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TWF/27/18
ORIGINAL: English
DATE: September 2, 1996

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY FOR FRUIT CROPS

Twenty-Seventh Session
Tel Aviv, April 22 to 26, 1996

REPORT

adopted by the Technical Working Party for Fruit Crops

Opening of the Session

1. The twenty-seventh session of the Technical Working Party for Fruit Crops (hereinafter referred to as "the Working Party") was held at Tel Aviv, Israel, from April 22 to 26, 1996. The list of participants is presented in Annex I to this report.

2. Mr. B. Bar-Tel welcomed the participants to Israel in the name of the Plant Breeders' Rights Council. The session was opened by Mrs. E. Buitendag (South Africa), Chairman of the Working Party.

Adoption of the Agenda

3. The Working Party adopted the agenda for its twenty-seventh session which is reproduced in document TWF/27/1, after having agreed to delete item 7 and to include a new item "Standardization of Test Guidelines" after item 9. The discussions on *Prunus* Rootstocks and Walnut took place partly in a subgroup, which reported to the main meeting, and partly in the main meeting.

Short Reports on New Developments in the Member States in Plant Variety Protection for Fruit Species

4. The Working Party received short reports from some of the experts on recent developments in their countries. The experts reported that, in general, applications for fruit varieties were limited and would only cover a small part of the total applications in most member States. The most important crops by far would be apple and strawberry, followed by cherry, citrus, grape, kiwifruit, peach, raspberry and gooseberry. Several experts reported on difficulties in distinguishing apple mutations. New Zealand informed on an application for an olive variety with higher cold tolerance. Germany is testing–for the first time–seed propagated strawberry varieties (supposed F_1 hybrids). Hungary reported also on applications apparently made only in order to prevent marketing of material of the variety. South Africa and Israel reported on the passing of their laws which were now in conformity with the 1991 Text of the UPOV Convention. The expert from Romania reported on a bill for a new law on plant variety protection.

5. Mr. L. van Eylen, Representative of the Community Plant Variety Office of the European Union, informed the Working Party on the starting-up of his Office at the end of April 1995.

6. The expert from the International Plant Genetic Resources Institute (IPGRI) gave a short explanation on the aims and the work of the organization.

Important Decisions Taken During the Previous Sessions of the Technical Working Party, the Technical Committee and the Technical Working Party on Automation and Computer Programs (TWC)

7. Mr. M.-H. Thiele-Wittig gave a brief report on the main items discussed during the previous session of the Technical Committee and referred participants needing further details to the full report reproduced in document TC/32/7 Prov.

8. Level of Involvement of the Applicant in the Growing Tests: The Working Party noted an updated version of document (TC/32/4) on the level of involvement of the applicant in the growing tests.

9. List of Species in Which Practical Technical Knowledge has Been Acquired: The Working Party noted an updated version of the list of species in which practical technical knowledge had been acquired (document TC/32/5) and appreciated its availability in electronic form. It asked all experts to inform the Office of UPOV of any changes that might occur in future.

10. Sequential Analysis: The Working Party noted an updated document (TC/32/6) on sequential analysis prepared by the Chairman of the Technical Working Party on Automation and Computer Programs (TWC) with the help of the experts from France, Germany, Denmark and the United Kingdom. Furthermore it noted the recommendations of the Technical Committee that each of the Technical Working Parties should act in connection with the TWC and look further into the sequential analysis method, which aimed at reducing the sample size

to be used in the testing of uniformity, thereby avoiding the rejection of good varieties or the acceptance of bad varieties, as one of the possible approaches for the future. The Working Party concluded that that method did not seem to be useful in its area of species tested, of which most were propagated vegetatively.

11. Transgenic/GM Varieties: The Working Party noted the decision of the Technical Committee to request from the applicant a statement in the Technical Questionnaire whether the candidate variety is a transgenic/GM variety or not. It further noted that after the session the expert from Germany asked for the whole question of release to be discussed first in the Administrative and Legal Committee (CAJ) before including it in all Test Guidelines.

12. Resistance Characteristics: The Working Party noted that the Technical Committee had added to the three definitions, of the terms describing the reaction of plants to pests and pathogens, the preamble which had been proposed at the same time.

13. Example Varieties: The Working Party noted that under certain circumstances Test Guidelines could be adopted even if only a few or no example varieties could be stated and that where species were given as examples these should be replaced as soon as example varieties were available.

14. Request for Photos in the Technical Questionnaire: The Working Party noted that the rule to request in the Technical Questionnaire a representative color photo of a candidate variety was applicable to fruit and ornamental species only.

15. Definitions of Categories of Characteristics and the Conditions of Their Use for the Description of Varieties: The Working Party noted the discussions in the Technical Committee and its need to have a clearer understanding and a definition of the different categories of characteristics used. It noted the draft presented during the Technical Committee session and reproduced in paragraph 64 of document TC/32/7 Prov. which comprised the following categories:

> "(a) Asterisk Characteristics
>
> Characteristics recommended by UPOV for use on all varieties in every growing period over which examinations are made and always included in the variety descriptions, except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible.
>
> (b) Non-Asterisk Characteristics
>
> Characteristics considered useful by UPOV for DUS testing and description, but not all UPOV member States recommended their routine use.
>
> (c) Routine Characteristics
>
> – All UPOV asterisk characteristics;

– Some UPOV non-asterisk characteristics if selected by a given State for routine testing;

– Some additional non-UPOV characteristics if selected by a given State for routine testing.

(d) Additional/Supplementary Characteristics

Any characteristic used in addition to the characteristics recommended by UPOV or in addition to those used routinely at national level.

(e) Complementary Characteristics

Characteristics which cannot be used at all to establish distinctness, but provide useful information on the variety. Example: DNA marker.

(f) Last Resort Characteristics

Special case of additional characteristics used only under the following conditions:

(i) with the agreement of the applicant;
(ii) if all other characteristics fail to establish distinctness;
(iii) a test procedure has been agreed between the competent authority and the applicant;
(iv) if used, can establish distinctness in combination with other characteristics but, in the ext reme case, alone."

16. It agreed to those definitions but proposed to add a further definition "grouping characteristics." A grouping characteristic is a characteristic which is suitable to divide the variety collection into clearly distinguishable groups. Grouping characteristics are all part of the characteristics appearing in the Technical Questionnaire. They should enable the examiner to place the candidate variety next to all relevant varieties either in data comparison or in the growing trial. Their purpose is to make comparisons only within the relevant group, with the exception of groups that are close to each other (e.g. "color," with the states "green, yellow green, yellow, orange, red, red, red purple, purple").

17. UPOV Documents in Electronic Form: The Working Party noted the discussions held in the Technical Committee on the usefulness of documents in electronic form. It also noted that a first distribution of technical reports had been made on discs. It again strongly supported making available the UPOV documents in electronic form. This should not be restricted to reports of meetings but should cover several other documents, especially Test Guidelines and other more important documents. Several experts considered availability via e-mail or on-line to be the best possibility. This would especially facilitate searches for certain subjects in existing documents or taking over parts for new documents. It finally concluded to continue the distribution of technical reports in electronic form for a second year. In addition, all experts would also send their working papers on Test Guidelines also in electronic form to the Office of UPOV. Taking the example of Test Guidelines for Pear, it

would make a trial to submit all comments to the Working Paper in electronic form to be combined by the expert from Israel into one single document.

18. Definition of Off-Type: The Working Party noted that the Technical Committee had discussed the amendment to the definition of off-types proposed by the TWF and had agreed that each Technical Working Party should discuss the definition of off-types again, as the definition would be different depending on the form of propagation, and submit a proposal to the next session of the Technical Committee. It furthermore noted that the Technical Working Parties should especially consider the handling of impurities, admixtures (genetically unrelated plants), and whether all mutations in parts of an organ or only "significant" mutations should lead to considering the plant in question an off-type. It also noted the proposal formulated by the Technical Working Party for Ornamental Plants and Forest Trees (TWO) the preceding week and agreed to that proposal reading: "Each plant which showed a clear mutation in any characteristic was considered an off-type."

19. Oil Content: The Working Party noted the reservations raised by the Technical Committee on the use of oil content for DUS purposes. However, it saw no reason why such characteristics should be excluded from the DUS tests if they fulfilled the normal requirements all characteristics had to fulfill.

Color Observations and Image Analysis

20. The Working Party had no further reports on progress on fruit species. It noted, however, the progress made in the TWO and the plans to have a subgroup meeting in September 1996 with experts doing the actual research and that interested experts could participate in that subgroup meeting if they informed the Office UPOV in time of their interest. The expert from IPGRI reported on a project to develop software for the characterization of varieties. The Working Party agreed to follow the work of the TWO.

New Methods, Techniques and Equipment in the Examination of Varieties

21. Screening of Varieties: The Working Party noted document TWF/27/15 on DNA Electrophoresis patterns facilitating the screening of reference varieties in DUS testing prepared by experts from the Netherlands. In the documents studied no relations were found between the banding patterns and morphological characteristics. As expected for mutants, although morphological differences were seen, banding patterns were identical. These methods were therefore not promising so far for screening varieties in vegetatively propagated varieties.

22. The Working Party noted the report on the third session of the Working Group on Biochemical and Molecular Techniques and DNA Profiling in Particular (BMT) as reproduced in document BMT/3/18, and the summary of the discussions in the Technical Committee as reproduced in document TC/32/7 Prov., paragraphs 50 to 60. It further noted that the next session of the BMT was scheduled to be held in Cambridge, United Kingdom, from March 11 to 13, 1997. The Technical Committee had concluded that further work and discussions were needed within the BMT. Scientists needed more information on the UPOV

aspects and UPOV experts needed more information on the techniques. The Working Party noted what was going on in the BMT and will follow the discussions in the next session. It had, however, some reservations on the possible use of these methods for DUS testing.

23. Bibliography of Published Papers on New Techniques: The Working Party referred to the information on the use of the bibliography of published papers on new techniques prepared in electronic form by the expert from the United Kingdom and mainly extracted from the Commonwealth Agriculture Bureau International in Oxford. It asked for any comments or additional information on literature to be sent to the expert in the United Kingdom.

UPOV Central Computerized Database

24. The Working Party noted the latest stage of preparation of the UPOV Plant Variety Database on CD-ROM (UPOV-ROM) as set forth in Circular U 2347 dated December 15, 1995. The Office of UPOV had invited all its member States to submit data for the envisaged disc by the end of January 1996. The disc will cover data from 23 member States. The data from four States, however, will be data sent already in 1995. Only seven States had not been able to provide data for the first production disc already (Belgium, Chile, Poland, Portugal, South Africa, Switzerland, Ukraine).

25. Several experts had had a chance to study the UPOV Demonstration Disc and expressed their satisfaction. The Working Party invited all the experts to contact their respective colleagues at national level for them to also see and assess the information on the first production disc.

Relation Between National Listing and Plant Variety Rights System

26. The expert from Israel reported on the results of questionnaire U 2383, dated March 5, 1996, on the different procedures in the individual member States with respect to the period between the date of application and the granting of rights. He had received 25 replies. In general, States from Eastern Europe had a national listing for fruit varieties. For agricultural varieties almost all States had a national listing; for vegetable varieties only a few States foresaw such a listing. For ornamental varieties, listing was rarely foreseen. DUS testing was done for all varieties, value testing mainly for agricultural varieties. Some special schemes existed for certain varieties. Provisional protection was foreseen in most States as from the date of application for plant variety protection. Only in a few countries existed a requirement for abstention from marketing during that period. Romania had an official national listing for varieties of all species. In the Ukraine the testing for national listing covered only value tests. More detailed information can be found in Annex II to this report.

Standardization of Test Guidelines

27. The Working Party noted documents TC/26/4 Rev., TC/27/5, TWF/27/3, TWF/27/16, TWV/29/7 and paragraph 49 of TC/32/7 Prov. It also noted that the TWO had followed the

example laid down in document TWV/29/7 and approved by the Technical Committee on the wording of attitude characteristics. It could, however, not follow that strict ruling. It considered that several different situations existed which would require different wording or different notes. It would thus be wrong to try to impose a certain wording. It would have to make more studies and collect the different cases, not only for attitude but also for other characteristics. Once having agreed on certain examples, a possible procedure to ensure better harmonization could be to observe the plant, note down a wording, compare it with the examples, decide whether one of the examples fitted or whether a different wording had to be chosen and re-check the solution with the plant on its applicability.

28. For the collection of standard examples, the Working Party agreed to start with document TWF/27/16. All experts were asked to inform the expert from South Africa of any objections to the characteristics and their states of expression, to the explanation of the terms and to the translations listed. As the document would be submitted to the Technical Committee, comments should reach the expert from South Africa before the end of July 1996. The document was considered a preliminary document and further example terms and translations of certain terms would be added. As a further step also some standard diagrams for certain terms appearing frequently should be foreseen as well as a more detailed proposal for the order of characteristics as reproduced in TG/1/2 paragraph 42 to 44 and some standardized Technical Notes.

29. The Working Party noted that the translation into Spanish of document TC/27/5 might be finished before the next session of the Technical Committee. Any comments on that document or document TC/26/4 Rev. should also be sent to the expert from South Africa before the end of July to enable her to summarize them for presentation to the Technical Committee.

30. The Working Party noted a correction in document TWF/27/3 where on page 3 under number 17 the number "2(iii)" should read "2(ii)."

31. The expert from Germany reported on an extract from the adopted Test Guidelines for Apple, Cherry and Peach with characteristics containing only two states. She recommended that in future the Working Party should more carefully consider whether there was always a clear cut dividing line and whether two states alone were sufficient.

32. The expert from South Africa finally explained that there were in principle six categories of characteristics, some with the possibility of quantitative states or qualitative states of expression depending on the variety or the characteristic and that the Editorial Committee should respect the decision of the Working Party on the attribution of different Notes, depending on the case, and not try to change the Notes without reflecting on a given case. The Working Party endorsed that proposal, however, the categories might be further explored during the next session and should thus only be considered in a proposal for information of the Technical Committee and the Editorial Committee and for further discussion. The categories are reproduced in Annex IV to this report.

33. The Working Party added that the above remarks and proposals were prepared mainly for vegetatively propagated varieties. The situation of seed propagation still required exploration.

Discussions on Working Papers on Test Guidelines

Working Paper on Citrus

34. The Working Party noted documents TG/83/3, TWF/23/6, TWF/24/3, Circular U 2234, TWF/27/14 and comments made during the session. It finally made the following main changes to document TWF/27/14:

(i) Material Required: To have in paragraph 1 the sentence on the rootstock deleted and the standard sentence on *in vitro* propagation added.

(ii) Conduct of Tests: To have in paragraph 3 the figure 4 replaced by 5.

(iii) Methods and Observations: To have the standard paragraph on the population standard (1%) and acceptance probability (95%) included allowing no off-types. In paragraph 2 the observations should be made on 5 plants or 10 typical parts of 5 plants. After paragraph 9 a new paragraph copied from paragraph 9 of the Test Guidelines for Apple to be included, however, without the second and third sentence and with observations on 5 trees only.

(iv) Grouping of Varieties: To have in paragraph 3 the word "fruiting" included before "varieties."

(v) Characteristics and Symbols: To have the asterisk applied to fruit varieties only.

(vi) Table of Characteristics:

Characteristics:

14, 14(a) and 15, 15(a) to be combined each with the states from 1 to 9

15, 17, 19, 31, 43, 44, 46(a), 53, 60, 68(a), 80, 104, 105: To be checked whether the states should mention absolute expressions or relative expressions (preliminary the characteristics 43, 44, 46(a), 53 and 105 might be observed as absolute expressions, the other ones as relative expressions). A relative expression was considered better for description purposes, an absolute one better for distinctness purposes.

26 To be deleted

33 To have the asterisk deleted

35 To have the spelling of the example variety "Benny Valencia" corrected

36, 37, 39, 40 To receive an asterisk

45(b), 45(c) To be combined in one characteristic

46, 46(a) To be combined in one characteristic

48 To have the first state read "absent or very weakly expressed"

51 To receive an asterisk

58 To be placed before characteristic 57

70, 70(a) To be combined in one characteristic

74 To have the states "weak, medium, strong"

79, 80 To be split into six groups

82 To be checked whether the asterisk should be deleted

82, 107, 108, 110: To be checked for which of the groups the asterisk should apply

85 To have the states "absent or very weak (1), weak (2), strong (3)"

122 To read: "Time of maturity of fruit for consumption"

122(a) To read: "Plant: parthenocarpy"

(vii) Technical Questionnaire: To have paragraph 4 copied from the Test Guidelines for Apple.

Working Paper on Test Guidelines for Grape

35. The Working Party noted documents TG/50/5, TWF/27/2, TWF/27/2 Add, TWF/27/11, TWF/27/12. It further noted some comments in writing from IPGRI (International Plant Genetic Resources Institute) and that IPGRI and OIV (International Vine and Wine Office) planned revising their lists of characteristics. It therefore did not enter into details regarding the new draft for revised Test Guidelines, but agreed to collect all comments on document TWF/27/12 in one document and inform IPGRI and OIV of these comments. The comments should be sent to the Office of UPOV before the end of June 1996 and should also be circulated to the members of the Working Party. The Working Party would await the timetables of the revisions made inside IPGRI and OIV and coordinate their further proceeding with those timetables in order to obtain a final document as close as possible to the other lists.

Working Paper on Test Guidelines for Japanese Apricot (*Prunus mume*)

36. The Working Party noted documents TWF/25/10, TWF/26/3, TWF/27/4 and comments made during the session. It finally made the following main changes to document TWF/27/4:

(i) Title: The English common name to be "Mume (Japanese Apricot)."

(ii) Subject of these Guidelines: To apply to fruit varieties only.

(iii) Material Required: To have in paragraph 1 the figure "5" replaced by "6."

(iv) Conduct of Tests: To have in paragraph 3 the first word read "Pollinators," to have the words "As a minimum" deleted and the word "five" replaced by "six."

(v) Methods and Observations: To have paragraphs 1 and 2 copied from the Test Guidelines for Cherry, in paragraph 5 the words "current season" added before "shoot" and in paragraph 7 the words "on fruits mature for picking" replaced by "at physiological ripeness."

(vi) Table of Characteristics:

Characteristics

1 To have the states "upright (1), semi-upright (2), semi-upright to spreading (3), spreading (4), drooping (5)"

3 To have state 3 deleted

4, 5 To start "One-year-old shoot: ....."

8 To have the Notes "1, 2, 3"

9 To have the second state read: "medium green (2)"

10 To have two additional characteristics on the length and width of the blade added after characteristic 10 and to delete the size

12 To read: "Leaf blade: length of tip" with the states "short, medium, long"

13 To have the Notes "1, 2, 3" and the second state read "obtuse"

14 To have the states "absent or very weak (1), weak (2), strong (3)"

15 To have the second state read "semi-palmate"

19 To have the Notes "1, 2, 3" and the first state read "apart"

20 To have the word "medium" added to states 3 and 4

21 To read: "Pollen: viability"

22 To have the states as characteristic 14

25 To have "frontal" replaced by "ventral"; to be checked whether the states should read "oblate, very broad ovate, broad ovate, ovate"

26 To have the states "depressed (1), flat (2), pointed (3)"

29 To have the bracketed content read "sunny side" and to have the states "medium green (1), light green (2), yellow (3), red (4)"

33 To have the last state checked whether it should read "obovate"

34 To have "shape of" replaced by "angle at" with the states "acute (1), approximately right angle (2), obtuse (3)"

36 To read: "Stone: roughness of surface"

37 To have the Notes "1, 2, 3" and the second state read "weak"

39 To have the bracketed content read: "20% burst"

40 To read: "Time of physiological ripeness"

42 To read: "Tendency to preharvest fruit drop" with the states from "absent or very low" to "very high"

43 To read: "Frequency of gummy fruits" with the states "low, medium, high," with no asterisk, to be checked whether to be deleted

44 To read: "Plant: self-compatibility"

(vii) Technical Questionnaire: To have paragraph 4 copied from the Test Guidelines for Apple but without the virus question and to indicate in paragraph 5 the characteristics 24, 38 and 40.

Working Paper on Test Guidelines for Loquat (*Eriobotrya japonica*)

37. The Working Party noted documents TWF/26/5, TWF/27/5 and comments made during the session. It finally made the following main changes to document TWF/27/5:

(i) Material Required: To have in paragraph 1 the figure "5" replaced by "6" and "meristem culture" replaced by "*in vitro* propagation."

(ii) Conduct of Tests: To have in paragraph 3 the word "newspaper" replaced by "paper," the words "As a minimum" deleted and the word "five" replaced by "six."

(iii) Methods and Observations: To have the standard paragraphs 1 and 2 copied from the Test Guidelines for Cherry. To have in paragraphs 4 and 5 the word "seasons" included after "current" and to have the following paragraphs read as follows:

"6. All observations on the flower cluster should be made at the beginning of flowering on the central current season shoots (when 5 - 10% of the flowers on 5 - 10% of the flower clusters have opened).

"7. All observations on the flower should be made on the current season central shoots at the time of full flowering. The flowering period lasts until 90% of the flower clusters have opened.

"8. Unless otherwise stated, all observations on the fruit should be made on fruits of moderate size from more than 5 clusters at the time of maturity for consumption (50% of fully colored fruits bagged in paper)."

(iv) Table of Characteristics:

Characteristics

1 To have the Notes "1, 2, 3" and the second state read "semi-upright"

11 To have the state "sharp acute (1), blunt acute (2), rounded (3)"

13 To have the words "of margin" added

14 To have the word "blade" added after "Leaf"

15 To have the second state read: "outwards"

16 To have the second state read: "truncate conical"

18 To read: "Flower cluster: length of lowest lateral of the peduncle" and to receive drawings

19 To read: "Flower cluster: attitude of lateral in relation to peduncle," to have the Notes "1, 2, 3," to have the second state read "outwards" and to receive drawings.

24 To have the last two states read: "broad obovate (5), obovate (6)"

27 To have the states "depressed, flat, raised"

29 To read: "Fruit: aperture of eye"

31 To have the drawing amended

38 - 40 To have the asterisk deleted

40 To read: "Fruit: average number of seeds" with the states "less than three (1), three to five (2), more than five (3)"

41 To read: "Fruit: weight of seeds compared to fruit"

44 To be deleted

45 - 47 To have the bracketed content deleted

48 - 50 To have the asterisk deleted

51 -54 To be deleted

(v) Technical Questionnaire: To have paragraph 4.1 to 4.3 copied from the Test Guidelines for Apple and to have in paragraph 5 the characteristics 24, 28 and 47 indicated.

Working Paper on Test Guidelines for Pear

38. The Working Party noted documents TG/15/1 and Corr., TWF/26/4, TWF/27/9 and comments made during the session. It finally made the following main changes to document TWF/27/9:

(i) Material Required: To have paragraph 1 copied from the Test Guidelines for Apple, however, with reversed order of plant material, starting with 6 trees for crossings, 12 trees for mutants and if acceptable ..... 3 bulbsticks ..... or 8 dormant shoots. Rootstocks to be quince "East Malling A," intergrafts "Beurré-Hardy" or "Doyenne du Comice." If the applicant wants to use another rootstock or intergraft he should contact the competent authority.

(ii) Conduct of Tests: To have the second sentence in paragraph 2 read: "Each test should include a total of 6 trees for varieties resulting from crossings and 12 trees for varieties being mutants."

(iii) Methods and Observations: To have in paragraph 1 the standard sentence on the population standard (1% for crossings with 1 off-type in 6, 2% for mutants with 1 off-type in 12) and the acceptance probability (95%). In paragraph 2 observations should be made on 5 trees or parts of 5 trees for crossings and on 10 trees or parts of 10 trees for mutants . The second sentence of paragraph 3 to be deleted. The first sentence of paragraph 6 to be inserted in paragraph 2.

(iv) Table of Characteristics:

Characteristics

1 To have the name of the example variety "Bon Chrétien Williams" corrected

2 To be checked whether an observation on trees gives different results than in a nursery (done before)

3 To have the second state read "upright"; the German expert to check the example varieties

6 To have the states "grey-green (Mirandino rosso, Nojabrskaja, 1), orange brown (2), brown red (3), brown purple (4), grey brown (5), brown (6), dark brown (7)"; thereafter a new characteristic to be inserted reading: "One-year-old shoot: size of bud support" with the states "small, medium large"

8 To have the words "apex of" inserted before "vegetative bud"

10 To have the words "before lignification" replaced by "during rapid growth"

12 To have the states "upwards (1), outwards (2), downwards (3)" and to have the first example variety checked.

16 To have the state "flat" replaced by "truncate" and to have a new drawing for the state "obtuse"

17 To have the words "upper part" replaced by "apex"

18 To be deleted

19 To have the word "pointed" inserted before "tip" and to have the additional states "absent or very short (1), very long (9)"

20 To have the states "entire (1), only serrate (2), only crenate (3), serrate and crenate (4)"

23 To have the example varieties for "absent" checked

24 To have the states "short, medium, long"

26 To read: "Flower bud: location"

29, 30 To have the Notes "1, 2, 3"

30 To have the first state read: "apart"

31 To repeat the bracketed content from characteristic 32

32 To have the states "cuneate, rounded, truncate, cordate"

33 To be checked whether the weight is actually measured

37 To have the bracketed content deleted and to have the states "in middle (1), slightly towards calyx (2), strongly towards calyx (3)"

38 To have the states "symmetric (1), slightly asymmetric (2), strongly asymmetric (3)"

40 To have the words "of skin" deleted and to have a new state "red (Red Bartlett, 4)"

41 To have the word "relative" added before "area" and to have the words "weak" replaced by "small" and "high" by "large," the example varieties for state 9 to be checked.

42 To have the order of states 3 (red pink) and 4 (red) reversed

43, 44, 45 To have the word "relative" added before "area," to be checked whether the amount of russet should be observed.

50, 52 To have the word "flat" replaced twice by "shallow"

51 To read: "Fruit: attitude of sepals (at harvest)" with the first state "converging"

Working Paper on Test Guidelines for *Prunus* Rootstocks (TWF/25/4, TWF/27/6)

39. The Working Party noted documents TWF/25/4, TWF/27/6, and comments made during the session. It started discussing the Technical Notes first in a subgroup but soon found difficulties in establishing a document on *Prunus* Rootstocks. It reported its outcome to the main session of the Working Party. There the question arose whether to prepare one common Test Guidelines document for rootstocks of the whole genus or several documents for different species inside that genus especially where Test Guidelines for fruit varieties already existed for some of them.

40. There were mainly the following three questions that have to be resolved:

(i) Some rootstocks are seed propagated, others are vegetatively propagated. Thus different degrees of uniformity have to be applied: in the case of cross-pollinated varieties a relative uniformity compared to existing varieties with a limited number of characteristics; in the case of self-pollinated varieties a certain variation has to be allowed between the plants; in the case of vegetatively propagated varieties no more off-types than fixed by the population standard and acceptance probability fixed in any characteristics.

(ii) Is it possible to observe for rootstocks any characteristics of the young stage, omitting flower and fruit characteristics? What happens if later on it becomes apparent that the variety is not uniform in a fruit characteristic (if it shows too many off-types in a flower or fruit characteristic)?

(iii) Is it really necessary to establish separate Test Guidelines for rootstocks? How many applications for rootstock varieties are existing? Would it be easier and feasible to amend existing Test Guidelines for fruit varieties to also cover rootstocks?

41. As a result of these questions the following possible solutions emerged:

(a) The existing Test Guidelines for fruit varieties are amended to cover also rootstocks. They would receive a number of additional characteristics of the young stage of the plants and possibly some others of the mature stage, added at the end of the Table of Characteristics and applicable only to rootstocks. In addition some of the existing

characteristics would be amended to cover also all possibilities of rootstocks (e.g. additional states of expression would be added).

(b) Separate Test Guidelines for rootstocks would be prepared in parallel for each of the species for which Test Guidelines for fruit varieties existed.

(c) In addition to amended Test Guidelines covering fruit varieties and rootstocks under (a) another Test Guidelines document would be prepared to cover one or more well defined species (e.g. *Prunus mahaleb*) for which no fruit varieties existed but several applications were received for rootstocks.

(d) In addition to amended Test Guidelines covering fruit varieties and rootstocks under (a) another Test Guidelines document would be prepared to cover all rootstock varieties not otherwise covered.

(e) In addition to separate Test Guidelines for rootstocks mentioned under (b) another Test Guidelines document would be prepared to cover one or several other well defined species (e.g. *Prunus mahaleb*) for which no fruit varieties existed but several applications for rootstocks had been received.

(f) In addition to separate Test Guidelines for rootstocks mentioned under (b) another Test Guidelines document would be prepared to cover all rootstock varieties not otherwise covered.

(g) One single Test Guidelines document would be prepared to cover all rootstocks of a given genus (e.g. one document for all Rootstocks of *Prunus*).

42. In order to better judge the consequences of the above possible solutions it was proposed to take an example and prepare documents for each of these solutions, study them and all their advantages and disadvantages.

43. Before doing that, however, it was proposed to obtain more information on the present situation of rootstocks. For that purpose it was agreed to prepare a questionnaire.

44. One expert from a Member State of the European Union (EU) reported that she would see difficulties in including additional rootstocks in the fruit Test Guidelines as that would increase even more the number of characteristics to be tested for a candidate under an EU application. As the EU, when starting the Community Plant Variety Office, had not yet possessed its own Test Guidelines it had been provisionally decided to use the UPOV Test Guidelines. That was a very good decision as it ensured harmonization in the testing. Unfortunately the EU had, however, made no distinction between asterisked and non-asterisked characteristics and made all characteristics compulsory for testing. The same was also the situation with many bilateral testing agreements between UPOV member States. In these cases many States did not look at the individual Test Guidelines but obliged the testing State to use all characteristics of the Test Guidelines without respecting whether a characteristic had an asterisk or not, thus making all characteristics *de facto* "asterisk characteristics." The EU Test Guidelines, being not recommendations but binding obligations, did not permit the expert to decide not to use a guideline characteristic.

45. Some other experts suggested that UPOV should not be concerned over an EU internal decision, and that the EU should be treated like any other State. It was for the EU to solve any problems.

46. However, as a result of the above situation whenever a UPOV Test Guidelines document was under revision, experts from the EU sought to drastically reduce the number of non-asterisked characteristics (sometimes by half) in order to avoid their testing. As in sessions of the UPOV Technical Working Parties, the EU Member States were often in the majority, their proposals were frequently accepted, to the regret of other States. The practice of the EU and of many States which were party to bilateral agreements had negative effects on the establishing of UPOV Test Guidelines for world-wide use and left many valuable characteristics outside the Guidelines if they were not thought to be needed in the EU whatever their value for other UPOV member States.

47. The Working Party was informed that the same concerns had already been raised by the Technical Working Party for Agricultural Crops (TWA) during its session in 1995 and that at that time members of the EU Task Force had been asked to intervene to try to change the decision of the EU, but apparently without success so far.

48. The expert from the Community Plant Variety Office confirmed the above decision of the EU. It was, however, only temporary until EU Test Guidelines were prepared. He explained that the decision had been taken because of the urgent need of the Administrative Council to adopt Test Guidelines to test EU applications and that the decision had had to be taken quickly. In order to avoid difficulties for UPOV, he recommended that whenever UPOV revised Test Guidelines or prepared new Test Guidelines and an expert from a EU Member State was involved that instead of reducing the UPOV Table of Characteristics the expert should prepare a full Table of Characteristics for UPOV and at the same time a list of reduced characteristics for testing of EU applications and send that list to the Community Plant Variety Office. On the basis of such a draft it would be easier and faster to prepare the EU's own Test Guidelines.

Working Paper on Test Guidelines for Walnut

49. The Working Party noted documents TG/125/3, TWF/26/2, TWF/27/7 and the report from the Subgroup which had met the evening before. It finally made the following main changes to document TWF/26/2:

(i) Material Required: To have paragraph 1 amended as for the Test Guidelines for Pear but with the following numbers: "6 plants or if accepted 3 budsticks ... or 8 dormant shoots ...." To have the sentence on *in vitro* propagation added.

(ii) Conduct of Tests: To have in paragraph 3 the figure "4" replaced by "6."

(iii) Methods and Observations: To have paragraphs 1 and 2 copied from the Test Guidelines for Cherry, however, 15 parts, 3 from each of 5 plants should be observed, with the exception of the observations on the fruit and the kernel which should be made on 25 fruits. Paragraphs 4 to 9 were changed completely and would now read as follows:

"4. The persistence of the husk and the rachis on the tree should be observed at the beginning of winter after leaf fall.

"5. The time of male and female flowering should be observed when 50% of the catkins or female flowers are in full bloom (at dehiscence of pollen or full development of stigmas).

"6. The type of female inflorescence and the type of branching of female flowering branches (predominant location of fruit buds) should be observed at the time of full bloom of the female flowers.

"7 All observations on the leaf should be made on fully developed leaves of the middle third of a primary current season's shoot.

"8. Time of maturity should be recorded at 50% of fruit fall.

"9. All observations on the fruit should be made at physiological ripeness immediately after harvest.

"10. All observations on the kernel should be made one month after harvest when the water content is less than 8%."

(iv) Table of Characteristics:

Characteristics

1 To have the bracketed content deleted

2 To read: "Tree: habit" with the states "upright (3), semi-upright (5), spreading (7)"

4 - 7 To be placed at the end of the Table

8, 9 To go back to the wording in the adopted Test Guidelines (TG/125/3)

10 To have the states "dark yellow (Milotai 10, 1), light brown (2), green brown (3), blackish (4)"

12 To have "number" replaced by "presence"

13 To be placed after characteristic 36

15 To have states 5 and 6 read as follows: "broad trapezoid (5), trapezoid (6)"

17 To have the states "oblate (1), round (2), ellliptic (3)"

19 To have the states "cuneate (1), rounded (2), truncate (3), emarginate (4)"

25 To be placed after characteristic 26

33 To have the words "of mass" added after "percentage"

(v) Technical Questionnaire: To have paragraphs 4.1 to 4.3 copied from the Test Guidelines for Apple and to have the old characteristics 8 and 9 reincluded in paragraph 5.

Status of Test Guidelines

50. The Working Party agreed that the draft Test Guidelines for Japanese Apricot (*Prunus mume*), Loquat (*Eriobotrya japonica*) and Walnut (Revision) should be sent to professional organizations for comments and that the Working Papers on Test Guidelines for the other species mentioned on the agenda should be (re)discussed at its next session.

Future Program, Date and Place of Next Session

51. At the invitation of the expert from the Netherlands, the Working Party agreed to hold its twenty-eighth session in Wageningen, Netherlands, from September 8 to 12 (noon), 1997. It was planned that the following items would be discussed during the forthcoming session:

(a) Short reports on new developments in member States in plant variety protection for fruit species (oral reports);

(b) Important decisions taken during the previous sessions of the Working Party and the Technical Committee (oral reports);

(c) Updated report from the Technical Working Party on Automation and Computer Programs (TWC) on uniformity;

(d) New methods, techniques and equipment in the examination of varieties;

(e) Testing of rootstocks (result of the questionnaire);

(f) UPOV Central Computerized Database;

(g) Relation between national listing and plant variety rights system (Annex III of TWF/27/18);

(h) Standardization of Test Guidelines (TWF/27/16, South Africa to prepare a new paper)

(i) Final discussion on draft Test Guidelines for

- Mume (Japanese Apricot)
- Loquat
- Walnut

(j) Discussions on working papers on Test Guidelines for

- Apple Rootstocks (TG/14/5, TWF/27/13; United Kingdom to prepare a new working paper)

- Citrus (Revision) (TG/83/3, TWF/27/14, South Africa to prepare a new working paper)

- European Plum (Revision) (TG/41/4, TWF/25/6, TWF/27/8)

- Grape (TG/50/5, TWF/27/12, plus comments received and sent to OIV and IPGRI)

- Kiwifruit (TG/98/3, TWF/27/17; comments to be sent before the end of the year to New Zealand, New Zealand to prepare a new working paper before April 1, 1997)

- Pear (TG/15/1 and Corr., TWF/27/9; Germany to prepare a new draft before October 20, 1996, all experts to send comments in electronic form to UPOV before February 1, 1997, Israel to prepare a combined document)

- Pear Rootstocks (TWF/27/10)

- *Prunus* Rootstocks (TWF/25/4, TWF/27/6)

- Walnut Rootstocks (TWF/26/8).

52. The Working Party agreed that the expert from the United Kingdom be asked to compare the Test Guidelines for fruit varieties of Apple with the draft for Rootstock Varieties and to prepare a list of additional characteristics from the rootstock document to be added to the fruit Test Guidelines to enable the use of the fruit Test Guidelines plus the additional characteristics to test Apple Rootstocks after having, if needed, also adapted a few further characteristics. The expert from Germany to do the same for Pear Rootstocks and the expert from France for *Prunus* Rootstocks and Walnut Rootstocks [after the session the office was informed that for *Prunus* there was no need for changes in the Test Guidelines for Cherry and Plum, and that they could directly be used also for rootstocks without any amendment].

53. As the chairmanship of Mrs. E. Buitendag was to end at the end of the coming ordinary session of the Council, the Working Party unanimously recommended to the Technical Committee to propose Mr. Chris Barnaby (New Zealand) as Chairman of the Working Party for the coming three years.

Visits

54. In the morning of April 25 , 1996, the Working Party visited the Ben Gurion University in Be'er Sheva where it received an introduction to the applied breeding research on crops which were either drought resistant or needed little water or were saline tolerant and could stand high salinity in the irrigation water. Prof. Yossi Mizrachi guided the Working Group through the trial fields of different fruit species (for the list of the species on which breeding

takes place, please refer to Annex III to this report) and showed practical examples of the final products for consumption which the Working Party was able to taste. He expected for these crops a prosperous future as the major part of Israel was desert land which in the future would have to be inhabited by part of the population.

55. *This report has been adopted by correspondence.*

[Four Annexes follow]

ANNEX I

LIST OF PARTICIPANTS

I. MEMBER STATES

FRANCE

Raymond SAUNIER, INRA - Centre de Bordeaux, Unité de Recherches sur les espèces fruitières et la vigne, Domaine de la Grande Ferrade, B.P. 81, 33883 Villenave d'Ornon (tel. +33-56 84 30 81, fax +33-56 84 30 83)

GERMANY

Reingart KLOSE (Mrs.), Bundessortenamt, Osterfelddamm 80, 30627 Hannover (tel. +49-511-95665, telex 921109 bsaha d, fax +49-511 56 33 62)

HUNGARY

József HARSANYI, National Institute for Agricultural Quality Control, Budapest II, Keleti K. u. 24, P.O. Box 30,93 1525 Budapest 114 (tel. +36-1-212-3989, fax + 36-1-212-5367)

ISRAEL

Baruch BAR-TEL, Plant Breeders' Rights Council, Agricultural Research Organization, POB 6, Bet Dagan 50 250 (tel. +972-3-968 3492, fax +972-3-968 3492)

Ja'acov VAN DAM, Plant Breeders' Rights Council, Agricultural Research Organization, POB 6, Bet Dagan 50 250 (tel. +972-3-968 3492, fax +972-3-968 3492)

JAPAN

Yoshio HATTORI, Seeds and Seedlings Division, Ministry of Agriculture, Forestry and Fisheries, 1-2-1 Kasumigaseki, Chiyoda-ku, Tokyo 100 (tel. +81-3-3591-0524, fax +81-3-3502-6572)

NETHERLANDS

Joost BARENDRECHT, CPRO-DLO, Postbus 16, 6700 AA Wageningen (tel. +31-317-4768 93, fax +31-317-416 513, e-mail: C.J.Barendrecht@crpo.agro.nl)

NEW ZEALAND

Chris BARNABY, Plant Variety Rights Office, P.O. Box 24, Lincoln (tel. 64-3-325 6355, fax 64-3-325 2946, e-mail: pvro@lincoln.cri.nz)

SOUTH AFRICA

Elise BUITENDAG (Mrs.), Plant and Quality Control, Private Bag X11208, Nelspruit 1200 (tel. +27-13 753 2071, fax +27 13 752 3854)

UKRAINE

Sergiy LUNOCHKIN, State Commission of Ukraine for Testing and Protection of Plant Varieties, Suvorova st. 9, 252010 Kyiv (tel. +7-044-290 3191, fax +7-044-290 3365)

Valeri VERNIGORA, State Commission of Ukraine for Testing and Protection of Plant Varieties, Suvorova st. 9, 252010 Kyiv (tel. +7-044-290 3191, fax +7-044-290 3365)

II. OBSERVER STATE

ROMANIA

Adriana PARASCHIV (Mrs.), Head, Examination Department, State Office for Inventions and Trademarks, 5 Jon Ghica, Sector 3, P.O. Box 52, 70018 Bucharest (tel. +40-1-615 9066, fax +40-1-312 38 19)

III. OBSERVER ORGANIZATION

EUROPEAN UNION

Louis VAN EYLEN, Community Plant Variety Office, rue de la Loi 102, 1040 Brussels, Belgium (tel. +32-2-299 1944, fax +32-2-299 1946)

INTERNATIONAL PLANT GENETIC RESOURCES INSTITUTE (IPGRI)

Stefano PADULOSI, Coordinator, Project on Underutilized Mediterranean Species, Via delle Sette Chiese 142, 00145 Rome, Italy (tel. +39-6-5189 2266, fax +39-6 575 0309)

IV. OFFICER

Elise BUITENDAG (Mrs.), Chairman

V. OFFICE OF UPOV

Max-Heinrich THIELE-WITTIG, Senior Counsellor, 34, chemin des Colombettes, 1211 Geneva 20, Switzerland (tel. +41-22-730 9152, telex 412 912 ompi ch, fax +41-22-7335428)

[Annex II follows]

The relation between National Listing and Plant Variety Rights

ANNEX II

	A	F	O	V			requirements	marketing allowed	purpose	provisional protection		additional information
Question number:	1	2	2	2	2	3	DUS 4	5	6	7	8	9
COUNTRY												
ARGENTINA	yes	yes	yes		yes	Law	yes purity maintenance scheme; field performance for certified varieties	no	identification of marketed varieties and avoidance of synonyms	no		test by breeder, checked by examiner
AUSTRALIA	no							yes	alert growers to commercial characteristics	yes	1 year	
AUSTRIA	yes	yes			yes	Law	yes VCU; not obligatory for vegetables	no	listing of varieties that are important	no		
BELGIUM	yes	yes	yes	yes	yes	Law;1	yes VCU for agr. crops only;denomination	yes for agric. crops and vegetables on national or EC list	trade allowance	yes	from application	
BOLIVIA	yes	yes			yes	Law	yes	yes				
CANADA	yes	yes				Law	yes VCU;purity;denomination;sample	yes	merit for Canadion production	yes	only licensed multiplication back to applicant	
CZECH REPUBLIC	yes	yes	yes	yes	yes	Law;2	yes VCU for agric. crops (except non-fodder grasses) and grapes	no	satisfactory quality of all economically important species	no;10	before application, according to novelty conditions	
CHILE	yes	yes				Law	no agr. value+description	yes;for agricultural species	protect breeders' rights and farmers			
DENMARK	yes	yes			yes	Law	yes VCU for agr. crops only	yes;if on list of another EC country	information to consumer and to certification authorities	yes	x	
FRANCE	yes	yes	yes		yes	Law;3	yes VCU for agr. crops only	no;for agric. and vegetable species	DUS is tool for certification, to garantee transfer of genetic improvement to user; VCU for checking main characteristics and discard varieties with low value	yes	from application	
GERMANY	yes	yes	yes	yes	yes	Law;4	yes VCU for agr. crops only;denomination	yes for ornamentals and fruit; no for agric. and vegetable varieties	protect the consumer	no		NLIs are based on EC directives
HUNGARY	yes	yes	yes	yes	yes	Law	yes VCU;denomination	no; except with provisional permission	protect farmers	yes	no restrictions	
INDIA	yes	yes	yes	yes	yes	Law	no VCU	yes	certification and quality	no		in process of PBR legislation
IRELAND	yes	yes				Law	yes;7 VCU;denomination;maintenance	yes;if on CC or OECD list	provide farmers with list of suitable varieties	yes;11	after application on applicants risk	
ISRAEL	yes	yes			yes	Law	no VCU	yes;provisional	protect farmers	yes	from application	
ITALY	yes		yes			Vol.						
JAPAN	no											
MEXICO	yes	yes	yes		yes	Law	yes description	no	certification	no		in process of PBR legislation
NETHERLANDS	yes	yes			yes	Law;5	yes VCU for agric. crops	no	trade regulations;recommendation	no		
NEW ZEALAND	no									yes	from application;12	
NORWAY	yes	yes	yes	yes	yes	Law	yes VCU	yes	certification;classification	yes	from application	
POLAND	yes	yes	yes	yes	yes	Law	yes VCU	no	protect farmers	yes	from application	
ROMANIA	yes	yes	yes	yes	yes	Law	yes;8 VCU	no	control quality	yes	from the date of publication	
RUSSIA	yes	yes	yes	yes	yes	Law	yes VCU	no	protect users	yes	not allowed	
SLOVAKIA	yes	yes	yes		yes	Law	yes VCU	no	recommendation	no	x	
SOUTH AFRICA	yes	yes	yes		yes	Law	yes	no		yes	from PBR grant	
SPAIN	yes	yes	yes		yes	Law	yes VCU for agric. crops	no;9	to know the material marketed	no		
SWEDEN	yes	yes			yes	Law	yes VCU for agric. crops	yes;if on CC or OECD list	certification	yes	from application	
SWITZERLAND	yes	yes				Law;6	yes quality, agricultural value	no	quality, agricultural value	yes	normally with PBR	
UNITED KINGDOM	yes	yes			yes	Law	yes VCU for agr. crops only	no	1.ensures seeds of a variety are sold under one name 2.ensures named varieties sold to growers are distinct 3.assures that seed purchased in UK and EU has been tested according to common standards 4.ensures a market for seed producers	yes;	application	

Remarks

1 voluntary for fruit. to be changed-already regulated, but not yet in praxis
2 ornamentals voluntary from July 1, 1996
3 volentary for fruit,including strawberries for selling certified plant materi
4 optional for ornamentals and fruit
5 vegetables EC rules
6 volentary for apple and pear
7 DUS only on nationally bred potato varieties; for others purchasing test reports
8 only for varieties protected under the Patent Law
9 yes, under some conditions
10 if granted, protection takes effect from date of application
11 on request per variety
12 applicants are aware of the risk that a variety may be refused protection

[Annex III follows]

ANNEX III

LIST OF CANDIDATE SPECIES

FAMILY *Botanical name*	Common name	Distribution
APOCYNACEAE		
Carrisa grandiflora A. DC.	Carrisa	Southern America
ANACARDIACEAE		
Sclerocarya birrea subsp. *caffra* Sonder	Marula (Morula)	Southern Africa
Spondias cytherea (Spondias dulcis) Forst	Ambarella	Polynesia
BOMBACACEAE		
Bombax glabra	Malabar nut	Central America
CACTACEAE		
Acanthocereus tetragonus (L.) Humlk.	Acanthocereus	Mexico
Cereus peruvianus (L.) Miller	Apple cactus (Pitaya)	North S. America
Escontria chiotilla (Weber) Britt & Rose	Pitaya (Jiotilla)	Mexico
Hylocereus costaricensis (Weber) Br. & R.	Pitahaya	Central America
Hylocereus paolyrhi (Weber) Br. & R.	Pitahaya	Central America
Hylocereus polyrhizus (Weber) Br. & R.	Pitahaya	Central America
Hylocereus purpusii (Weber) Br. & R.	Pitahaya	Central America
Hylocereus undatus (Haworth) Br. & R.	Pitahaya	Central America
Myrtilloactus geometrizans (Mart.) Cons.	Pitaya	Mexico
Nopalea cochenillifera (L.) Salm-Dyck	Nopalito ,Nopalea	Mexico
Opuntia ficus-indica (L.) Miller	Prickly pear	Trop. America
Opuntia streptocantha Lem.	Prickly pear	Trop. America
Pachycereus pringlei (Berger) Britt & Rose	Cardon pelon	Sonoran Desert
Selenicereus megalanthus (Schum.) Br. & R.	Pitaya	Colombia
Stenocereus griseus (Haw.) Buxb.	Pitaya	Oaxaca Mexico
Stenocereus gummosus (Engelm.) Gilbs.	Pitaya agria	Sonoran Desert
Stenocereus stellatus (Pfeiff.) Riccob.	Pitaya	Mexico
Stenocereus thurberi (Engler.) Buxb.	Pitaya dulce	Sonoran Desert
Stenocereus thurberi var *litoralis* (E.) B.	Pitaya dulce	Sonoran Desert
CAESALPINIACEAE		
Cordeauxia edulis Hemsl.	Yehib	NE Africa
EBENACEAE		
Diospyros digyna Jacq.	Black sapote	South America
Diospyros discolor Willd.	Mabolo (Velvet apple)	Philippine islands
Diospyros mespiliformis Hocht.	Mmilo namibia	South Africa
EUPHORBIACEAE		
Ricinodendron rautanenii Schinz	Mongongo	Southern Africa
GUTTIFERAE		
Rheedia madruno Triana & Planch.	Madrono	Central America
FLACOURTIACEAE		
Dovialis caffra Warb.	Kei apple	Southern Africa

FAMILY *Botanical name*	Common name	Distribution
LEGUMINOSAE		
Tamarindus indica L.	Tamarind	Tropical Africa
LOGANIACEAE		
Strychnos cocculoides Backer	Monkey orange	Southern Africa
Strychnos spinosa Lam.	Monkey orange	Southern Africa
Strychnos pungens Solereder	Monkey orange	Southern Africa
MIMOSACEAE		
Inga spp.	Ice cream bean	South America
MORACEAE		
Artocarprus heterophyllus Lam.	Jackfruit	Asia
RHAMNACEAE		
Ziziphus mauritiana Lank.	Ber	Old World Tropics
ROSACEAE		
Prunus salicifolia H BK.	Capulin cherry	Mexico
RUBIACEAE		
Vangueria infausta Burch.	Mmilo	Southern Africa
RUTACEAE		
Casimiroa edulis Llave & Lex.	White sapote	Mexico, C. America
SANTALACEAE		
Santalum accuminatum (R. Br.) A. DC.	Quandong	Australia
SAPOTACEAE		
Argania spinosa L.	Argan	Morroco
Chrysophyllum cainito L.	Star apple	Central America
Manilkara zapota van Royen	Sapodilla	India, Africa & C. America
Mimusops angel Engler	Angel	Somalia
Mimusops zeyheri Sond.	Mmupudu	Southern Africa
Pouteria sapota (Jacq.) Merr.	Mammey sapote	Central America

[Annex IV follows]

ANNEX IV

STATES OF EXPRESSION AND NOTES OF CHARACTERISTICS

Categories of Characteristics

1. True qualitative characteristics with no in between states
(very few examples)

Ex.1: solid flush (1), striped (2), mottled (3)

2. Non-linear quantitative characteristics (presented in a qualitative way)

Ex.2: Color: green (1), yellow (2), orange (3), red (4), purple (5)

Ex. 3: Shape: ovate (1), elliptic (2), round (3), obovate (4)

3. Linear quantitative characteristics with no fixed point (presented in a quantitative way)

Ex. 4: Size: small (3), medium (5) large (7)

or Ex. 5: very small (1), small (3), medium (5), large (7), very large (9)

or Ex. 6: very small (1), very small to small (2), small (3), small to medium (4), medium (5), medium to large (6), large (7), large to very large (8), very large (9)

Ex. 7: Color intensity: weak (3), medium (5), strong (7)

Ex. 8: Shape/width: narrow (3), medium (5), broad (7)

4. Linear quantitative characteristics with a fixed point at one extreme end

(a) Quantitative expression

Ex. 9: absent or very weak (1), weak (3), medium (5), strong (7), very strong (9)

or Ex. 10: Alternative for Ex. 9 only for cases where a clear (genetically based) absence exists

(i) absent (1), present (9) followed by another characteristic

(ii) weak (3), medium (5), strong (7)--in cases where it is required to clarify the different degrees of presence

(b) Qualitative expression

In some cases one may choose to regard example 9 (and 10) qualitatively:

Ex. 11: absent or very weakly expressed (1), weakly expressed (2), strongly expressed (3)

Ex. 12: closed (1), partly open (2), fully open (3)

Ex. 13: adpressed (1), slightly held out (2), strongly held out (3)

Ex. 14: attitude: upward (1), slightly outwards (2), strongly outwards (3)

5. Linear quantitative characteristics related to a fixed balancing point in the middle of a scale with limited possibilities

(a) Quantitative expression

Ex. 15: far above (1), above (3), same height (5), below (7), far below (9)

Ex. 16: strongly concave (1), concave (3), flat (5), convex (7), strongly convex (9)

Ex. 17: much smaller (1), smaller (3), same size (5), larger (7), much larger (9)

Ex. 18: much closer to base (1), closer to base (3), in middle (5), closer to apex (7), much closer to apex (9)

Ex. 19: Attitude: erect (1), semi erect (3), horizontal (5), semi-pendulous (7), pendulous (9)

TWV proposal: to fix states, even if asymmetrically, e.g. erect (1), semi-erect (3), horizontal (5)

TWF accepts TWV proposal for cases of attitude where the axis is vertical.

Ex. 20: deeply depressed (1), depressed (3), flat (5), pointed (7), strongly pointed (9)

(b) Qualitative expression

In some cases one may choose to regard these characteristics qualitatively

Ex. 20: concave (1), flat (2), convex (3)

Ex. 21: closer to base (1), in middle (2), closer to apex (3)

Ex. 22: depressed (1), flat (2), pointed (3)

6. Linear quantitative characteristics related to fixed points not necessarily at extreme end or at middle of scale--to be qualitative (?) because wording difficulty

Ex. 23: narrow elliptic (1), elliptic (2), round (3), oblate (4), flat oblate (5)

Ex. 24: elliptic (1), broad elliptic (2), round (3)

Ex. 25: acute (1), obtuse (2), rounded (3), truncate (4), emarginate (5)

[End of document]