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TWO/35/7 – TWF/33/15
ORIGINAL: English
DATE: November 4, 2002

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY FOR ORNAMENTAL PLANTS AND FOREST TREES

Thirty-Fifth Session
Quito, November 18 to 22, 2002

TECHNICAL WORKING PARTY FOR FRUIT CROPS

Thirty-Third Session
San Carlos de Bariloche, Argentina
November 25 to 29, 2002

COMMENTS ON TGP DOCUMENTS MADE BY THE

TECHNICAL WORKING PARTY
ON AUTOMATION AND COMPUTER PROGRAMS (TWC)
Twentieth Session
Mexico City, June 17 to 20, 2002

TECHNICAL WORKING PARTY FOR VEGETABLES (TWV)
Thirty-Sixth Session
Tsukuba, Japan, September 9 to 13, 2002

TECHNICAL WORKING PARTY FOR AGRICULTURAL CROPS (TWA)
Thirty-First Session
Rio de Janeiro, Brazil, September 23 to 27, 2002

Document prepared by the Office of the Union

TGP/3.2 DRAFT 1: DEVELOPMENTS AND EXPLANATIONS REGARDING VARIETIES OF COMMON KNOWLEDGE

Comments Made by the TWV [1]

33. The TWV observed that the contents of the existing drafts of the document groups under TGP/3 and TGP/4 were duplicated in several areas. It was considered that the objectives of TGP/3 would be to explain the legal background of variety of common knowledge on the basis of provisions of the UPOV Convention while the objectives of TGP/4 would be to give practical guidance to DUS testing authorities when establishing reference collection. The TWV, being aware of the close link between TGP/3 and TGP/4, thought, however, that a clear functional division should be respected.

Comments Made by the TWA [2]

31. The TWA noted the discussions which had taken place in the CAJ concerning the interpretation of a variety whose "existence" was a matter of common knowledge. In particular, it noted that the interpretation in the draft of the General Introduction, that "living plant material must be in existence for a variety to be taken into account for distinctness," had not been acceptable and had been deleted from the adopted version. In recognition of the problems in trying to clarify this matter, it was agreed that section 4 of the document "Aspects concerning the existence of living plant material" should be deleted. It was also agreed that section 3.1.2 should be deleted and that section 3.2.5 should be modified to refer to comparisons in a growing trial.

32. The TWA agreed that the way forward on the problem of obtaining material of varieties of common knowledge was for the technical experts to clarify the practical basis on which variety collections were established and highlight the differences between these collections and the potential collection of all varieties of common knowledge. This would then allow the Testing Authorities to evaluate the risks of possible wrong decisions on distinctness and decide if this risk was unacceptable, what supplementary procedures it should take to address the problem. It noted that the General Introduction made reference to such supplementary procedures in section 5.3.1.2. Furthermore, it noted that the issues concerning the development of variety collections would be handled in document TGP/4.1 "General Guidance for the Management of Variety Collections". It proposed that a reference to this document should be made in document TGP/3.1 and the difference between all varieties of common knowledge and variety collections highlighted.

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[1] These and the following comments from the TWV are an extract from document TWV/36/13 "Report on the Conclusions."

[2] These and the following comments from the TWA are an extract from document TWA/31/14 "Report on the Conclusions."

TGP/4.1 DRAFTS 1 AND 2: GENERAL GUIDANCE FOR THE MANAGEMENT OF VARIETY COLLECTIONS

Draft 1

Comments Made by the TWC [3]

28. Conclusions: Some experts considered that the wording of paragraph 14 was confusing, particularly the second part. The expert from Germany clarified that the aim of this part of paragraph 14 was to stress the need for and importance of having a variety collection.

29. The TWC agreed the following modifications in the text of paragraph 14 of document TGP/4.1 (additional text underlined and deleted text strikethrough):

Paragraph 14 to read:

"14. As a conclusion, it is important to underline that whatever the situation adopted to establish a variety collection, it is impossible and not necessary to have a full collection of varieties of common knowledge~~, but also to have a working variety collection with all varieties which would have to be included~~. Nevertheless, it is important that there should be an inclusive and relevant working variety collection"

Draft 2

Comments on Made by the TWV

23. The TWV noted that the coverage of this document overlapped with that of document TGP/9.3.1, and thought that a restructuring might be necessary. Furthermore, the TWV agreed that Paragraph 13(a)(ii) should read: "access to a representative sample of plant material of the variety."

Comments on Made by the TWA

34. The TWA proposed the following changes to the document:

Paragraph 9: In the last sub-paragraph of paragraph 9(a) and in 9(b)(i), rather than to supra-national organizations, it should refer to certain territories or countries, where the variety collection might be limited, by taking into account some physiological traits of the variety.

Paragraph 9(b): The heading should refer to other territories, rather than countries.

Paragraph 13(c)(i): Indicate that, wherever possible, the representative seed sample should be obtained from the Testing Authority to which the initial application was made. In addition, a separate section on the difficulties of maintaining a collection of

[3] These and the following comments from the TWC are an extract from TWC/20/6 "Report on the Conclusions"

vegetatively propagated varieties (e.g. cost, virus infection and risk of mutation) should be added, indicating that this would make it impractical for Testing Authorities to establish such collections.

Paragraph 13(iv): "… can only be based ..." should be replaced by "… may be possible …" and

Paragraph 13(v): a reference should be made to document TGP/9.5 "Use of the Parental Formula for Examining Distinctness in Hybrids."

Paragraph 14: to read "…and also, *in most cases*, unnecessary…"

35. It was agreed that a separate section should be included on the benefits of cooperation between Testing Authorities, for improving the efficiency of managing variety collections.

36. The TWA discussed whether a variety which was a parent line submitted exclusively for the examination of DUS of hybrid varieties, and included in the variety collection of a Testing Authority, would be considered to be in common knowledge. It noted that the inclusion of such a parent line in a collection of varieties held by a Testing Authority for the examination of DUS did not, in itself, make this parent line a matter of common knowledge, since such a collection was not "publicly accessible" (Section 5.2.2.1(c) of the General Introduction). However, it noted that parent lines would, in some members of the Union, become a matter of common knowledge by commercialization of the hybrid.

37. The TWA also noted that the CAJ was considering certain issues concerning the use of material submitted for DUS examination, including the ability of Testing Authorities to exchange parent lines submitted for DUS examination of hybrid varieties.

38. The TWA noted that the comments made by the TWC had already been addressed in document TGP/4.1 draft 2 and that the comments made by the TWV would be addressed by the changes proposed above.

TGP/6.1.2 DRAFT 1: EXAMPLES OF ARRANGEMENTS FOR DUS TESTING

Comments Made by the TWA

39. The TWA considered that this document provided a useful explanation of the different arrangements for DUS testing in the countries concerned. It agreed that further elaboration of certain aspects would be helpful. The expert from New Zealand proposed to prepare an example of the system used in his country. The TWA proposed that the document should be presented as illustrative examples of systems and not primarily as the system of a particular country.

TGP/7.1 DRAFT 1: GUIDANCE FOR DRAFTERS OF TEST GUIDELINES

Comments Made by the TWV

15. The TWV observed that the current presentation of document TGP/7.1 might give the impression to the drafters that all additional standard wordings (ASWs) should be used in UPOV Test Guidelines. However, the objective of the document was to provide guidance in order to maintain a minimum level of harmonisation in the layout and the wording used in Test Guidelines. The TWV observed that document TGP/7.1 could be improved to make it clear that the additional standard wording should be used only when necessary and as appropriate and this would never force the drafter to include the information indicated by the headings of the additional standard wording.

16. The TWV further agreed to the following changes in the document TGP/7/1:

ASW 1(TGP/7.2: Section 2.3)-seed quality requirement: The second sentence should be amended to read: "In cases where the seed is to be stored, the germination capacity should be as high as possible and should, if possible, be stated by the applicant."

ASW 6 (TGP/7.2: Section 4.3.3)-stability assessment of hybrid varieties: An additional sentence referring to the stability assessment of parental lines should be added reading: "The stability of a parental line may, in addition to an examination of parental lines itself, also be assessed by examination of the uniformity and stability of its hybrids."

ASW 9 (TGP/7.2: Section TQ 4.2)-information on method of propagating hybrid varieties: The last line should read:" (b) maintenance system of male sterile lines."

17. The TWV further considered GN 14 (TGP/7/2: Section 7)-Table of Characteristics: Handling of a long list of characteristics, and observed that it should be stated clearly that a consensus should be required for the inclusion of characteristics fulfilling the criteria in order to avoid automatic adoption of such characteristics. The TWV further agreed in general to the following:

(a) a list of characteristics longer than necessary should be avoided,
(b) characteristics proposed but not adopted as standard Test Guidelines characteristics could be placed on a list, which would be then placed on the UPOV Web Site for further consideration and/or eventual adoption in future as standard Test Guidelines characteristics.

Comments Made by the TWA

40. The TWA proposed the following changes to the document:

ASW 3(d)

41. To read A: spaced plants

ASW 5(e)

42. The expert from Germany to draft appropriate wording after consultation with the Chairman of the TWC.

ASW 9

43. It was proposed that, where appropriate, an additional standard wording should be provided for the title box of the Technical Questionnaire, to read: "Technical Questionnaire to be completed in connection with an application for plant breeders' rights and for the parent lines of hybrid varieties which are the subject of an application for plant breeders' rights."

ASW 10

44. The TWA noted the objections of the International Seed Federation (ISF) to the requirement for a photograph to accompany the Technical Questionnaire. The TWA also proposed that the sentence should be reworded as follows: "A representative color photograph of the relevant characteristics of the variety should accompany the Technical Questionnaire."

GN 6

45. The TWA considered that it would be practically impossible to create a detailed formula and proposed that Option 2 should be presented first, to indicate that this would be the most suitable approach. Regarding Option 1(b), it proposed to replace the word "should" with "may." In Option 2(b), it proposed that the word "proportion" should be replaced by "quantity."

GN 10

46. The TWA proposed that this section should be redrafted to emphasize that there are relatively few characteristics where harmonized variety descriptions can be developed. It also proposed that the examples in (a) should be more realistic to reflect the interaction of characteristics with the environment.

47. Regarding the presentation of multiple sets of example varieties the TWA proposed that the example varieties should be presented in an Annex to the Test Guidelines. It agreed that these could be presented in a tabulated format as follows:

	Country A					
Example varieties	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6
Variety A	3	1	3		3	7
Variety B	5	2	7	1	1	5
Variety C	7	3	5	9	2	
Variety D		4			4	3

	Country B					
Example varieties	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6
Variety I	3	4	5		1	3
Variety II	5	2	3	1	2	5
Variety III	7	1	7	9	3	
Variety IV		3			4	7

48. It was agreed that a column for example varieties should be retained in the table of characteristics, but this would be left blank for each Testing Authority to complete as appropriate. This blank column would be of a reduced width to reduce the size of the Test Guidelines as far as possible.

GN 14

49. The TWA noted that it was important for all the criteria set out in GN 11 to be checked before including a characteristic in the Test Guidelines. It noted that, at present, there were no problems with the size of the Table of Characteristics in the Test Guidelines developed by the TWA and proposed that it would be more appropriate to consider any schemes for indicating the extent of use of a characteristic if this became a real issue.

GN 21

50. It was proposed that the title of part (b) should be deleted and the text should refer to the recognition of independent characteristics.

GN 22 and 23

51. The TWA noted that these sections would be superceded by document TGP/7.3 “Standardized UPOV Terms and Explanations.” However, with regard to GN 23, it noted the value of retaining the “1-5” scale for quantitative characteristics.

GN 24

52. It was proposed that the text following (b) should read “unless it is considered unrealistic to expect breeders to describe these characteristics.”

TGP/7.2 DRAFT 1: TG TEMPLATE

Comments Made by the TWV

18. The TWV agreed to endorse document TGP/7.2 as agreed by the Technical Committee including the newly drafted Annex to the Technical Questionnaire.

Comments Made by the TWA

53. The TWA proposed the following changes to the document:

Section 3.5 “Number of Plants / Parts of Plants to be Examined”:

54. The existing standard wording should be omitted and introduced as additional standard wording using the following revised wording:

“Unless otherwise indicated, all observations on single plants should be made on {xx} plants or {xx} parts taken from each of {xx} plants.”

Section 6.5 “Legend”:

55. The legend indicating QL, QN and PQ to be omitted and introduced as additional standard wording.

Section 10.1 “Subject of the Technical Questionnaire”:

56. In the case of Test Guidelines covering more than one species, the template should provide for applicants to indicate to which species the application applied.

Section 10.6 “Similar varieties and differences from these varieties”

57. The examples given should be omitted and suitable examples could be provided for individual Test Guidelines.

TGP/7.4 DRAFT 1: PROCEDURE FOR THE INTRODUCTION AND REVISION OF TEST GUIDELINES

Comments Made by the TWV

20. The TWV noted the importance of establishing procedures in a written form to ensure transparency and full participation of members of the Technical Committee and its observers in the process of the introduction and revision of Test Guidelines. The TWV agreed, however, that the proposed procedures should be improved by taking into account the following general comments made during the discussion:

(a) Initiatives of Technical Working Parties in the drafting and revision of Test Guidelines would be affected by the proposed procedures, in particular, through the approval procedures included in Steps 1 to 3.

(b) The proposed procedures may lead to the imposition of additional burden onto Technical Working Parties.

(c) It would be necessary to include a mechanism to respect the priority and expertise of the Technical Working Party concerned when allocating drafting work.

(d) Criteria for the prioritization should be clearly formulated.

(e) Parties having requested the introduction and revision of Test Guidelines should be prepared to contribute to the work.

21. In connection to the discussion on document TGP/7, the TWV noted that the procedures between the adoption of draft Test Guidelines and their publication were not clear and might need to be clarified, especially when draft Test Guidelines have been adopted subject to the inclusion of additionalinformation to be provided by the leading expert. The TWV proposed that the decision taken by the Technical Committee, including the instruction to the leading expert, be circulated to the interested experts of the Technical Working Parties concerned.

22. The TWV proposed that questionnaires be prepared to ask for opinions of TWPs on their mid-term work plan with respect to the establishment and/or revision of Test Guidelines.

Comments Made by the TWA

58. The TWA did not have time to consider this document and were invited to send written comments to the Office of the Union. It also agreed that the next draft should incorporate a step for the exchange of seed of varieties in order to develop good grouping and asterisked characteristics.

TGP/8.1 DRAFT 1: USE OF STATISTICAL PROCEDURES IN DUS TESTING: INTRODUCTION

Comments made by the TWC

37. Several experts considered that the document included a too extensive part devoted to experimental design, a subject to be covered in document TGP/8.3 ("Experimental Design Practices".) Other experts supported its inclusion because they thought that this would raise awareness on the importance of having a good experimental design, and was also an attractive issue that would encourage crop experts to read it. Experts from the United Kingdom proposed that the document should be presented in a more structured way. The expert from Germany noted that the document referred to candidate varieties as "new varieties", which might cause confusion with the notion of Novelty in the UPOV Convention. Furthermore she considered that the use of the terms "internal factors" and "external factors" was confusing for crop experts. Finally she proposed to use the term "candidate variety" as for other TGP documents and to refer to "genetic effects" and "environmental effects" respectively. Other confusing terms identified were: "over the years" instead of "generations", "maternal effects", "sowing" instead of "growing cycle" and "replication" to designate each single vegetatively propagated plant.

38. The TWC proposed to use a wording consistent with the other TGP documents to avoid confusing crop experts. It considered that testing a variety over more than one growing cycle did not check stability as mentioned in paragraph 9.

39. The TWC considered that the inclusion of other methods for partitioning the error as proposed by Australia was in too much detail for an introduction to TGP/8. It also considered that data should be observed on plants in good growing conditions and that consistent results was an aim laid down in the General Introduction (see paragraph 5.3.3.1 of TG/1/3).

40. Conclusion: The TWC requested the drafter to reduce the reference to experimental design and to modify the document following the proposal raised during the discussion. The TWC also agreed the following modifications in the text of document TGP/8.1 (additional text underlined and deleted text strikethrough):

Paragraphs 10 and 11 to read:

"10. A fourth key element is the specific set of considerations that holds for a crop. There can be no general set of experiments and/or characteristics given, that will fulfil the UPOV requirements for DUS-testing. It will depend on the crop and the considerations are diverse, but general information is provided in this document. For most crops, the characteristics and requirements are defined in the Test Guidelines. But sometimes other characteristics can be used as a complement for the 'agreed' characteristics. Observations can be made at all different stages of development of the crop, so it is imperative that all aspects of recording a characteristic are described properly and exhaustively to ensure that they can be compared in the long run but also understood by a novice."

"11. During or at the end of the study, the data, on the same set of characteristics ~~between~~ for all varieties, are used by the experts of the crop for DUS testing. The use of and the need for computations may differ considerably. In some cases the notes recorded and the knowledge of the expert are sufficient, while in other cases there is a need to compute a large set of data from more than one ~~sowing~~ growing cycle in order to obtain objective values on which to base the final expert decision."

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52. TGP documents to be redrafted before further consideration by other Technical Working Parties: The TWC considered that the following TGP documents should be redrafted and reconsidered by the Working Party before being sent to other Technical Working Parties for further consideration:

TGP/8.1 Introduction

TGP/8.2 Validation of Data and Assumptions

TGP/8.3 Experimental Design Practices

TGP/8.5 Statistical Methods for DUS Examination

TGP/14.3 Statistical Terms

TGP/8.2 DRAFT 1: VALIDATION OF DATA AND ASSUMPTIONS

Comments Made by the TWC

42. The expert from the United Kingdom proposed to include additivity of blocks and variety effects under item 8.2.3 Assumptions. It was also clarified that examples of ANOVA would be included in document TGP/8.5 "Statistical Methods for DUS Examination." The drafter requested the participants to provide examples when transformation of data had been used to be included in future versions of document TGP/8.2

43. Conclusion: The TWC agreed the following modifications in the text of TGP/8.2 (additional text underlined and deleted text strikethrough):

Paragraphs 6 and 7 to read:

"6. First of all, it is very important to design experiments in a proper way. The most important assumptions of analysis of variance methods are:

- independent observations
- variance homogeneity
- normal distributed observations (residuals).
- additivity of blocks and variety effects"

"7. In addition, one could state that there should be no ~~errors~~ mistakes in the data. However, most ~~errors~~ mistakes (at least the biggest) will usually also mean that the observations are not normally distributed and that they have different variances."

Paragraph 9 to read:

"9. This is a very important assumption. It means that no records may depend on other records in the same analysis (dependence between observations may be built into the model, but this is not so in the COYD and COYU or other UPOV recommended methods). Dependency may be caused e.g. by competitions between neighbouring plots, by lack of randomisation or by improper randomisation. More details ~~on independent~~ on ensuring independence of observations may be found in TGP/8.3 "Experimental Design Practices.""

Paragraph 10, second bullet point to read:

- "The variance ……. has a variance of 5, whereas varieties I and J each has a variance of 10. ~~Some results of comparing~~ The real probability of detecting differences between these varieties when they ~~are~~ in fact ~~identical~~ have the same mean are shown in Table 1. In Table 1, the variety comparisons are based on the pooled variance as is normal in traditional ANOVA. If they are compared using the 1% level of significance, the probability that the two varieties with a variance of 10 become significantly different from each other is almost 5 times larger (4.6%) than it should be. On the other hand, the probability of significant differences between two varieties with a variance of 5 decreases to 0.5%, when it should be 1%. This means that it becomes more difficult to detect differences between two varieties with small variances and easier between varieties with large variances."

Explanation of Table 1 to read:

"Table 1. Probability of significant difference between two identical varieties in the case where variance ~~heterogenity~~ homogeneity is assumed but not fulfilled (varieties A to H have a variance of 5 and varieties I and J have a variance of 10.)"

Paragraph 11 to read:

"11. The data should be approximately ~~normal~~ normally distributed. The ideal normal distribution means that the distribution of the data is symmetric around the mean value and with the characteristic bell-shaped form (see Figure 2). If the data are not approximately normally distributed, the actual level of significance may deviate from the nominal level. The deviation may be in both directions depending on the way the actual distribution of the data deviates from the normal distribution.. However, deviation from normality is usually not as serious as deviations from the previous two assumptions."

Paragraph 12 to replace "error" by "mistake".

Paragraph 12 to replace "outliners" by "outliers".

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52. TGP documents to be redrafted before further consideration by other Technical Working Parties: The TWC considered that the following TGP documents should be redrafted and reconsidered by the Working Party before being sent to other Technical Working Parties for further consideration:

TGP/8.1 Introduction

TGP/8.2 Validation of Data and Assumptions

TGP/8.3 Experimental Design Practices

TGP/8.5 Statistical Methods for DUS Examination

TGP/14.3 Statistical Terms

TGP/8.3 DRAFT 1: EXPERIMENTAL DESIGN PRACTICES

Comments Made by the TWC

45. Conclusion: The TWC agreed to delete the following paragraphs: 2, 4 to 10, 12 to 33; to reword paragraph 11 because the use of the term "plots of the population" was confusing and to include the use of grouping characteristics in the trial design. The TWC also agreed the following modifications in the text of document TGP/8.3 (additional text underlined and deleted text strikethrough):

Paragraph 44 to delete the comma in the first sentence and to replace "so" by a comma in the last sentence.

Paragraph 69 to read:

"69. The comparison between candidate and reference varieties is mostly based on observations from 1 to 3 years or cycles. Therefore, the number of replicates and the number of plants per plot in a single trial have an indirect effect on the variability which is used in the COYD and COYU analyses. Before performing these analyses the means of the variety means and (log) standard deviations per year or cycle are calculated and then the analysis is performed on these means in the two-way variety by year or cycle layout. The residual variation in these analyses is the variety by year or cycle interaction. More refined techniques ~~based in~~ such as fitted constant and REML can be used, which allow for, e.g., between-trial heterogeneity in error variance."

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52. TGP documents to be redrafted before further consideration by other Technical Working Parties: The TWC considered that the following TGP documents should be redrafted and reconsidered by the Working Party before being sent to other Technical Working Parties for further consideration:

TGP/8.1 Introduction

TGP/8.2 Validation of Data and Assumptions

TGP/8.3 Experimental Design Practices

TGP/8.5 Statistical Methods for DUS Examination

TGP/14.3 Statistical Terms

TGP/8.4 DRAFT 1: TYPES OF CHARACTERISTICS AND THEIR SCALE LEVELS

Comments Made by the TWC

47. Conclusions: The TWC agreed to replace “level of view” by “level of process” throughout the whole document and also the following modifications in the text of TGP/8.4 (additional text underlined and deleted text strikethrough):

Page 4, second paragraph to read:

“ The continuous quantitative data for the characteristic “Plant length” are measured on a continuous scale with defined units of assessment. It depends only on the costs and the necessity to get any value in cm or in mm. ~~Changing of measure~~ A change of unit of measurement e.g. from cm into mm is only a question of precision and not a change of type of scale.”

Page 4, last paragraph to read:

“ The definition of an absolute zero point makes it possible to define ~~additional constant~~ meaningful ratios. This is also a requirement for the construction of index numbers (e.g. the ratio of length to width). An index is the combination of at least two characteristics. In UPOV terms this special case is defined as a combined characteristic.”

Page 5, second paragraph to read:

“ The interval scale is ~~higher classified than the ordinal scale but~~ lower classified than the ratio scale (Table 2). That means that it is possible to use more statistical procedures. Fewer statistical procedures can be used with interval scaled data than with ratio scaled data (Chapter 7). The interval scale is theoretically the minimum scale level to calculate arithmetic mean values.”

Page 5, last paragraph to read:

“ The ordinal scale is ~~higher classified than the nominal scale but~~ lower classified than the interval scale (Table 2). ~~It is possible to use more statistical procedures than for nominal scaled data but less than for interval scaled data~~ Less statistical procedures can be used for ordinal scale than for all of the higher classified scale data (Chapter 7).”

Page 6, third paragraph

Characteristics with only two categories (dichotomous ~~alternative~~ characteristic) are a special form of nominal scales.

Page 6, Table 2

To replace “exact zero” by “absolute zero” in the column Description.

Page 7, the third paragraph and the remark to read:

“ For quantitative characteristics the scale level of data depends on the method of assessment. They can be recorded on a quantitative or ordinal scale. For example, "Length of plant" is usually recorded by measurements resulting in ratio scaled continuous quantitative data. Under specific circumstances, visual assessment on a 1 to 9 scale may

be appropriate. In this case, the recorded data are qualitatively scaled (ordinal scale) because the ~~size~~ interval between the midpoint of categories is not exactly the same.

Remark: In some cases visually assessed data on quantitative characteristics may be handled as ~~quantitative data~~ measurements. The possibility to apply statistical methods for quantitative data depends on the precision of the assessment and the robustness of the statistical procedures. In case of very precise visually assessed quantitative characteristics the usually ordinal data may reach the level of discrete interval scaled data or of discrete ratio scaled data."

Table 4 and 5: to merge the columns Type/Procedure and Further Conditions and to delete "Recommended" from the titles of these tables. To replace "alternative" by "dichotomous" in table 5.

48. The TWC furthermore agreed that a paper on Chi Square distribution should be prepared for the following session by experts from France and United Kingdom.

Comments Made by the TWV

34. The TWV agreed to send comments to the Office of the Union as soon as possible so that other Technical Working Parties could consider its comments.

Comments Made by the TWA

65. The TWA did not have time to consider the document mentioned above at the meeting and requested that written comments be sent to the Office by the end of November.

TGP/8.5 DRAFT 1: STATISTICAL METHODS FOR DUS EXAMINATION

Comments Made by the TWC

50. Conclusions: The TWC agreed that the bibliography should be included in the document and the drafter would contact the national expert to get that information and to include another example of randomized block design, another example of completely randomized design and a section on paired t-test. As the document would become more voluminous with the inclusion of more methods, the TWC considered that special care should be taken in its structure. It was agreed that experts from Denmark and Poland would prepare a document on incomplete block design and experts from France and the United Kingdom would prepare a document on Chi Square for discussion at the next session of the TWC.

51. Procedure for recommending statistical methods in TGP documents: The TWC received several comments suggesting that the statistical procedures and methods included in the TGP documents were not the only ones that could be used in DUS testing. Even though the TWC considered that it might be the case, it also considered that, to be recommended by UPOV in a TGP document, the Working Party and the Technical Committee should examine any statistical method as follows:

(a) a working paper ("TWC document") should be presented to the consideration of the TWC, explaining the statistical principles applied including examples of its practical use in DUS testing.

(b) the TWC to examine the proposal and to decide whether it could be put to the Technical Committee as a recommended statistical method or whether further development is necessary.

(c) if considered suitable, the proposal to be put to the Technical Committee to be included as a TGP document.

52. TGP documents to be redrafted before further consideration by other Technical Working Parties: The TWC considered that the following TGP documents should be redrafted and reconsidered by the Working Party before being sent to other Technical Working Parties for further consideration:

TGP/8.1 Introduction

TGP/8.2 Validation of Data and Assumptions

TGP/8.3 Experimental Design Practices

TGP/8.5 Statistical Methods for DUS Examination

TGP/14.3 Statistical Terms

TGP/8.6 DRAFT 1: EXAMINING DUS IN BULK SAMPLES

Comments Made by the TWC

34. Some experts considered that it would be necessary to include more examples to show the reaction to bulking in different characteristics. An expert from the United Kingdom proposed that the components of the formula in paragraph 3 should be considered as "sources of variation" instead of "variance caused by".

35. Conclusion: The TWC also agreed the following modifications in the text of TGP/8.6 (additional text underlined and deleted text strikethrough):

Paragraph 4 to read:

"4. In cases where the data are not bulked the variance ~~on~~ of the difference between two variety means, σ^2_{diff} , becomes:"

Paragraph 10 the explanation to the formula to read:

$Var(Z_{vy}) = \sigma^2_{vy} + \sigma^2_f$

where

σ^2_{vy} is the total variance caused by the year in which the variety is measured

σ^2_f is the variance ~~caused~~ influenced by the number of degrees of freedom

σ^2_f is approximately $\frac{1}{2\nu}\left(\frac{\sigma}{\sigma+1}\right)^2$ when the recorded variable is normally distributed and the variances are not too variable. This last expression reduces to $0.5/\nu$ when $\sigma >> 1$. Here σ is the mean value of the s_{vy} values and ν is the number of degrees of freedom used in the estimation of s_{vy}.

Comments Made by the TWV

32. The TWV agreed to send comments to the Office of the Union before the end of the year.

Comments Made by the TWA

65. The TWA did not have time to consider the document mentioned above at the meeting and requested that written comments be sent to the Office by the end of November.

TGP/9.1.1 DRAFT 1: GENERAL PROCEDURES FOR DETERMINING DISTINCTNESS: OFFICIAL TESTING

Comments Made by the TWV

24. The TWV noted the document mentioned above, without making any specific comments.

Comments Made by the TWA

59. ….. After discussion it was agreed that it would be very difficult to develop a generalized approach to the examination of distinctness. It was, therefore, agreed that different examples of approaches to the examination of distinctness should be provided in the same way as adopted for document TGP/6.1.2 “Examples of Arrangements for DUS Testing” and the merging of these two documents should be considered. It was also agreed that the title of the document should be changed accordingly.

TGP/9.1.2.1 DRAFT 1: GENERAL PROCEDURES FOR DETERMINING DISTINCTNESS: BREEDER TESTING (AUSTRALIA)

Comments Made by the TWV

24. The TWV noted the document mentioned above, without making any specific comments.

Comments Made by the TWA

60. The TWA agreed that this document presented a clear explanation of the Australian system of breeder testing. It noted that this document addressed the overall examination of DUS and not just distinctness and should, therefore, be incorporated in document TGP/6.1.2 “Examples of Arrangements for DUS Testing.”

TGP/9.1.2.2 DRAFT 1: GENERAL PROCEDURES FOR DETERMINING DISTINCTNESS: WITH THE PARTICIPATION OF BREEDERS (FRANCE)

Comments Made by the TWV

24. The TWV noted the document mentioned above, without making any specific comments.

Comments Made by the TWA

61. It was proposed that this document should be covered within a new draft of document TGP/6.1.2 “Examples of Arrangements for DUS Testing,” explaining the French arrangements for DUS testing.

TGP/9.1.3 DRAFT 1: GENERAL PROCEDURES FOR DETERMINING DISTINCTNESS: GENERAL

Comments Made by the TWV

25. The TWV made the following remarks in the Table:

Page 4: The superscript given to the word "Cross-pollinated" should be moved to the word "Obs" in the column for the second growing cycle.

Page 5: The indication of the possibility of the rejection for any variety with an erroneous TQ description may be interpreted in various way and thus should be redrafted to avoid any misunderstanding.

Comments Made by the TWA

62. It was noted that this document was very similar to document TGP/9.1.1 and would be covered by the proposals concerning that document and its merging with document TGP/6.1.2 "Examples of Arrangements for DUS Testing."

TGP/9.3.1 DRAFT 1: CONSIDERATION OF ALL VARIETIES OF COMMON KNOWLEDGE IN THE EXAMINATION OF DISTINCTNESS

Comments Made by the TWV

26. ….. The TWV noted a similarity in the contents of this document to document TGP/4.1: General Guidance for the Management of Variety Collection and suggested a possible reorganization of the structure of the TGP documents.

Comments Made by the TWA

63. The TWA noted that issues raised in this document were addressed more to document TGP/3.2 “Developments and Explanations Regarding Varieties of Common Knowledge.” It noted the difficulties there had been in discussions on document TGP/3.2 when trying to elaborate the term “varieties whose existence is a matter of common knowledge,” beyond that agreed in Section 5.2 of the General Introduction. It proposed that the CAJ should be invited to comment on whether it would be appropriate to try to elaborate this matter further. If the CAJ considered this to be appropriate, the TWA proposed that the drafters of document TGP/3.2 draft 1 and document TGP/9.3.1 draft 1, should collaborate to produce a new draft of document TGP/3.2, taking into account the comments made on their respective documents.

TGP/9.3.2 DRAFT 1: CONSIDERATION OF ALL VARIETIES OF COMMON KNOWLEDGE IN THE EXAMINATION OF DISTINCTNESS: THE USE OF 'PHENOTYPIC DISTANCE' FOR EXAMINING DISTINCTNESS

Comments Made by the TWC

10. Mr. Sylvain Grégoire (France) introduced the document. He noted that the program is being rewritten and that a pre/test version would be available for member States by the end of the year.

11. Conclusions: The TWC noted that the proposed program had been used by one member State only and considered that it should be tested by more member States before being recommended by UPOV in TGP/9.3.2. The TWC further agreed to keep the introduction as part of TGP/9.3.2 and the program GAIA to be presented in a TWC paper the following session.

Comments Made by the TWV

27. The TWV noted the following general comments made during the discussion:

(a) the determination of the weight applied to each characteristic is important and should be carefully done by crop experts with sufficient knowledge on the crop species concerned;

(b) the result of the application of the proposed GAÏA system should be examined in conjunction with the application of COYD analysis.

28. The TWV noted, with appreciation, that France would examine the applicability of GAÏA system to theforage pea varieties for the next session .

Comments Made by the TWA

65. The TWA did not have time to consider the above document at the meeting and requested that written comments be sent to the Office by the end of November.

TGP/9.4.1 DRAFT 1: EXAMINING DISTINCTNESS IN DIFFERENT TYPES OF VARIETY: GENERAL

Comments Made by the TWC

13. Conclusions: The TWC agreed to have references to the features of propagation in this chapter and not in the chapters describing the statistical method for distinctness. The TWC also agreed the following modifications in the text of document TGP/9.4.1 (additional text underlined and deleted text strikethrough):

Paragraph 1 to read:

"1. The appropriate method for examining distinctness depends on the methods of recording the expression of a characteristic in a specific crop and the resulting set of data (see TGP/8). …."

Paragraph 3 and 4 to read:

"3. Vegetatively propagated, truly self-pollinated and mainly self-pollinated varieties normally have very little variation within varieties. The same situation may occur in qualitative characteristics in cross-pollinated varieties (including synthetic varieties). A lack of significant variation within varieties allows examination of distinctness based on a single observation per variety, year and location. Guidance for the assessment of Distinctness in such cases is provided in (TGP/9. ~~In general, a minimum distance of one or more than one states is recommended to consider a variety to be distinct. In the case of a single observation for each variety, the application of a statistical analysis is not possible or necessary.~~"

"4. Within variety variation is normally greater for quantitative characteristics in cross-pollinated varieties, including synthetic varieties, due to genotypic variation. In this case, the expression of a variety should be recorded using ~~more than one~~ observations~~. Usually, records are taken from a~~ on number of individual plants. Distinctness can then be assessed by comparing the differences in variety means with a measure of random variation inherent in the variety means (see TGP/9.7 "Recommended Statistical Methods"). If a characteristic in a vegetatively propagated, truly self-pollinated or mainly self-pollinated variety is recorded by observation of individual plants, the same methods can be applied. This situation might occur where there is considerable plant to plant variation within varieties due to environmental effects is observed. However, in general, ~~a~~ one single observation per plot for each variety is sufficient in vegetatively propagated, truly self-pollinated and mainly self-pollinated varieties."

To add new paragraph at the end:

"The assessment of distinctness for hybrid varieties should follow the same rules independently of the degree of within variety variation on the level of the hybrid or of the parental lines. Specific guidance for the assessment of distinctness using the parental formula is provided in TGP/9."

Comments Made by the TWV

29. The TWV noted the documents mentioned above, without making any specific comments. The members of the TWV were invited to send comments on the documents to the Office as soon as possible so thatthose comments could be considered by t he Technical Working Party for Agricultural Crops.

Comments Made by the TWA

65. The TWA did not have time to consider the above document at the meeting and requested that written comments be sent to the Office by the end of November.

TGP/9.5 DRAFT 1: USE OF THE PARENTAL FORMULA FOR EXAMINING DISTINCTNESS IN HYBRIDS

Comments Made by the TWA

65. The TWA did not have time to consider the document mentioned above at the meeting and requested that written comments be sent to the Office by the end of November.

TGP/9.6 DRAFT 1 CORR.: USE OF MULTIPLE LOCATIONS IN THE EXAMINATION OF DISTINCTNESS

Comments Made by the TWC

15. Conclusions: The TWC agreed the following modifications in the text of document TGP/9.6 (additional text underlined and deleted text strikethrough)

Paragraph 4 to read as follows:

"4. For some crops, such as fruit trees, the same plants are examined over successive years. In this case, the condition of independence of growing cycles is not ~~also~~ satisfied. But, as it would be impossible in practice to plant successive trials, this is accepted"

To reword the second sentence of paragraph 7 or to remove the whole paragraph.

The last point of paragraph 8 to read as follows:

- "Some offices systematically grow varieties in more than one location (usually 2). They do this in order to provide a double check for consistency in crops for which they experience difficulties in proving distinctness and uniformity."

16. The TWC did not accept to modify the fifth point of paragraph 8 as proposed by Australia because it considered it necessary to check the consistency of the DUS test by sampling different environments.

TGP/9.7 DRAFT 1: RECOMMENDED STATISTICAL METHODS - COYD

Comments Made by the TWC

17. …..

Conclusion: The TWC agreed to add an example of long term COYD and to put in the name of the Annex in paragraph 14. It also agreed to include other possibilities than "fitted constants" in paragraph 10 of Appendix A. The TWC also agreed to include the following modifications in the text of document TGP/9.7 (additional text underlined and deleted text strikethrough):

Paragraph 1, first sentence to read:

"1. To distinguish varieties on the basis of a ~~measured~~ quantitative characteristic we need to establish a minimum allowable distance between varieties so that a pair of varieties showing a difference greater than the minimum might be regarded as "distinct" in respect of that characteristic…"

Paragraph 12 to read as follows:

"12. COYD is recommended for use in assessing distinctness of varieties

– when observations are made on a plant (or plot) basis over two or more years;

– when the characteristic is quantitative

– when there are some differences between plants (or plots) of a variety ~~but, nevertheless, this variation is sufficiently small to allow us to distinguish between varieties;~~

– ~~in general COYD is recommended for use in the testing of allogamous (cross fertilized) varieties~~."

Paragraph 16: to replace "present" by "common".

TGP/10.2 DRAFT 1: ASSESSING UNIFORMITY ACCORDING TO THE FEATURES OF PROPAGATION

Comments Made by the TWC

19. Conclusions: The TWC did not accept the proposal from Australia to modify paragraph 6, sentence 2 because it considered that the COYU is the only recommended method. The TWC also agreed to have references to the features of propagation in this chapter and not in the chapters describing the statistical method for uniformity, and to make the following modifications in the text of document TGP/10.2 (additional text underlined and deleted text strikethrough):

Paragraph 1 (b) to read as follows:

"(b). Variation within mainly self-pollinated varieties should also result, predominantly, from environmental influences but a low level of genotypical variation caused by some cross pollination is accepted. Therefore~~, the tolerance limit for uniformity may be higher~~ more variation may be tolerated than for vegetatively propagated and truly self-pollinated varieties."

Paragraph 2: to read as follows and to add a new one:

"2. As a result of the above, appropriate uniformity standards for the different types of varieties must be developed according to the features of propagation (specific population standards)."

"2.a The variation within varieties in a characteristic determines how that characteristic is used to determine uniformity in the crop (off-types in case of discontinuous variation or variances in case of continuous variation of characteristics). Thus, the uniformity of the crop may be determined by off-types alone, by variances of the characteristics alone, or by off-types for some characteristics and by variances for other characteristics."

Paragraph 4 (b), last sentence to read as follows:

"(b). … An appropriate fixed population standard ~~should~~ may also be applied in the case of a very low number of comparable varieties."

Paragraph 6 to read as follows:

"6. If the detection of off-types is not possible because of considerable genotypic and/or environmental variation within varieties, uniformity should be assessed after taking this variation into account. The variability of a candidate variety should not exceed the variability of comparable varieties or types already known. The comparison between a candidate variety and comparable varieties is carried out on the basis of variances calculated from individual plant observations. The COYU procedure is the recommended statistical method for this comparison (see Section 10.3.1). This procedure calculates the tolerance limit on the basis of comparable varieties already known i.e. uniformity is assessed using a relative tolerance limit."

Paragraph 8 to read as follows:

> "8. If the inheritance of a clear-cut segregating characteristic is not known, the ~~expression of the characteristic is treated in the same way as other characteristics in cross-pollinated varieties (including synthetic varieties). The~~ observed segregation ratio should be described. An assessment of uniformity is not possible for these characteristics. (The rules outlined for predictable segregation ratios in Chapter 10.3.3 should be used for testing stability.)"

Comments Made by the TWV

29. The TWV noted the documents mentioned above, without making any specific comments. The members of the TWV were invited to send comments on the documents to the Office as soon as possible so thatth ose comments could be considered by the Technical Working Party for Agricultural Crops.

Comments Made by the TWA

64. It was agreed that paragraph 4 (b) would be elaborated, perhaps with examples, to clarify the proposed approach, it was proposed that the document should avoid the use of the term "type."

TGP/10.3.1 DRAFT 1: RECOMMENDED STATISTICAL METHODS: COYU

Comments Made by the TWC

21. Conclusions: The TWC agreed to include a paragraph clarifying that the same number of plants, measurements and replications as in COYD are used. It also agreed a paper to be prepared for the next TWC meeting proposing an alternative method to COYU when the requirements on degrees of freedom for COYU are not fulfilled. The TWC also agreed the following modifications in the text of document TGP/10.3.1 (additional text underlined and deleted text strikethrough)

Paragraph 1, first sentence to read:

"1. When the uniformity of plants of a variety is to be judged on the basis of ~~measurements~~ quantitative characteristics then the standard deviation (SD) can be used to summarise the spread of the observations."

Paragraph 11: to include an extra point "when the characteristic is quantitative"

Paragraph 14: to amend the second formula.

Paragraph 30: reference to "Table B2" should be to "Table A 2"

To check the format of Table A 2.

TGP/10.3.2 DRAFT 1: RECOMMENDED STATISTICAL METHODS: OFF-TYPES

Comments Made by the TWC

23. Conclusions: The TWC considered that the tables and figures included in the document from pages 14 to 36 should be improved. It was agreed that Denmark would send the drafter the program to create new ones.

24. The TWC also considered it necessary to include advice for the assessment of Uniformity by relative tolerances in the number of off-types in TGP/10. It was agreed that experts from Germany and the United Kingdom would prepare a document for the next session of the TWC.

25. Several experts wondered whether the term “heterogeneous” included in the table of paragraph 11 was properly used or could be replaced by “non-uniform”. It was also considered whether the chapter “ Definition of Statistical Terms and Symbols” (paragraph 54) should be deleted and its content included in TGP/14. The TWC agreed to request the opinion of the other Technical Working Parties in relation to the use of the term “heterogeneous” and it also decided to keep paragraph 54.

26. The TWC agreed the following modifications in the text of TGP/10.3.2 (additional text underlined and deleted text strikethrough)

> “2. ~~Uniformity of candidate varieties of self-pollinated and vegetatively propagated crops is normally assessed on the basis of the number of off-types recorded in tests~~. The maximum number of off-types that is acceptable should be chosen so that the probability of rejecting a candidate variety that should meet the crop standard is small. On the other hand the probability of accepting a candidate variety that has many more off-types than the standard of that crop should also be low.”
>
> “8. This method is recommended for use in assessing the uniformity by number of off-types ~~in self-pollinated and vegetatively propagated crops~~ with a fixed population standard.”

TGP/12.1.1 DRAFT 1: CHARACTERISTICS EXPRESSED IN RESPONSE TO EXTERNAL FACTORS: DISEASE RESISTANCE.

Comments Made by the TWV

30. Mr. Kees van Ettekoven (Netherlands) introduced the document. The TWV agreed to the following changes to be incorporated in the document:

Paragraphs

4. To read: "The decreasing input from science on the taxonomy of the diseases and of the strains of diseases ~~is decreasing rapidly~~ around the world is compensated by the input of phytologists from DUS testing institutes and seed companies."

13. The last sentence to read: "It has to be avoided that the heterogeneity introduced through ~~to attribute~~ the trial is blamed ~~induced heterogeneity~~ to the candidate variety."

15. The second sentence to read: "Therefore, ~~In fact in many cases~~ disease characteristics ~~may~~ are often ~~be~~ used as grouping characteristics."

16. The last sentence to be deleted.

17. (g) to read: "the availability of reliable inoculum and host differential set"

21. The second indent to read: " The applicant / breeder may be requested to carry out a blind disease test with coded samples including the candidate variety and a number of also coded control samples as susceptible and resistant controls on the basis of a clear control."

Comments Made by the TWA

65. The TWA did not have time to consider the document mentioned above at the meeting and requested that written comments be sent to the Office by the end of November.

TGP/12.1.2. DRAFT 1: CHARACTERISTICS EXPRESSED IN RESPONSE TO EXTERNAL FACTORS: CHEMICAL RESPONSE

Comments Made by the TWA

65. The TWA did not have time to consider the document mentioned above at the meeting and requested that written comments be sent to the Office by the end of November.

TGP/12.1.3 DRAFT 1: CHARACTERISTICS EXPRESSED IN RESPONSE TO LIVING ORGANISMS: INSECT RESISTANCE

Comments Made by the TWA

65. The TWA did not have time to consider the document mentioned above at the meeting and requested that written comments be sent to the Office by the end of November.

TPG/14.3: GLOSSARY OF STATISTICAL TERMS

Comments Made by the TWC

31. An expert from the United Kingdom considered that reference textbooks on statistics should be included, and he had concerns about including some terms in the glossary. The expert from Denmark proposed to check the consistency between the definitions included in document TGP/14.3 and the ISO definitions. Following the proposal of the expert from France, the TWC agreed to keep the way it is written in the future version because it makes the glossary easy to read for non-statisticians.

32. Conclusions: The TWC agreed that the document should be modified following the discussions at the meeting and that an expert from the United Kingdom would prepare an updated version in consultation with other experts. It also requested the Office of the Union to seek the opinion of the initial drafter from Australia about this proposal.

…..

52. TGP documents to be redrafted before further consideration by other Technical Working Parties: The TWC considered that the following TGP documents should be redrafted and reconsidered by the Working Party before being sent to other Technical Working Parties for further consideration:

TGP/8.1 Introduction

TGP/8.2 Validation of Data Assumptions

TGP/8.3 Experimental Design Practices

TGP/8.5 Statistical Methods for DUS Examination

TGP/14.3 Glossary of Statistical Terms

[End of document]