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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

TECHNICAL COMMITTEE

Thirty-Fifth Session
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REVISED WORKING DOCUMENT FOR THE PREPARATION OF A NEW REVISED GENERAL INTRODUCTION TO THE GUIDELINES FOR THE CONDUCT OF TESTS FOR DISTINCTNESS, UNIFORMITY AND STABILITY OF NEW VARIETIES OF PLANTS

prepared by the Office of the Union

This document should be read in conjunction with document TC/35/5. It contains the following:

Annex I: Amended Annex II of TC/35/5: Working Paper for the Drafting of a Revised Text of the General Introduction Containing Additional Explanations

Annex II: Amended Annex III of TC/35/5, List of Documents Useful for the Testing of Plant Varieties

Annex III: Amended Annex IV of TC/35/5: Explanations on the Use of Terms and/or their Definitions

The amendments made result from comments received on document TC/35/5.

[Three annexes follow]

ANNEX I

WORKING PAPER FOR THE DRAFTING OF A REVISED TEXT OF THE GENERAL INTRODUCTION CONTAINING ADDITIONAL EXPLANATIONS*

LIST OF CONTENTS

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* This draft contains in square brackets, after the new paragraph number, the number of the respective paragraph of document TG/1/2 (if existing). Explanations in italics contain supplementary information which will be included in a separate document; explanations in smaller script contain information to facilitate the drafting, which will be deleted once the drafting is finalized.

1. INTRODUCTION

Remark:

(a) Short text: This introduction could be shortened with more references to other texts (e.g. UPOV Convention, basic documents, technical documents).

(b) Complete text: The General Introduction should not only be an introduction to Test Guidelines but also a description of the basic principles of the testing of varieties. For that purpose a good introduction, which is self-comprehensive and complete, is preferred.

1. As mentioned in document TC/35/5 it is proposed that the General Introduction only contains the text in the numbered paragraphs without any explanations. The explanations would be included in the planned separate collection of documents according the list in Annex II of this document.[1] The International Convention for the Protection of New Varieties of Plants provides that protection shall only be granted after examination of the variety. The prescribed examination should be adapted to the special requirements of each genus or species, and must of necessity take account of any special requirements for growing the plants.

Explanation: UPOV decided to stick to the term "variety" despite the rather common use of the word "cultivar."

2. Before the development of the UPOV system, many countries had their own regulations regarding the examination of varieties. The technical criteria for the grant of rights differed from one country to another and even the variety concept was not seen in the same light in all countries. The technical standards and testing procedures depended largely on the expertise of the official concerned. This lack of harmonization caused problems, especially when a breeder sought protection for his variety in several countries. A variety which had been considered distinct, uniform and stable in one country might be rejected in another or vice versa. It was realized that harmonization was urgently required and this responsibility was taken on by UPOV, as a result of the adoption of the International Convention for the Protection of New Varieties of Plants in 1961, which has in the meantime been revised several times, the most recent revision dates back to 1991.

3. Protection may only be granted to a variety on the condition that it has been proved clearly distinguishable from any variety of common knowledge and that it is sufficiently uniform and stable in its relevant characteristics. The testing system for determining Distinctness, Uniformity and Stability is generally referred to as "DUS" testing. It is a technical examination performed according to standardized principles established by UPOV. It comprises a comparative growing trial, which involves sampling, observation and measurement, processing and evaluation. These trials are conducted either by the official national government authorities themselves or on their behalf by specialized bodies, or, to varying degrees, by the applicants or breeders themselves. In order to interpret the DUS criteria on a common basis, UPOV has set up some basic principles which are summarized in this document.

4. [2] With these basic principles and the individual UPOV Test Guidelines prepared for each genus or species or for several species, UPOV member States have a common basis for establishing variety descriptions in a standardized form and for testing varieties which

facilitates international cooperation in examination between their authorities. These basic principles and the Test Guidelines are also helpful to applicants for the grant of rights by giving them information on the characteristics to be studied and on the questions which they will be asked about their varieties.

4(a) The Test Guidelines are meant for making descriptions and not primarily for determining distinctness. They are mainly a tool to harmonize descriptions. Distinctness is a step further than description. The Guidelines are silent on the size of the difference needed to ensure distinctness. *[Remark: proposal to be included in the General Introduction itself and not only in the remarks].*

Explanation: The present valid text is contained in document TG/1/2 adopted by UPOV in 1979. The list of individual Test Guidelines adopted by UPOV can be found in Annex II of document TC/34/10 or in the Collection of the Texts of the UPOV Convention and Other Important Documents Established by UPOV. UPOV is preparing a CD-ROM (TG-ROM) which will comprise all adopted Test Guidelines in electronic form.

In the case of "characteristics other than truly qualitative or quantitative," it is aimed at forming the states in such a way that as far as possible a clear difference can be presumed with a difference of two states of expression [should it read: "... for each state of expression?]

As a result, some countries regard consecutive states of true qualitative characteristics to be distinct (1 and 2), while only every second state of a quantitative characteristic is regarded as distinct (1 and 3, 2 and 4). The majority of the UPOV member States do not follow this idea. There is a frequent misinterpretation of the use of the Test Guidelines which may stem from the title of the Test Guidelines. The function of the Test Guidelines is mainly for description purposes. It has to be avoided that experts would mix description and distinction of a variety. It is possible that two varieties have identical descriptions but are nevertheless sufficiently distinct to be different varieties, or that two samples of plant material could have different descriptions but are not sufficiently distinct to be from two varieties eligible for protection. Therefore the yard stick of two states of expression in quantitative characteristics is for the drafter of the Test Guidelines and not for the user.

Test Guidelines are, as stated, merely guidelines and not instructions for the testing at a certain place.

5. [3] These principles, and especially the individual Test Guidelines prepared for each genus or species, should not be considered an absolutely rigid system. There may be cases or situations which are not covered within the present framework, and these should be dealt with in a manner which is in keeping with the principles. The Test Guidelines for the individual species are prepared by Technical Working Parties which are coordinated by a Technical Committee appointed by the UPOV Council.

6. [4] The Test Guidelines consist of 10 chapters of which the Table of Characteristics is the most important one. The chapters are described in more detail in the Chapter "10. Composition of Test Guidelines."

7. [5] Normally, separate Test Guidelines are prepared for each species. However, inclusion of two or more species or even a whole genus or even a larger unit in one Test Guidelines document or subdivision of a species into different Test Guidelines may be considered necessary. A subdivision is only possible if the borderline between the groups inside a species can be clearly defined.

Remark: Test Guidelines are more genera-based than species-based [that is not true for all Test Guidelines but mainly for fruit or ornamental species only].

2. RELEVANT ARTICLES IN THE UPOV CONVENTION

Remark: This chapter could be shortened or deleted. Several experts considered the link to the UPOV Convention very important and therefore this chapter should not be deleted. Especially for the General Introduction as document with the basic principles of testing varieties the legal basis for such testing is very important.

2.1 Definition of a Plant Variety

8. While the former Acts of the UPOV Convention abstained from giving a clear definition on what was considered a variety, Article 1 of the 1991 Act of the UPOV Convention gives a broad definition of a plant variety, including varieties not necessarily meeting the conditions for the grant of a breeder's right.

9. Article 1(vi) states:

> "(vi) "variety" means a plant grouping within a single botanical taxon of the lowest known rank, which grouping, irrespective of whether the conditions for the grant of a breeder's right are fully met, can be
> - defined by the expression of the characteristics resulting from a given genotype or combination of genotypes,
> - distinguished from any other plant grouping by the expression of at least one of the said characteristics and
> - considered as a unit with regard to its suitability for being propagated unchanged;"

10. The technical criteria for a variety eligible for protection under the UPOV Convention are set at a higher level than the general definition of variety stated above. From a technical point of view the main Articles in the UPOV Convention are Articles 5 to 9.

2.2 Conditions of Protection

11. [6] Article 5 reads as follows:

"(1) [*Criteria to be satisfied*] The breeder's right shall be granted where the variety is

(i) new,

(ii) distinct,

(iii) uniform and

(iv) stable.

"(2) [*Other conditions*] The grant of the breeder's right shall not be subject to any further or different conditions, provided that the variety is designated by a denomination in accordance with the provisions of Article 20, that the applicant complies with the formalities provided for by the law of the Contracting Party with whose authority the application has been filed and that he pays the required fees."

Remark: The last paragraph should be deleted.

12. The requirement of novelty is a matter of facts [outside the variety or facts concerning actions done with the variety] and does not depend on the descriptive features of the variety. The requirements of distinctness, uniformity and stability are requirements calling for technical judgements concerning the variety. These requirements are further defined in Articles 7 to 9.

2.3 Distinctness

13. Article 7 reads as follows:

"The variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of the filing of the application. In particular, 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."

2.4 Uniformity

14. Article 8 reads as follows:

"The variety shall be deemed to be 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."

2.5 Stability

15. Article 9 reads as follows:

> "The 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."

3. STATUS OF THE UPOV TEST GUIDELINES

Remark: This chapter could be shortened: keep only first two sentences of paragraphs 16 and 19. The explanation of the role of the Test Guidelines is appreciated by several experts who welcomed that for the first time that role was exactly spelled out in writing.

This Chapter should be placed after Chapter 5 (Definition and Observation of Characteristics).

16. The only binding obligations on UPOV member States are those contained in the text of the Convention itself. UPOV can moreover only make recommendations on that text or prepare guidelines for the interpretation of the legal obligations. The UPOV Test Guidelines are intended to give guidance for the interpretation of the above Articles 7, 8 and 9 of the 1991 Act of the UPOV Convention. Their purpose is to ensure that the Articles in question are applied in as harmonized a form as possible and that decisions are taken in a similar way leading to the same or similar results.

17. How far the UPOV Test Guidelines are reflected in national practice or national law will depend on the individual situation in each member State, on its national legislation and on the status which might be given to them in that legislation. In some States they are no more than just guidelines which, if considered necessary, could be ignored, while in others they have a certain force. In most States it is 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, who will determine how far the UPOV Test Guidelines are actually applied in national tests.

Remark: This paragraph should be deleted.

18. In practice the UPOV Test Guidelines are taken over in many member States entirely without any change (no deletion of characteristics, no addition). In other member States all characteristics with an asterisk and a selection of those without an asterisk are taken over. As they are not exhaustive, further characteristics may be added. In principle the UPOV Test Guidelines are broadly accepted and guaranteed on account of the broad participation in their preparation and continuous updating, which also proves their quality. The use of the UPOV Test Guidelines is independent of whether a given State has a system of official growing tests done by government testing authorities or a breeder testing system where the applicant is responsible for the growing test and the submission of a test report.

19. Although the UPOV Test Guidelines are only guidelines, they nevertheless play a certain role in court cases on infringements, as they represent an official opinion

internationally agreed upon and based on the technical knowledge of experts from the UPOV member States responsible for plant variety protection and for the testing of the species concerned.

4. ASSESSMENT OF VARIETIES

Remark: This Chapter should be placed at the end of the document (after Chapter 10).

4.1 Characteristics

20. [6] The word "characteristics" has been taken out of the Article 7 of the 1991 Act of the UPOV Convention on distinctness but is still maintained in the definition of the variety and in the articles on uniformity and on stability and thus remains also the basis for distinctness. The three requirements of

- distinctness
- uniformity and
- stability

are therefore assessed in UPOV member States on the basis of characteristics and their expressions.

Explanation: The correct term might have been "character" instead of "characteristic," but UPOV maintains the term "characteristic." UPOV also does not use the common term "trait."

4.1(a) Minimum Distances

21. In order to sustain a reliable plant breeders' rights system in which each protected variety has a clear identity, the DUS testing has to be reliable and repeatable. The minimum degree of distinctness from the nearest (or most similar) variety for the purpose of protection has been discussed for many years within UPOV, using the term "minimum distances." Minimum distances between varieties should not become so small that plagiarism is promoted and protection eventually becomes meaningless. A larger distance in most cases leads to a stronger protection. If, however, the umbrella of protection around each variety is too large it leads to less encouragement and opportunity for crop development and may lead to monopoly, inhibiting the release of other new varieties in the given species.

Explanation: Connection between the states of expression and minimum distance of distinctness: The main aim of the Test Guidelines is to establish a harmonized description. For the decision on distinction uniformity and stability they only represent the first step. The Test Guidelines are silent on the minimum distance required in each characteristic and thus a decision on distinctness can never be based on the description resulting from the Test Guidelines. However, to make this first step meaningful and start to develop the possibility of distinction the following should be observed:

(a) In true qualitative characteristics each state is clearly separated from the other without any transition; the minimum distance is therefore always one Note. There are, however, very few true qualitative characteristics.

In quantitative characteristics which are observed visually, it should, if possible, be aimed at setting a scale of states where a difference of two Notes could lead to a clear difference (this is meant by the requirement that the states be meaningful). However, these two Notes are no absolute standard for the minimum distance. Depending on the testing place, the year or other environmental conditions, variety collection or special pair of varieties, the minimum distance may be more or less than two Notes, e.g. three, four or five Notes in a characteristic affected to a larger degree by the environment or may be one only or even inside one Note, distinction may be possible. It is up to the expert doing the observations to take the necessary precautions or additional tests (e.g. side-by-side comparison). The variety description based on the Test Guidelines should therefore never be used alone for the decision on distinctness and a general yard stick of two Notes is only an aim for the experts who draft the Test Guidelines but never for the user.

(b)(i) In quantitative characteristics which are measured it should be aimed at setting a scale of states in a meaningful way, based on the statistical exceptions in the characteristics, e.g. a difference between two Notes of at least 2 LSD.

(c) Characteristics which are handled like qualitative characteristics but which are not really qualitative characteristics, should be handled in such a way that possible fluctuations are taken into account when distinctness is assessed. Therefore one cannot automatically presume that the minimum distance is one Note. The sequence of the states should in such characteristics rather be chosen in such a way that as a rule a minimum distance of two Notes can be expected. Accordingly, the states may be for instance for growth habit: erect (1), semi-erect (2), prostrate (3), in one species and erect (1), semi-erect (3), intermediate (5), semi-prostrate (7), prostrate (9) in another species, and for a third species the states may be set up in yet a different way. The same reservations as for quantitative characteristics apply, however, and the description based on the Test Guidelines should not be used alone to take a decision on distinctness.

Remark: One expert proposed to shorten this paragraph as part of the explanation is contained in paragraphs 40 to 42 or could be included there.

22. The new criterion of essential derivation as specified in Article 14.5 of the Convention has slightly reduced the risk of distances that are too narrow between two varieties from different breeders, but the main aim to have not too small differences between two varieties remains still valid. Practically speaking, the protected variety should, as far as possible to be achieved, be a clearly defined unit that can also be identified in commercial trade. Protection should furthermore offer a high degree of legal certainty in order to be defensible in a court of law, if necessary.

Proposal: Delete the sentence "Practically speaking ..."; it could evoke false expectations with the breeders as the minimal distance is zero in practice. Moreover, as

UPOV's position is still a position of non-elaborating the essential derivation problem leaving it over to the breeders, the whole paragraph could be deleted.

23. Atypical plants, or off-types, which may occur due to occasional mixtures, mutations or other causes, should be limited to such a degree that accurate description and the assessment of distinctness is possible and that stability is ensured. Such an acceptable level of uniformity is also an essential prerequisite for commercial production of the variety, giving assurance of quality to the producer as well as the consumer

Remark to the last sentence: Not necessarily, morphology is not fully representative of plant composition (see also paragraph 38).

Paragraphs 22 and 23 could be deleted as they appear in Chapter 7? (which talks of uniformity).

4.2 Comparison with Similar Varieties

Remark: paragraphs 24 to 27 could be shortened.

24. To test whether a candidate variety meets the technical criteria, it is compared with varieties of common knowledge in a growing trial. In case of growing trials performed by government testing authorities, a Technical Questionnaire, completed by the applicant and submitted with the application, indicates characteristics of importance for selecting varieties most similar to the candidate. These varieties are included in the trial, together with the candidate, for side-by-side comparison. A red rose candidate variety, for example, need not be compared with all known rose varieties but only with those with red flowers. Other characteristics, such as growth habit, may limit the extent of the trial even further. In case of growing trials performed by the applicant, on instructions of the national competent authorities, the same procedure will have to be followed by the applicant.

25. The similar varieties to be taken into account for comparison should not, however, be limited to national borders. An application for protection or for entry into an official register anywhere in the world causes the variety to be regarded as a matter of common knowledge. However, in practice testing experts know that varieties which were selected in an environment which is significantly different from that in which the variety is to be tested are bound to be different from the variety under test. This enables them to limit the size of the reference collection against which candidate varieties must be tested. In order to keep up with the increasing number of varieties worldwide, UPOV collects and publishes information on varieties on the UPOV-ROM Plant Variety Database, a central computerized database which is updated bimonthly and which will be updated on a monthly basis in the future.

Explanation: The database is free of charge to the UPOV member States submitting their updated data, but it is also available to other States or the general public for a yearly subscription price of 750 CHF (see Circular U 2631). In addition to the database the UPOV-ROM also contains for those who do not yet have access to Internet several documents and other information as the texts of the Convention, lists of publications, lists of member States, etc., which are offered on the UPOV Website.

There should be an explanation on common knowledge (GB will make a proposal).

The third sentence may required discussion.

26. With the entering into force of the 1991 Act of the UPOV Convention, more and more States are offering protection to the whole plant kingdom and will increasingly have to rely on the applicant or botanical gardens, gene banks, specific institutes or regional groups to maintain part of their reference collection.

27. Prescreening of all existing varieties of a species on a worldwide level may become very cumbersome but will also be more and more necessary as the number of varieties increase and the markets become more global, especially with the ornamental, but also other species. To facilitate this task, characteristics least influenced by the environment are used in the first instance, corresponding to the normal selection of grouping characteristics. In addition, other characteristics may be used as supplementary information, confirming differences in morphological characteristics [if these characteristics have been approved by UPOV].

Explanation: Caution should be applied with the use of electrophoretic characteristics as mostly there is no direct correlation between morphological expressions and certain electrophoretic bands. This will be even more crucial in case it is intended to use other methods such as DNA profiling, for the purpose of prescreening.

Therefore, clearly defined rules for the whole prescreening process will first have to be prepared by UPOV and laid down in the prescription for the testing for each species in the Test Guidelines concerned.

The Technical Working Party for Fruit Crops (TWF) and the Technical Working Party on Ornamental Plants and Forest Trees (TWO) are strictly opposed to the use of electrophoretic characteristics and even more to other methods as DNA profiling as long as there is no strong correlation to existing morphological characteristics. [This is to be expected because morphology is directly linked to commercial value].

In the Technical Working Party for Agricultural Crops (TWA) the knowledge of the genetic control of electrophoretic bands is a prerequisite for their possible use. If the genetic background of a given band is not known, it cannot be used for distinctness purposes.

The TWO prefers digital image for prescreening before any other new methods, as a picture together with the grouping characteristics, would give information closer to the testing.

The Technical Working Party on Automation and Computer Programs (TWC) noted the conclusion of document TWC/16/13, which compared morphology, pedigree and molecular methods, that DNA methods appear to provide a better correlation with pedigree data than does morphology and may be able to identify a minimum set of close varieties. However, DUS tests are based mainly on morphology, and therefore in the Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular (BMT) (see also document BMT/5/3) several experts questioned the basic idea that morphological distance could be substituted by molecular distance in absence of any systematic linkage between these distances.

Experts in several Technical Working Parties asked for a definition of common knowledge in the General Introduction. The TWO will collect information for ornamental species on what is considered to be common knowledge.

4.3 The Introduction of New Methods for Variety Testing

28. The classical methods of DUS testing are based almost exclusively on 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 results. In the light of the increasing number of varieties that need to be distinguished, the need has also increased for methods which are less influenced by the environment and thus may be more objective. In some UPOV Test Guidelines, characteristics obtained from electrophoresis have already been annexed to the Test Guidelines thereby creating a separate group of characteristics which on their own may not be sufficient to establish distinctness.

Explanation: Document TWC/16/11 on Digital Images in Plant Variety Testing gives some information on image analysis. Document BMT/3/2 on Identification Methods Based on Molecular Marker explains briefly the most important DNA profiling methods at present under study.

Various, recently developed, techniques in image analysis, electrophoresis and molecular and biochemical techniques are already being used by breeders for rapid identification of varieties. UPOV is investigating the possibility of introducing them into the DUS testing system, either

(i) in combination with traditional morphological and physiological characteristics as a means of selecting most similar varieties which have to be grown next to the candidate variety for close comparison, or

(ii) as supplementary information in addition to other differences (in morphological or physiological characteristics) in DUS tests.

The UPOV Working Group on Biochemical and Molecular Techniques and DNA Profiling in Particular ("BMT") has the objective of harmonizing these developments in the different member States in accordance with the UPOV Convention.

Remark: Explanations should not be included in the final text.

4.4 Cooperation in Growing Tests

Remark: paragraphs 29 to 33 should be shortened.

29. The UPOV Convention does not oblige the national authorities to perform the testing themselves. They may delegate the task to another party, or make use of results already obtained by another party. The task of those national authorities who choose to accept full

responsibility for the technical examination, including their own growing tests, is becoming increasingly demanding, especially since their lists of protectable plant species are continually being extended. These lists have been totally abandoned under the 1991 Act of the Convention and varieties of all botanical taxa must be eligible for protection within a period of five years after its coming into effect in a particular State. It is unthinkable that official testing stations will be able to provide testing facilities with growing tests for all taxa applied for and member States are increasingly considering the adoption of systems of cooperation with breeders and applicants or with the competent authorities of other States.

30. International Cooperation: Cooperation with other member States in DUS testing alleviates the problem by sharing the time, expense and expertise involved in carrying out the DUS tests or the maintenance of live collections of reference varieties required for each genus or species in which varieties are tested..

Explanation: International cooperation often begins as a mere exchange of varietal 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 agreements for the testing of varieties.

Document C/32/5 prepared for the ordinary Council session in 1998 gives further information on cooperation in examination and will be updated every year.

UPOV has also prepared a model for a UPOV Report on Technical Examination and UPOV Variety Description (Section 23 of the UPOV Collection).

The ultimate form of international cooperation is a "centralized" testing system where the full procedure is carried out by one authority on behalf of other member States, irrespective of the origin of the varieties or their applicants. This can be done for a given region or–in case of glass house plants–for most, if not all, member States.

Chrysanthemums, for example, are tested in the United Kingdom on behalf of most other member States. South Africa has offered reciprocal facilities 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.

UPOV has established a document, TC/34/4 comprising a List of Species in Which Practical Technical Knowledge has Been Acquired or for Which National Guidelines Have Been Established, giving technical experts useful information on whom to contact in other member States with respect to a given species.

A list of e-mail addresses of technical experts in UPOV member States is available in document TWC/16/8 or a more updated version on the Internet: http://www.bioss.sari.ac.uk/links/upov/upemail.html.

31. Cooperation with Breeders and Applicants: Close cooperation with breeders has always been promoted by UPOV, even in the case of member States with a strict system of government grown test. Basically, breeders and applicants are required to provide the testing authorities with all necessary information, documentation and propagating material but, to varying degrees, they may actively partake in the growing test process.

32. In most countries, plant breeders' rights are exclusively administered by the official authority, although the breeders' facilities are sometimes used under certain circumstances to grow the plants. At the other extreme the applicant or breeder may be asked to do the full growing test according to prescribed Test Guidelines and submit a test report. There are well-established industries, which have available carefully controlled evaluation trials. Instead of going to the expense of establishing its own examination plots, the official testing authority makes use of these existing facilities. This is also to the advantage of the breeders or applicants, since it is time-saving, especially in the case of trees which take some years to reach fruiting maturity. Normally, a flexible relationship exists between the testing officials and the breeders and often reference varieties are selected for inclusion in the trials by personal communication, even before the application for plant breeders' rights has been filed.

Explanation: Cooperation is particularly useful for those species for which breeding activity is limited to a few breeders who are highly specialized in their particular field.

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

Document TC/32/4 on the Level of Involvement of the Applicant in the Growing Test gives useful information on the different possibilities of involvement of applicants in the growing tests.

33. Some member States have a system where breeders or applicants even perform the whole growing test and observations leading to a test report themselves where this is subject to the strict technical procedures and high degree of legal certainty required by UPOV. The decision is entirely based on the test results supplied by the breeder or applicant. UPOV has prepared a list of conditions for the examination of a variety based upon trials carried out by or on behalf of breeders.

Explanation: See Section 16 of the UPOV Collection, containing the declaration on the conditions for the examination of a variety based upon trials carried out by or on behalf of the breeder.

5. DEFINITION AND OBSERVATION OF CHARACTERISTICS

Remark: A chapter on the grouping of varieties should be added.

5.1 Selection of Characteristics

34. [7] The characteristics listed in the Test Guidelines are those which are considered to be important for the description of varieties and therefore also for distinguishing one variety from another and for the examination of uniformity and stability. They are not necessarily qualities which give an idea of a certain value that the variety may possess. Such characteristics may be morphological, physiological, biochemical or of another nature but they must be capable of precise recognition and description and must lead to consistent and repeatable results. The Tables of Characteristics of the individual Test Guidelines are not exhaustive but may be enlarged by further characteristics if this proves to be useful and the characteristics meet the conditions set out in the Convention.

Remark: The normal requirements which any characteristic has to fulfill to be included in the Test Guidelines should be enumerated.

35. 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 for all those characteristics. Other States may accept a smaller number in order to avoid an unnecessary workload for the breeder but with the consequences that it may be more difficult to distinguish a candidate variety within that limited number of characteristics.

36. [combined with paragraph 39].

37. Although some degree of fluctuation in the expression of genetically controlled differences is expected under different environmental circumstances, priority is given to those inherited characteristics that are least susceptible to environmental influences. Precisely defined testing procedures are also of importance in minimizing the influence of environmental conditions. In testing one has to be careful that expressions of characteristics are not due to factors such as disease or mineral deficiency. Rootstocks may also have an effect and certain expressions occurring during the youth phase of a tree may disappear with age.

38. Under the UPOV system, characteristics are selected from the point of view of suitability for description and for DUS testing and not for their commercial value. The superiority or usefulness of a variety is not a criterion for protection, since the economic value of its so-called performance characteristics may change from time to time and from country to country. In certain ornamental varieties it would be almost impossible to assess value because of personal preference. It is for the users of the variety to decide on its superiority or usefulness and not for the testing authorities. Performance characteristics may, however, be used for description and for DUS testing, if they fulfill the normal requirements fixed for any other characteristics. Examples include plant height, fruit color and time of fruit maturity. Disease resistance characteristics may be included, provided that they can be precisely tested and that they are necessary for establishing distinctness. It is important that each disease resistance characteristic should be well defined and that an accepted, standardized method be

prescribed for its evaluation. For characteristics on chemical contents a well defined and accepted method has to be included in the Test Guidelines.

5.2 Qualitative and Quantitative Characteristics

39. [8] [9] 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, called in short "states," and the wording of each state is followed by a "Note." For a better definition of the states of a characteristic, example varieties are indicated in the UPOV Test Guidelines whenever possible. The characteristics used to distinguish varieties may be either qualitative or quantitative.

40. [10] "True Qualitative characteristics" are those which show discrete discontinuous states with no arbitrary limit on the number of states (e.g. number of whirls: one (1), two (2), three (3)). 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 other and as a rule these characteristics are not influenced by environment.

> *Remark: Make three groups (true qualitative characteristics as a separate group). See also paragraph 116 and remarks.*

41. "Non-true-qualitative characteristics" are characteristics which do not fit this definition of true qualitative characteristics but are handled as qualitative when it is more reasonable to disregard the continuous variation for practical purposes and the states created are meaningful and sufficiently different from one another (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)).

42. [11] "Quantitative characteristics" are those which 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 for the purpose of description. The division is made primarily for description and not for distinctness purposes. The Test Guidelines are silent on the difference needed for distinctness. The states of expression should, however, be meaningful.

5.3 Combined Characteristics

43. [12] Characteristics which are assessed separately may subsequently be combined, for example the length/width ratio. Combined characteristics have to be treated in the same way as other characteristics.

5.4 Observation of Characteristics

44. [13] In order to obtain comparable results in the various member States the scope of the test has to be fixed as far as possible and considered useful (for example, size of plots, sample size, number of replications, duration of tests, etc.).

Explanation: Some Technical Working Parties insist on a fixed sample size to reach comparable results, others prefer minimum sizes which may be enlarged if the national authority considers it useful.

Remark: This may need more explanation, also in view of the contents of paragraphs 70 and 90.

45. [14] Qualitative characteristics are normally recorded visually, whereas quantitative characteristics can be measured; in most cases, however, a visual assessment or, if applicable, other sensory observations (for example, taste, smell) are sufficient, especially where measurements are impractical and can only be made with considerable effort. When a fixed scale is used, for a qualitative or quantitative characteristic, throughout the trials and over the years, the environmental influence on the varieties is reflected in the figures.

Question: Should we add a paragraph on shifting scales used for agricultural species?

5.5 Statistical Methods

46. [15] Statistical operations on the figures of test results must be preceded by a test on the properties of the scale (e.g. nominal, ordinal or interval); for example, do the observations show normal (Gaussian) distribution and, if not, why not? Especially for characteristics which have been created by combining given characteristics, the question of whether the assumptions of the statistical methods to be used are fulfilled must be addressed. Combined characteristics can only be used for distinctness if the uniformity test on the combined characteristic itself, and not only on the components, has been successful.

Explanation: Document TWC/14/14 on Similarity, Clustering and Dendrograms gives some information on the mentioned methods. Document TC/32/6 provides some information on the use of sequential analysis. Further information on statistical documents prepared by the Technical Working Party on Automation and Computer Programs (TWC) can be found in documents TWC/15/2 and TWC/15/3.

The TWC offered to prepare a document on the definition of good statistical practices.

47. For measured quantitative characteristics, statistical methods should be applied. UPOV has devised a method called Combined Over-Years Distinctness (COYD) Analysis and the Combined Over-Years Uniformity (COYU) Analysis. These are statistical tools primarily intended to be used for cross-fertilized, seed-propagated varieties. In cases where certain standards required for the COYD Analysis cannot be met, UPOV recommends use of the long

term Least Significant Distance Analysis. These methods may, however, prove to be useful for other types as well.

Explanation: *The method is reproduced in document TC/33/7. A computer program is explained in document TWC/15/17. Document TWC/14/7 gives some further explanations on the use of COY.*

Most vegetatively propagated varieties are not planted at random blocks, which means that the requirements for the application of the long-term LSD are not met.

A screen-based input module for COYD has still to be prepared by the TWC as well as a computer-generated demonstration of COYD.

The Technical Working Party on Automation and Computer Programs (TWC) will have to prepare a more detailed summary on the COY analysis and may propose an alternative for measurements over a single year only which is common in ornamental and fruit crops (see also paragraph 58 below).

The COY analysis is contested by all Crop Technical Working Parties except the Technical Working Party for Agricultural Crops (TWA). Some Technical Working Parties have been very outspoken stating that they do not accept that a method planned to allow detection of small differences, which was considered necessary for some grasses, is imposed on them without any need and usefulness and against their strong opposition.

48. [16] In so far as visual characteristics have been recorded with a scale which does not fulfill the assumptions of the usual parametric statistics, normally 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 facilitates the interpretation of data.

Explanation: The TWC proposed to delete this paragraph. The paragraph should, however, only be deleted if the TWC has drafted an adequate replacement giving advice on the handling of visually assessed characteristics.

Question: Do countries strictly adhere to the practice mentioned in the last sentence? If certain reference varieties are left out from a test in a particular year, e.g. those with a light green leaf color, would the other example varieties then shift to fill the total scale or not?

5.6 Environmental Influence

49. [17] Both qualitative and quantitative characteristics may be, to a greater or lesser extent, subject to environmental influence which may modify the expression of genetically controlled differences. The 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.

Remark: Should the reference to qualitative characteristics be deleted as it contradicts paragraph 40?

6. TESTING DISTINCTNESS

6.1 General

50. [18] According to Article 7 of the Convention, the variety must be clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of filing of the application.

51. [19] The varieties with which a variety under test has to be compared are the varieties whose existence is a matter of common knowledge. The first basis for comparison is normally those varieties which are considered to be similar to the variety under test and are available in the examining State, for example in a reference collection, or can be easily obtained.

Explanation: Some Technical Working Parties asked for the General Introduction to contain more information and explanation on how to define "common knowledge." For that purpose, all experts from the Technical Working Party on Ornamental Plants and Forest Trees (TWO) will send to the expert from the United Kingdom comments and prepared definitions on what they consider to be common knowledge for the preparation of a document by the end of January 1999. The Working Party was aware that also legal aspects were involved and not too precise information could be given.

52. In the Acts preceding the Act of 1991 of the UPOV Convention it was stated that the variety had to be clearly distinguishable "by one or more important characteristics." The word "characteristic" is still kept in the definition of a variety but it is no longer included in the requirement for distinctness and even more the word "important" is no longer kept.

53. This does not mean, however, that the concept of checking distinctness on the basis of characteristics is abolished. So far it is still the basic concept but the Convention is open to other possibilities as well. In the first instance it is possible to combine several characteristics to obtain a clear difference as long as this is definable and reproducible. It is also possible to have a recourse to other methods which could support small morphological differences observed or differences in characteristics difficult or expensive to observe. However, so far distinction is still based on clear differences in characteristics.

Remark: A combination of characteristics is to be understood as a combination of two characteristics (e.g. ratio length/width) or in some cases three characteristics. It does not mean the application of methods like the multivariate analysis which would just give a global measure of distance without indication of a real characteristic.

54. For the decision on distinctness, only those characteristics in which both the candidate variety as well as its closest similar varieties are uniform can be used. If in one of the two varieties the expression of the characteristic is not uniform, the characteristic has to be rejected. Different degrees of uniformity are not accepted as a characteristic for distinctness.

Question: What about a selection from land races?

Explanation: For characteristics observed using bulk samples some rules still have to be established on whether uniformity is only tested in cases of doubt or in cases where the characteristic is the only characteristic for establishing distinctness, especially if tests are very expensive (e.g. fragrances for Lavender).

6.2 Criteria for Distinctness

55. [20] Two varieties have to be considered distinct if the difference

- has been determined in at least one testing place,
- is clear and
- is consistent.

6.3 Qualitative Characteristics

56. [21] In the case of true qualitative characteristics the difference between two varieties has to be considered clear if the respective characteristics show expressions which fall into two different states.

57. In the case of other qualitatively handled characteristics a possible fluctuation has to be taken into account in establishing distinctness and thus a different state may not be sufficient to establish distinctness.

Explanation: See also explanation after paragraph 4.

6.4 Measured Quantitative Characteristics

58. [22] When distinctness depends on measured characteristics the difference has to be considered clear if it occurs with one per cent probability of error, for example, on the basis of the method of the Least Significant Difference. The differences are consistent if they occur with the same sign in two consecutive, or in two out of three, growing seasons.

Explanation: The Technical Working Party on Automation and Computer Programs (TWC) proposed to keep this paragraph and the existing rule in TG/1/2 paragraph 22 in cases where only data of one year is available because all possible situations of measurements should be covered.

59. In order to take into account the variation between years, UPOV developed a more sophisticated method, the Combined Over Years (COY) method. It is supplemented by a further Least Significant Difference (LSD) method for the cases of those few varieties leading to less than about 20 degrees of freedom in the growing tests. Its main use is for measurements in cross-fertilized varieties, but if so desired it can also be used for measurements in vegetatively propagated or self-fertilized varieties.

Explanation: Several Technical Working Parties asked for a more simple test (e.g. t-test) as often only data from one year are available.

The Technical Working Party on Automation and Computer Programs (TWC) will have to prepare an enlarged summary on COYD. It should be in line with paragraph 47 unless it is also reworded.

6.5 Normally Visually Observed Quantitative Characteristics

60. [23] Quantitative characteristics do not necessarily imply measuring or counting. A large part of the quantitative characteristics is observed visually. If a normally visually observed quantitative characteristic is the only distinguishing characteristic in relation to another variety, in case of doubt, it should be measured where this is possible with reasonable effort.

61. [24] A direct comparison is always recommended between two similar varieties since direct pair-wise comparisons show the least bias. In each comparison it is acceptable to note a difference between two varieties as soon as this difference can be seen with the eye and could be measured although the measurement might be impractical and require unreasonable effort.

Explanation: The Technical Working Party on Automation and Computer Programs (TWC) will propose the most appropriate method for direct pair-wise comparisons between two similar varieties.

62. [25] 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 following trials. The number of comparisons has to be sufficient to allow a reliability comparable with measured characteristics.

Explanation: In the species so far dealt with by the Technical Working Party on Ornamental Plants and Forest Trees (TWO), decisions on distinctness and uniformity are taken on the basis of visual observations. Measurements, if taken at all, are only a further tool and are only used to support the visual observation of the expert. Therefore the application of simple statistical methods such as t-test or LSD is sufficient.

The TWC is also working to develop methods for the handling of visually assessed characteristics.

Remark: It is proposed to consider changing the wording in the technical notes of the Test Guidelines reading "All observations determined by measurement ..." Normally decisions are not determined by measurement in ornamental plants. It could rather say "All measurements ..." If decisions were to be made on those measurements, would ten measurements on typical organs (one from each of ten plants) be enough, statistically? (The variation on each plant is not taken into consideration).

6.6 Combined Data

63. [26] Cases can arise in which differences between two varieties may be observed in several separately assessed characteristics. If the combination of such data is used to establish distinctness (e.g. length/width ratio, but not multivariate components or a linear combination of characteristics), it should be ensured that the degree of reliability is comparable with that provided for measured or normally visually observed characteristics.

7. TESTING UNIFORMITY

7.1 General

64. [27] According to Article 8 of the Convention, the variety shall be deemed to be 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.

65. This means that in establishing a test, as well as in deciding on its outcome, the genetic structure and mode of propagation of a variety should be fully taken into account. The approach to vegetatively propagated varieties, truly self-pollinated varieties, mainly self-pollinated varieties, cross-pollinated varieties, synthetic varieties and hybrid varieties is necessarily very different.

Remark: The way of propagation should be taken into consideration ONLY and not the genetic structure.

66. [27] To be considered uniform, the variation shown by a variety, depending on the breeding system of that variety and off-types (see next paragraph) due to occasional mixture, mutation or other causes, must be as limited as necessary to permit accurate description and assessment of distinctness and to ensure stability. This requires a certain tolerance which will differ according to the reproductive system of the variety–vegetatively propagated, self-fertilized or cross-fertilized. The degree of variation and the number of off-types appearing should not exceed the tolerance indicated in the appropriate UPOV Test Guidelines.

Proposal: To rewrite the paragraph in less general words and with more links to the next paragraph.

7.2 Definition of Off-type

67. For the assessment of uniformity

"Any 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 plant or of part of the plant, used in the testing of distinctness, taking into consideration the particular species."

Explanation: The TWO discussed an alternative clarifying better that an off-type in some organs and not necessarily in all of them, could make the plant an off-type. That wording could read:

"Any plant is to be considered an off-type if it can be clearly distinguished from the variety in the expression of any characteristic used in the testing of distinctness, whether expressed on all organs to which its expression refers or even only on one or several organs of that plant, taking into consideration the particular species."

68. With this definition, it is made clear that for the definition of off-types the same criteria apply as for the testing of distinctness.

69. The trials may also contain plants which are very different from those of the variety; these could be disregarded as long as their number does not interfere with the test. In choosing the term "could be disregarded" UPOV makes it clear that it would depend on the judgment of the crop expert whether they are disregarded or not. That would in practice mean that in horticultural crops, with a low number of plants, already one single plant would interfere in the test and could not be disregarded.

Remark: The first sentence may be sufficient for the main document and the other sentences could be placed under explanations.

7.3 Vegetatively Propagated Varieties

70. [28] For vegetatively propagated varieties of most species, the acceptable number of off-types tolerated in samples of various sizes is based on a population standard of 1 percent and on an acceptance probability of at least 95 percent as a result of experience. 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 as reproduced in a separate document, in each of the individual UPOV Test Guidelines, the Technical Working Parties state whether the population standard to be used is 1% and the acceptance probability is 95% or whether the species or a certain type of variety of that species justifies a different population standard and acceptance probability. The Test Guidelines then also state for the respective sample size the maximum number of off-types tolerated.

Explanation: Document TC/34/5 on the Testing of Uniformity of Self-Fertilized and Vegetatively Propagated Species Using Off-types gives more detailed information.

The TWC may propose an enlarged summary to document TC/34/5.

The TWA preferred to indicate in the Test Guidelines a minimum number and not a fixed number, and leave the testing offices the possibility to increase it, as that would not affect the α-error but only reduce the β-error, which would only reduce the risk of wrong decisions. The TWC stressed the need for a fixed sample size to guarantee the same probability of acceptance and/or rejection.

See remark to paragraph 44.

7.4 Truly Self-Pollinated Varieties

71. [28] For truly self-pollinated varieties, the same criteria and tolerances apply as for vegetatively propagated varieties (see paragraph 70 above).

7.5 Mainly Self-Pollinated Varieties

72. [29] Mainly self-pollinated varieties are those varieties which are not fully self-pollinated but which are treated as self-pollinated for testing. For those, 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 doubled.

Explanation: Please note that the number of off-types tolerated is, no longer, doubled (as in the past) but is the population standard.

Question: Does this also include species with pollen incompatibility and other pollination barriers that do not really fit into the cross pollination variety definition? These types of species can be very uniform but do not self-fertilize.

7.6 Cross-Pollinated Varieties Including Synthetic Varieties

73. [30] Cross-pollinated varieties normally exhibit wider variations within the variety than vegetatively propagated or self-pollinated varieties and it is sometimes difficult to distinguish off-types. Therefore no fixed tolerance can be determined but relative tolerance limits are used through comparison with comparable varieties already known. That means that the candidate variety should not be significantly less uniform than the comparable varieties.

Explanation Many experts asked for an example to be prepared by the TWC to better understand what is meant by relative tolerance.

74. [31] For measured characteristics, the number of plants visually different from those of the variety should not significantly (5% probability of an error) exceed the number found in comparable varieties already known. In order to take into account variations between years, the Combined Over Years Uniformity (COYU) method has been developed, which is a further development of the same method used for distinctness, but in this case for uniformity.

Explanation: At present in case only data from one year are available, at present, States use different methods: 1.6 times the average of the variance of varieties used for comparison; variation between standard deviations of varieties, etc. The Technical Working Party on Automation and Computer Programs (TWC) is still discussing which method to recommend but the experts have still various opinions on the validity of the different methods.

Question: If a 1.6 times "variance" is used, will varieties not become less and less uniform from one set of reference varieties to the next?

75. [32] Visually assessed characteristics have to be handled in the same way as those which are measured. The number of plants visually different from those of the variety should not significantly (5% probability of an error) exceed the number found in comparable varieties already known.

7.7 Hybrid Varieties

76. [33] Single cross varieties have to be treated as mainly self-pollinated varieties, but an additional tolerance has to be allowed for inbred plants. It is not possible to fix a percentage as the decisions differ according to the species and the breeding method. However, the percentage of inbred plants should not be so high as to interfere with the trials. The maximum number tolerated will be fixed in the Test Guidelines concerned by the Technical Working Parties.

77. [34] For other categories of hybrids, a segregation of certain characteristics is acceptable if it is in agreement with the formula of the variety. If the heredity of a clear-cut segregating characteristic is known, this characteristic has to be treated as a qualitative characteristic. If the described characteristic is not a clear-cut characteristic, it has to be handled as in the case of other kinds of cross-pollinated varieties; that is to say, the uniformity has to be compared with that of comparable varieties already known. For the fixing of a tolerance for inbred plants or parent plants, the same considerations apply as in the case of a single cross variety.

78. For hybrids from non-uniform parent lines UPOV has not yet decided whether the same rules as for hybrids from inbred lines should apply or whether special treatment is justified. As long as no other proof is given, this type of variety should be treated a cross-pollinated varieties. Consistency (stability) of the variety must be ensured by examination of the uniformity of its parents or of the variety itself. Where neither possible or achievable, the variety cannot be described. Non-uniformity for specific characteristics is different from general non-uniformity in this context.

Explanation: A decision is needed before a final version of the General Introduction is established.

8. TESTING STABILITY

79. [35] According to Article 9 of the Convention, the 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.

80. [36] It is not generally possible during a period of 2 to 3 years to perform tests on stability which lead to the same certainty as the testing of distinctness and uniformity.

81. [37] Generally, when a submitted sample has been shown to be uniform, the material can also be considered stable. Nevertheless, during the testing for distinctness and uniformity, careful attention has to be paid to stability. As far as necessary, stability has to be tested by growing a further generation or new seed stock to verify that it exhibits the same characteristics as those shown by the previous material supplied.

Remark: This is self-policing. If the "variety" is unstable it will no longer be the variety.

9. REFERENCE COLLECTIONS

82. [38] As far as is feasible and necessary in relation to the crops concerned, each country is expected to maintain, or to arrange for another country to maintain on its behalf, reference collections of viable seed or of vegetative plant material of the varieties to which it has granted protection. Preferably, the reference collections should also contain seed or vegetative plant material of any other varieties which are likely to be useful as a reference. Normally, seed or vegetative plant material should be obtained from the breeder and, when it is necessary to renew the seed or plant material in stock, the new lot should be checked against material in stock in a growing test before use.

Explanation: At present only living material of the variety capable of reproducing the variety can be considered as reference material. A description of an old variety or a test report alone, as detailed as it may be even with herbarium material, is not enough for the decision of distinctness if no more living material exists.

Question: If an old variety is no longer available as living material but only as a description, is it still common knowledge? Apparently not - see Annex V, page 8, paragraph 38 of document TC/35/5.

10. COMPOSITION OF TEST GUIDELINES

10.1 Introduction

83. It is not possible to prepare Test Guidelines for all species in a general way. It is necessary to prepare them for each species separately or in a few cases for one whole genus or in extreme cases even for a higher unit. Different groups inside a species can only be separated into different Test Guidelines if they can be clearly separated and there is no risk that a candidate variety tested according to the wrong Test Guidelines would be declared distinct if in reality it is not. The more hybrids exist between species, the less groupings are possible. In annual species more groups are possible than in perennials, in seed propagated varieties more than in vegetatively propagated varieties.

*Remark: The first two sentences could be sufficient.*84. In addition to the basic principles for testing also some basic general rules are established which apply to all individual Test Guidelines. One important rule is the composition and lay-out of the documents. This has changed with time. While some older documents still have a different lay-out, all newer ones are grouped into 10 chapters.

Remark: This paragraph may be shortened.

10.2 Cover Page

10.2.1 Original Language

85. [39] The Test Guidelines are originally drafted in one of the four UPOV working languages (English, French, German or Spanish) and adopted in that version. In most cases it will be the English language, as in the discussions on the drafts, English is mostly used. In the case of any discrepancy between the original text and the translations into the three other languages, the original text prevails. For this purpose, each set of Test Guidelines contains an indication of the original language in which it has been drafted and adopted.

Remark: This paragraph my be shortened.

10.2.2 Reference to the General Introduction

86. Each individual Test Guidelines document makes 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. This may be needed especially for a user of the Test Guidelines who may be only interested in a single species and will not be as familiar with the general UPOV philosophy.

Remark: The last sentence may be deleted.

10.3 Individual Chapters of the Test Guidelines

87. [40] The UPOV Test Guidelines are grouped into 10 Chapters. These individual chapters give technical recommendations and special guidance with respect to the species dealt with. In Chapter VII, which is the main chapter, the characteristics which should be observed are listed. The chapters 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 of the Table of Characteristics
Chapter IX:	Literature
Chapter X:	Technical Questionnaire

10.3.1 Subject of these Guidelines (Chapter I)

88. This chapter fixes the limits of the application of the document, mainly giving the Botanical or Latin name of the species or genus to which the document would apply and stating whether the document applies to all varieties of that given species or genus or only to a

part of them, e.g. only to vegetatively propagated varieties, or only to fruit varieties, only to ornamental varieties or only to rootstocks.

Explanation

In Latin names no abbreviations are used, even if a number of species from the same genus is listed, e.g. Vitis candicans, then Vitis labrusca – not V. labrusca.

Family names are normally included in Test Guidelines of ornamental species.

Botanical names in italics are only used for taxa from the genus downwards. Family names are not written in italics.

Remark: Explanations are not needed.

10.3.2 Material Required (Chapter II)

89. This chapter indicates the quantity and quality of material to be submitted to the testing authority, e.g. so many grammes of seed or so many seeds, plants or cuttings. It makes remarks on the health of material required, e.g. visibly healthy, not lacking in vigor or affected by any important pests or diseases, or is more precise, e.g. free of all known viruses, or viruses or diseases specifically mentioned. It also states that the material should not have been chemically or otherwise treated (no short day or long day treatment, no cold treatment, etc.) unless requested by the authority. Most recently it also states, for several species, that the material should preferably not originate from *in vitro* propagation as that may affect certain expressions of the variety.

10.3.3 Conduct of Tests (Chapter III)

90. This chapter indicates the way in which the test should be conducted, how many growing periods or years the plants should be observed, in how many places (mostly one place only) and how many plants with how many replications should be observed. In order to achieve comparable results, it is important that the same number of plants and the same number of replications are observed in different countries, otherwise, especially when applying statistics, a larger number of plants or more replications would lead to smaller differences which would still be considered statistically significant. It further states that when separate plots are grown for visual assessment and measuring they have to be subject to the same treatment and also that additional special tests may be established, e.g. laboratory tests on electrophoresis.

Explanation: Uniformity is observed on any characteristic of the plant, not only on characteristics listed in the Test Guidelines. Any difference in an obvious characteristic has to be considered, whether in the Test Guidelines or not. Differences in non-obvious characteristics will, however, seldom be observed.

When distinctness and uniformity are determined by visual assessment, the whole plot is observed. Measurements are made only on a restricted number, e.g. 10 plants.

Measurements from identified off-types should not be included in the calculations of distinctness.

Remark: The explanation may be misleading and contradictory to preceding paragraphs.

10.3.4 Methods and Observations (Chapter IV)

91. [40] This chapter explains how the variety should be observed, how many of the grown plants should be observed for distinctness, 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, terminal flowers or fruits or whether the terminal flower or fruit should be excluded), at what time the observations of a given organ should be made, etc. In some Test Guidelines, this Chapter is very detailed and contains numerous paragraphs. For ornamental plants, it may also state how to observe the color of the flower indicating the standard conditions or recommending the use of the RHS Colour Chart of the Royal Horticultural Society in the United Kingdom. Chapter IV also fixes the statistical threshold for observations made by measurements (e.g. in vegetatively or self-fertilized species, it fixes the population standard and acceptance probability and fixes the number of off-types tolerated for a given sample size. In principle all information applicable to a number of characteristics is included here, while more particular (or more detailed) information valid for only one or a few characteristics is included in Chapter VIII (Explanations on the Table of Characteristics).

Explanation: All Test Guidelines for vegetatively-propagated or self-fertilized varieties have to contain a paragraph fixing the population standard and the acceptance probability.

Remark: The bracketed examples in the first sentence should be deleted. The second sentence and the explanation should be deleted.

10.3.5 Grouping of Varieties (Chapter V)

92. This chapter first gives general information on the criteria for selecting grouping characteristics to place most similar varieties close to each other in the growing test and thereafter lists the most appropriate characteristics which should be used for such grouping. With only a few varieties, grouping may not be very important and for this reason in some Test Guidelines no grouping characteristics are indicated, but in some species several hundred varieties have to be grown every year and, in those cases, a grouping into subgroups facilitates the comparison, as a variety would not be compared with the totality of all varieties but only with those in the same group. Depending on the species, different characteristics are selected, mainly qualitative ones and preferably those quantitative characteristics which are less affected by environment, e.g. color in ornamental species, earliness in cereals or size for trees or bushes of some fruit species.

Explanation: The purpose of grouping characteristics is to help in planning the lay-out of the trial and in selecting appropriate example varieties.

Qualitative characteristics should be used in the first instance as grouping characteristics. In case of doubt, candidate varieties have to be tested in more than one group.

In the Technical Notes the grouping characteristics should have the same wording and states of expression as in the Table of Characteristics.

Grouping characteristics should normally cover most of the characteristics of the list of characteristics appearing in the Technical Questionnaire. These are mainly based on information supplied by the applicant. They must be of such a nature that the breeder/applicant will interpret them correctly and will be able to provide correct information.

The grouping characteristics are normally listed chronologically as in the Table of Characteristics. Another order is, however, acceptable if so desired by the Technical Working Party concerned.

Remarks: The examples in the last sentence should be deleted as they are considered doubtful. Other experts especially asked for the indication of examples for a better understanding. The explanations are not needed. In the sessions of the Technical Working Parties such explanations are very helpful to ensure harmonized approaches and avoid long discussions between experts on the practice inside UPOV.

10.3.6 Characteristics and Symbols (Chapter VI)

93. [41] It may not always be necessary to use all the characteristics listed in the individual Test Guidelines to describe a variety and to establish that it is distinct. This chapter therefore explains the different groups of characteristics mentioned in the chapters which follow. In principle, two groups are included in the document:

10.3.6.1 Characteristics with an Asterisk

94. The first group are those characteristics which all experts accepted at the time of preparation of the Test Guidelines and which all agreed to use every time in a description in order to harmonize descriptions issued by the member States under the terms of the Convention. The use of those characteristics is "obligatory" in so far as one can speak of an obligatory characteristic in a document which *per se* is only a recommendation

95. This group of characteristics has been marked with an asterisk (*) to show that the characteristics should be included in the variety description of all varieties in every growing period over which examinations are made, except when the state of expression of a preceding characteristic or regional environmental conditions renders this impossible.

Explanation: A characteristic should only receive an asterisk if

(a) it is important for description;

(b) it is needed as a minimum information for the exchange of information on the variety;

(c) if all experts agree to the asterisk (in case one State objects to the indication of an asterisk to a given characteristic and states the reasons (e.g. no discriminating power under his country's conditions), no asterisk should be given);

(d) at least the range of example varieties remains the same in the different countries in case the expressions change from country to country; [questioned by some experts and proposed to be deleted as the example varieties may change from one country to another].

(e) in the case of a pest or disease resistance characteristic that it has the states "absent, present," characteristics with degrees of resistance should not receive an asterisk.

Remark: The explanation is dispensable (see objection to deletion under paragraph 92)

10.3.6.2 Characteristics Without an Asterisk

96. The second "non-obligatory" group covers those characteristics which many experts consider useful for description and for DUS testing but which not all experts of the member States can accept, either because they consider them unnecessary and only increase the workload, or because the environment of their country does not enable them to observe these characteristics.

Explanations: With respect to the selection criteria for the second group of characteristics different opinions exist so far.

(a) In order to reach harmonization between the member States one group of experts would prefer to reach a situation where the number is almost fixed for all States and only in exceptional cases further characteristics are added (e.g. if the applicant declares that his variety is different only in that new characteristic) and that this addition is brought to the attention of the respective Technical Working Party for inclusion into the Test Guidelines.

(b) Another group prefers a short list (especially for TWA species), but feels free to add new characteristics at any time. Therefore some States use a large number of additional characteristics not included in the UPOV Test Guidelines for certain species.

(c) A third group (especially for TWF and some TWO species) prefers a large list of non-asterisk characteristics out of which each State selects those which are suited to its special situation and environment. A characteristic should not just be deleted because it is not needed in one State but is useful in another State with the argument that that State is free to add it at any time on the national level. A large list is preferred to ensure that in case the characteristic is used, all States use it in the same way. That

procedure is preferred to a short list to which every State adds numerous additional characteristics but several States may add the same characteristic with a different wording and different states of expression.

(d) There is another group of a few States and a regional grouping which prefers a short list as internally they/it have/has decided to use in principle and if possible all characteristics of the UPOV Test Guidelines irrespective of whether they are marked with an asterisk or not.

10.3.6.2(a) Characteristics Not Included in the UPOV Test Guidelines But Used for Distinctness by Some Member States

97(a) There is still another group of additional characteristics during the trial becoming of importance for the distinctness of the candidate variety. These characteristics are not mentioned in the Test Guidelines and are used only when the characteristics mentioned in the Test Guidelines fail to show the distinctness observed. These characteristics have to fulfill the same requirements as any other characteristic accepted for inclusion in the UPOV Test Guidelines and especially the requirement of uniformity and reproducibility.

10.3.6.3 Characteristics for Supporting Evidence

97. Recently a third group of characteristics has been agreed upon by UPOV and has been added to the UPOV Test Guidelines in an Annex. For these characteristics, the majority of the UPOV member States are of the view that it is not possible to establish distinctness solely on the basis of a difference found in these characteristics. They can thus only been used as supporting evidence in addition to a difference found in a characteristic from the Table of Characteristics.

Explanation: These characteristics are so far limited to characteristics derived by using electrophoresis. The size of that difference required, especially whether it could be lower than if there were no supporting evidence by this third category of characteristics, has not yet been fixed by UPOV.

Remark: Explanations are dispensable.

10.3.6.4 States of Expression, Notes, Example Varieties, Explanations

98. In the Table of Characteristics, a scale of possible states of expression (so-called "states") is indicated for each characteristic. The 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 the sign (+), which indicates that the characteristic is illustrated by explanations and drawings or that testing methods are indicated in the chapter entitled "Explanations and Methods."

99. Chapter VI also explains other signs added to the characteristics in the Table of Characteristics in Chapter VII making reference to Chapter VIII which gives explanations and details on those characteristics.

10.3.7 Table of Characteristics (Chapter VII)

10.3.7.1 General

100. [41] The Table of Characteristics represents the main part of the Test Guidelines. It contains a list of all characteristics recommended by UPOV for the description of varieties and for the testing of distinctness, uniformity and stability, in short called DUS testing. For each characteristic listed, several individual columns with information are provided.

10.3.7.2 Layout

101. In the past UPOV had issued all Test Guidelines in a single trilingual version covering the English, French and German text in one single document. With the introduction of Spanish the Test Guidelines would have become too voluminous and it was therefore decided to prepare separate versions for each of the languages. The trilingual Table of Characteristics had however been appreciated by many experts especially because it showed immediately any error of translation and thus contributed to a correct application of the Test Guidelines in all languages. It was therefore decided to keep the multilingual Table and add the Spanish language. This required a change in its layout to fit all four languages in one single table. Since that time the layout of the Table of Characteristics has been as follows:

Remark: paragraph 101 could be shortened and just read: "The layout of the Table of Characteristics is as follows:"

102. In the new layout the first column contains the chronological numbering of the characteristics and also some other signs. It also indicates whether the characteristic is an "obligatory" one by marking or not marking it with an "asterisk" (obligatory means that those characteristics should be used on all varieties in every growing period over which examinations are made and should always be included in the variety descriptions, except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible). It may furthermore contain a plus (+), making reference to more detailed information on the characteristic in chapter VIII (Explanations on the Table of Characteristics). Thereafter follows the full text of the characteristic with its different states of expression, in four separate columns, one for each of the official UPOV languages. Thereafter follows a column with example varieties for most states of expression. The "example varieties" are varieties which are considered representative for the given state of expression. The final column of the Table of Characteristics indicates, opposite the states of expression for each characteristic, numerical Notes () for the purpose of electronic data processing.

Remark: The contents is already in the previous paragraphs, therefore paragraph 102 is dispensable.

103. The use of Notes facilitates the storage of data and their handling and the comparison of variety descriptions. By this it is, for example, possible to present on one single page in a table the full variety descriptions of 50 to 100 varieties. This facilitates a general overview of the range of the collection in a given species. It also facilitates the treatment of data in the computer. Finally it enforces discipline, as it requires the experts to look at all characteristics in a more systematic way, especially at the time of preparation of Test Guidelines.

Explanation: The layout, in the trilingual versions,–at present still used in a large number of the older adopted UPOV Test Guidelines–shows differences in the first column where it is indicated whether the characteristic is an "obligatory" one by marking or not marking it with an "asterisk." Thereafter follows the column with chronological numbering of the characteristics, followed by the column with the full text of the characteristic in all three languages. The next column indicates the different states of expression in English, followed by a column in French and another in German. All other parts are the same as in the new layout.

Remark: The first sentence may be sufficient.

10.3.7.3 Order of Characteristics

104. [43] In the Test Guidelines, the morphological characteristics are normally 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 the grains submitted and the grains harvested from the plants obtained from the submitted material. For the different organs the following order is used:

grain (seed submitted)
seedling
plant (e.g. attitude)
root
root system or other subterranean organs
stem (stipule)
leaf (blade, petiole) [petiole, blade?]
inflorescence
flower (calyx, sepal, corolla, petal, stamen, pistil)
fruit
grain (harvested)

105. Within the above order, the following subdivision of the characteristics of different organs of the plants has been adopted:

attitude
height
length
width
size
shape
color

other details (such as surface, etc., and characteristics of part of the organ such as base, top and margin).

106. Seed characteristics to be observed on the seed sent in by the applicant should be placed at the beginning of the Table of Characteristics; characteristics to be observed on the seed harvested from the material in the growing trials should be placed at the end of the Table of Characteristics.

Remark: This paragraph is already covered by paragraph 104 and therefore superfluous. Objection to deletion: Many experts do not clearly understand the meaning of "grain (harvested)" as all grains are harvested, thus an explanation is needed.

107. Physiological characteristics should be included at the end of the Table unless specific growth stages are involved in which case they may be included in their correct chronological position (e.g. time of bud burst) in order that one should not forget to do that observation at the right phenological stage.

108. [42] In certain cases this order has been replaced by a chronological order of recording, starting from the time of planting or sowing (in some cases even before) until harvest (or even thereafter), especially if the recording follows an existing code of growth stages of the species concerned, or it has been combined with the botanical order of organs, whereby inside one organ a chronological order of recording is applied.

Explanation: Numbering of characteristics: It is proposed to use, throughout the drafting of new Test Guidelines in each new version in square bracket, the number the characteristic had in the first draft. In the revision of the existing Test Guidelines the number in the adopted Test Guidelines should always be added in brackets until a new final version has been reached.

Remark: Paragraphs 107 and 108 are dispensable as they leave any choice.

10.3.7.4 Order of States of Expression Inside a Characteristic

109. [44] As far as it is possible to build up an order for the expressions inside a characteristic, the smaller, lesser or lower expressions should be assigned the lower Note.

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

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

The order of the states should as far as possible be:

- *from small to large*
- *from light to dark (e.g. flower color)*
- *from green to ripe (e.g. fruit color)*

- *from low to high*
- *from narrow to broad*
- *from young to old*
- *from base to apex*

In certain characteristics there appears to be a clash between two recommended orders: Ex. Shape of base: pointed (1), rounded (2), flattened (3), depressed (4). In this case the "narrow to broad" should overrule the "low to high."

Remark: There is an overlapping with document TC/35/8. It has to be decided which parts or how much of the information in TC/35/8 should be included in this General Introduction.

10.3.7.5 Categories of Characteristics

10.3.7.5.1 Qualitative Characteristics

110. [44] True qualitative characteristics are classified by consecutive numbers according to the state commencing with Note 1 and often with no upper limit, for example:

Poplar: sex of plant	Note
dioecious female	(1)
dioecious male	(2)
monoecious unisexual	(3)
monoecious hermaphrodite	(4)

Remark: The poplar example is not the optimal one as this characteristic cannot be observed in the DUS test (the plants would have to be older). Another example could be:

Kalanchoë: Leaf: type of incisions	*Note*
serrate	*1*
biserrate	*2*
crenate	*3*
bicrenate	*4*

111. There are a few exceptions to that rule, thus in the case of ploidy, the number of chromosomes sets is accepted as Note (e.g. diploid (2), tetraploid (4)).

10.3.7.5.1(a) Non-true Qualitative Characteristics

111(a) Non-true qualitative characteristics are characteristics which are handled as qualitative characteristics when it is more reasonable to disregard the continuous variation for practical purposes 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

10.3.7.5.2 Quantitative Characteristics

112. [45] 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

113. [45] These word pairs are given the Notes 3 and 7 and the word "medium" is given the Note 5. The remaining states of the scale indicated by the 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

114. [46] Often only the Notes 3, 5, 7 or 1, 3, 5, 7, 9 are indicated in the Test Guidelines to state that the quantitative scale is applicable. This is made for reasons of simplification and in order to save work and space in the documents. It means, however, that in each case the full scale (1 to 9) is applicable.

115. [47] In alternative observations, with a clear-cut separation between absence and presence, the state "absent" is coded by Note 1 and the state "present" by Note 9. If in a characteristic it is necessary to make a distinction between complete absence and different degrees of presence, the characteristic is split into one alternative characteristic with the states "absent (1)" and "present (9)" and in another quantitative characteristic with the Notes from 1 to 9. For those characteristics where it is not possible to make a clear-cut distinction

between "absent" and "very weak," the Note 1 receives the meaning "absent or very weak" and then represents the first state in the scale 1 to 9 for quantitative characteristics.

10.3.7.6 Harmonization of the States of Expression

116. In the course of the years many new different practices to the above basic principles have developed and a large part of the many quantitative characteristics are today presented in a qualitative way. As the main aim of the Test Guidelines is to harmonize descriptions this creates no problems. Attention has, however, to be paid when the description is used as a first step for the establishing of distinctness. In these cases it makes a difference whether the characteristic is a true qualitative characteristic or not.

Remark: Its essence to be integrated in Chapter V (on the other hand, does it mean that we should introduce a new column in the Test Guidelines earmarking the true qualitative characteristics?) (see also paragraph 40 and remarks).

117. The harmonization of states of expression will be handled in separate documents.

Explanation: Document TC/33/9 on the Harmonization of States of Expression and Notes of Characteristics Appearing in UPOV Test Guidelines contains translations into the four UPOV languages (English, French, German and Spanish) of the main terms used in the Table of Characteristics.

Document TWF/28/7 gives detailed information on the selection of expressions to be used in the Table of Characteristics. The document has been revised and considerably shortened and reproduced as document TC/35/8. Some preliminary rules and definitions of technical terms are also reproduced in Annex III to this document.

10.3.7.7 Example Varieties

118. [48] Wherever possible, example varieties are indicated describing different states of expression of the different characteristics. Figures–if used at all–have been used only for the first editions of the Test Guidelines, to be abandoned at their next revision. Actual measurements are only valid for a given testing place or even for a given year of testing at that place. They will change from place to place and from year to year and are therefore unsuitable for a document which aims at worldwide coverage. Example varieties can only be combined for one characteristic if all varieties have been tested at the same place and, if placed for one single state, have shown the same expression at that single place.

Remark: The second sentence is dispensable. Objection: its is often very helpful in the discussion why figures are not accepted by UPOV.

119. [48] UPOV is aware of the fact that many example varieties indicated have only regional importance and some may also change slightly in their expression from place to place, but so far they are considered to fulfill the purpose of explaining the given expression much better than any measurement. Example varieties are used only as a help. The testing would become too difficult if an example variety had to be used for each characteristic and for each state. Example varieties are those varieties available to the expert who first drafted the

document. It is also not possible to use the same example varieties on a worldwide level. Each State will have to prepare its own list of example varieties which are grown in its region or country. Thus the example varieties mainly represent or give an idea of the state of expression of a given characteristic at the testing place of the expert who prepared the draft for the Test Guidelines or the revision of existing Test Guidelines or at testing places with similar environment. The national authorities will choose out of the example varieties indicated in the Test Guidelines or from further varieties grown in their region the ones which they consider most appropriate for the solution of a given problem.

Explanation: *Preferably species should not be listed as examples at all. They may only be provisionally indicated as examples if there is no doubt that the whole species shows the expression it represents and only if no example variety exists. Therefore a species cannot be indicated next to an example variety and as soon as a variety exists in a given species only that variety has to be indicated and no other species.*

In order to avoid different environmental influences in any single characteristic of a given document it is not possible to combine varieties proposed by experts from different States unless they have been grown side-by-side for comparison in one place.

Example varieties are not supposed to change their order under different environmental conditions.

If new seed is no longer available for an example variety, the example variety should normally be deleted. It should only be kept if no other example variety can be found representing the expression.

If more than one example variety is indicated, the example varieties should be stated in alphabetical order.

If varieties are indicated for different groups, they should either be separated by a semi-colon or receive an abbreviation in brackets (e.g. (w) = white, (r) = red. They can, however, only be stated if they represent exactly the same expression (e.g. in case of length the same cm or mm under the same conditions). If this is not the case, the characteristic has to be split into two characteristics.

For quantitative characteristics, at least for a few states of expression (e.g. 3, 5, 7) example varieties should–as far as possible–always be indicated.

Remark: The paragraph could be shortened. Objection to its shortening: at present there is a huge confusion among experts on the role of example varieties coming up at every session of the Technical Working Parties.

There is disagreement on the penultimate paragraph of the explanations.

10.3.8 Explanations on the Table of Characteristics (Chapter VIII)

120. [50] The Table of Characteristics of the Test Guidelines is normally followed by a chapter entitled "Explanations on the Table of Characteristics." It gives explanations useful for the understanding of the meaning of a given characteristic, defining the exact time, place or position of the observation 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 highlight precautions to be taken. Very often it provides drawings pointing to the exact position in the plant where the observation has to be made, explaining the part of the plant to be observed or the different states of expression (e.g. "dentation," "serration," "crenation," etc., in relation to incisions of the margins) or explains with drawings the meaning of certain shapes. For pest and disease resistance characteristics, it describes the standardized method of observation and fixes the pathotypes and explains where to obtain samples. For laboratory methods it also describes the method. For certain crops it reproduces a growth stage code which then is used in the Table of Characteristics to indicate the time of observation.

Explanation: Remarks or explanations should be placed in the Test Guidelines as follows:

(a) short remarks for 1 to 3 characteristics should be placed in brackets after the wording of the characteristic in Chapter VII, Table of Characteristics;

(b) remarks or explanations for certain organs or groups of characteristics should be placed in Chapter IV, Methods and Observations;

(c) longer remarks or explanations for one or a few characteristics should be placed in Chapter VIII, Explanations to the Table of Characteristics.

Drawings for "length," "width" or "size": There is no need for drawings for length, width or size, they have no meaning, except in some special cases in order to indicate from where to where certain measurements should be made.

Document TWF/29/3 contains three examples from books with definitions of shapes. On the basis of an inventory of similar books used, UPOV may choose one book as standard in a similar way as the RHS Colour Chart is recommended for use by UPOV for colors.

Remark: Explanations could be shortened.

10.3.9 Literature (Chapter IX)

121. This chapter cites the titles of literature on the species concerned or on the testing of species covering also the species concerned, which may be helpful to the testing authorities in the execution of the test or which could be useful for those experts who have to build up a testing system on the given species. It may also cite literature on laboratory methods, e.g. for electrophoresis or for the testing of resistances to diseases. If the list of literature indicated is rather long, a reduced number of the most important publications should be highlighted.

Explanation: Document TC/31/7 on Reference Books and Documents for Testing of Varieties contains lists of literature grouped according to species.

Document TC/31/7 dates back to 1994 and needs updating to represent the latest stage of development.

10.3.10 Technical Questionnaire (Chapter X)

Remark: This Chapter could be shortened.

122. [51] This chapter finally gives the layout of a standardized UPOV Technical Questionnaire on the species, which has to be completed in connection with an application for plant breeders' rights." In the Technical Questionnaire, certain indications have to be given in the following seven sections:

Explanation: A model for a Technical Questionnaire to be completed in connection with an application for Plant Breeders' Rights is reproduced in Section 12 of the UPOV Collection.

The model has to be revised and updated to represent the latest stage of development.

10.3.10.1 Genus/Species

123. The UPOV Technical Questionnaire starts with Section 1, asking for the Latin and common names of the species or genus to which the candidate variety belongs.

10.3.10.2 Applicant (Name and Address)

124. Section 2 asks for the Applicant's name and address.

10.3.10.3 Proposed Denomination or Breeder's Reference

125. Section 3 asks for the Proposed denomination or breeder's reference of the candidate variety.

10.3.10.4 Information on Origin, Release, Maintenance and Reproduction of the Variety

126. Section 4 asks for detailed information on the origin, release, maintenance and reproduction of the variety. Information is requested here on the breeding history, the parents of the variety, whether they are known or unknown (discovery), whether the variety results from a crossing or a mutation, the type of variety (e.g. hybrid or open pollinated variety and in case of a hybrid also information on the inbred lines and the formula), the method of propagation (e.g. whether by *in vitro* propagation or not). For some species, like apples or

peaches needing foreign pollenizers for the production of fruits, it asks for the name of pollenizer [pollinator?] varieties.

127. Since recently in all Technical Questionnaires there will be a request to indicate whether the variety requires prior authorization for release under legislation concerning the protection of the environment, human and animal health and whether such authorization has been obtained. This is mainly to ensure that in the case of a GMO (Genetically Modified Organism) the testing authorities are warned in case they have to take certain precautions during the testing or obtain necessary authorizations but it covers also other possible environment or health problems. A GMO variety has, apart from those precautions, to be tested according to the same principles as any other variety.

10.3.10.5 Characteristics of the Variety to be Indicated

128. Section 5 requests information on the expression of the variety in a limited number of characteristics, normally in the so-called "grouping characteristics" which is considered necessary to place the variety in the right order in official government growing trials. In particular cases, in addition to the characteristics of the Table of Characteristics, indications are also used which give valuable information on the variety (for example, the "Horticultural Classification of Lily for Registration" in case of a lily variety).

129. This limited number of characteristics is mainly applicable for countries doing official government growing tests. In other systems where the applicant does more of the testing, or even the whole growing test himself, the applicant will of course have to use all characteristics of the Table of Characteristics of Chapter VII prescribed by the national competent authority or even further characteristics as agreed upon by that authority.

10.3.10.6 Similar Varieties and Differences from these Varieties

130. Section 6 requires information on similar varieties and differences from these varieties. The applicant is asked to state the denomination of the similar variety, the characteristic in which the similar variety is different, the state of expression in that characteristic of the similar variety and of the candidate variety. This information is important for the testing authorities to avoid them failing to grow, from the start, a similar variety known to the breeder or applicant. If such varieties are found only in the second year and the applicant has not indicated them in the Technical Questionnaire, he cannot claim compensation if the test has to be prolonged for a further year.

10.3.10.7 Additional Information Which may Help to Distinguish the Variety

131. Section 7 finally asks for any additional information to be given which may help to distinguish the variety, mainly information on resistance to pests and diseases, on special conditions for the growing (e.g. time of sowing or planting, any special conditions for the examination of the variety). Several Technical Questionnaires for ornamental and fruit species also ask for a representative color photo of the candidate variety to provide helpful

additional information and also to prove that the variety really existed at the time of application.

132. It should be particularly noted that for countries offering official government growing tests the applicant is not required to provide a full description at the time of application. A full official description eventually becomes available as the end product of the growing test.

10.4 Annexes to Test Guidelines (Special Category of Characteristics)

133. In some Test Guidelines, a third category of characteristics (next to the asterisk and non-asterisk characteristics) has been added in an Annex. That Annex is not an official part of the Test Guidelines and is only added for information:

> "because the majority of the UPOV member States is of the view that it is not possible to establish distinctness solely on the basis of a difference found in these characteristics. Such characteristics should therefore only be used as a complement to other differences in morphological or physiological characteristics. UPOV reconfirms that these characteristics are considered useful but that they might not be sufficient on their own to establish distinctness. They should not be used as a routine characteristic but at the request or with the agreement of the applicant of the candidate variety."
>
> *Explanation: At present only characteristics derived by using electrophoresis are added to the Test Guidelines as an annex for a few species.*
>
> *Remark: This paragraph should be summarized with paragraph 97.*

134. UPOV agreed to only include such characteristics in an Annex if–in addition to the normal condition for the inclusion of any characteristics in UPOV Test Guidelines–certain further conditions have been fulfilled. The main additional conditions that have to be fulfilled are that a good knowledge on the genetic background of the different results and a good harmonized method, which has proved to give comparable results in a ring test between the laboratories of member States, existed.

> *Explanation: In the Test Guidelines for Wheat, for example, only one electrophoretic method has been annexed, namely that on glutenins, as the conditions were fulfilled only for glutenins. The method on gliadins, although widely used for purposes other than plant variety protection, was rejected, mainly because not enough knowledge on the genetic background was available.*

[Annex II follows]

ANNEX II

LIST OF DOCUMENTS USEFUL FOR THE TESTING OF PLANT VARIETIES

1. GENERAL INFORMATION	
645:	List of Documents Contained in the Collection of the Texts of the UPOV Convention and Other Important Documents Established by UPOV, Part I: Documents excluding Test Guidelines, Part II: Test Guidelines
	List of Test Guidelines Included in the TG/ROM
Circular U 2631:	Publicity on the UPOV-ROM
TWC/16/18 and http://www.bioss.sari.ac.uk/links/upov/upemail.html:	Useful addresses for Crop Experts (e-mail addresses Bulletin Board, Web sites still to be prepared).
Circular U 2662:	Distribution of UPOV-ROM 98/01
	UPOV-ROM Guide
TC/31/7:	Reference Books and Documents for the Testing of Varieties
2. COOPERATION	
UPOV Collection, Section 19:	Model Administrative Agreement for International Cooperation in the Testing of Varieties
C/32/5:	Cooperation in Examination
TC/32/4:	Level of Involvement of the Applicant in the Growing Test
3. TECHNICAL INFORMATION	
TC/35/5, Annex II	Explanations and Examples to Some Paragraphs of the General Introduction
BMT/3/2:	Identification Methods Based on Molecular Techniques
TC/34/4:	List of Species in Which Practical Technical Knowledge has Been Acquired or for Which National Guidelines Have Been Established
TC/33/9:	Harmonization of States of Expression and Notes of Characteristics Appearing in the UPOV Test Guidelines
TC/35/8:	Categories of Characteristics and Harmonization of States of Expression

TWF/29/3:	Some Observations and Suggestions on the Use of Explanatory Diagrams in Fruit Test Guidelines
TWO/27/3	Grouping of Colors of the RHS Colour Chart
UPOV Collection, Section 23:	UPOV Report on Technical Examination and UPOV Variety Description
UPOV Collection, Section 16:	Conditions for the Examination of a Variety Based Upon Trials Carried Out by or on Behalf of Breeders
UPOV Collection, Section 12:	Technical Questionnaire to be completed in Connection with an Application for Plant Breeders' Rights
	Proposals for the Use of Explanatory Diagrams (still to be prepared)
4. STATISTICAL INFORMATION	
	Definition of Technical, Botanical and Statistical Terms Used in UPOV Documents (still to be prepared)
	Summary on COYD and on COYU (still to be prepared)
	Computer-generated Demonstration of COYD (still to be prepared)
	Screen-based Input Module for COYD (still to be prepared)
	Definition of Good Statistical Practices (still to be prepared)
TWC/15/2:	Documents Produced by the Technical Working Party on Automation and Computer Programs
TWC/15/3:	Topic Index to Documents Produced by the Technical Working Party on Automation and Computer Programs
TC/33/7:	Combined-over-years Distinctness and Uniformity Criterion (COY)
TC/34/5:	Testing of Uniformity of Self-Fertilized And Vegetatively Propagated Species Using Off-Types
TWC/14/14:	Similarity, Clustering and Dendrograms
TC/32/6:	Sequential Analysis
TWC/15/17:	Distinctness, Uniformity and Stability Trial Analysis System for Windows (DUSTW)
TWC/16/11:	Digital Images in Plant Variety Testing

[Annex III follows]

ANNEX III

EXPLANATIONS ON THE USE OF TERMS AND/OR THEIR DEFINITIONS

Abbreviation

In the Test Guidelines abbreviations should be avoided.

Absence/Presence

In characteristics with the states "absent, present" "absent" means total absence on all plants, e.g. of asymmetric leaves, "present" means some leaves on a plant are affected, the variation within one plant does not matter.

The correct Notes for alternative expressions "absent" and "present" would more correctly have been 1 and 2, but UPOV decided to stick to its original decision with the Notes absent (1) and present (9) to avoid confusion.

Remark: Some experts are of the opinion that states 1 and 9 are more correct anyway as this implies either a clear absence or different degrees of presence, which can lie anywhere on the quantitative scale. Absence/presence is seldom truly qualitative.

Anthocyanin

This term is used as a generic term for reddish coloration.

Explanation: It has to be checked if it is right to assume that all reddish coloration is caused by anthocyanin pigmentation. Red coloration may be a better term, or just "pigmentation."

Apex

For UPOV purposes the apex is considered to be the whole (larger) apical (highest) part of an organ while the tip is only the small, most apical (extreme) part. The term "apex" should be used where the organ becomes about 20% narrower than the broadest part and the term "tip" only after it has become concave (to be checked). "Top" should only be used for the highest part with relation to soil level.

Explanation: This proposal needs to be checked.

Attitude

"One and the same characteristic may have different numbers of meaningful states in different species, e.g.:

Attitude: erect (1), semi-erect (2), horizontal (3)
or: erect (1), erect to semi-erect (2), semi-erect (3), semi-erect to horizontal (4), horizontal (5)"

It depends on the variation within varieties and whether it is more reasonable in each particular species to divide the full range into 3 or 5 qualitatively expressed states or into the 9 quantitatively expressed states.

Proposal: either: erect - prostrate, or
vertical - horizontal.

Explanation: This matter still needs to be clarified.

Attitude

"Attitude" or "position" should be used instead of "pose" or "stance."

Central

"Central" should be used for the center of a circle (it is pinpointed) while "middle" for the middle area (e.g. of a branch (a range)).

Color

It is proposed to use only basic terms and not descriptive ones, e.g. "red" instead of "crimson," "yellow-green" instead of "lime," etc., unless they have been widely used for certain species and would otherwise lead to misunderstanding (e.g. "cream" for "yellowish white").

Combination of States

It is not possible to form a state of expression by combining two truly qualitative states, as by definition there is not transition between qualitative states. Therefore the following combinations are not possible: elliptic to ovoid, smaller to equal, flat to convex (e.g. "flat to convex" would include flat and all intensities of convex expression, and therefore would not be a state but a wide range of expression).

Explanation: This position is contested with respect to some of the examples as shape characteristics are often not truly qualitative characteristics (see also next paragraph).

Consistency

In one document or in one group of documents there has to be consistency in the use of certain terms. The use of synonyms may lead to misunderstanding, e.g. "ramification" versus "branching" etc. (could be misunderstood to mean different things).

Dentation

"Dentate" and "serrate" are often creating doubts. In the case of "dentate" the inner part of the incision is concave (to be checked).

Explanation: This definition needs to be checked.

Existence of States of Expression

In case where more than only Notes 3, 5, 7 states are mentioned that does not necessarily mean that the whole range is represented in the reference collection. The mentioning of a state of expression of a quantitative characteristic in the Test Guidelines does not mean that the state really exists in the reference collection.

Explanation: Some experts are against this rule, a state of expression that does not exist in the reference collection should not be mentioned as that would be misleading to some experts.

Remark: This is not clear: Does it mean that there are states of expression in the Test Guidelines which never occur in a DUS test? The states and the Test Guidelines should be meaningful. (The answer to the first question is yes, e.g. often state 9 does not exist but is mentioned for symmetry (see use of 1 to 9 scale).

Even Notes

All Notes of a quantitative characteristic of the Table of Characteristics should be used, including the even Notes (although perhaps) not explicitly indicated. The naming of the even Notes must be obvious and clearly formable, otherwise they have to be indicated. If the even Notes are not mentioned in the Table of Characteristics this does not mean that these Notes are only reserved for states of expression which may occur in future. They are as important as the uneven Notes for the description of a variety and should be used whenever they are occurring in the variety.

Remark: The penultimate sentence to be deleted. Objection: There is still a large misunderstanding concerning the use of the even states, even among experts of "old" UPOV member States.

Foliage

The foliage includes branches and does not refer to leaves only. It gives a global impression.

Remark: According to different dictionaries foliage means all the leaves of a tree or plant.

Height

For "Height" the terms "short → tall" should be used.

Hyphen (-)

There should be no hyphen for the connection of the words (narrow acute, yellowish green, greenish yellow, etc.). The hyphen should only be used in cases where the first and the second word could be reversed without causing a grammatical error, e.g. with hyphens: ovate-elliptic, yellow-green, green-yellow. It would be grammatically incorrect (e.g. to say "green yellowish.") The hyphen could be replaced by "to" without change of meaning, that is both words have the same value. If the second word has the main meaning there should be no hyphen (e.g. yellow green means a green which has some yellow, while yellow-green means yellow to green). [In English yellow - green with a space before and after the hyphen would mean yellow to green while yellow-green without spaces has a different meaning (yellowish green). This differentiation cannot be made in other languages and thus should not be applied to avoid confusion for translations.]

Remark: This is a linguistic question for English. So far I took it that in colors the second word has always the main meaning, e.g. yellow green (whether or not written with hyphen) is a green color with yellow proportion. This would be the same in German and reverse in French and Spanish.

An expression "ovate-elliptic" (whether or not written with hyphen) is unlikely; if ever it could only be "ovate or elliptic."

Length

"Length" and "width" are normally easier to observe, even if the observation is made by visual assessment rather than by measurement. However, "size" may be preferable for very small plant parts, e.g. stipules. Both "length" and "width" should normally not be included together with "size" for the same characteristic in one document. They may be included together with the length/width ratio. There may be special cases where it is preferred to also add "size" in addition to "length" and "width" but these should be kept to real exceptions.

Light/Pale

The difference between "pale green" and "light green" often creates doubts. "Pale green" has a lack of intensity while "light green" has a yellowness.

Question: Does that mean "white green" versus "yellow green"?

Maximum

When measuring the diameter or width, the maximum dimension is always taken unless otherwise stated. It is therefore superfluous to include the word "maximum." Only in cases where a plant part has a larger and a smaller diameter, is it recommended to say "maximum diameter" and "minimum diameter."

Numbers

For numbers lower than 10, the actual numbers are often used, but spelled out. For higher numbers, "few (3), medium (5), many (7)" is used. If actual numbers are used, the states should be mutually exclusive, e.g. smaller than three (state 1), three to five (state 2), larger than five (state 3), unless the following situation occurs: only two (state 1), only three (state 2), two and three (state 3).

Heading of a Characteristic

A characteristic normally starts by mentioning an organ of the plant, followed, after a colon, by the suborgan or the specialty to be observed (e.g.: "Leaf: shape of blade" or "Leaf blade: shape").

Intensity

For characteristics on color intensity, no example varieties should be indicated except if only one color (e.g. green) is mentioned. Example varieties could be given in the explanations for each color separately.

Oblong

"Oblong" should be used rather than "elongate" when referring to a shape. "Elongate" is not a defined shape.

One-Dimensional Characteristics

For clearly one-dimensional quantitative characteristics a symmetric arrangement of the states around a medium state is meaningful (e.g. plant length: very short (1), short (3), medium (5), long (7), very long (9); intensity of .....: weak (3), medium (5), strong (7)).

If there is not clear "absence" in any of the varieties, the absent/present characteristic is not justified and the first state of expression should read: "absent or very low." If such a characteristic is preceded by an absent/present characteristic, the intensity should always start with "very low."

Explanation: This last proposal is contested and in many Test Guidelines only the states 3, 5, 7 are indicated and not the state 1 (very low) or state 9 in case no example varieties are to be indicated for state 1 or 9.

In the case of not clearly one-dimensional quantitative characteristics, a symmetric arrangement of the states around a medium state is not necessary (and often not meaningful). Moreover, there is no obligation to use a 1 to 9 scale (e.g.: flat (1), slightly concave (2), clearly concave (3); slightly convex (1), flat (2), slightly concave (3), clearly concave (4); in the middle (1), slightly to the base (2), clearly to the base (3), at the base (4)). In these cases the word "medium" or "intermediate" should be avoided as a term for a state, as it would be meaningless (e.g. leaf shape: intermediate).

Order of Characteristics

(a) Heading of a characteristic: The wording before the heading of a characteristic refers to the plant or plant part concerned, e.g. "Plant: number of flowers," or "Flower: width of petal" or Petal: width" or "Petal: color of margin." The order in the Test Guidelines is normally plant, stem, stipule, leaf, petiole, [alternative: order by TWO + TWF: petiole, leaf blade] inflorescence, flower, calyx, sepal, corolla, petal, stamen, pistil, fruit, seed, and the physiological characteristics are normally listed at the end. The underlined example is used very frequently. That characteristic is not a flower characteristic but a petal characteristic.

(b) The characteristics in the Table of Characteristics should follow the botanical order as follows: plant, stem, leaf, petiole, flower, parts of the flower, fruit, seed, physiological characteristics as time of flowering, etc. That order should, however, be applied with some flexibility. If considered useful by the experts, the characteristic of a part of a higher organ concerning that organ was considered to be more usefully connected with other characteristics of the lower organ, that should be acceptable. Therefore, the characteristic: "Flower; number of petals" should be placed, if so desired, next to other characteristics of the petal and not necessarily next to other flower characteristics or it may follow the chronological order of recording.

(c) The order normally starts with characteristics of the whole organ followed by those of its parts (e.g. base, margin) followed by suborgans starting with the larger parts and followed by smaller parts (e.g. inflorescence, flower, stamen, anther, pollen).

(d) In case the totality of all given suborgans is concerned, which would be in reality a characteristic of the next higher organ (e.g.: Flower: arrangement of petals; flower: number of styles), which normally would be placed before the characteristics of suborgans of the flower, it could remain together with the characteristics of the suborgan concerned (e.g.: "Flower: arrangement of petals" could remain together with the other characteristics on the petal and "Flower;

number of styles" could remain together with the other characteristics on the styles).

Order of States of Expression

In the case of characteristics with two single alternative expressions and one combined expression, the combined expression is always placed at the end (e.g. only green (1), only red (2), green and red (3)), unless special reasons justify a different order (e.g. for Grapevine: to avoid an unnecessary deviation from a previous decision by another organization (OIV).

Presence

The Editorial Committee proposed a few years ago that the words "presence of" or "intensity of" should not be used in connection with a state "absent" for the reason that "presence" or "intensity" cannot be absent. Thus instead of "Presence of stipule: absent (1), present (9)" it should be stated: "Stipule: absent (1), present (9)."

Explanation: Several Technical Working Parties disagree with that proposal and have asked to be able to use the wording: "Intensity of anthocyanin coloration" with the first state: "absent or very weak (1)" instead of "Anthocyanin coloration: absent or very weak (1), weak (3), etc." The same would apply to "Anther: amount of pollen: absent (1), sparse (2), abundant (3)." Although from a purely linguistic point of view it may be wrong, it is much more helpful for the understanding of the characteristic. It helps to separate the given characteristic from other characteristics of the same organ without having to look at the states of expression.

Presentation of Characteristics

The Working Party noted that in the past the states of expression for quantitative characteristics had been presented in a symmetrical way. In the last one or two years this practice has apparently been changed without notice.

Explanation: The Technical Working Party on Ornamental Plants and Forest Trees (TWO) regretted that change and asked to return to the former practice that if state 1 was indicated also state 9 should be indicated even if no example varieties could be given for that state and *vice-versa*.

Pubescence

This is used as a generic term for hair. Pubescence itself is a specific and described type of hair.

Explanation: It has to be checked whether hair would be a better term.

Quadrangular

"Quandrangular" should be used instead of "square."

Qualitative Characteristics

If several graduations of a qualitative state of expression are used for a characteristic, all these states of expression should be formed by combining the qualitative expression with a quantitative attribute. Therefore it should read: strongly convex–slightly convex–flat (and not strongly convex–convex–flat), straight–slightly recurved–strongly recurved (and not straight–recurved–strongly recurved), much broader than long–slightly broader than long (and not much broader than long, broader than long), light red–medium red–dark red (and not light red–red–dark red).

Explanation: This position is questioned as the use of quantitative attributes demonstrates that the characteristic is not a truly qualitative characteristic. Where is the border between strongly and slightly in the first example? See also (c) under Harmonization of States of Expression on page 6 of Annex IV of document TC/35/5).

Qualitative Characteristics with 3 or 4 States

In the case of one-dimensional quantitative characteristics which allow only 3 or 4 states, these states should, if possible, be formed in an alternative way to the usual 1 to 9 scale (e.g. absent or very weakly expressed (1), weakly expressed (2), strongly expressed (3) and not absent or very weak (1), weak (2), strong (3)).

Ramification

"Ramification" should be used instead of "branching."

Repetitions Inside States

Instead of repeating a word in the states, it has to be used only once after the wording of the text of the characteristics, e.g. "Leaf blade: green color of upper side: light (3), medium (5), dark (7)" instead of "Leaf blade: color of upper side: light green (3), medium green (5), dark green (7)."

Resistance

Pest and disease resistance characteristics as well as characteristics on chemical constituents should only be included in the Test Guidelines if an agreed standardized method is included as well.

Rigidity

"Rigidity (rigid)" should be used instead of "stiffness (stiff)"

Round

"Round" should be used for a full shape but "rounded" for a base or apex shape.

Shape

If all states of expression of a shape characteristic have some basic shape (e.g. narrow elliptic, medium elliptic, broad elliptic), the characteristic should not be expressed as a shape (e.g. width: narrow, medium, broad).

"Shape in cross section" should be used and not "... of cross section."

Shape Characteristics

In shape characteristics in one state of expression, there can be two different expressions (e.g. Weeping Fig, characteristic 19: narrow elliptic (1), elliptic (2), broad elliptic or broad ovate (3), ovate (4)), but also cases exist when there could be the whole range between two states of expression (e.g. Statice, characteristic 5: elliptic (1), broad ovate to deltoid (2), narrow obovate (3), obovate (4)). The use of the word "to" was therefore also acceptable in shape characteristics.

Explanation: See also one-dimensional characteristics(l) above of this Annex.

Splitting a characteristics

Splitting into several characteristics should be done as early as possible (e.g. leaf color cut down to color and intensity of color), but may not always be useful (e.g. ornamentation of grain cut down to marbling (1/9), flecking (1/9), dotting (1/9)). It should thus not be obligatory but would depend on each case.

Symmetry of Notes

In quantitative characteristics, the Notes should be given in a symmetric way in case of a fixed medium state. In cases where Note 1 is indicated, Note 9 should also be given in a symmetric way. If the Note 1 is indicated, Note 9 should be indicated even if there is no example variety mentioned. The request for the same word to be used for the same Note for "attitude" should be limited to few exceptions, as also proposed by the Technical Working Party for Fruit Crops (TWF).

Remark: Should be rejected as in contradiction to preceding paragraphs.

Terms

At present the following terms are used for similar cases: inner/outer (used e.g. for two sides of a single Chrysanthemum ray floret), upper/lower, adaxial/abaxial, ventral/dorsal.

Explanation: It would be preferable if an agreement could be reached on which of those terms should be used.

True Quantitative Characteristics with Only the "Medium" State Fixed (Relative Size or Curvature)

The use of the word "very" for the states 1 and 9 of a quantitative characteristic should not be imposed in all cases. For example in the case of curvature it should be possible to use the following states:

strongly curved	(1)
moderately curved	(3)
straight	(5)
moderately reflexed	(7)
strongly reflexed	(9)

Depending on the species concerned and the wish of the crop experts, the states could be given the Notes "1, 2, 3, 4, 5" or "1, 3, 5, 7, 9." The same should also apply to the states: "Much smaller, moderately smaller, same size, moderately larger, much larger; very acute, moderately acute, right angle, moderately obtuse, very obtuse; much lighter, moderately lighter, similar, moderately darker, much darker; far below, moderately below, same level, moderately above, far above."

Explanation: At present the Technical Working Party on Ornamental Plants and Forest Trees (TWO) favored the qualitative expression.

Remark: As a matter of fact, expressions like straight, same size, same level, right angle have a clear-cut definition. So, an in-between state like same size to slightly larger does not exist, this could only be a range and possibly be called "same size or slightly larger." So, all the examples given on this and the next page should be looked through in this sense.

In all the above cases, in the quantitative presentation, the word "to" should be used for the even states. In the same way as in other quantitative characteristics like "length" the word "to" would not be considered to indicate a range (e.g. from very acute to moderately acute) but it would indicate the intermediate position between the two words mentioned as would "short to medium" indicate the intermediate position between "short and medium" and not the whole range between short and medium.

Proposal I:	very much smaller	(1)
	much smaller	(2)
	moderately smaller	(3)
	slightly smaller	(4)
	same size	(5)
	slightly larger	(6)
	moderately larger	(7)
	much larger	(8)
	very much larger	(9)

Proposal II:	much smaller	(1)	much smaller	(1)
	slightly smaller	(3)	much smaller to slightly smaller	(2)
	same size	(5)	slightly smaller	(3)
	slightly larger	(7)	slightly smaller to same size	(4)
	much larger	(9)	same size, etc.	(5)

Proposal III:	very strongly curved	(1)
	very strongly curved to moderately curved	(2)
	moderately curved	(3)
	moderately curved to straight	(4)
	straight	(5)
	straight to moderately reflexed	(6)
	moderately reflexed	(7)
	moderately reflexed to very strongly reflexed	(8)
	very strongly reflexed	(9)

Proposal IV:	strongly curved	(1)
	strongly curved to moderately curved	(2)
	moderately curved	(3)
	moderately curved to straight	(4)
	straight	(5)
	straight to moderately reflexed	(6)
	moderately reflexed	(7)
	moderately reflexed to strongly reflexed	(8)
	strongly reflexed	(9)

Explanation:

Remarks to I and III: Simple and easy words

Objections to I: Very much (very strongly) is too extreme

Remarks to II and IV: Corresponds more to reality

Objections to II: There is too much distance between "much" in state 1 (or 9) and "slightly" in state 3 (or 7). This wording does not allow for a moderate difference in size, spaced exactly in between state 1 and 5 (or 5 and 9).
The word "to" makes it rather clumsy, especially in cases with more complicated wording.

Objection to III: States 2 and 8 should read: "strongly curved/reflexed."

Test Guidelines should not contain addresses or names of experts.

Underlining

In the case that in two or more characteristics the only difference is e.g. in "upper" and "lower," both "upper" and "lower" should be underlined. The part that differs should be underlined.

Uniform

The term "uniform" is not admitted as a state of expression (e.g. do not use "uniform" for distribution of color, etc). This term is restricted for use with reference to uniformity in DUS and all varieties have to be uniform. The same applies to "distinct" for a color that is clear, etc.

Upright

"Upright" should be used for the whole plant, "erect" for plant parts.

Use of Scale 1 to 9

In a 1 to 9 scale of a quantitative characteristic normally only the states 3, 5, 7 are indicated, and in the extreme even only states 4, 5, 6 may be indicated. Further states (e.g. 1 and 9) are only mentioned to indicate example varieties. If no example varieties are mentioned they will be deleted. In case of a preceding absent/present characteristic, the intensity characteristic starts automatically with state 1.

Remark: Opposed by many experts as the normal rule should also apply to those cases (e.g. only 3, 5, 7).

If state 1 of a quantitative characteristic is indicated state 9 should also be indicated and vice versa (except if state 1 reads "absent or very weak," or "absent or very small," etc.).

Explanation: This is contested by some Technical Working Parties.

Weight

"Weight" should be used instead of "mass," otherwise it might get confused with "volume."

Whole Scale

The whole scale 1, 2, 3, 4, 5, 6, 7, 8, 9 with example varieties should only be indicated if there is no risk of a change in order of the example varieties under different environmental conditions.

Remark: Although example varieties are not supposed to change their order under different environmental conditions (see document TC/35/5: Annex II, paragraph 119, explanation), I do not think that any guarantee can be given since they only apply at the place and time of preparation of the Test Guidelines.

Wording of Characteristics

The wording of the characteristics should be made more precise and self-contained without the knowledge of the states. The states should also be made more easily understood without the full text of the characteristic irrespective of whether it would sound a little strange from a purely linguistic point of view, as long as the experts consider it helpful for the understanding of the characteristic. Therefore, the word "presence of" or "intensity of" could be added, even if the first state would read "absent" (if it was felt necessary to avoid confusion) or "absent or very weak" as long as without the addition it was not clear whether only the absence was of importance or other criteria as number, size, length, width, density, color, etc.

[End of document]