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DRAFT
REVISED WORKING DOCUMENT FOR A NEW
GENERAL INTRODUCTION TO THE EXAMINATION OF DISTINCTNESS,
UNIFORMITY AND STABILITY IN NEW VARIETIES OF PLANTS

prepared by the Office of the Union from comments
received on document TC/36/8 during meetings of the Technical Working Parties
and the forty-second session of the Administrative and Legal Committee

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1. INTRODUCTION
[NEW TEXT – old text is reproduced at the end of document TC/36/10(b) – revisions marked]

1. According to Article 7 of the 1961/72 and 1978 Acts and Article 12 of the 1991 Act of the UPOV Convention, protection can only be granted in respect of a new plant variety after examination of the variety has shown that it complies with the requirements for protection laid down in these Acts, and in particular, that the variety is distinct (D) from any other commonly known variety and that it is sufficiently uniform (U) and stable (S), or "DUS" in short. The examination generates a description of the variety by which it can be recognized and, therefore, considered for protection. If a variety is granted protection the description of the variety is an important element for providing effective protection. This examination, or "DUS Test," is based mainly on so-called growing tests, carried out by the authority competent for granting plant breeders' rights or by separate institutions, such as public research institutes, acting on behalf of that authority or in some cases on the basis of growing tests carried out by the breeder.

2. The purpose of this document (TG/1/2) and its associated documents (TGP/Ref.) is to identify the principles which are used in the examination of DUS. The identification of these principles ensures that examination of new plant varieties is conducted in a harmonized way throughout the members of UPOV. This harmonization is important because it facilitates cooperation in DUS testing and also helps to provide effective protection through the development of harmonized, internationally recognized descriptions of protected varieties.

3. The only binding obligations on UPOV member States are those contained in the text of the UPOV Convention itself. However, the principles in this General Introduction provide guidance for the examination of all species in accordance with the UPOV Convention and this document is authorized by the Council of UPOV. In addition, starting with important species, UPOV has developed "Guidelines for the Conduct of Tests for Distinctness, Uniformity and Stability," or "Test Guidelines" for many individual species. The purpose of these Test Guidelines is to translate certain of the principles contained in this document into detailed practical guidance for the harmonized examination of DUS and in particular, to identify the most important characteristics for examination of DUS and production of a harmonized variety description. The reputation of the UPOV Test Guidelines is such that they are used as standard reference documents worldwide in relation to the description of plant varieties.

4. The Test Guidelines for individual species are prepared by the appropriate Technical Working Party, composed of government experts from each member State with the added participation of observer experts from other interested States and intergovernmental organizations and experts from nongovernmental organizations. The main international nongovernmental organizations in the field of plant breeding and the seed and plant industries are given the opportunity to comment on the drafts of Test Guidelines before their adoption, thus ensuring that the knowledge and experience of breeders and the seed and plant industries is taken into account. Once developed the Test Guidelines are submitted for approval by the Technical Committee. The list of individual Test Guidelines adopted by UPOV and information on how to obtain copies of all the adopted Test Guidelines in electronic form can be found in document TGP/2 "List of Test Guidelines Adopted by UPOV."

5. This document is the replacement for the previous TG/1/2 “Revised General Introduction to the Guidelines for the Conduct of Tests for Distinctness, Homogeneity and Stability of New Varieties of Plants,” which as the title suggests acted as the introduction to the Test Guidelines , whereas this document seeks to include aspects of DUS testing not addressed within the specific Test Guidelines. Although the Test Guidelines provide detailed practical guidance for the examination of DUS and identify the important characteristics for variety description there are certain aspects for which detailed guidance cannot be provided in such Test Guidelines.

6. The main aspect for which DUS examiners should refer to the basic principles in the General Introduction is for the decision on distinctness because the Test Guidelines are unable to provide detailed recommendations covering all circumstances which may occur in a growing test. This is the consequence of a system which uses characteristics where expression is influenced by environment.

7. However, there are other circumstances where a DUS examiner may need recourse to the basic principles contained in the General Introduction. In particular, the absence of Test Guidelines for the species concerned will obviously lead the DUS examiner to resort to this General Introduction and there is a specific section in the document for this circumstance. The basis for this section is that, in such a circumstance, the DUS examiner should develop a DUS test in the same way as if new Test Guidelines were being developed.

8. The other situation in which a DUS examiner would use the basic principles contained in the General Introduction, rather than following the detailed recommendations of the Test Guidelines, is where circumstances of the DUS examination determine that the recommended approach may not be the most appropriate for a particular set of conditions. The main examples of such a circumstance are where a DUS examiner considers that a particular characteristic contained in the Test Guidelines cannot be properly examined in a particular region, or where the DUS examiner considers that a characteristic which is not included in the Test Guidelines may be appropriate for examination of DUS. In these, or other, circumstances where the Test Guidelines are not followed the DUS examiner must proceed with caution because this may reduce the level of harmonization in DUS examination of that species. To maintain harmonization and reduce the potential risk to the effectiveness of protection for a variety the General Introduction provides guidance on how to proceed in these circumstances.

9. In conclusion, it is important that any DUS examiner is familiar with the principles for DUS examination set out in this document and applies these in conjunction with the appropriate individual Test Guidelines.

10. This document and its associated documents are kept under review by the Technical Committee. Member States of UPOV will automatically receive updates direct from UPOV but details of the current versions of all documents are available on TGP/00 which readers are advised to consult if they are in doubt as to the validity of the documents in their possession.

11. A glossary of technical terms used in this document are also catalogued in TGP/14 “Glossary of Technical, Botanical and Statistical Terms Used in UPOV Documents.”

("RELEVANT SECTIONS OF THE UPOV CONVENTION": -Old Section 2- has been removed. The old text is reproduced at the end of the revisions marked version of this document for reference. This section made specific reference only to the 1991 Act of the UPOV Convention. The references to the relevant Articles of the different Acts will be made in the appropriate sections on Examination, Distinctness, Uniformity and Stability.)

2. THE EXAMINATION OF DISTINCTNESS, UNIFORMITY AND STABILITY ("DUS TESTING")

2.1 Requirement for Examination

12. The UPOV Convention (Article 7(1) of the 1961/72 and 1978 Acts and Article 12 of the 1991 Act) requires that a variety be examined for compliance with the distinctness, uniformity and stability criteria. The 1991 Act of the UPOV Convention clarifies that in the course of this examination the authority may grow the variety or carry out other necessary tests.

2.2 UPOV Test Guidelines as the Basis for DUS Testing

13. Where UPOV has established specific Test Guidelines for a particular genera, species, or other plant group these represent an agreed and harmonized approach for the examination of new varieties and in conjunction with the basic principles contained in the General Introduction, should form the basis of the DUS Test.

14. Where UPOV has not established individual Test Guidelines relevant for the variety to be examined, the examination should be carried out in accordance with the principles in this document and in particular the recommendations contained in Chapter 10 "Conduct of DUS Testing in the Absence of UPOV Test Guidelines." In particular, the recommendations in Chapter 10 are based on the approach that in the absence of Test Guidelines the DUS examiner proceeds as if developing UPOV Test Guidelines.

Explanation

(i) How far the UPOV Test Guidelines are reflected in national practice or national law will depend on the situation in each member State, on its national legislation and on the status that they are given in that legislation. In some States they are no more than guidelines, while in others they have a certain legal force. In most States it is up to the authority responsible for the granting of rights or for the testing of varieties, or the expert responsible for the testing of a given species, to determine how far the UPOV Test Guidelines are actually applied in national tests.

(ii) In practice the UPOV Test Guidelines are taken over in many member States without any change at all (no deletion of characteristics, no addition). In other member States all characteristics with an asterisk and a selection of those without are taken over. As they are not exhaustive, further characteristics may be added.

(iii) Although the UPOV Test Guidelines are only guidelines, they nevertheless play a certain role in court proceedings for infringement, as they represent an internationally agreed official opinion based on the technical knowledge of experts from UPOV member States responsible for plant variety protection and for the testing of the species concerned.

2.3 Design of the Growing Trial and Other Tests

15. The design of the growing trial, or other tests, with regard to aspects such as the number of growing cycles, layout of the trial, number of plants to be examined and method of observation is largely determined by the nature of the species to be examined. Guidance on the design is a key function of the Test Guidelines. Guidance on the development of the Test Guidelines, including the design of the trials and tests, is provided in TGP/7 "Development of Test Guidelines."

2.4 Characteristics as the Basis for Examination of DUS

16. For any variety to be capable of protection it must first be clearly defined. Only after a variety has been defined can it be finally examined to consider if it fulfils all the criteria i.e. distinctness, uniformity and stability to warrant protection. Throughout all Acts of the UPOV Convention it has been established that a variety is defined by its characteristics and that these characteristics are therefore the basis by which the eligibility of a variety for protection can be examined:

17. The 1991 Act of the UPOV Convention makes this clear by stating in Article 1(vi) that a variety is a plant grouping which can be "defined by the expression of the characteristics resulting from a given genotype or combination of genotypes" and which can be "distinguished from any other plant grouping by the expression of at least one of the said characteristics."

18. Further to their use in defining a variety, characteristics are the basis for examining distinctness, uniformity and stability.

19. In the 1961/72 and 1978 Acts of the UPOV Convention, Article 6(1)(a) specifies that distinctness is established by a variety being "clearly distinguishable by one or more important characteristics" and Article 6(1)(d) requires stability in its "essential characteristics." Although the term characteristic is not specified in the criteria for uniformity it is clearly implied that the uniformity requirement relates to the characteristics of the variety given that these are the basis for distinctness and uniformity.

20. In the 1991 Act of the UPOV Convention, Article 8 states that uniformity is assessed on the basis of a variety being "sufficiently uniform in its relevant characteristics" and Article 9 states that a variety is "deemed to be stable if its relevant characteristics remain unchanged." Although the criteria for distinctness (Article 7) do not require a variety to be **clearly** distinguishable using exclusively characteristics the requirements in Article 1(vi) that a variety can only be established where it can "be distinguished from any other plant grouping by the

expression of at least one of the said characteristics..” means that a variety must, at least, be distinguishable by characteristics. The possible use of aspects other than characteristics in examining distinctness, under the 1991 Act of the UPOV Convention, are explored in Chapter 5 (Testing Distinctness).

21. Chapter 4 “Characteristics Used in DUS Testing” considers the various aspects of characteristics for their use in DUS Testing

2.5 Requirements of Material for DUS Testing

2.5.1 Factors Which May Affect the DUS Test

22. The expressions of a characteristic or several characteristics of a variety may be affected by factors such as pests and disease, growth retardants, past effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc. Depending on the circumstances, the testing authority should ensure either that the varieties under test are all free of such factors, or that all varieties under test, including all comparable varieties, are subject to the same factor in a way that the results may be compared with each other. Therefore, many individual Test Guidelines require virus-free material, material not obtained from tissue culture or material of a specific age after grafting. Alternatively, the submitted plant material sent may be used as parent material from which suitable vegetative material is obtained by the national office in order to provide a satisfactory assessment.

2.5.2 Representative Plant Material

23. In principle, the material to be submitted for the assessment of DUS should be representative of the candidate variety as it would be marketed. In the case of varieties with a particular cycle of propagation such as in some seed propagated varieties and especially for cross-pollinated varieties, this means that the material tested should be of the same generation level i.e. the final stage in the cycle of propagation, as that later on placed on the market. If appropriate, for certain types of variety the national authority may make exceptions to that rule.
[OLD 3.4 Comparison with Similar Varieties moved to Distinctness Chapter]

3 COOPERATION IN DUS TESTING

3.1 Cooperation Between Testing Authorities

24. Cooperation with other member States in DUS assessment reduces the overall time, expense and number of examiners involved in the DUS tests and the maintenance of variety collections for each genus or species in which varieties are tested. For details of current international cooperation arrangements *and a model administrative agreement for international cooperation in DUS testing* see document TGP/5 “Experience and Cooperation in DUS Testing.”

25. The ultimate form of international cooperation is a "centralized" testing system where the entire assessment is carried out by one authority on behalf of other member States, regardless of the variety concerned or the applicant. This could be for a specific region, for example, or in the case of glasshouse-tested plants, for most if not all member States.

Explanation

(i) International cooperation often begins as a mere exchange of variety data which may then develop in a more formal bilateral testing agreement. UPOV has prepared a Model Administrative Agreement for International Cooperation in the Testing of Varieties (Section 19 of the UPOV Collection of Important Documents) to facilitate the conclusion of bilateral variety testing agreements. UPOV has also drawn up a model UPOV Report on Technical Examination and UPOV Variety Description (Section 23 of the UPOV Collection).

(ii) Chrysanthemums, for example, are tested in the United Kingdom on behalf of most other member States. South Africa has offered reciprocal facilities for the testing of varieties for some of its indigenous ornamental genera. A great advantage of central testing is that it provides a single basis for decisions on distinctness, uniformity and stability for all varieties of a given genus or species.

(iii) A list of e-mail addresses of technical experts in UPOV member States is available on the Internet site http://www.bioss.sari.ac.uk/links/upov/upemail.html.

3.2 Cooperation with Breeders and Applicants

26. In most countries, variety testing is administered by an official authority, although the breeders participate in the growing tests to varying degrees.

27. Close cooperation with breeders has always been promoted by UPOV, even in the case of member States with a strict system of government-conducted testing. Some member States have a system whereby breeders or applicants are asked to perform the whole test on the basis of prescribed national Test Guidelines or Technical Questionnaires. They make the observations and produce a full test report according to strict technical procedures and the high standards required by UPOV. The decision on DUS is based entirely on the test results supplied by the breeder or applicant, verified by the national authority.

28. UPOV has drawn up a list of conditions for the examination of a variety on the basis of trials carried out by or on behalf of applicants or breeders. Details of the conditions are given in document TGP/6 "DUS Testing by the Applicant/Breeder."

29. Document TGP/6 "DUS Testing by the Applicant/Breeder" also gives useful information on the different possibilities of applicant involvement in the growing tests.

Explanation

(i) The task of those national authorities that choose to conduct the DUS examination themselves, including their own growing tests, is becoming increasingly demanding, especially since their lists of plant species eligible for protection are continually being extended. These lists have been abandoned under the 1991 Act of the UPOV Convention, and varieties of all botanical taxa must be eligible for protection within a period of five or ten years after it comes into effect in a particular State. It is unthinkable for official testing stations to have to provide testing facilities with growing tests for all taxa in which applications may be filed, and member States are increasingly considering the adoption of systems of cooperation with breeders and applicants or with the competent authorities of other States.

(ii) In minor crops with few varieties, where the applicant has had a satisfactory trial with the full range of reference varieties concerned, officials have been able to carry out the observations on the breeder's premises.

4. CHARACTERISTICS USED IN DUS TESTING

4.1 Characteristics as the Basis for DUS Testing

30. The basis of using characteristics for the examination of DUS is explained in Chapter 2.4. The purpose of this chapter is to set out the critical aspects of characteristics and their applications.

4.2 Selection of Characteristics

31. Where UPOV Test Guidelines are in place, the characteristics listed are those considered important for the description of varieties and therefore also for the assessment of DUS.

32. The basic requirements that a characteristic should fulfill before it is used for DUS testing or producing a variety description are that it:

(a) results from a given genotype or combination of genotypes
(this requirement is specified in Article 1(vi) of the 1991 Act of the UPOV Convention but is a basic requirement in all cases);

(b) is sufficiently independent of the environment to produce consistent and repeatable results for uniform and stable varieties

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

(d) is capable of precise definition and recognition
(this requirement is specified in Article 6 of the 1961/72 and 1978 Acts of the UPOV Convention but is a basic requirement in all cases);

(e) allows uniformity requirements to be fulfilled;

(f) allows stability requirements to be fulfilled i.e. it produces consistent and repeatable results after repeated propagation, or where appropriate at the end of each cycle of propagation, for existing varieties;

33. However, it should be noted that there is no requirement for a characteristic to have any intrinsic commercial value.

34. For the inclusion in the Test Guidelines, further criteria are set out below and in document TGP/7 "Development of Test Guidelines." In particular, the Table of Characteristics should include as many characteristics as are, or in the case of a relatively new species or types are considered likely to be, necessary for routine differentiation of the varieties in the countries contributing to the Test Guidelines.

Explanation

Some member States also require that the observation and evaluation of the characteristic should be possible with reasonable effort and expenditure, and that the breeder should be able to keep his variety uniform and stable in those characteristics with reasonable effort.

35. Characteristics in the Test Guidelines are not selected on the basis of their commercial value to a variety. However, if a characteristic which is of commercial value satisfies all the criteria for inclusion it should be included in the normal way.

36. The Tables of Characteristics of the individual Test Guidelines are not exhaustive and could be expanded with additional characteristics if that proves to be useful and the characteristics meet the conditions set out above.

Explanation

Some member States accept a large number of characteristics for description and for DUS testing, which means that the breeder has to make his variety uniform in all those characteristics. Other States may accept a smaller number in order to avoid an unnecessary workload for the breeder (who would have to keep this variety uniform in all of them) but with the attendant risk of it being more difficult to distinguish a candidate variety within that limited number of characteristics.

4.3 States of Expression of Characteristics

37. To enable varieties to be tested and a variety description to be established, characteristics in the UPOV Test Guidelines are subdivided into their different states of expression, or "states" for short, and the wording of each state is followed by a Note. The classification into states of expression will be influenced by the type of expression of the characteristic (see below). To clarify the states of expression of a characteristic, example varieties are mentioned in the UPOV Test Guidelines

4.4 Types of Expression of Characteristics

38. To enable the appropriate use of characteristics in DUS testing it is important to understand the different ways in which characteristics can be expressed. Although all characteristics must result from the genotype, or combination of genotypes, the expression of a characteristic can be influenced to differing extents by environmental conditions. The following section identifies the different types of expression and considers their application in DUS Testing.

4.4.1 Truly Qualitative Characteristics

39. "Truly qualitative characteristics" are those that are expressed in discrete discontinuous states with no arbitrary limit on their number (for instance, sex of plant: dioecious female (1), dioecious male (2), monoecious unisexual (3), monoecious hermaphrodite (4)). These are qualitative characteristics with clear-cut (discrete) discontinuous states of expression, each state being self-explanatory and independently meaningful. Each state is clearly different from the others and as a rule the characteristics are not influenced by environment.

4.4.2 Quantitative Characteristics

40. "Quantitative characteristics" are those whose expression can be recorded on a one-dimensional scale and show continuous variation from one extreme to the other. They are divided into a number of states of expression for the purpose of description. The division is made only for description and not for distinctness purposes. The Test Guidelines do not specify the difference needed for distinctness. The states of expression should, however, be meaningful for DUS assessment.

4.4.3 Pseudo-qualitative Characteristics

41. "Pseudo-qualitative characteristics" are characteristics that do not fit the definition of truly qualitative characteristics, but are treated as qualitative where it is appropriate and practical to disregard continuous variation and the states created are meaningful and sufficiently different from each other (e.g. shape: ovate (1), elliptic (2), round (3), obovate (4), or expression: absent or very weakly expressed (1), weakly expressed (2), strongly expressed (3)).

4.5 Observation of Characteristics

4.5.1 Trial Design

42. In order that comparable and reliable results may be obtained in the various member States, as far as possible and considered useful, recommendations are given for exact plot size,

sample size, number of replications and duration of tests, or at least minimum recommendations are made in the Test Guidelines.

Explanation

It is recommended that, whenever possible, there be agreement on a fixed sample size in order that comparable results may be obtained, rather than on minimum sizes which may be enlarged if the national authority sees fit.

4.5.2 Individual Plant Observations

43. Qualitative characteristics are usually assessed visually, while quantitative characteristics are usually measured. However, a visual assessment or such other sensory observations as may be applicable (such as taste or smell) may under certain conditions be sufficient, especially where measurement is impracticable or can only be made with considerable effort.

4.5.3 Bulk Samples

44. There are specific rules for the handling of characteristics examined in bulk samples which are set out in document TGP/12 “Nontraditional Characteristics and Methods for DUS Testing.”

4.6 Environmental Influence on Characteristics

45. Quantitative characteristics, and in certain special circumstances also qualitative characteristics, may be subject to environmental influences which may modify the expression of genetically controlled differences. Characteristics which are least influenced by environment are preferred. If, in certain cases, the expression of a characteristic has been influenced more than usual by environmental factors, it should not be used for the assessment of DUS.

46. When a fixed scale is used throughout the trials and over a period of years, the influence of environment on the varieties is reflected in the figures.

4.7 Special Characteristics

4.7.1 Characteristics Expressed in Response to External Factors

47. Characteristics based on the response to living organisms (e.g. disease resistance characteristics) or chemicals (e.g. herbicide resistance characteristics), may be used, provided that they can be precisely tested and fulfil on the normal criteria. It is important for these characteristics to be well defined, for an accepted, standardized method to be established for evaluation and for that method to be clearly referred to in a well known publication or to be

included in the Test Guidelines. More details can be found in document TGP/12 "Nontraditional Characteristics and Methods for DUS Testing."

48. Different levels of resistance, for example to a specific disease, are only acceptable as a characteristic for establishing distinctness if the states of expression can be clearly established and the test results are consistent and technically reliable

4.7.2 Chemical Constituents

49. Characteristics based on chemical constituents may be accepted provided they can be precisely tested and fulfil the normal criteria. It is important for these characteristics to be clearly and precisely defined, for an accepted, standardized method to be established for evaluation and for that method to be clearly referred to in a well known publication or to be included in the Test Guidelines. More details can be found in document TGP/12 "Nontraditional Characteristics and Methods for DUS Testing."

4.7.3 Combined Characteristics

50. A combined characteristic is a simple combination of a small number of characteristics. Provided that the combination is biologically meaningful, characteristics that are assessed separately may subsequently be combined, for example the ratio of length to width, to produce such a combined characteristic. Combined characteristics must be examined for distinctness, uniformity and stability to the same extent as all other characteristics. In some cases these combined characteristics are examined by use of sophisticated techniques such as Image Analysis. In these cases the methods for appropriate examination of DUS are specified in TGP/12 "Nontraditional Characteristics and Methods for DUS Testing."

51. Combined characteristics are not to be confused with the application of methods such as multivariate analysis. The potential for use of multivariate analysis is considered in document TGP/12 "Nontraditional Characteristics and Methods for DUS Testing."

4.7.4 Hybrid Formula

52. Document TGP/12 "Nontraditional Characteristics and Methods for DUS Testing" will set out guidance for the possible use of parental formula in the examination of DUS of hybrid varieties.

4.7.5 Nontraditional Characteristics and New Methods of Variety Testing

53. The classical methods of DUS testing are based on traditional morphological and physiological characteristics. In the course of time, however, technology and procedures have been evolving that have broadened the range of characteristics available and offered the potential for more rapid assessment. In view of the increasing number of varieties that need to be distinguished, there has also been an increase in the need for methods that are less influenced by the environment and may thus be more objective. The use of these new

approaches, including the potential for use of molecular characteristics, is set out in document TGP/12 “Nontraditional Characteristics and Methods for DUS Testing.”

4.7.6 Introduction of Additional Characteristics
[see discussions in the CAJ]

54. There may be circumstances in the examination of DUS where the characteristics contained in the Main Table of Characteristics of UPOV Test Guidelines are not sufficient. For example, the Test Guidelines may not contain an important characteristic for distinctness in a particular region because it is not important in other regions or a novel trait may be introduced into a crop.

55. It is important for the continued harmonization of variety examination and description that such characteristics fulfil all the normal criteria and that, if possible, these new or additional characteristics are included in the Test Guidelines at the earliest opportunity, either through a revision of the Main Table of Characteristics, or inclusion in a list of additional characteristics. Further information can be obtained from TGP/7 “Development of Test Guidelines.”

4.8 Functional Categorization of Characteristics

56. The nature of each characteristic determines its scope for use in examination of DUS. The following section categorizes the way in which characteristics can be used in the examination and the appropriate criteria.

Functional Categories of Characteristic

Type	Function	Criteria
Test Guidelines Classification Characteristic	1. To classify varieties of a species into separate Test Guidelines or sub-divisions of Test Guidelines. 2. To create classes of varieties containing varieties which are not compared on an individual basis because, unless a specific provision for overlapping varieties is made, varieties in one class are necessarily distinct from all varieties in another class. 3. To produce separate Test Guidelines or subdivide a Test Guideline **for DUS testing** to apply, for each class of varieties, appropriate: • characteristics • example varieties for each characteristic • ranges of expression for each characteristic • uniformity standards	1. Different classes must be clearly distinguishable by documented description of such characteristics or states of expression of characteristics (either singly or by a combination) and in the case of potential overlapping varieties with a system of addressing the risk of an incorrect decision on distinctness.
Universal Grouping Characteristic	1. To facilitate universal subdivision of varieties into groups or grouping combinations and thereby reduce the number of varieties which require direct comparison in a growing trial but for which the same Test Guidelines are appropriate. 2. To indicate characteristics which can always be used to distinguish varieties from descriptions produced in any location (incl. applicant) at any time.	1. Qualitative or some Pseudo-Qualitative characteristics whose expression is sufficiently independent of environment to permit distinctness by documented description from any MS produced at any time without the need of example varieties to standardize the range of expression. 2. ALL UPOV MS agree to use for grouping (3. Must be a UPOV asterisk characteristic)
Asterisked Characteristic (Universal Grouping + Restricted Grouping (TQ))	1. To indicate characteristics which will always, with very limited exceptions, be included in a variety description by all MS. 2. To indicate characteristics which have the potential to distinguish varieties from documented descriptions produced at the same testing location (in different years) and from documented descriptions produced at different testing locations (incl. applicants), if necessary with a greater margin. 3. Should always be included in the variety description except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible.	1. With sufficient margin, to permit distinctness by documented description, within a single location in different growing cycles and, if necessary, with a wider margin, across different testing locations. 2. ALL UPOV MS agree to inclusion in UPOV Test Guidelines. (3. For Disease Resistance characteristics there must be no objections from breeders' organizations.)

Type	Function	Criteria
Restricted Grouping Characteristic/ UPOV Technical Questionnaire	Same function as asterisked characteristic.	Same function as asterisked characteristic.
Standard Test Guidelines Characteristic	1. To identify characteristics which may be used, if conditions allow, to reliably establish distinctness in most MS. 2. To ensure that, taken together with the other UPOV Test Guidelines characteristics, uniformity is established in a sufficient number of characteristics to facilitate new variety development.	1. Must satisfy, the criteria for use of any characteristic for DUS. 2. Absence, across all MS, of inverted results associated with location or timing. 3. The total number of such characteristics to be sufficient to establish distinctness, where appropriate, for new varieties on a routine basis. 4. Number to be constrained by that required to facilitate future variety development. Priority to be given to those with most discriminating power.
Additional Characteristic	1. To ensure that, as far as possible, where distinctness is not resolved by the Test Guidelines' characteristics the further characteristics selected by a MS have been subject to UPOV consideration to verify their suitability. 2. To ensure harmonization of, as far as possible, all characteristics used for DUS by any MS.	1. Must satisfy the criteria for use of any characteristic for DUS. 2. Absence, across all MS, of inverted results associated with location or timing.
Potential UPOV Characteristic	1. To notify potential new characteristics which may be suitable for UPOV approval or inclusion in future Test Guidelines. 2. To facilitate peer review and harmonization in the development of new characteristics.	1. Must satisfy, in the opinion and experience of the submitting MS, the criteria for use of any characteristic for DUS. 2. Must have been used by a MS for DUS in at least one variety. 3. All MS recommended to submit any characteristic used for DUS subject to confidentiality constraints.

5. EXAMINING DISTINCTNESS

5.1 Requirements of the UPOV Convention

57. According to the UPOV Convention (Article 6 of the 1961/72 and 1978 Acts, and Article 7 of the 1991 Act), to satisfy the requirement of distinctness, a variety must be clearly distinguishable from any other variety whose existence is a matter of common knowledge.

5.2 Varieties of Common Knowledge

5.2.1 Particular Case Established in the UPOV Convention (1991 Act)

58. Article 7 of the 1991 Act of the UPOV Convention specifies that the following is a particular situation which establishes a variety whose existence is a matter of common knowledge:

> "… the filing of an application for the granting of a breeder's right or for the entering of another variety in an official register of varieties, in any country, shall be deemed to render that other variety a matter of common knowledge from the date of the application, provided that the application leads to the granting of a breeder's right or to the entering of the said other variety in the official register of varieties, as the case may be."

5.2.2 Other Varieties Whose Existence is a Matter of Common Knowledge

59. Although the 1991 Act of the UPOV Convention identifies a particular case (see 5.2.1 above) this is not the only case which establishes a variety whose existence is a matter of common knowledge. Key aspects for determining if a variety is indeed a variety and furthermore its existence is a matter of common knowledge are as follows:

5.2.2.1 Criteria for a Variety

60. A variety whose existence is a matter of common knowledge must satisfy the definition of a variety set out in Article 1(vi) of the 1991 Act of the UPOV Convention but is not necessarily required to fulfil the DUS criteria required for grant of a breeder's right under the UPOV Convention.

5.2.2.2 Existence of a Variety

61. Living plant material must be in existence for a variety to be taken into account for distinctness.

5.2.2.3 Common Knowledge

62. Specific aspects which shall be considered to establish common knowledge include, among others:

(a) commercialization of propagating or harvested material of the variety or publishing a detailed description;

(b) the filing of an application for the granting of a breeder's right or for the entering of another variety in an official register of varieties, in any country, shall be deemed to render that other variety a matter of common knowledge from the date of the application, provided that the application leads to the granting of a breeder's right or to the entering of the said other variety in the official register of varieties, as the case may be;

(c) existence of living plant material in publicly accessible plant collections;

(d) varieties included in a collection officially used for examination of applications for plant breeders' rights.

63. Common knowledge is not restricted to national or geographic borders.

5.2.4 Ecotypes and Landraces

64. The "variety" and "common knowledge" criteria apply to any plant material including ecotypes and landraces.

5.2.5 Further information

65. Further developments and a more detailed explanation of the issues related to varieties of common knowledge are to be found in document TGP/3 "Varieties of Common Knowledge."

5.3 Clearly Distinguishing a New Variety

5.3.1 Comparing Varieties

66. A systematic individual comparison may not be required against those varieties of common knowledge which are within a group known to have specific expressions of characteristics reliably ensuring that the variety will be distinct from the candidate variety. Administrative measures to supplement the technical examination may be developed to allow such an approach in some circumstances where there cannot be absolute certainty that a variety will be distinct but where the risk is such that an administrative measure is an appropriate mechanism to cover this risk without jeopardizing the value of protection offered to existing varieties. The circumstances and measures to be taken will be set out in TGP/9 "Examining Distinctness."

Explanation

Examples of characteristics for the reduction of varieties of common knowledge to be considered for the comparison could be that

(i) the varieties come from a different growing environment (e.g. adaptation to different day-length, greenhouse versus open air),

(ii) the varieties have different end uses (starch potato versus potato for human consumption).

67. Where varieties can be further distinguished in a reliable way from a candidate by comparing documented descriptions, it is not necessary to include these in a growing trial with the respective candidate variety. However, where there is no possibility to clearly distinguish them from the candidate variety, the varieties should be compared with the candidate variety in a growing trial or other test. This emphasizes the importance of harmonization of variety descriptions in minimizing the workload of the DUS examiner.

68. A Technical Questionnaire, completed by the applicant and submitted with the application, specifies characteristics of importance for identifying the varieties most similar to the candidate. Where necessary those varieties are grown and directly compared with the candidate.

69. Guidance for the management of variety collections is given in detail in document TGP/4 “Management of Reference Collections.”

5.3.2 Clearly Distinguishing Varieties by their Characteristics

70. As explained in Chapter 2, characteristics are the basis for examining distinctness, uniformity and stability.

71. In the 1961/72 and 1978 Acts of the UPOV Convention, Article 6(1)(a) specifies that distinctness is established by a variety being “clearly distinguishable by one or more important characteristics.” In the 1991 Act of the UPOV Convention, although the criteria for distinctness (Article 7) does not require a variety to be **clearly** distinguishable using exclusively characteristics the requirements in Article 1(vi) that a variety can only be established where it can “be distinguished from any other plant grouping by the expression of at least one of the said characteristics..” means that a variety must, at least, be distinguishable by characteristics. The possible use of aspects other than characteristics in examining distinctness, under the 1991 Act of the UPOV Convention, are explored later in this Chapter.

72. A difference only in the level of uniformity of a characteristic, without any resultant change in the overall expression of the characteristic in the variety, is not a basis for establishing distinctness [see discussions in the CAJ].

5.3.3 The Criteria for Distinctness using Characteristics

73. To ensure that a variety is clearly distinguishable the difference in characteristics must be:

- consistent and
- clear.

5.3.3.1 Consistent Differences

74. The normal means of ensuring a difference in a characteristic observed in a growing trial, or influenced by the environment in a growing trial, is consistent is to conduct the examination over at least two independent growing cycles. It is accepted that a trial grown at the same location in two different seasons represents two independent growing cycles but guidance on the possible use of different approaches, such as two different locations in the same year, is explored in Document TGP/9 "Examining Distinctness."

75. However, in some circumstances the influence of the environment is not such that a second growing cycle is required to ensure that the differences observed between varieties are consistent. For example, in the case of many vegetatively propagated crops the level of uniformity within a variety, or in other words the consistency between individual plants of the same variety, is sufficient to observe that differences between varieties are significantly greater than the variation within a variety and therefore ensure that these are not due to environmental variation. Furthermore, if the growing environment of the crop is consistent, for example in a greenhouse with fixed temperature and light, it may not be necessary to observe two growing cycles to be confident that any differences observed could be considered to be consistent in that environment, although this will also be dependent on the features of propagation also providing such confidence for the consistency of the observation

Explanation

Several member States provide for a second testing place from the outset as a safeguard against extreme weather conditions or other hazards that might make it impossible to collect information on the candidate variety in the given year and thus prolong the test for another year, especially for those species grown in the open.

76. The individual Test Guidelines specify whether several independent growing cycles are required to show sufficient consistency (e.g. several years or in certain cases several independent locations or different independent environments), or whether for certain species the growing test could be made in one growing cycle.

Explanation

For most field crops, vegetables and fruit varieties the UPOV Test Guidelines specify two independent growing cycles. For ornamental varieties for most species one growing cycle is sufficient, especially if the plants are vegetatively

reproduced and grown in a glasshouse under controlled, standardized conditions, as by repeated vegetative propagation they already proved to be stable.

5.3.3.2 Clear Differences

77. Whether a difference between two varieties is clear depends on many factors, and primarily on the type of expression of the characteristic (Chapter 4.4) used to establish distinctness, namely whether it is a truly qualitative characteristic, a quantitative characteristic or a pseudo-qualitative characteristic.

5.3.3.2.1 Truly Qualitative Characteristics

78. In the case of truly qualitative characteristics the difference between two varieties is to be considered clear if the characteristics show expressions that fall into two different states in the Test Guidelines.

Explanation

In truly qualitative characteristics each state is clearly separated from the other without any transition; the minimum distance is therefore always one expression. There are in fact very few truly qualitative characteristics, however.

5.3.3.2.2 Quantitative Characteristics

79. Quantitative characteristics can be either visually observed or measured. Their use in distinctness is addressed later in this chapter, according to the method of observation and type of variety.

5.3.3.2.3 Pseudo-qualitative Characteristics

80. In the case of characteristics treated as qualitative but which are not genuinely qualitative, a possible fluctuation has to be allowed for when establishing distinctness, so a different state in the Test Guidelines may not be sufficient to establish distinctness (see also Chapter 5.2.3.3).

5.4 Interpretation of Observations for the Assessment of Distinctness without the Application of Statistical Methods

81. In many species in which varieties are vegetatively propagated and consequently there is very little variation within each variety, assessments on distinctness are usually made by visual observation and in principle no statistical methods are applied. If in exceptional cases the application of statistics is needed to assess distinctness, statistical methods can be found in document TGP/9 “Examining Distinctness.”

82. For more details on the assessment of distinctness without the application of statistical methods see document TGP/9 “Examining Distinctness.”

5.5 Interpretation of Observations for the Assessment of Distinctness with the Application of Statistical Methods

5.5.1 General

83. For measured characteristics as well as for visually assessed characteristics statistical methods can be applied. Appropriate methods have to be chosen for the interpretation of observations. The data structure and the type of scale from a statistical point of view (nominal, ordinal, interval or ratio) is decisive for the choice of appropriate methods. The data structure depends on the way of assessment (visual assessment or measurements, observation of plots or single plants) which is influenced by the type of characteristic, the species, the experimental design and other factors. Experts should be conscious of certain basic rules of statistics and especially that the use of statistics is linked to mathematical assumptions and usual experimental design practices such as randomization. Therefore these assumptions ought to be verified before applying statistical methods. Some statistical methods are, however, rather robust and can be used with certain precaution even if some assumptions are not fully met.

84. Document TGP/8 “Good Statistical Practices for DUS Testing” gives guidance on good statistical practices for DUS assessment. Keys for the choice of methods in relation to the data structure are given in document TGP/9 “Examining Distinctness”.

85. A combined characteristic should only be used for distinctness if the uniformity test on the combined characteristic itself, and not only on the components, has been successful.

5.5.2 Visually Assessed Characteristics

86. Where visual characteristics have been recorded with a scale that does not fulfill the assumptions of the usual parametric statistics, usually only non-parametric statistical procedures are applicable. The calculation of the mean value, for example, is only permitted if the Notes are taken on a graded scale which shows equal intervals throughout the scale. In the case of non-parametric procedures the use of a scale which has been established on the basis of example varieties representative of the different states of the characteristics is recommended. The same variety should then always receive about the same Note and thereby facilitate the interpretation of data. More details on the handling of visually assessed characteristics are given in document TGP/9 “Examining Distinctness.”

5.5.2.1 Truly Qualitative Characteristics

87. For visually assessed truly qualitative characteristics, different states of expression in direct comparisons are generally sufficient to assess distinctness. In most cases therefore no statistical methods are needed for the interpretation of the results.

5.5.2.2 Quantitative Characteristics

88. Quantitative characteristics are not necessarily assessed by measuring or counting and can be assessed visually (e.g. intensity of anthocyanin coloration). If a normally visually assessed quantitative characteristic is the only distinguishing characteristic in relation to another variety, in case of doubt it should be measured where possible with reasonable effort.

89. A direct comparison between two similar varieties is always recommended since direct pair-wise comparisons are the most reliable. In each comparison it is acceptable to note a difference between two varieties as soon as it can be visually assessed and could be measured, although measurement might be impracticable or require unreasonable effort.

90. The simplest criterion for establishing distinctness is that of consistent differences (significant differences with the same sign) in pair-wise comparisons, provided that they can be expected to recur in the subsequent trials. The number of comparisons has to be sufficient to ensure reliability.

91. For more details on the handling of visually observed characteristics when assessing distinctness see document TGP/9 “Examining Distinctness.”

5.5.2.3 Pseudo-qualitative Characteristics

92. The use of statistics for the assessment of pseudo-qualitative characteristics depends on the individual case and no general recommendation can be made. In certain cases the same rules apply as for truly qualitative characteristics, and in others the same rules as for quantitative characteristics.

5.5.3 Measured Characteristics

93. The following paragraphs provide guidance on the typical methods for examining distinctness according to the nature of the variety:

5.5.3.1 Specific Method for Self-Pollinated and Vegetatively Propagated Varieties

94. UPOV has proposed several statistical methods for the handling of measured quantitative characteristics. In the standard method for vegetatively propagated and self-pollinated species the difference between two varieties is considered clear if it exceeds the Least Significant Difference (LSD) at the 1 per cent probability level. Differences can be considered consistent if they occur with the same sign in two consecutive years, or two out of three years. This is a relatively simple method but is considered appropriate for vegetatively propagated and self-pollinated species because the level of variation within varieties is relatively low, i.e. they are quite uniform.

5.5.3.2 General Method with Particular Application for Cross-Pollinated and Synthetic Varieties

95. In particular, for cross-pollinated and synthetic varieties UPOV has developed more sophisticated methods which take into account different sources of possible variation.

96. A method has been developed which requires the size of the differences to be consistent over the years and which takes into account the variation between years. It is called the Combined Over Years Distinctness (COYD) analysis and is explained in document TGP/9 "Examining Distinctness." A refinement to the COYD analysis is also included and should be used to adjust the COYD analysis when environmental conditions cause a significant change in the spacing between variety means in a year, such as when a late spring causes the convergence of heading dates. It is supplemented by a further LSD method for cases where few varieties in the growing tests lead to less than about 20 degrees of freedom. Its main use is for measurement in cross-pollinated and synthetic varieties, but if desired it can also be used for measurement in vegetatively propagated or self-fertilized varieties. For more details on the handling of measured quantitative characteristics see document TGP/9 "Examining Distinctness."

Explanation

(i) The COYD method and a computer program for its application are explained in document TGP/9 "Examining Distinctness." Up to now COYD has been used mainly for forage crops and seldom for cross-fertilized vegetable species.

(ii) Most vegetatively propagated varieties are not necessarily planted in a statistically proper design, which means that the full requirements for the application of statistical methods as for example the long-term LSD may not be met. The method may nevertheless be used in such cases, however, with the necessary precautions (see document TGP/9 "Examining Distinctness").

5.6 Summary of Methods for Examining Distinctness

5.6.1 Vegetatively Propagated and Self Pollinated Varieties

Recording	**Analysis**	**Type of Expression of Characteristic / Criteria for Distinctness**	
		Qualitative / Pseudo-Qualitative*	Quantitative / Pseudo-Qualitative*
Visual	**Direct**	1 state	Side by side
Visual	**Statistics**	n/a	Pair wise comparison: Sig. diff. in same sign
Measured	**Statistics**		
(Option 1)	Most common approach	n/a	LSD @ 1%; same sign in 2 consecutive or, 2 out of 3 years
(Option 2)	Large trial	n/a	COYD
(Option 2)	Small trial	n/a	COYD (with LSD supplement)

5.6.2 Cross Pollinated and Synthetic Varieties

Recording	**Analysis**	**Type of Expression of Characteristic / Criteria for Distinctness**	
		Qualitative / Pseudo-Qualitative*	Quantitative / Pseudo-Qualitative*
Visual	**Direct**	1 state	n/a
Visual	**Statistics**	n/a	Pair wise comparison: Sig. diff. in same sign
Measured	**Statistics**		
	Large trial	n/a	COYD
	Small trial	n/a	COYD (with LSD supplement)

* Pseudo-qualitative to be treated as qualitative or quantitative according to observed expression

5.7 Distinctness Using more than Characteristics

97. In the 1991 Act of the UPOV Convention, the criteria for distinctness (Article 7) is that a variety is to be clearly distinguishable from any other variety whose existence is a matter of common knowledge. In the 1961/72 and 1978 Acts of the UPOV Convention it stipulates that a variety must be clearly distinguishable by one or more important characteristics. This could imply that the 1991 Act anticipates a basis for distinctness other than the exclusive use of characteristics. However, the requirements in the 1991 Act, Article 1(vi) that, by definition, a variety can "be distinguished from any other plant grouping by the expression of at least one of the said characteristics.." means that a variety must, at least, be distinguishable by characteristics. Nonetheless this does open the possibility that something other than a characteristic can be used to establish that a variety is **clearly** distinguishable.

98. At the time of introducing this version of the General Introduction distinctness based on characteristics is the only basis which has been considered. Any approach which provides for the use of another basis for determining if varieties, which are distinguishable by at least one characteristic, can be clearly distinguished will be considered in TGP/12 "Nontraditional Characteristics and Methods for DUS Testing."

5.8 System for Determining Distinctness

99. Individual member States may develop their own systematic way of determining distinctness based on the principles laid down in this document. However, because the Test Guidelines do not provide specific practical guidance on distinctness a model procedure has been developed to demonstrate the practical application of UPOV principles, which can be used by the DUS examiner in conjunction with the Test Guidelines at a practical level. This is set out in document TGP/15.

6. EXAMINING UNIFORMITY

6.1 Requirements of the UPOV Convention

100. According to Article 6(1)(c) of the 1961/72 and 1978 Acts of the UPOV Convention, a variety is deemed uniform if, it is sufficiently homogeneous having regard to the particular features of its sexual reproduction or vegetative propagation. Article 8 of the 1991 Act deems that a variety is uniform if subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics, thereby clarifying that characteristics are the basis for examination of uniformity.

6.2 Relevant Characteristics

101. At least for the purposes of the 1991 Act of the UPOV Convention it is necessary to clarify the meaning of relevant characteristics. Relevant characteristics of a variety include at least all characteristics used as a basis for distinctness or included in the variety description established at the date of grant of protection of that variety. In particular, the relevant characteristics includes a sufficient number of characteristics to characterize a variety in such

a way as to facilitate distinctness for future varieties. Therefore, all obvious characteristics may be considered relevant, irrespective of whether they appear in the Test Guidelines or not.

6.3 Particular Features of Propagation

102. The UPOV Convention links the uniformity requirement for a variety to the particular features of its propagation. This means that the absolute level of uniformity required for vegetatively propagated varieties, truly self-pollinated varieties, mainly self-pollinated varieties, inbred lines of hybrid varieties, cross-pollinated varieties, mainly cross-pollinated varieties, synthetic varieties and hybrid varieties will be different. This provision allows for a different approach to the assessment of uniformity according to the nature of variation found in different types of varieties. The simplest approach, which is possible where all the plants of a variety are very similar, is to assess uniformity by the number of obviously dissimilar plants – "off-types"- which occur. However, where the range of variation within a variety is larger, because of the features of its propagation, the plants are not all very similar and it is not possible to visualize which plants should be considered as atypical or "off-types." In this case the uniformity can be assessed by considering the overall range of variation, across the individual plants, to assess if it is similar to comparable varieties i.e. is within "relative tolerance limits." These two approaches are explained below:

6.4 Visual Assessment of Uniformity – Observation of "Off-types"

6.4.1 Determination of Off-Types

103. A plant is to be considered an off-type if it can be clearly distinguished from the variety in the expression of any characteristic of the whole or part of the plant that is used in the testing of distinctness, taking into consideration the particular features of its propagation.

Explanation

This wording makes it clearer that (e.g. in the case of a mutation on part of the whole plant) an off-type in some organs (e.g. in some of the fruits) and not necessarily in all of them could make the plant an off-type.

104. That definition makes it clear that in the assessment of uniformity the standard for distinctness between off-types and a candidate variety is the same as for distinctness between a candidate variety and other varieties (see Chapter 5.5.2).

105. For a judgment on whether a plant is an off-type, therefore, the same rules apply as stated for distinctness, where distinctness is determined by visual observation:

(a) For truly qualitative characteristics a plant with an expression of a different state of expression would indicate an off-type.

(b) For visually assessed quantitative characteristics in vegetatively propagated and self-pollinated varieties a plant is considered an off-type if the difference can be visually assessed and could be measured, although measurement might be

impractical. Quantitative characteristics are not assessed visually in cross-pollinated or synthetic varieties and the off-type approach is, therefore, not applied.

(c) For pseudo-qualitative characteristics the judgment would depend on the type of characteristic.

6.4.2 Unrelated and Atypical Plants

106. The test material may contain plants that are atypical or unrelated to those of the variety. These are not necessarily treated as off-types, and may be disregarded as long as their number does not interfere with the test. In choosing the term "may be disregarded" UPOV makes it clear that it would depend on the judgment of the crop expert whether they are disregarded or not. In practice that would mean that in tests conducted with a small number of plants just one single plant could interfere with the test and could not be disregarded.

6.4.3 Self-Pollinated and Vegetatively Propagated Varieties

107. Most characteristics of self-pollinated and vegetatively propagated varieties are observed visually, however, methods for handling measurements from individual plants, where necessary, in order to assess off-types in vegetatively propagated varieties and truly or mainly self-pollinated varieties are set out in document TGP/10 "Examining Uniformity."

6.4.3.1 Statistical Basis for Setting Numbers of Off-Types

108. The acceptable number of off-types tolerated in samples of various sizes is normally based on a population standard of 1 or 2 per cent and on an acceptance probability of at least 95 per cent.

109. The population standard can be expressed as the percentage of off-types to be accepted if all individuals of the variety could be examined. The probability of correctly accepting a uniform variety is called the acceptance probability. Based on statistical calculations for population standards and acceptance probabilities, in each of the individual UPOV Test Guidelines, the Technical Working Parties state whether the population standard to be used is 1 per cent and the acceptance probability at least 95 per cent, or whether the species or a certain type of variety of that species warrants a different population standard and acceptance probability. The Test Guidelines also state for a given sample size the maximum number of off-types tolerated. More detailed information can be found in document TGP/10 "Examining Uniformity."

6.4.3.2 Vegetatively Propagated and Truly Self-Pollinated Varieties

110. Experience has shown that for vegetatively propagated and truly self-pollinated varieties of most species, the acceptable number of off-types tolerated in samples of various sizes should be based on a population standard of 1 per cent and on an acceptance probability of at

least 95 per cent. Where justified, the Test Guidelines may recommend a higher population standard (e.g. in many fruit species 2 per cent in case of varieties resulting from mutations).

6.4.3.3 Mainly Self-pollinated Varieties and Inbred Lines of Hybrid Varieties

111. For the purpose of DUS testing mainly self-pollinated varieties are those that are not fully self-pollinated but are treated as self-pollinated for testing. For those as well for as inbred lines of hybrid varieties, a higher tolerance is admitted and the population standard for the calculation of the maximum number of off-types allowed for truly self-pollinated varieties is, as a rule, doubled i.e. 2 per cent. This is explained further in document TGP/10 "Examining Uniformity" (see also Chapter 6.6.1).

Explanation

Please note that it is not the number of off-types tolerated that is doubled (as it was in the past), but the population standard.

6.4.4 Cross Pollinated and Synthetic Varieties

112. For visually assessed qualitative characteristics the number of off-types should not significantly **(? 5 per cent probability of an error ?)** exceed the number found in comparable types of varieties already known.

6.5 Relative Tolerance Limits (Cross-Pollinated and Synthetic Varieties)

113. Cross-pollinated varieties, mainly cross-pollinated varieties and synthetic varieties generally exhibit wider variations within the variety than vegetatively propagated varieties or self-pollinated varieties and inbred lines of hybrid varieties, and it is sometimes difficult to determine off-types. Therefore, off-types are not the basis for determining uniformity,, but relative tolerance limits for the range of variation, are set by comparison with comparable varieties or types already known. That means that the candidate variety should not be significantly less uniform than the comparable varieties. For more detailed information on comparable varieties and relative uniformity, including guidance on setting standards for new types, see documents TGP/10 "Examining Uniformity" and TGP/13 "Guidance for New Types and Species."

Explanation

Comparable varieties are varieties of the same type. Depending on the number of varieties, differentiation could go into very great detail, for instance in a given group (e.g. only tall varieties, only early emerging or early flowering varieties).

6.5.1 Visually Observed Characteristics

114. For visually observed quantitative characteristics, the acceptable level of variation for the variety should not significantly exceed the level of variation found in comparable varieties already known. For more details on the handling of uniformity of visually assessed characteristics see document TGP/10 "Examining Uniformity." (see 6.4.4 for visually assessed qualitative characteristics)

6.5.2 Measured Characteristics

115. For measured characteristics, the acceptable level of variation for the variety should not significantly exceed the level of variation found in comparable varieties already known. UPOV has proposed several statistical methods for dealing with uniformity in measured quantitative characteristics. One method, which takes into account variations between years, is the Combined Over Years Uniformity (COYU) method.

116. For more details on the handling of uniformity in measured quantitative characteristics see document TGP/10 "Examining Uniformity."

6.6 Assessment of Uniformity in Hybrid Varieties

6.6.1 General

117. The assessment of uniformity in hybrid varieties depends on the type of hybrid i.e. whether it is a single-cross hybrid or another type of hybrid, and whether it is a hybrid resulting from inbred parent lines or cross-pollinated parents.

118. In order that hybrid varieties may be treated as such for testing and thus benefit from different treatment, the testing authority should be satisfied that the candidate variety is in fact a hybrid. Submission and testing of the progenitor lines is a common requirement for checking this.

Explanation

There may in certain cases be some other way of satisfying the testing authority that the candidate variety is in fact a hybrid. That is why, for some vegetable species, national authorities do not systematically request the applicant to submit the progenitor lines for a candidate hybrid variety.

119. The uniformity and stability of a hybrid variety may be assessed by examining the uniformity and stability of the hybrid itself or, under certain conditions that of the progenitor and the hybrid. Where neither is possible or practicable, the variety cannot be examined.

6.6.2 Single Cross Hybrid Varieties Resulting from Inbred Parent Lines

120. Single-cross hybrid varieties resulting from inbred lines are treated as mainly self-pollinated varieties. Therefore, for the purpose of DUS testing, the population standard for the calculation of the maximum number of off-types allowed for truly self-pollinated varieties is, as a rule, doubled i.e. 2 per cent.

121. In addition to the doubled population standard, an additional tolerance is allowed for the occurrence of self pollinated inbred parent plants. It is not possible to fix a percentage, as decisions differ according to the species and method of propagation. However, the percentage of such plants should not be so high as to interfere with the trials. The maximum number tolerated will be fixed in the Test Guidelines.

6.6.3 Single Cross Hybrid Varieties Not Resulting Exclusively From Inbred Parent Lines

122. For hybrid varieties resulting from at least one cross-pollinated parent relative tolerance limits should be used and they should be treated as a cross-pollinated or synthetic variety as long as no other proof is given.

6.6.4 Complex Hybrid Varieties

123. For other than single cross hybrids (e.g. three way crosses or double crosses), a segregation of certain characteristics is acceptable if it is compatible with the method of propagation of the variety.

(a) If the heredity of a clear-cut segregating characteristic is known, that characteristic has to behave in the predicted manner.

(b) If the heredity of the characteristic is not known, it is treated in the same way as other cross-pollinated or synthetic varieties i.e. is set by existing comparable varieties (see Chapter 6.5).

(c) For setting a tolerance for the occurrence of inbred plants or parent plants, the same considerations apply as for a single-cross hybrid variety (see Chapter 6.6.2).

6.7 Summary of Methods of Examining Uniformity

		Method of Examining Uniformity		
Method of Propagation	Characteristic	Off-Types	Allowance for In bred / Parent plants	Relative Tolerance Limits
Vegetatively Propagated & Truly Self Pollinated Varieties	All	Pop. Std 1% (or 2%) Acc. Prob 95%	n/a	n/a
Mainly Self Pollinated varieties & In Bred lines	All	Pop. Std 2% Acc. Prob 95%	n/a	n/a
Cross Pollinated, Mainly Cross Pollinated & Synthetic Varieties	Qualitative	Number set by comparable varieties (? 5% Prob error ?)	n/a	n/a
	Quantitative (Visual)	n/a	n/a	Set by comparable varieties (? 5% Prob error ?)
	Quantitative (Measured)	n/a	n/a	e.g. COYU
Single Cross Hybrid (In bred lines)	All	Pop. Std 2% Acc. Prob 95%	Set in Test Guidelines	n/a
Single Cross Hybrid (Non inbred lines) & Complex Hybrids*	Qualitative	Number set by comparable varieties	Set in Test Guidelines	n/a
	Quantitative (Visual)	n/a	Set in Test Guidelines	Set by comparable varieties
	Quantitative (Measured)	n/a	Set in Test Guidelines	e.g. COYU

* Segregating characteristics must behave in the predicted manner where heredity is known.

7. EXAMINING STABILITY

7.1 Requirements of the UPOV Convention

124. Article 6 (1)(d) of the 1961/72 and 1978 Acts of the UPOV Convention require that a variety must be stable in its *essential characteristics*, that is to say, it must remain true to its *description* after repeated reproduction or propagation or, where the breeder has defined a particular cycle of reproduction or multiplication, at the end of each cycle. Similarly Article 9 of the 1991 Act of the UPOV Convention requires that a variety shall be deemed to be stable if its *relevant* characteristics remain unchanged after repeated propagation or, in the case of a particular cycle of propagation, at the end of each such cycle.

7.2 Relevant / Essential Characteristics

125. The relevant or essential characteristics are considered to be at least those characteristics used for the assessment of distinctness or which are included in the variety description drawn

up on the date of the grant of protection. In particular, they include a sufficient number of characteristics to characterize a variety in such a way as to facilitate distinctness for new varieties. Therefore, all obvious characteristics may be considered, irrespective of whether they appear in the Test Guidelines or not.

7.3 Examination of Stability

126. It is not usually possible during a period of two or three years to perform tests on stability that produce results as certain as the testing of distinctness and uniformity does. Generally, when a submitted sample has been shown to be uniform, the material can also be considered stable. However, if the variety is not stable, material produced will not conform to the characteristics of the variety and where the breeder is unable to provide material conforming to the characteristics of the variety the breeder's right may be cancelled.

127. Where appropriate, stability may be tested by growing a further generation from new seed stock to be supplied by the applicant to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

7.4 Hybrid Varieties

128. The stability of a hybrid variety should be assessed by examination of the uniformity and stability of its progenitor lines and the variety itself. Where neither is possible or practicable, the variety cannot be shown to possess stability.

8. REFERENCE COLLECTIONS

129. The 1961/72 and 1978 Acts of the UPOV Convention (Article 30(2)) state that "Contracts may be concluded between the competent authorities of the Member States of the Union, with a view to the joint utilization of the services of the authorities entrusted with the examination of varieties in accordance with the provisions of Article 7 and with assembling the necessary reference collections and documents."

130. The necessary reference collection and documents will be determined by the requirements of the examination. In particular, consideration will need to be given to those varieties which need to be compared, either in the form of written descriptions or in a growing trial or other test, for the purposes of distinctness (see Chapter 6.3). The necessary reference collection may also include varieties which are appropriate as a reference for determining uniformity requirements and suitable example varieties for developing variety descriptions.

131. Practical guidance on the management of reference collections is provided in TGP/4 "Management of Reference Collections."

9. COMPOSITION OF UPOV TEST GUIDELINES

9.1 Introduction

132. In most cases individual Test Guidelines are prepared for each species, although in some cases it may be appropriate to prepare Test Guidelines covering a whole genus, or even higher grouping. Different categories within a species can be dealt with in separate or sub-divided Test Guidelines if these categories can be reliably separated on the basis of characteristics suitable for distinctness, or where an appropriate administrative procedure has been developed to ensure that all varieties of common knowledge will be adequately considered for distinctness. Where appropriate, such administrative procedures are explained in TGP/9 "Examining Distinctness."

Explanation

(i) The more hybrids there are between species, the fewer groupings are possible.

(ii) In addition to the basic principles for testing, some basic general rules are also established which apply to all individual Test Guidelines. One important rule is the composition and layout of the documents. This has changed with time. While some older documents still have a different layout, all newer ones are grouped into ten chapters.

(iii) The current texts of the UPOV Test Guidelines are contained in a collection forming Part II of the Collection of Important Texts and Documents. UPOV is preparing a CD-ROM (TG-ROM) which contains all adopted Test Guidelines in electronic form.

133. The individual Test Guidelines are prepared or, if appropriate, revised according to the procedures set out in TGP/7 "Development of Test Guidelines." Once prepared by the appropriate Technical Working Party for the species concerned, a 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 UPOV Technical Committee for final adoption and publication.

134. Document TGP/2 "List of Test Guidelines Adopted by UPOV" contains a list of all Test Guidelines adopted by UPOV.

9.2 Cover Page

9.2.1 Original Language

135. The Test Guidelines are in most cases originally drafted in English, adopted in that form and then translated into the other UPOV languages (French, German and Spanish).

9.2.2 Reference to the Basic Principles of DUS Testing (General Introduction)

136. Each individual Test Guidelines document makes a reference to the General Introduction on its first page to ensure that harmonized basic principles to be followed in the application of the Test Guidelines are remembered.

Explanation

The reference is needed especially for users of the Test Guidelines who may be interested in a single species only, and will not be as familiar with the general UPOV philosophy.

9.3 Individual Chapters of the Test Guidelines

137. The individual chapters give technical recommendations and special guidance with respect to the species concerned. In Chapter VII, which is the main chapter, the characteristics that should be observed are listed. The chapter headings are as follows:

Chapter I: Subject of these Guidelines

Chapter II: Material Required

Chapter III: Conduct of Tests

Chapter IV: Methods and Observations

Chapter V: Grouping of Varieties

Chapter VI: Characteristics and Symbols

Chapter VII: Table of Characteristics

Chapter VIII: Explanations on the Table of Characteristics

Chapter IX: Literature

Chapter X: Technical Questionnaire

Chapter XI: Interim Report on DUS Examination

Chapter XII: Final Report on DUS Examination

9.3.1 Subject of these Guidelines (Chapter I)

138. 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, or to subdivide a species into different Test Guidelines or categories within Test Guidelines.

9.3.2 Material Required (Chapter II)

139. This chapter indicates the recommended quantity and quality of material to be examined in accordance with the requirements of the General Introduction

9.3.3 Conduct of Tests (Chapter III)

140. This chapter shows how the test should be conducted, for instance:

(a) the number of growing periods or years during which the plants should be observed;

(b) the number of places (usually only one);

(c) the number of plants;

(d) the number of replications.

141. It further states that when separate plots are grown for visual assessment and measuring they have to be subjected to the same treatment, and also that, if additional special tests have been prescribed, they have to follow the same basic principles. In order to achieve comparable results, it is important that the same number of plants and the same number of replications should be observed in different countries, as otherwise, especially when statistics are used, a larger number of plants or more replications would lead to smaller differences being considered statistically significant.

142. When distinctness and uniformity are determined by visual assessment, the whole plot or a representative sample out of the plot is observed. When distinctness and uniformity are determined by measurements, these are normally made only on a restricted number of plants in accordance with the appropriate method set out in documents TGP/9 “Examining Distinctness” and TGP/10 “Examining Uniformity.”

9.3.4 Methods and Observations (Chapter IV)

143. This chapter explains

(a) how the variety should be observed;

(b) how many of the plants grown should be observed for distinctness;

(c) which organs from which part of the plant should be observed (e.g. main stem, side branches, leaves from the outer side of a plant, from a fixed height or from the middle part of a branch or terminal flowers or fruits, or whether the terminal flower or fruit should be excluded);

(d) at what time the observations on a given organ should be made, etc.

144. Chapter IV also sets the statistical standards for observations made by measurement. In vegetatively or self-pollinated species, for instance, it fixes the population standard and acceptance probability and the number of off-types tolerated for a given sample size. In principle all general information on the observation of characteristics is included here, while more specific (or more detailed) information such as drawings or chemical tests is included in Chapter VIII (Explanations on the Table of Characteristics).

9.3.5 Grouping of Varieties (Chapter V)

145. This chapter clarifies the criteria, as set out in Chapter 4, for selecting universal grouping characteristics to identify similar varieties and place in other groups those varieties that require no further comparison. Where there are few varieties, grouping in the growing trials may not be very important, and thus some UPOV Test Guidelines do not give any grouping characteristics.

146. Grouping characteristics that meet these criteria will always be asterisked in the Test Guidelines.

9.3.6 Characteristics and Symbols (Chapter VI)

147. This chapter explains the different categories of characteristics mentioned in the chapters that follow. The categories are those set out in Chapter 4.8 "Functional Categorization of Characteristics," i.e.:

9.3.6.1 Test Guidelines Classification Characteristics
9.3.6.2 Universal Grouping Characteristics
9.3.6.3 Asterisked UPOV Test Guidelines Characteristics
9.3.6.4 Restricted Grouping Characteristics
9.3.6.5 Standard Test Guidelines Characteristics
9.3.6.6 Additional Characteristics
9.3.6.7 Potential UPOV Characteristics

9.3.6.8 States of Expression, Notes, Example Varieties, Explanations

148. In the Table of Characteristics, a scale of possible states of expression (known as "states") is given for each characteristic. States are accompanied by "Notes" containing code numbers which permit the computerization of variety descriptions. As far as possible, "example varieties" are also cited for each state. Some characteristics are marked with a plus sign (+), which means that the characteristic is illustrated by explanations and drawings or that testing methods are given in the chapter entitled "Explanations and Methods."

149. Chapter VI explains other signs that are added to the characteristics in the Table of Characteristics in Chapter VII, and also refers to Chapter VIII which gives explanations and details on those characteristics.

9.3.7 Table of Characteristics (Chapter VII)

9.3.7.1 General

150. The Table of Characteristics is the main part of the Test Guidelines. It contains a list of all characteristics considered by UPOV to be suitable for the description of varieties and for DUS testing. For each characteristic listed, several individual columns with information are provided and different states of expression are mentioned. For more details on the various categories of characteristics and the harmonization of states of expression see document TGP/7 "Development of Test Guidelines."

9.3.7.2 Layout

151. In the new layout—some documents may still use a different, older layout—the first column contains the chronological numbering of the characteristics and some other signs. It also states whether the characteristic is an "obligatory" one by marking or not marking it with an asterisk. It may in addition contain a plus sign (+), which refers to more detailed information on the characteristic in Chapter VIII (Explanations on the Table of Characteristics). Then comes the full text of the characteristic with its different states of expression, in four separate columns, one for each of the official UPOV languages. They are followed by a column with example varieties for most states of expression. Example varieties are varieties considered representative of the given state of expression. In the final column of the Table of Characteristics, opposite the states of expression for each characteristic, there are numerical Notes or codes for the purpose of electronic data processing.

152. In some Test Guidelines there is an additional column before the full text of the characteristics which gives, for each characteristic, a number from a growth stage code indicating the optimum growth stage for recording that characteristic. The same column may also give other information, for instance references to other lists of characteristics from other organizations, suggestions on whether the characteristic should be observed visually or measured, etc.

153. The use of Notes facilitates the storage and handling of data and the comparison of variety descriptions. It also makes for easier processing of the data in a computer. Finally it enforces discipline, as it requires the experts to look at all characteristics in a more systematic way, especially when the Test Guidelines are actually drawn up.

9.3.7.3 Order of Characteristics

154. In the Test Guidelines, morphological characteristics are generally arranged in the botanical order of organs. Where applicable, distinctions are made between different stages in the life of a plant, such as dormant and growing periods, juvenile and mature stages, or grain submitted by the applicant and grain harvested from the plants in the growing trials.

9.3.7.4 Order of States of Expression Inside a Characteristic

155. 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.

156. More details on the order of states of expression are contained in document TGP/7 "Development of Test Guidelines."

9.3.7.5 Types of Expression of Characteristics

9.3.7.5.1 Qualitative Characteristics

157. Truly qualitative characteristics are classified by consecutive numbers according to the state, starting with Note 1 and often with no upper limit, for example:

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

158. There are a few exceptions to that rule, so—in order to avoid confusion—in the case of ploidy, the number of chromosome sets is accepted as the Note (e.g. diploid (2), tetraploid (4)).

9.3.7.5.2 Quantitative Characteristics

159. 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

160. 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:

State	Note
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)

9.3.7.5.3 Pseudo-qualitative Characteristics

161. Pseudo-qualitative characteristics are characteristics that are treated as qualitative characteristics when it is more reasonable, for practical purposes, to disregard the continuous variation and the states created are meaningful and sufficiently different from one another, for example:

Leaf: shape	Note
ovate	(1)
elliptic	(2)
round	(3)
obovate	(4)

or

Expression	Note
absent or very weakly expressed	(1)
weakly expressed	(2)
strongly expressed	(3)

9.3.7.6 Harmonization of States of Expression

162. Many quantitative characteristics are presented in a qualitative way. However, care should be taken when the description is used as a first step in establishing distinctness, as it makes a difference whether the characteristic is a truly qualitative characteristic or not.

163. The harmonization of states of expression is dealt with in detail in document TGP/7 "Development of Test Guidelines."

Explanation

Document TGP/7 "Development of Test Guidelines" on the Establishment of Tables of Characteristics in UPOV Test Guidelines contains also a part on translations in the four UPOV languages (English, French, German and Spanish) of the main terms used in the Table of Characteristics.

9.3.7.7 Example Varieties

164. Wherever possible, example varieties are given to illustrate different states of expression of the various characteristics. Actual measurements are only valid for a given testing place, or even for a given year of testing at that place, and are therefore less suitable in UPOV Test Guidelines applicable worldwide. This does not mean that they are not or should not be used

for the decision on DUS. Actual measurements are therefore seldom used in UPOV Test Guidelines. Example varieties from different regions should not be combined for a characteristic unless they have been tested in the same place. In the UPOV Test Guidelines the location should preferably be specified where the example varieties mentioned showed the expressions given. In principle only those varieties which are available without restriction to other testing authorities should be indicated as example varieties.

165. Example varieties for a given characteristic should not change their order under different environmental conditions (see also paragraph 164(d)).

166. A species should preferably not be listed as an example except where there is no doubt that the whole species shows the expression that it represents, and only if no example variety exists.

167. Where the set of example varieties given for characteristics in the Test Guidelines is not appropriate for two or more member States from a particular region, a second set of example varieties from that region may be given in the Test Guidelines. In this case, the concordance of the example varieties in the different sets should be sought, especially with respect to characteristics which are important for the exchange of information and data between the different regions, when examining distinctness.

9.3.8 Explanations on the Table of Characteristics (Chapter VIII)

168. The Table of Characteristics of the Test Guidelines is usually followed by a chapter entitled “Explanations on the Table of Characteristics.” It gives explanations useful for understanding the meaning of a given characteristic, or defining the exact time, place or position of the observation of that characteristic and the way in which it has to be made (e.g. visual observation or measurement, in the middle part of a shoot, on the current year’s shoot). It may draw attention to precautions that need to be taken. Very often it provides drawings pointing to the exact position on the plant where the observation has to be made, giving the part of the plant to be observed or the different states of expression (e.g. “dentation,” “serration,” “crenation,” etc., in relation to incisions on the margins) or explains the meaning of certain shapes with the aid of drawings. For pest and disease resistance characteristics it describes the standard method of observation and fixes pathotypes. For laboratory methods it also describes the method. For certain crops it reproduces a growth stage code which is then used in the Table of Characteristics to specify the time of observation of each characteristic.

169. More detailed information can be found in document TGP/7 “Development of Test Guidelines”.

9.3.9 Literature (Chapter IX)

170. This chapter cites the titles of literature on the species concerned or on the testing of several species including the species concerned, which may be helpful to the testing authorities in the execution of the test, or useful for experts who have to develop a testing system for the species. If the list of literature is rather long, a smaller number of more important publications should be highlighted.

9.3.10 Technical Questionnaire (Chapter X)

171. This chapter gives the layout of the standard UPOV Technical Questionnaire for a given taxon (genus, species, group of species or part of a species), which has to be completed when plant breeders' rights are applied for. A specimen Technical Questionnaire is reproduced in document TGP/7 "Development of Test Guidelines."

9.3.11 DUS Reports

172. This chapter refers the DUS examiner to the model interim and final reports and model variety description format, which have been developed by UPOV.

9.4 Annexes to Test Guidelines

173. In some Test Guidelines, additional characteristics have been included in an Annex, together with the requirements for their use in examination of DUS.

10. CONDUCT OF TESTING IN THE ABSENCE OF UPOV TEST GUIDELINES

174. Test Guidelines have been developed for a number of species and there are continual additions to the list of species, an up to date list of which is provided in TGP/2 "List of Test Guidelines Adopted by UPOV." However, UPOV recommends the following procedure to provide guidance on the testing of distinctness, uniformity and stability where there are no UPOV Test Guidelines for a given species:

(a) The examining office is invited to consult document TGP/5 "Experience and Cooperation in DUS Testing" to ascertain whether other UPOV member States have already carried out testing on the required species or have national test guidelines.

(b) Where such experience is available or national test guidelines exist, countries are invited to approach the States concerned and seek to harmonize, in accordance with the principles in the General Introduction, their testing procedures as far as possible, and preferably to inform UPOV of the existence of that harmonized testing procedure, or if appropriate recommend that UPOV prepare UPOV Test Guidelines for the species concerned.

(c) Where neither practical testing experience nor national test guidelines are available in other countries, States should develop their own testing procedures. It would be advisable to inform UPOV accordingly so that the information may be passed to all member States, as other States might consider preparing test guidelines of their own for the same species.

(d) When developing their testing procedures, offices are encouraged to align them to the principles set forth in this General Introduction, by following this document and the guidance for development of Test Guidelines contained in TGP/7 "Development of Test

Guidelines." The easiest way of starting to develop a testing procedure would be to start with the closest existing recent UPOV Test Guidelines document to the species concerned, or the closest in terms of the nature of varieties of that species (e.g. varieties which are also seed-propagated or vegetatively propagated, are also trees, are grafted, etc.) and to make whatever changes are necessary to adjust the Guidelines to the species concerned.

(e) The testing procedure should be documented in accordance with the requirements of UPOV Test Guidelines to the extent that experience and information permit.

(f) The Office should then inform UPOV of these developments to allow this information to be passed on to all member States and consideration given to the development of UPOV Test Guidelines.

[Annex follows]

ANNEX

DRAFTS OR OUTLINES FOR DOCUMENTS COMPLEMENTING THE GENERAL INTRODUCTION TO THE ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY IN NEW VARIETIES OF PLANTS

Planned document	Present document	Title
TG/00	*Coordinator: UPOV Office* Annex of TC/36/8	List of TGP Documents and Latest Issue Dates
TGP/1	*Coordinator: UPOV Office* TC/36/8	General Introduction With Explanations
TGP/2	*Coordinator: UPOV Office* http://www.upov.int/eng/document/index or TC/36/2, Annex	List of Test Guidelines Adopted by UPOV
TGP/3	*Coordinator: Ms. Scott, GB*	Varieties of Common Knowledge
(a):		The Concept of Varieties of Common Knowledge
(b):		The Notion of Breeder
TGP/4	*Coordinator: Mr. Guiard, FR*	Management of Reference Collections
(a):		General Management
(b):		
TGP/5	*Coordinator: UPOV Office*	Experience and Cooperation in DUS Testing
(a):	C/32/5	Cooperation in Examination
(b):	C/27/15, Annex III	Model Administrative Agreement for International Cooperation in the Testing of Varieties
(c):	TC/XXV/12 Annex	UPOV Interim and Final Reports on Technical Examination
	TC/26/6 Annex I	UPOV Variety Description
(d):	TC/36/4	List of Species in Which Practical Technical Knowledge has Been Acquired or for Which National Guidelines Have Been Established and E-mail Addresses
(e):	File to be prepared on the Website	Notification of National Test Guidelines for Species for Which no UPOV Test Guidelines Exist Notification of Routine Characteristics not Included in UPOV Test Guidelines
(f):	http://www.bioss.sari.ac.uk/upov//upemail.html	E-mail addresses of Technical Experts

Planned document	Present document	Title
TGP/6	*Coordinator: Mr. Hossain, AU*	DUS Testing by the Applicant/Breeder
(a):	To be prepared by AU	Practical Application
(b):	C/27/15, Annex II	Declaration on the Conditions for the Examination of a Variety Based on Trials Carried Out by or on Behalf of Breeders
(c):	TC/32/4, to be updated	Level of Involvement of the Applicant in the Growing Test
TGP/7	*Coordinator: Mrs. Buitendag, ZA*	Development of Test Guidelines
	TC/36/5	Establishment of Tables of Characteristics in UPOV Test Guidelines Harmonization of Characteristics and States of Expression
	TC/33/9	Vocabulary for states of expression
	TC/26/6, Annex II	Technical Questionnaire to be Completed in Connection with an Application for Plant Breeders' Rights
	To be prepared by Germany	Types of characteristics and their scale levels
TGP/8	*Coordinator: Mr. Law, GB*	Good Statistical Practices for DUS Testing
(a):	To be prepared by TWC	Chapter I: measured data, checking of the truth of the assumptions, actions and methods when those assumptions were not proved true
(b):	To be prepared by TWC	Chapter II: outliers, adequate randomization, one tail and two tail distributions, sufficient replications and number of plants for individual plant recording
(c):	To be prepared by TWC	Chapter III: COY approach
TGP/9	*Coordinator: Mr. Law, GB*	Examining Distinctness
(a):	To be prepared by GB	Without the application of statistical methods
(b):		With the application of statistical methods
(b1):	To be prepared by TWC	Visually Assessed Characteristics
		(i) Qualitative Characteristics (non-parametric methods)
		(ii) Pseudo-qualitative Characteristics (one observation per plant, per plot/row)
		(iii) Quantitative Characteristics (one observation per plant, per plot/row)
(b2):		Measured Characteristics
	To be prepared by TWC	(i) Self-fertilized and Vegetatively Propagated Species (LSD, other methods)
		(ii) Cross-fertilized Species
	TC/33/7	Combined-over-years Distinctness Criterion (COY)
	To be prepared by TWC	Summary on COYD

Planned document	Present document	Title
	TWC/15/17	Distinctness, Uniformity and Stability Trial Analysis System for Windows (DUSTW)
	http://www.bioss.sari.ac.uk/ upov//pdus/coyd/sl/intro.htm	Screen-based Input Module for COYD
	To be prepared on the Website	Computer-generated Demonstration of COYD
	To be prepared by TWC	DUSTNT Computer Program
(c):	Other methods still to be listed by TWC	Application of Statistics in Nonrandomized Plots
(d):	*Coordinator: ?* *To be prepared*	Model system for examining distinctness
	Mr. Guiard, FR	Process for establishing distinctness for annual species (uniform varieties)
TGP/10	*Coordinator: Mr. Law, GB*	Examining Uniformity
(a):	To be prepared by GB	Without the Application of Statistical Methods
(b):		With the Application of Statistical Methods
(b1):	To be prepared by TWC	Visually Assessed Characteristics
		(i) Qualitative Characteristics (one observation per plant)
		(ii) Pseudo-qualitative characteristics (one observation per plant)
		(iii) Quantitative Characteristics (one observation per plant)
(b2):		Measured Characteristics
	TC/34/5 Rev.	(i) Self-fertilized and Vegetatively Propagated Species
	TC/33/7 http://www.bioss.sari.ac.uk upov//pdus/coyu/sl/intro.htm	(ii) Cross-fertilized Species (COYU and Website)
	To be updated by GB	Relative Uniformity, Comparable Varieties
TGP/11	*Coordinator: Mr. Barendrecht, NL*	Observation of Colors
(a):	To be prepared by TWO	Use of Color Charts, Connection, Munsel, etc. HCC, Color Pictures, no Use of Colorimeter
	To be prepared by JP	Correspondence Between Different Color Charts, RHS Colour Chart, Japanese Color Standard for Horticultural Plants (JHS)
(b):		Grouping of Colors of the RHS Colour Chart
(c):		Standardization of Pictures

Planned document	Present document	Title
TGP/12	*Coordinator: UPOV Office*	Nontraditional Characteristics and Methods for DUS Testing
(a):	To be prepared by TWC, TWF, TWO, TWV	Biochemical Characteristics, Electrophoresis, Molecular Marker, Digital Images, etc.
(b):		Image Analysis
(c):	BMT/3/2, to be updated	Identification Methods Based on Molecular Techniques
(d):		Resistance to Diseases
(e):		DUS Assessment of Bulk Samples
(f):	To be prepared by FR	Combining Characteristics in DUS Assessment (old TGP/14)
(g):	To be prepared by FR	Use of Hybrid Formula in DUS Assessment
		Other Statistical Methods
(h):	TWC/14/14, to be updated	Similarity, Clustering and Dendrograms
(i):	TC/32/6, to be prepared	Sequential Analysis
TGP/13	*Coordinator: Ms. Scott, GB*	Guidance for New Types and Species
(a):	To be updated by GB	Guidance for New Types
(b):		DUS Testing of New Species
TGP/14	*Coordinators:* *UPOV Office* *Ms. Scott, GB +* *Mrs. Buitendag, ZA* *Mr. Law, GB +* *Mr. Pilarczyk, PL +* *Mr. Harsanyi, HU* To be prepared by TWA, TWC, TWF, TWO, TWV	Glossary of Technical, Botanical and Statistical Terms Used in UPOV Documents

[End of document]