If in a

characteristic it is necessary to make a distinction between complete absence and different degrees of presence, the characteristic is split into an alternative (qualitative) characteristic with the states “absent (1)” and “present (9)” and a quantitative characteristic with Notes from 1 to 9 (see quantitative characteristics below).

Quantitative characteristics

As a general rule, states are formed in such a way that for the weak and strong expressions a reasonable word pair is chosen, for example:

weak/strong
short/long
small/large

These word pairs are given Notes 3 and 7 and the intermediate state Note 5. The remaining states of the scale using Notes 1 to 9 are formed according to the following example:

<u>State</u>	<u>Note</u>
very weak	(1)
very weak to weak	(2)
weak	(3)
weak to medium	(4)
medium	(5)
medium to strong	(6)
strong	(7)
strong to very strong	(8)
very strong	(9)

In all cases of quantitative characteristics the full scale 1, 2, 3, 4, 5, 6, 7, 8, 9 is applicable, with the intermediate (“medium”) state in the middle. However, for the practical purposes of presentation, only Notes 3, 5, 7 or 1, 3, 5, 7 or 3, 5, 7, 9 or 1, 3, 5, 7, 9 are indicated in the Test Guidelines to cover the range of the well known variety collection in the genus or species concerned. In all cases, however, the full quantitative scale (1 to 9) is applicable. Experts very seldom decide to include example varieties for even states as well but in this case the full range of states 1, 2, 3, 4, 5, 6, 7, 8, 9 is listed. For cases where the total of possible differences is small, it is also acceptable to list only a limited section of the full range, such as 4, 5, 6, provided that the symmetry is maintained. This situation does, however, not occur often.

Usually the use of Notes 3, 5 and 7 is sufficient to indicate that the whole 1 to 9 scale is applicable, therefore it makes no difference whether a certain state is mentioned or not. Additional states are only given if additional information on example varieties is needed. The allocation of Note 1 does not require a mention of Note 9 for symmetry or vice versa. However, in cases with an unclear “absence”, state 1 (e.g. “absent or very weak”) should always be indicated.

For those characteristics where it is not possible to make a clear-cut distinction between “absent” and “very weak,” Note 1 denotes “absent or very weak” and then represents the first state in the 1 to 9 scale for quantitative characteristics.

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. (*extract from document TC/37/9*)

8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

9. LITERATURE

[Guidelines to be developed]

10. TECHNICAL QUESTIONNAIRE

1. Subject of the Technical Questionnaire

1.1 *Latin Name* [Guidance: Provide same details as in TGP/7: 1.1]

1.2 Common Name [Guidance: Provide same details as in TGP/7: 1.1]

2. Applicant

3. Proposed denomination or breeder's reference

4. Information on the origin and propagation of the variety

4.1 Origin

4.2 Method of Propagation

(a) Seed

- (i) Self-pollinated
- (ii) Cross-pollinated
- (iii) Hybrid

Standard wording where appropriate:

Where there are hybrid varieties the following text can be used:

“In the case of hybrid varieties the production scheme for the hybrid should be provided on a separate sheet. This should provide details of all the lines required for propagating the hybrid e.g.

Single Hybrid (SH)

(....female parent....) x (...male parent....)

Three-Way Hybrid (3WH)

(....female line) x (...male line....)

=> single hybrid used as female parent x (....male parent....)

and should identify in particular:

- Any male sterile lines
- Maintainers of male sterile lines”

(b) Vegetative Propagation

5.

Characteristics

Example Varieties

Note

Guidance: Reproduce details from table of characteristics

Guidance: **Only characteristics which are identified as grouping characteristics should be included in this section.**

6. Similar varieties and differences from these varieties

7. Additional information

7.1 Additional characteristics which may help to distinguish the variety

7.2 Special conditions for the examination of the variety

7.3 Other information

Standard wording where appropriate:

In the case of fruit and ornamental varieties the following text is inserted:

“A representative color photograph of the variety should accompany the Technical Questionnaire.”

Guidance: This can be used to identify certain aspects such as:

- Type of use (e.g. cut flower)
-

8. Authorization for release

9. Declaration of suitability of material for DUS examination

[Annex I follows]

TC/37/10

ANNEX I

TG/Template

See separate document “TC-37-10-Annex I(e).doc” for draft TG template.

[Annex II follows]

ANNEX II

Standardized UPOV Terms and Explanations

- Part 1: Examples of Types of Expression (Qualitative, Quantitative and Pseudo-Qualitative) of Characteristics – to be developed from document TWF/28/7.
- Part 2: Harmonized States of Expression and Notes of Characteristics – to be based on document TC/33/9 “Harmonization of States of Expression and Notes of Characteristics appearing in the UPOV Test Guidelines”

[Annex III follows]

ANNEX III

Procedure for the Introduction and Revision of Test Guidelines

To be developed by the Technical Working Parties during their meetings in 2001.

[End of document]