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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

TECHNICAL COMMITTEE

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MATTERS ARISING FROM THE TECHNICAL WORKING PARTIES

Document prepared by the Office of the Union

1. This document summarizes certain matters arising from the 2004 sessions of the Technical Working Parties (TWPs) which are not covered by specific agenda items. The matters arising are presented in two sections. The first section, "Matters for information and for a possible decision to be taken by the Technical Committee (TC)", identifies matters raised by the TWPs, which may require a decision to be taken by the TC. The Office of the Union (Office) has highlighted aspects where the TC may wish to take a decision by introducing a proposed decision paragraph shown in italics. The second section, "Matters for information", is provided for the information of the TC but does not require decisions at this stage.

2. The following abbreviations are used in this document:

CAJ:	Administrative and Legal Committee
TWA:	Technical Working Party for Agricultural Crops
TWC:	Technical Working Party on Automation and Computer Programs
TWF:	Technical Working Party for Fruit Crops
TWO:	Technical Working Party for Ornamental Plants and Forest Trees
TWV:	Technical Working Party for Vegetables
BMT:	Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular

3. The following table of contents specifies the items covered in this document:

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I. MATTERS FOR INFORMATION AND FOR A POSSIBLE DECISION TO BE TAKEN BY THE TC

Chairmanship of the TWPs

4. The TWPs noted that the terms of office for their Chairpersons would expire with the ordinary session of the Council in 2005. It was noted that the last session of the TC before the 2005 ordinary Council session would be the TC session in April 2005, and it would, therefore, be necessary for each TWP to make a proposal for a candidate for chairmanship during their sessions in 2004. The respective TWPs suggested to the TC that it propose to the Council that it elect the following persons as Chairpersons:

TWA: Mrs. Beate Rücker (Germany)
TWC: Mrs. Sally Watson (United Kingdom)
TWF: Mr. Alejandro Barrientos Priego (Mexico)
TWO: Ms. Sandy Marshall (Canada)
TWV: Mr. Niall Green (United Kingdom)

5. *The TC is invited to make proposals, to the Council, for the chairmanship of the TWPs.*

II. MATTERS FOR INFORMATION

Project for Exchanging Seed of Selected Varieties Between Interested Countries

6. The TWA considered document TWA/33/9, which presented some preliminary results on the comparison of the description of rice varieties provided by seven countries (Brazil, France, Hungary, Italy, Russian Federation, Spain and Uruguay) when grown in Japan, and agreed to invite a further report for the next session of the TWA.
7. Mr. Philip Rhodes (New Zealand) made an oral report of the project on White Clover. Some results had been obtained from seed provided by New Zealand, South Africa and the United Kingdom. With regard to quantitative characteristics, there was a reasonable level of agreement between New Zealand and the United Kingdom in descriptions for varieties with states of expression towards the small and large ends of the scale, but less agreement for varieties with states of expression in the middle of the ranges. He also reported that where varieties were described in New Zealand, using seed provided by New Zealand and the United Kingdom, there was, in general, agreement in descriptions. However, in some cases there were significant differences.
8. Further information is presented in conjunction with agenda item 10 “Publication of variety descriptions”.

Development of Regional Sets of Example Varieties for the Test Guidelines for Rice

9. The TWA recalled that during its thirty-second session, held in Tsukuba, Japan, from September 8 to 12, 2003, it had agreed that the Test Guidelines for Rice should be submitted to the TC for adoption on the basis of a minimal set of example varieties which had been verified by the leading expert and on the basis that regional sets of example varieties would be incorporated as these became available. Experts from Japan, China and the Republic of Korea agreed to develop a regional set of example varieties for East Asia.
10. The TWA considered document TWA/33/14 and received an oral report from Mr. Keun-Jin Choi (Republic of Korea). It heard that Japan and the Republic of Korea had exchanged candidate varieties of rice, and had started a selection program for the regional set of example varieties for East Asia. The list of candidate example varieties and the testing places are presented in document TWA/33/14.
11. The Office reported to the TWA that the International Rice Research Institute (IRRI) / the International Network for Genetic Evaluation of Rice (INGER) were working with countries in South East Asia to develop a set of example varieties for the South East Asian region.

GAIA Software

12. During its twenty-first session in Tjele, Denmark, from June 10 to 13, 2003, the TWC discussed the calculation of phenotypic distances using the GAIA software. The TWC agreed that the Office should issue a questionnaire to all recipients of the GAIA software, requesting information on the crops to which the software was being applied. In February 2004, the developers of the GAIA software, the *Groupe d'étude et de contrôle des variétés et des*

semences (GEVES) from France, circulated a questionnaire to the recipients of the software requesting comments and suggestions. Since the questionnaire issued by GEVES requested the same information as that sought in the Office questionnaire, it was decided that, in conjunction with the Chairman of the TWC and the experts from GEVES, a document should be prepared containing the information collected by GEVES.

13. The TWC noted the information provided in document TWC/22/13 and the explanations provided by Mr. Sylvain Grégoire (France), noting that Croatia, Estonia, the Netherlands, Portugal and the United Kingdom had replied to the questionnaire issued by GEVES.

14. Following the suggestion made by experts from France, the TWC agreed that the GAIA software could be loaded with standard data as examples in order to guide the crop experts when using the software for the first time.

Image Analysis

15. The TWA and TWC considered documents TWC/22/9-TWA/33/7 “Image analysis in DUS testing in NIAB” and TWA/33/10 / TWC/22/7 “Automatic measurement of pea characteristics”.

16. The TWA recalled that document TG/1/3 (“General Introduction”) stated that:

“4.6.3.1 A combined characteristic is a simple combination of a small number of characteristics. Provided the combination is biologically meaningful, characteristics that are assessed separately may subsequently be combined, for example the ratio of length to width, to produce such a combined characteristic. Combined characteristics must be examined for distinctness, uniformity and stability to the same extent as other characteristics. In some cases, these combined characteristics are examined by means of techniques, such as Image Analysis. In these cases, the methods for appropriate examination of DUS are specified in document TGP/12, ‘Special Characteristics’”.

and emphasized the need to examine uniformity and stability of combined characteristics. The expert from the United Kingdom explained that, in relation to document TWC/22/9-TWA/33/7, the uniformity of varieties with respect to all characteristics, including combined characteristics, was examined.

17. In the TWA discussions, an expert from France noted that it was important to differentiate between the introduction of new characteristics and the use of different methods to examine existing Test Guidelines characteristics, the former being the area of most concern. An expert from Germany explained that, in Germany, image analysis was, in general, used to examine existing characteristics and raised concerns that new derived characteristics may lack the necessary level of independence from other characteristics. Another expert from France noted that consideration of uniformity was crucial and expressed concern at creating the possibility of selecting varieties from within existing protected varieties, which could undermine the value of protection. The expert from the United Kingdom noted that in both documents TWC/22/9-TWA/33/7 and TWA/33/10 (or TWC/22/7), the primary objective of image analysis was to examine existing characteristics more efficiently. The Office noted that the consideration of new characteristics was an important role of the TWPs and observed that the development of characteristics which were

not considered for Test Guidelines could undermine harmonization in DUS testing. With regard to document TWA/33/10, the expert from Germany expressed concern at the development of characteristics which involved the multiplication of measurements, as indicated in Table 1 of that document. The TWA considered that an explanation of this would be useful.

18. It is anticipated in document TC/41/5 Annex that a first draft of TGP/12: Section 3 (Special Characteristics: Examination of combined characteristics using image analysis) would be presented to the TWC for consideration at its twenty-third session to be held from June 13 to 16, 2005, in Ottawa, Canada.

Criteria for Determining Off-Type Plants

19. At their sessions in 2003, the TWF and TWO agreed that the Office, in conjunction with Mr. Chris Barnaby (New Zealand), Chairman of the TWO, would prepare and issue a questionnaire seeking information on the proportion of a plant which would need to be affected by a mutation or variation in order to be considered to be an off-type, e.g. whether a single atypical leaf or petal would render the plant an off-type. The results of the survey were presented in document TWO/37/7-TWF/35/7, prepared by Mr. Barnaby.

20. The TWF and TWO agreed that Mr. Barnaby should produce a draft document seeking to provide guidance on the criteria for determining off-type plants. As a basis for the drafting, information would be provided by the TWO experts from Australia (Melia), France (Lavandula), Germany (Regal Pelargonium), New Zealand (Hebe, Phormium) and the United Kingdom (Hebe) by the end of December 2004. With respect to fruit crops for which information might be provided, the TWF agreed that apple would be of particular interest, and experts were invited to send information to Mr. Barnaby by the end of December 2004. Mr. Barnaby would also draw on the information provided in document TWO/37/7-TWF/35/7 and the information provided by the experts from the Community Plant Variety Office (CPVO) in document TWO/36/5, as well as other relevant UPOV documents. It was agreed that if a consensus could be reached on such guidance, it should be incorporated as a section within document TGP/10. It was agreed that it would not be appropriate to consider the development of different uniformity standards for variegated varieties.

Calculation of Relative Tolerances in the Number of Off-types

21. During its discussions on document TGP/10.2 Draft 2, the TWV heard from an expert from France that there might be cases in the assessment of uniformity of some cross-pollinated varieties where the authority would need guidance on whether the uniformity should be assessed on the basis of the number of off-types or according to the relative uniformity concept. For example, in cases where off-types occur, e.g. skin color in a cross-pollinated root crop, how these should be considered. The expert suggested that it should be made clear whether the number of off-types should be compared with other similar varieties, or whether a population standard and acceptance probability should be applied, as in self-pollinated species. In addition, it was suggested that supplementary explanations should be provided to address such cases, for example, by introducing a procedure for a combined application of both strategies for the assessment of uniformity. The expert from the United Kingdom considered that the uniformity assessment on the basis of the relative uniformity concept might not be appropriate if the first varieties for protection of a crop

species were very uniform. In such cases, later applications might be rejected for being less uniform, even if the level of uniformity was reasonable. The establishment of a fixed uniformity standard, say 1% or 2% of allowable off-types, might be helpful in such cases. Similarly, a maximum acceptable level could be set for continuous variation.

22. Mr. Uwe Meyer (Germany) introduced document TWC/22/15, explaining that in specific cases, the off-type procedure can be appropriate for the assessment of uniformity in cross-pollinated varieties. See document TGP/10.2 paragraph 5(b):

“(b) Most characteristics in cross pollinated varieties show continuous variation within varieties (for assessment of uniformity see Section 10.2.2). If, especially in qualitative characteristics, the great majority of individuals of a variety have the same expression, plants with a clearly different expression can be detected as off-types (e.g. root color in fodder beet). In such cases the off-type procedure is appropriate for cross pollinated varieties (including synthetic varieties). The recommended limit for the number of off-types should then be based on the number of off-types in comparable varieties. [...]”

23. Mr. Meyer noted that there was not a recommended procedure for the calculation of relative tolerances for off-types and recalled that the TWC agreed at its twenty-first session that the subject of relative tolerances for off-types should be incorporated in a section within document TGP/10.3.2. Document TWC/22/15 elaborated a practical example where relative tolerances could be applied and proposed an approach for the calculation of relative tolerance limits.

24. The TWC agreed to review a new version of the document at its twenty-third session. It requested the participants to contact crop experts for information on the implementation of relative tolerances in the number of off-types in their countries and send this information to Mr. Meyer for incorporation in the next version of the document.

Assessment of Distinctness for Segregating Characteristics

25. Mr. Vincent Gensollen (France) introduced document TWC/22/8 concerning the assessment of distinctness for segregating characteristics. The document explained how the Chi-square or the Fisher exact tests could be used to assess distinctness by comparing the frequencies of plants expressing different states of a characteristic in different varieties.

26. The TWC agreed that a new document, containing more information about the alternative hypothesis of Chi-square and Fisher exact tests and exploring the possibility of using other tests, should be prepared for its twenty-third session.

COYU

Moving Average

27. The TWC discussed variation in the moving average procedure in COYU on the basis of document TWC/22/14. Mr. Uwe Meyer (Germany) explained that, to estimate the relationship between standard deviation (SD) and arithmetic mean, a 9-point moving average (MA-9) is calculated using the COYU procedure according to the method described in TGP/10.3.1 Draft 3 (see Chapter “Mathematical Details”). For each reference variety, the

average of log SDs ($\log(\text{SD}+1)$) of the variety and the four varieties on both sides are the basis of MA-9. At the extremes, this average is based on the mean of 3, 5 or 7 values (MA-3, MA-5 and MA-7, respectively). In a further step, the so-called trend values for candidate varieties have to be estimated by using the linear interpolation between trend values of the nearest two reference varieties. The aim of document TWC/22/14 was to show the influence of choosing an MA-9 on the results of the COYU procedure and to show that alternatives were possible by using more or less reference varieties on either side (20, 10, 6 or 2 instead of 4).

28. The TWC concluded that the document confirmed the robustness of the method used at present and requested the Chairman to contact Mr. Hans-Peter Piepho (Germany), who had sent comments the previous year, to get his opinion and comments on the document.

Standard Probability Levels

29. At its twenty-first session, held in Tjele, Denmark, from June 10 to 13, 2003, the TWC discussed “Uniformity Standards for COYU” on the basis of document TWC/21/7. The TWC agreed that a new document on probability levels for COY should be prepared for the twenty-second session. It decided that an explanation on the way decisions were taken when using the COY approach should be included in the request and that the replies should be organized by type of decision. Following that decision, a circular was issued requesting information on the probability levels used by members of the Union for COYU. The following countries replied to the survey: China, Czech Republic, Denmark, Finland, France, Germany, Kenya, the Netherlands, the United Kingdom and the United States of America. The information received was summarized in the Annex to document TWC/22/10 and the explanations provided by Mrs. Sally Watson (United Kingdom).

30. Some experts wondered about the accuracy of the information submitted by some contributors and requested the members of the TWC to contact the relevant crop experts to check if the information submitted to the Office was correct. The TWC also agreed that future versions of the document should include the diagrams of the four cases in an annex. It finally agreed, once the information had been checked, the results of the questionnaire could be sent to other TWP for information and comments about its possible inclusion in the relevant TGP documents.

Incomplete Block Design

31. Mr. Kristian Kristensen (Denmark) introduced document TWC/22/6 concerning incomplete block designs in DUS trials. He explained that for many crops, the number of varieties to be tested was large and was increasing. As the influence of soil variability within a block usually increased with increasing block size, the increasing number of varieties to be tested meant that, if complete block designs were used, there would be more variability and it would be more difficult to discriminate between candidate varieties and reference varieties. Several approaches existed for decreasing block sizes. Firstly, the total number of varieties could be decreased by using grouping characteristics to separate the varieties and carry out an independent experiment for each group. Another approach was to split the total number of plants per variety into more complete blocks, i.e. 6 blocks with 10 plants per plot in each instead of 3 blocks with 20 plants per plot, or perhaps 10 blocks with 6 plants per plot or 12 blocks with 5 plants per block. Another approach was to use designs where each block did

not contain all varieties - incomplete block designs. Document TWC/22/6 focussed on the principles, the availability and the benefits/draw backs of incomplete block designs.

32. With respect to document TWC/22/6, the TWC considered that the effectiveness of the design was dependent on the place in addition to the year and the characteristic.

33. The TWC agreed that a section about incomplete block design should be incorporated into TGP/8.2 “Experimental design practices”.

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