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UPOV

TC/XIV/ 5
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NTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL COMMITTEE

Fourteenth Session
Geneva, November 12 to 14, 1979

DRAFT REPORT

prepared by the Office of the Union

Opening of the Session

1. The Technical Committee (hereinafter referred to as "the Committee") held its fourteenth session in Geneva at the headquarters of UPOV from November 12 to 14, 1979. The List of Participants appears in Annex I to this report.

2. The session was opened by Mr. A.F. Kelly, Chairman of the Committee, who welcomed the participants.

Adoption of the Agenda

3. The Committee adopted the agenda as appearing on document TC/XIV/1.

4. The Chairman informed the Committee that he had reported to the thirteenth session of the Council on the progress of the Committee's work and that the Council had noted the report with satisfaction and had approved the program of the Committee and especially the envisaged publication of the revised General Introduction to the Test Guidelines.

Adoption of the Report on the Thirteenth Session

5. The Committee unanimously adopted the report on its thirteenth session as appearing in document TC/XIII/9, after having noted that at the end of paragraph 6 the quoted document should read "Annex to document TC/XIII/7" and that in paragraph 29 the document TG/70/2(proj.) referred to "Apricot" instead of "Almond."

General Introduction to the Test Guidelines

6. Discussions were principally based on Annex I to document TC/XIV/3 Rev., being the proposal of the Delegation of the Federal Republic of Germany for a revised General Introduction to the Test Guidelines. The Committee went through that Annex paragraph by paragraph comparing it with the outcome of the discussions on this subject during the thirteenth session, as reproduced in the Annex to document TC/XIII/10.

7. The Committee decided to delete all reference to cases where for two varieties differences were observed in two or more separately tested characteristics, each below the agreed level of significance, since no common approach could be achieved on the questions involved.

8. The Committee also failed to agree on an additional explanation of the term "reference collection." In particular, no common approach was achieved on whether a "reference collection" was only to be understood as a collection of varieties grown by the examining office or whether it would also include varieties of which the Office could obtain living material or even varieties which were available only in a herbarium, in a photo-collection or of which detailed descriptions existed in the Office. The Committee, however, agreed that the term was not limited to varieties which were grown in a given year since for a number of reasons such as finance, lack of space in the trial fields or glass houses or phyto-sanitary reasons, the growing of reference varieties is usually limited.

9. With respect to paragraph 33 of Annex I to document TC/XIV/3 Rev., the Committee decided that when evaluating the maximum acceptable number of off-types in samples of various sizes the sample size should be understood as defined in the Test Guidelines, meaning that it was left open whether the tests were carried out at one or more locations.

10. The Committee decided to delete in paragraph 55 the sentence "The Note 0 has not been used in the Test Guidelines." In this connection it confirmed its opinion that, with respect to the coding of the absence of a certain expression of a characteristic, there was little difference between the system applied inside UPOV and the system applied by the gene banks, as in most cases the information given in one system could be easily translated into the other system.

11. The Committee finally agreed on the text as reproduced in Annex II to this report which, after having been edited, will, as decided by the Council at its thirteenth ordinary session in October 1979 (see document C/XIII/16, paragraph 13), constitute the Revised General Introduction to the Guidelines for the Conduct of Tests for Distinctness, Homogeneity and Stability of New Varieties. The Committee asked the Office of the Union to publish the "Revised General Introduction to the Test Guidelines" as it is called in its short title in the UPOV Newsletter to give it the largest possible distribution.

Progress Reports by the Chairmen of the Five Technical Working Parties

12. Miss Jutta Rasmussen (Denmark), Chairman of the Technical Working Party for Agricultural Crops, reported on the last session of her Working Party which had taken place in Versailles, France, from May 21 to 23, 1979. The report on that session was reproduced in document TW/34. During the session, the Working Party had finalized its work on the draft Test Guidelines for Lupins and for Sheep's Fescue and Red Fescue, which were submitted to the Committee for adoption during the current session. It had concluded the preparation of a first draft of the revised Test Guidelines for Maize for submission to the professional organizations for comment. It had also discussed the Working Papers for Test Guidelines for Flax and Linseed and for revised Test Guidelines for Ryegrass. It had further discussed the possibility of the exchange of seed of varieties, for which an application for breeders' rights had been received by one authority, between all Offices of member States which were carrying out tests on the same species, the question whether non-significant observations had to be considered when checking consistency, the application of the 1 to 9 scale for quantitative characteristics with fixed ends as well as with open ends, the question of hybrid ryegrass, the possible preparation of a growth stage code for grasses and the question of synthetic varieties. Further discussion items had been the use of the even states in the Test Guidelines and the placement of example varieties for the different states of a characteristic. For the Working Party's ninth session at Wageningen, Netherlands, to be held from May 12 to 14, 1980, it was planned to finalize the work on the draft Test Guidelines for Ryegrass as well as to discuss any comments expected from the professional organizations on the draft Test Guidelines for Maize. It was also planned to assemble information allowing a decision to be taken on the further species for which Test Guidelines should be established or existing Test Guidelines revised and to discuss certain questions of principle, as for instance the harmonization of methods, the harmonization of reference collections and closer cooperation with respect to laboratory tests, in particular disease tests. The Committee would also discuss working papers for Test Guidelines for Soya Bean and for Sunflower if they could be established early enough.

13. Mr. J. Brossier (France), Chairman of the Technical Working Party for Vegetables, reported on the last session of his Working Party, which had taken place at Cavaillon, France, from June 12 to 14, 1979. The report on that session was reproduced in document TW/35. During the session the Working Party had finalized its work on the draft Test Guidelines for Black Radish, for Radish and for Kohl-

rabi, which were all submitted to the Committee for adoption during the coming session. It had prepared first drafts of Test Guidelines for Celeriac, for Cornsalad and for Sweet Pepper for submission to the professional organizations for comment. It had further discussed a Working Paper for revised Test Guidelines for Peas and had prepared a new draft which was sent to the Technical Working Party for Agricultural Crops for the inclusion of further characteristics for field peas. Furthermore, the Working Party had examined whether in the second year of tests additional material should be requested from the breeder and had discussed possibilities of centralizing disease tests. For the Working Party's thirteenth session at Lund, Sweden, from Septmeber 23 to 25, 1980, it was planned to finalize the work on draft Test Guidelines for Celeriac, for Cornsalad and for Sweet Pepper and to prepare a first draft of revised Test Guidelines for Peas. It was also planned to start discussions on Working Papers on Test Guidelines for Endive, for Leek, on revised Test Guidelines for Lettuce and, if a Working Paper could be prepared in time, also for Celery. Furthermore, the harmonization of reference collections and the testing of resistence would be discussed.

14. Mr. A.J. George (United Kingdom), Chairman of the Technical Working Party for Ornamental Plants, reported on the last session of his Working Party, which had taken place in Hanover, Federal Republic of Germany, from July 17 to 19, 1979. The report on that session was reproduced in document TW/36. During the session, the Working Party had finalized its work on the draft Test Guidelines for Berberis, for Forsythia, for Chrysanthemum and for Pelargonium, which were all submitted to the Committee for adoption during the current session. It had prepared first drafts for Test Guidelines for Gerbera, for Kalanchoe and for revised Test Guidelines for Rose for submission to the professional organizations for comment. It had also prepared a Working Paper on Test Guidelines for White Cedar, which had been sent to the Technical Working Party for Forest Trees for the inclusion of any further characteristics required for forest varieties of white cedar. It had furthermore discussed the question of distinctness in vegetatively propagated plants and, in this context, the problem connected with easy mutations. For the Working Party's thirteenth session, to be held at Lund, Sweden, from September 16 to 18, 1980, it was planned to finalize the work on the Test Guidelines for Gerbera, for Kalanchoe, for White Cedar and for revised Test Guidelines for Rose. It was also planned to start discussions on Working Papers on Test Guidelines for Narcissus, for Ornamental Apple and for revised Test Guidelines for Euphorbia fulgens and for Poinsettia. Further items of discussion would be the testing of homogeneity and stability in vegetatively propagated plants as well as the question arising by the existence of seed propagated and vegetatively propagated varieties within the same species. Depending on the work completed by the Technical Working for Forest Trees, discussion was also envisaged on a Working Paper on Test Guidelines for Norway Spruce.

15. Mr. F. Schneider (Netherlands), Chairman of the Technical Working Party for Forest Trees, reported on the last session of his Working Party which had taken place in Wageningen, Netherlands, on September 25 and 26, 1979. The report on that session was going to be reproduced in document TW/37. During the session the Working Party had prepared a first draft for revised Test Guidelines for Poplar. In the draft, an additional table was added containing characteristics to be observed on the adult tree. It had, however, not been possible to include in that additional table all characteristics which were used by the International Poplar Commission since some of them were value characteristics. The Working Party had also continued its discussion on Working Papers on Test Guidelines for Willow and for Norway Spruce. In connection with Norway Spruce, the Working Party also discussed problems of typophysis and cyclophysis. It further examined the Working Paper on Test Guidelines for White Cedar and concluded that no further characteristics were to be added. For the Working Party's eighth session, to be held at Hanover, Federal Republic of Germany, from August 26 to 28, 1980, it was planned to finalize the work on the draft Test Guidelines for Willow and on the revised Test Guidelines for Poplar and to prepare a first draft of Test Guidelines for Norway Spruce to be presented to the professional organizations for comment. Depending on the progress of the discussion in the Technical Working Party for Fruit Crops on rootstocks, this item might also be discussed.

16. Mr. A. Berning (Federal Republic of Germany), Chairman of the Technical Working Party for Fruit Crops, reported that his Working Party had not met since the last session of the Technical Committee. The report on the last session of the Working Party was reproduced in document TW/33. The eleventh session of the Working Party was scheduled to be held in South Africa from April 27 to May 11, 1980, on which occasion various visits to institutes were also scheduled. During the session it was planned to finalize the work on the Test Guidelines for Blackberry, to continue discussing the Working Paper on Test Guidelines for Citrus and to start discussing Working Papers on Test Guidelines for Japanese Plum and for Olive, to

continue the discussion on the revision of the Test Guidelines for Apple and, time permitting, start discussing Working Papers on Test Guidelines for Quince and for Khaki and to establish Test Guidelines for Rootstocks for Apple, for Prunus and for Ribes.

17. In connection with the report on the last session of the Technical Working Party for Agricultural Crops, the Committee discussed whether for generatively propagated varieties in the second year of tests a further sample should be requested from the breeder. In this connection it recalled the discussions on the testing of stability at its twelfth session. It finally decided to discuss the matter again at its fifteenth session on the basis of a paper to be prepared by the Chairman of the Technical Working Party for Agricultural Crops.

18. The Committee also discussed the necessary differences between two states of measured quantitative characteristics with open ends. It finally decided that the states inside a characteristic of this kind should be fixed in a way that was meaningful, which in certain cases could mean that the difference from one state to the next should at least correspond to one LSD (Least Significant Difference).

19. With respect to the selection of example varieties for the different states of expression of a given characteristic, the Committee considered that, whenever possible, example varieties should be chosen in such a way that they represented the middle of a given state. This ideal situation could, however, not always be achieved.

20. The Committee followed the opinion of the majority of the members of the Technical Working Party for Agricultural Crops that two varieties should be considered distinct if they showed consistent differences in two out of three years even if in one of the years a non-significant difference was observed which was not consistent. Therefore, when checking consistency, non-significant differences would have to be ignored.

21. As suggested by the Technical Working Party for Agricultural Crops, the Committee discussed whether it should be recommended that the authority of a member State, in which protection is requested for a new variety, should send seed of that variety to the authorities of all other member States testing varieties of the same species, for inclusion in the reference collections. The Committee, though well aware of the great advantages of such a procedure, concluded that it could not be implemented since the authorities would have to request the breeder to submit too large an amount of seed. It was therefore recommended that the authorities receiving applications should, as at present, inform the authorities of the other member State of the varieties under test and should supply seed only on request.

22. With respect to indicating example varieties in the Test Guidelines for the even states of a characteristic also, the Committee considered that this should only be done if the differences between the states were sufficiently big to avoid the order of some of the example varieties of neighbouring states being reversed under certain environmental conditions.

23. The Committee noted that the Technical Working Party for Vegetables had discussed whether a breeder of a hybrid variety should be requested to submit for testing not only seed of the hybrid itself but also of the parental lines. It decided that this question would have to be discussed during its fifteenth session.

24. The Committee noted that several of the Technical Working Parties had recently discussed the testing of disease resistance and the possibility of further cooperation in this field. It asked the Technical Working Parties to continue discussions during the coming sessions and to put emphasis especially on the following points:

(a) to list in their field of competence the diseases to which resistance could in their opinion be used for distinguishing varieties for the granting of plant breeders' rights;

(b) to note whether in the Technical Working Party agreement on the methods of testing, including the methods of maintaining the biotypes, was possible;

(c) to identify where further cooperation was useful and

(d) to report on the outcome of their discussions to the Committee during its sixteenth session.

25. The Chairman of the Technical Working Party for Agricultural Crops would already endeavor to prepare a preliminary paper on this subject for the fifteenth session of the Committee in March 1980.

26. In connection with the report on the last session of the Technical Working Party for Ornamental Plants, the Committee discussed the question of easy mutations, which was a problem especially for chrysanthemums and considered the four possible solutions as presented in paragraph 7 of document TC/XIV/2. With respect to the first two possible solutions, namely to establish minimum distances or to require a certain "improvement," the Committee stated that the first solution was not practical while it was doubtful whether the UPOV Convention would allow for the second mentioned requirement. As it was not possible to prove that a certain variety was a mutation from another variety, mutations would have to be treated in the same way as other varieties and no different treatment could be accepted. In view of this problem it might, however, in future be necessary to look for a more refined interpretation of the words "important characteristic" in Article 6(1)(a) of the Convention, which at present were interpreted as important for the purpose of establishing distinctness. With the introduction of more sophisticated methods such as biochemical analysis or electrophoresis it might be difficult to maintain that interpretation and it might become necessary to differentiate between characteristics which are acceptable for establishing distinctness for the granting of plant breeders' rights and those which would be acceptable only for identification purposes. The Delegation of the Netherlands offered to draft a working paper on the implications of such new methods as electrophoresis or biochemical methods on the testing of distinctness, for the next session of the Committee. After a thorough examination of this subject in the Committee, the professional organizations should be asked for comments. In addition, the Technical Working Parties were asked to review the methods used in their field of competence and to report to the Committee during its sixteenth session.

27. With respect to the other two solutions mentioned by the Technical Working Party for Ornamental Plants in the case of easy mutations, namely bulk applications and breeders' descriptions for several mutants to establish common knowledge, the Committee considered that these proposals would also require further study.

28. In connection with the report on the last session of the Technical Working Party for Forest Trees, Dr. M.-H. Thiele-Wittig reported on his attendance at the Twenty-Ninth Session of the Executive Committee of the International Poplar Commission held in Lisbon, Portugal, on October 15, 1979. During that session, he had tried to explain the reasons for which it had not been possible for the Technical Working Party for Forest Trees to include all characteristics used by the International Poplar Commission in the UPOV Test Guidelines. Several of the characteristics were mainly value characteristics and could not be used for distinguishing varieties, as for example the characteristics "resistance to diseases or other damage," "suitability for various uses" and "main use." The International Poplar Commission had been informed that it would soon receive a draft for revised Test Guidelines for Poplar on which it would be asked to comment in writing in good time before the next session of the Technical Working Party for Forest Trees. The Committee agreed that the draft for revised Test Guidelines for Poplar, containing an additional Table of Characteristics of the adult tree, should be sent to the International Poplar Commission for comment.

Test Guidelines

29. The Committee discussed the draft Test Guidelines mentioned in paragraph 1 of document TC/XIV/2 and finally adopted the following Test Guidelines, subject to the changes made by the Editorial Committee and reported on during the session:

TG/26/3(proj.) - Test Guidelines for Chrysanthemum
TG/28/4(proj.) - Test Guidelines for Pelargonium
TG/63/2(proj.) - Test Guidelines for Black Radish
TG/64/2(proj.) - Test Guidelines for Radish
TG/65/2(proj.) - Test Guidelines for Kohlrabi
TG/66/2(proj.) - Test Guidelines for Lupins
TG/68/2(proj.) - Test Guidelines for Berberis
TG/69/2(proj.) - Test Guidelines for Forsythia.

30. The Committee followed the recommendation of the Editorial Committee to refer the draft Test Guidelines for Sheep's Fescue and Red Fescue (document TG/67/2(proj.)) back to the Technical Working Party for Agricultural Crops for the clarification of several open points (methods, even states of characteristics, example varieties, indications on which characteristics should be tested in rows and which on single plants).

31 The Committee also took note of the stages of the draft Test Guidelines mentioned in paragraphs 3 to 5 of document TC/XIV/2, as well as in its Annex, and agreed on the priorities mentioned on page 2 of the Annex. It noted that in the Annex under the column "Forest Trees" the last line "Poplar (revision)" should be deleted and that under the heading "Ornamental Plants" the words "Freesia splendens" should be replaced by "Vriesea splendens."

Cooperation in Examination

32. Discussions were based on documents C/XIII/5 and C/XIII/7, which had in the meantime replaced document TC/XIII/11. As the document C/XIII/5 had already been issued on September 12, 1979, the experts from the different member States reported on changes having occurred since that date.

33. In this connection, Dr. D. Böringer (Federal Republic of Germany) informed the Committee on his visit to Israel. He pointed out that Israel needed the help of the Offices of the present member States for the testing of varieties. In view of the fact that Israel was on the way to becoming a member State, he recommended supplying examination results on request and considering the favorable conclusion of bilateral agreements for the examination of varieties.

Program for the Fifteenth Session

34. The Committee finally decided to discuss during the coming session to be held on March 18 and 19, 1980, the following items: implications of new methods such as electrophoresis or biochemical methods for the testing of distinctness, the need for the submission of a different seed sample for testing in the second growing season, harmonization and cooperation in the testing of resistance to diseases and the need for the testing of parental lines in the case of a hybrid variety in addition to the testing of the variety. Despite the fact that there will be no sessions of the Technical Working Parties held before the next session of the Committee, the draft agenda will provide for receiving reports which the Chairmen of the Technical Working Parties may wish to submit on the progress achieved in their Working Parties.

[Two Annexes follow]

ANNEX I/ANNEXE I/ANLAGE I

LIST OF PARTICIPANTS/LISTE DES PARTICIPANTS/TEILNEHMERLISTE

I. MEMBER STATES/ETATS MEMBRES/VERBANDSSTAATEN

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Mr. A.F. KELLY, Chairman

III. OFFICE OF UPOV/BUREAU DE L'UPOV/BÜRO DER UPOV

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Dr. M.-H. THIELE-WITTIG, Senior Technical Officer
Mr. A. WHEELER, Legal Officer
Mr. A. HEITZ, Administrative and Technical Officer

[End of Annex I, Annex II follows/
Fin de l'annexe I, l'annexe II suit/
Ende der Anlage I, Anlage II folgt]

ANNEX II

REVISED GENERAL INTRODUCTION TO THE GUIDELINES FOR THE CONDUCT OF TESTS FOR DISTINCTNESS, HOMOGENEITY AND STABILITY OF NEW VARIETIES OF PLANTS

REVISED GENERAL INTRODUCTION TO THE GUIDELINES FOR THE CONDUCT OF TESTS FOR DISTINCTNESS, HOMOGENEITY AND STABILITY OF NEW VARIETIES OF PLANTS

A. INTRODUCTION

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.

2. To give guidance on this adaptation UPOV has published Guidelines for the Conduct of Tests for Distinctness, Homogeneity and Stability of New Varieties of Plants. With these "Test Guidelines" member States have a common basis for testing varieties and establishing variety descriptions in a standardized form which facilitates international cooperation in examination between their authorities. 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.

3. The Test Guidelines 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 contained in the Test Guidelines. The Test Guidelines are prepared by Technical Working Parties which are coordinated by a Technical Committee appointed by the UPOV Council. The Test Guidelines will be amended in the light of experience.

4. The Test Guidelines consist of:

- Technical Notes,
- A Table of Characteristics,
- Explanations and Methods, and
- A Technical Questionnaire.

Details are given in paragraph 39 et seq. in the Chapter on Layout and Presentation of the Test Guidelines.

5. Normally separate Test Guidelines are prepared for each species. However, grouping of species in one Test Guidelines document or subdivision of a species into different Test Guidelines may be considered necessary. Such subdivision is only possible if the borderline between the species or groups inside a species can be clearly defined.

B. GENERAL CONSIDERATIONS ON EXAMINATION

6. According to Article 6 of the Convention, the criteria for the grant of plant breeders' rights include:

(i) distinctness,
(ii) homogeneity, and
(iii) stability.

I. DEFINITION AND OBSERVATION OF CHARACTERISTICS

(a) General

7. The characteristics listed in the Test Guidelines are those which are considered to be important for distinguishing one variety from another and which are therefore also important for the examination of homogeneity and stability. They are not necessarily qualities which give an idea of a certain value that the variety may possess. The characteristics must be capable of precise recognition and description. The Table of Characteristics are not exhaustive but may be enlarged by further characteristics if this proves to be useful.

8. To enable varieties to be tested and a variety description to be established, characteristics are subdivided in the Test Guidelines 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 in the Test Guidelines, example varieties are indicated whenever possible.

(b) Qualitative and Quantitative Characteristics

9. The characteristics used to distinguish varieties may be either qualitative or quantitative.

10. "Qualitative characteristics" should be those which show discrete discontinuous states with no arbitrary limit on the number of states. Some characteristics which do not fit this definition may be handled as qualitative when the states encountered are sufficiently different from one another.

11. "Quantitative characteristics" are those which are measurable on a one dimensional scale showing continuous variation from one extreme to the other. They are divided into a number of states for the purpose of description.

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.

(c) Observations on the Characteristics

13. In order to obtain comparable results in the various member States the scope of the test (for example, size of plots, sample size, number of replications, duration of tests etc.) has to be fixed.

14. Qualitative characteristics are normally recorded visually, whereas quantitative characteristics can be measured; in many cases, however, a visual assessment or, if applicable, other sensory observations (for example, taste, smell) are sufficient, especially when measurements can only be made with considerable effort.

15. When a fixed scale is used for the observation of the qualitative or quantitative characteristics throughout the trials and over the years, the environmental influence on the varieties is reflected in the figures. Statistical operations on these figures must be preceded by a test on the properties of the scale; 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 (see paragraph 12), the question has to be examined whether the assumptions of the statistical methods to be used are fulfilled.

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 it is recommended to use a scale which has been established on the basis of example varieties representative of the different levels of the characteristics. One and the same variety should then always receive about the same Note and thus facilitate the interpretation of data.

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 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.

II. TESTING DISTINCTNESS

(a) General

18. According to Article 6(1)(a) of the Convention, the variety must be clearly distinguishable by one or more important characteristics from any other variety whose existence is a matter of common knowledge at the time when protection is applied for. The characteristics which permit the variety to be defined and distinguished must be capable of precise recognition and description.

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.

(b) Criteria for Distinctness

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

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

(c) Qualitative Characteristics

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. In the case of other qualitatively handled characteristics an eventual fluctuation has to be taken into account in establishing distinctness.

(d) Measured Quantitative Characteristics

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

(e) Distinctness in the Case of a Normally Visually Observed Quantitative Characteristic

23. If a normally visually observed quantitative characteristic is the only distinguishing characteristic in relation to another variety, it should be measured, in the case of doubt, if this is possible with reasonable effort.

24. In any case it is recommended to make a direct comparison 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 can be measured if this can be done with reasonable effort.

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 comparable reliability as for measured characteristics.

(f) Remark

26. Cases can arise in which for two varieties differences may be observed in several separately assessed characteristics, and if combination of such data is used to establish distinctness, it should be ensured that the degree of reliability is comparable with that provided in paragraphs 22 to 25.

III. TESTING HOMOGENEITY

(a) General

27. According to Article 6(1)(c) of the Convention, a variety must be sufficiently homogeneous, having regard to the particular features of its sexual reproduction or vegetative propagation. To be considered homogeneous, the variation shown by a variety, depending on the breeding system of that variety and off-types 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. It requires a certain tolerance which will differ according to the reproductive system of the variety--vegetatively propated, self-fertilized or cross-fertilized. The number of off-types appearing, that is, plants which differ in their expression from that of the variety, should not--unless otherwise indicated in the appropriate Test Guidelines--exceed the figures indicated below.

(b) Vegetatively Propagated Varieties and Truly Self-Pollinated Varieties

28. For vegetatively propagated varieties and truly self-pollinated varieties, the following table based on existing experience indicates the maximum acceptable number of off-types in samples of various sizes. The sample size should be understood as defined in the Test Guidelines.

Maximum Acceptable Number of Off-Types in Samples of Various Sizes

Sample Sizes	Maximum Number of Off-Types
≤ 5	0
6 - 35	1
36 - 82	2
83 - 137	3

(c) Mainly Self-Pollinated Varieties

29. Mainly self-pollinated varieties are varieties which are not fully self-pollinated but which are treated as such for testing. For these, a higher tolerance is required and the maximum number of off-types allowed in the table for vegetatively propagated varieties and for truly self-pollinated varieties are doubled.

(d) Cross-Pollinated Varieties including Synthetic Varieties

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.

31. For measured characteristics, the standard deviation or variance should be used as the criterion for comparison. A variety is considered not to be homogeneous in the measured characteristic concerned if its variance exceeds 1.6 times the average of the variance of the varieties used for comparison.

32. Visually assessed characteristics have to be handled in the same way as those which are measured, namely, by comparing them with comparable varieties already known. The number of plants visually different from those of the variety should not significantly (95% confidence level) exceed the number found in comparable varieties already known.

(e) Hybrid Varieties

33. Single cross varieties have to be treated as mainly self-pollinated varieties, but a tolerance has also 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 Technical Working Parties will fix the maximum percentage tolerated in the Test Guidelines concerned.

34. For double cross or three-way cross varieties, a segregation of certain characteristics is acceptable if it is in agreement with the formula of the variety. If the heredity of a characteristic is known, clear-cut segregating characteristics have to be treated as qualitative characteristics. If the described characteristic is not a clear-cut characteristic, it has to be handled as in the case of normal cross-pollinated varieties; that is to say, the homogeneity has to be compared with that of comparable varieties already known. To establish a tolerance for inbred plants, the same considerations apply as in the case of a single cross variety.

IV. TESTING STABILITY

35. According to Article 6(1)(d) of the Convention, the variety must be stable in its essential characteristics, that is to say, it must remain true to its description after repeated reproduction or propagation or, where the breeder has defined a particular cycle of reproduction or multiplication, at the end of each cycle.

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 homogeneity.

37. Generally, when a submitted sample has been shown to be homogeneous, the material can also be considered stable. Nevertheless, during the testing for distinctness and homogeneity, 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.

V. REFERENCE COLLECTIONS

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 vegetative plant material of the varieties to which it has granted protection. Preferably, the reference collections should 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 in a growing test before use.

C. LAYOUT AND PRESENTATION OF TEST GUIDELINES

I. ORIGINAL LANGUAGE

39. The Test Guidelines are originally drafted in one of the three working languages of UPOV (English, French and German) and adopted in that version. In the case of any discrepancy between the original text and the translations into the two other languages, the original text prevails. For this purpose, each set of Test Guidelines contains an indication of the original language in which it was drafted.

II. TECHNICAL NOTES

40. The individual Test Guidelines for a given species start with a reference to the present document, followed immediately by the so-called "Technical Notes." While the present document gives merely general recommendations and guidance applicable to all Test Guidelines--or most of them--the Technical Notes give technical recommendations and special guidance with respect to the species dealt with by the respective Test Guidelines. These recommendations refer, for example, to the quantity and quality of plant material to be sent in, the conditions under which the tests have to be undertaken, including the size of plots and numbers of replications, the duration of the tests, the grouping of varieties in the tests, as well as indications as to the part of the plant on which a given characteristic has to be observed, at what time and in what manner. More detailed information on growing conditions will be provided in a special Annex.

III. TABLE OF CHARACTERISTICS

(a) General

41. The Table of Characteristics indicates those characteristics of a given species which should be examined and included in the description of varieties. These are marked with an asterisk (*). It also contains additional characteristics which are considered to be helpful in taking the final decision on the variety. In this Table of Characteristics, a scale of possible states of expressions (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."

(b) Order of Characteristics

42. In the Test Guidelines, the sequence of morphological characteristics is normally arranged in the chronological order of recording, starting from the time of planting or sowing (in some cases even before) until harvest (or even after). Within this 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, base and top).

43. 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)
seedling
plant (e.g. attitude)
root
root system or other subterranean organs (bulb, stolon)
stem
leaf
inflorescence
flower
fruit
grain

(c) Qualitative Characteristics

44. Qualitative characteristics as well as those of the quantitative characteristics which are handled in the same way as true qualitative characteristics are classified by consecutive numbers according to the state commencing with Note 1 and with no upper limit, for example,

Poplar: sex of plant

dioecious female	(1)
dioecious male	(2)
monoecious unisexual	(3)
monoecious hermaphrodite	(4)

As far as it is possible to build up an order for the expressions, the small, lesser or lower expressions should be assigned the lower Note.

(d) Quantitative Characteristics

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,"

and that 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

46. The full scale (1 to 9) may be used, even if only some of the states (for example, only 1, 3, 5, 7, 9 or 3, 5, 7) have been indicated in the Test Guidelines for reasons of simplification.

47. In alternative observations, 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 in one alternative characteristic with the state "absent (1)" and "present (9)" and in another quantitative characteristic with the Notes from 1 to 9. For those characteristics where it is possible to make a combined scale, the combination is treated as a quantitative characteristic and Note 1 is given the meaning "absent or very weak."

(e) Example Varieties

48. Wherever possible example varieties are indicated fixing or describing different states of expression of the different characteristics. Figures--if used at all--are used only for the first editions of the Test Guidelines, to be abandoned as soon as possile. 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. Out of the example varieties indicated in the Test Guidelines the national authorities will choose the ones which they consider most appropriate for the solution of a given problem.

(f) Characteristics Which Should Always be Included in the Description of a Variety

49. It may not always be necessary to use all the characteristics listed in the individual Test Guidelines to identify and describe a variety. To harmonize descriptions issued by the member States under the terms of the Convention, certain characteristics have been marked with an asterisk (*), as already mentioned above, to show that they should be used every growing period for the examination of all varieties and should always be included in the description of the variety, except when the states of expression of a preceding characteristic render this impossible. Characteristics which are not so marked have to be recorded if they are necessary to distinguish the variety under examination from another variety. The list of characteristics is not exhaustive, however, and further characteristics may be used by the examining authority if they are considered useful or necessary.

IV. EXPLANATIONS AND METHODS

50. The Table of Characteristics of the Test Guidelines is normally followed by a chapter entitled "Explanations and Methods." It contains explanations, drawings, photographs or an indication of the methods which are necessary for the understanding of the different characteristics presented in the Table of Characteristics.

V. TECHNICAL QUESTIONNAIRE

51. The Test Guidelines contain in an Annex a "Technical Questionnaire to be completed in connection with an application for plant breeders' rights." In the Technical Questionnaire, certain indications have to be given on the origin, maintenance, reproduction and multiplication of the variety to help the examining authority to understand certain results obtained during the testing. Those characteristics from the Table of Characteristics of the Test Guidelines are indicated on which information is considered necessary to enable the testing authorities to group the varieties with other varieties in such a way that the test can be conducted in a reasonable manner. 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"). For the same purpose, the applicant is asked in another part to give an indication of the characteristic(s) by which he considers his variety to be different from the other varieties most closely resembling it. In the final part of the Technical Questionnaire, the applicant for plant breeders' rights is free to add any additional information which he may consider helpful in establishing that the variety is distinct as well as any particulars he may think useful for the testing of the variety.

[End of Annex II and of document]