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TECHNICAL WORKING PARTY FOR FRUIT CROPS

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ADDENDUM TO TGP DOCUMENTS

Document prepared by the Office of the Union

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1. The purpose of this document is to report the comments on TGP documents made by the Technical Working Party on Automation and Computer Programs (TWC), at its thirty-fourth session, held in Shanghai, China, from June 7 to 10, 2016, the Technical Working Party for Ornamental Plants and Forest Trees (TWO) at its forty-ninth session, held in Gimcheon City, Republic of Korea, from June 13 to 17, 2016, the Technical Working Party for Vegetables (TWV), at its fiftieth session, held in Brno, Czech Republic, from June 27 to July 1, 2016 and the Technical Working Party for Agricultural Crops (TWA), at its forty-fifth session, held in Mexico City, Mexico, from July 11 to 15, 2016.

2. The structure of this document is as follows:

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3. The TWC, TWO, TWV and TWA considered the TGP documents below on the basis of documents TWC/34/3, TWO/49/3, TWV/50/3 and TWA/45/3, respectively (see documents TWC/34/32 "Report", paragraph 15, TWO/49/25 "Report", paragraph 13, TWV/50/25 "Report", paragraph 18 and TWA/45/25 "Report", paragraph 16).

Program for the development of TGP documents

4. The TWC, TWO, TWV and TWA noted the program for the development of TGP documents, as set out in Annex III to documents TWC/34/3, TWO/49/3, TWV/50/3 and TWA/45/3, respectively (see documents TWC/34/32 "Report", paragraph 21, TWO/49/25 "Report", paragraph 17, TWV/50/25 "Report", paragraph 22 and TWA/45/25 "Report", paragraph 20).

5. The TWC agreed to request the expert from China to prepare a proposal for reorganizing document TGP/8 to facilitate searches and use by DUS examiners to be reported at the thirty-fifth session of the TWC for consideration (see document TWC/34/32 "Report", paragraph 22).

TGP/7: Development of Test Guidelines

Revision of document TGP/7: Drafter's Kit for Test Guidelines

6. The TWC, TWO, TWV and TWA considered documents TWC/34/9, TWO/49/9, TWV/50/9 and TWA/45/9 respectively, and received a presentation from the Office of the Union on the web-based application for drafting of Test Guidelines (web-based TG Template).

7. The TWC, TWO, TWV and TWA noted the issues addressed in response to the comments by Leading and Interested Experts that participated in the testing of the prototype of the web-based TG Template, as set out in documents TWC/34/9, TWO/49/9, TWV/50/9 and TWA/45/9, paragraphs 21 and 22, respectively. The TWC noted that further comments by users of the web-based TG Template could be sent to the Office of the Union.

8. The TWC noted that the system specifications of the web-based TG Template allowed the future development of a web-service application to allow data extraction from the web-based TG Template to other databases, which could offer possibilities to support the development of authorities' own test guidelines. The TWC noted that such a functionality could be developed in the future if data mapping of their own databases was done by the authorities (see documents TWC/34/32 "Report", paragraphs 23 to 29, TWO/49/25 "Report", paragraphs 17 to 23, TWV/50/25 "Report", paragraphs 23 to 28 and TWA/45/25 "Report", paragraphs 21 to 27).

TGP/8: Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability

Revision of document TGP/8: Part II: Section 9: the Combined-Over-Years Uniformity Criterion (COYU)

9. The TWC, TWO, TWV and TWA considered documents TWC/34/10, TWO/49/10, TWV/50/10 and TWA/45/10, respectively.

10. The TWC, TWO, TWV and TWA noted that the TC, at its fifty-second session, had agreed to request members of the Union to provide larger data sets to the United Kingdom for developing probability levels for the new method that would match results obtained using the previous probability levels, as set out in documents TWC/34/10, TWO/49/10, TWV/50/10 and TWA/45/10, paragraph 20, respectively.

11. The TWC, TWO, TWV and TWA noted that the Office of the Union had issued UPOV Circular E-16/098 to invite UPOV members' experts to provide to the United Kingdom, by May 27, 2016, data sets including at least 100 candidate varieties, with a possibility that data for those 100 varieties could be derived from several years.

12. The TWC noted the report by an expert of the United Kingdom that a data set on red fescue had been submitted by Slovakia and that Denmark had agreed to submit a data set on spring and winter canola later in 2016. The TWO, TWV and the TWA noted the report made at the TWC by the expert of the United Kingdom.

13. The TWC welcomed the offers from China and France to submit data sets on maize and fescue, respectively. The TWC noted the invitation for submission of other data sets with 100 candidates from as many crops as possible for developing probability levels for the new method. The TWC agreed to invite the expert from the United Kingdom to report on progress during the thirty-fifth session of the TWC (see document TWC/34/32 "Report", paragraphs 30 to 34).

14. The TWO noted that COYU was not commonly used for DUS examination of ornamental plants (see document TWO/49/25 "Report", paragraphs 24 to 28).
15. The TWV noted the offer made from the experts of France and the United Kingdom to provide data on pea and field pea, respectively see document TWV/50/25 "Report", paragraphs 29 to 33.
16. The TWA noted the report from the expert from Denmark that the software provided by the United Kingdom had been tested and that a data set on oilseed rape varieties would be provided to support the development of probability levels for the new method of calculation of COYU (see document TWA/45/25 "Report", paragraphs 28 to 32).

Revision of document TGP/8: Part II: New Section: Examining DUS in Bulk Samples

17. The TWC, TWO, TWV and TWA considered documents TWC/34/11, TWO/49/11, TWV/50/11 and TWA/45/11, respectively.
18. The TWC noted that guidance for examining DUS in bulk samples would be developed on the basis of the criteria set out in document TWC/34/11, paragraph 22, and agreed with the proposal by the expert from the Netherlands to use the approach "Control of the characteristic before it is accepted in the relevant guideline".
19. The TWC also agreed that approaches "subplots" and "plant number" would be acceptable on the basis of examples and discussions in the relevant Technical Working Parties, as proposed in the Annex to document TWC/34/11.
20. The TWC agreed that DNA analysis could be used to assess characteristics on the basis of the existence of a reliable link between the marker and the characteristic and there was no need to develop guidance in this regard under a general guidance for characteristics observed on the basis of bulk samples (see document TWC/34/32 "Report", paragraphs 35 to 38).
21. The TWO noted the proposed guidance for examining DUS in bulk samples as presented in the Annex to document TWO/49/11, for inclusion in a future revision of document TGP/8.
22. The TWO considered the proposed approach to assess uniformity of individual plants for different varieties to validate the characteristic before being used in DUS examination and agreed that for vegetatively propagated ornamental plants the number of applications per crop would not be sufficient to provide over years data from many varieties.
23. The TWO noted the reports from members on experiences with assessing chemical component characteristics and agreed on the technical difficulty and cost implications to obtain a sufficient quantity of certain chemical components to assess uniformity on individual plants.
24. The TWO agreed that characteristics assessed on the basis of bulk samples could provide complementary information for the analysis of distinctness in direct comparison of pairs of varieties for certain crops and agreed that the future guidance should set parameters for selecting among the approaches listed in the Annex to document TWO/49/11 (see document TWO/49/25 "Report", paragraphs 31 to 34).
25. The TWV and the TWA considered the proposed guidance for examining DUS in bulk samples as presented in the Annex to documents TWV/50/11 and TWA/45/11 respectively, for inclusion in a future revision of document TGP/8.
26. The TWV received the confirmation by the drafter of the proposed guidance (Ms. Amanda van Dijk (Netherlands)), that in the paragraph reproduced below, the 3 subsamples are per plot, and proposed to read the following:

"(2015, d) Subplots.

"Making use of subplots in order to indicate the uniformity of the characteristic. Only one observation per plot, but there are more subplots in the trial. An example is dry matter content in Onion. There are three subsamples in the trial. It is possible to work with 3 subsamples per plot for an indication of uniformity. (see: TGP/8.6)."

27. The TWV was not in favor of reducing the number of plants as proposed in the guidance and the paragraph reproduced below, because it was important to have the full range of expression of variation:

“(2015, i) Plant number.

“Use a different number of plants for this characteristic to be tested in the guideline that is in congruence with the nature of the characteristic. For example: in a certain guideline it is mentioned that 60 plants have to be judged for uniformity. If the characteristic involved is not suitable for judgment of 60 plants, one can propose a lower number of plants for the relevant characteristic for example 5 plants.”

28. The TWA noted that the TC had agreed to invite the Netherlands to develop guidance, with the inclusion of examples, for examining DUS in bulk samples, and agreed that the following criteria proposed by the TC were a good basis for inclusion in a future revision of document TGP/8 (see document TWA/45/11, paragraph 22):

(a) “the characteristic should fulfill the requirements of a characteristic, as set out in the “General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of new Varieties of Plants” (see document TG/1/3, Section 4.2.1);

(b) “there should be knowledge of the genetic control of the characteristic;

(c) “the suitability of the characteristic should be validated through an initial assessment of uniformity on individual plants;

(d) “information on plant-by-plant variation and differences between growing cycles should be provided (data from routine measurement of the characteristic from different years);

(e) “a full description of the method of assessment should be provided;

(f) “states of expression should be based on existing variation between varieties considering environmental influence.”

29. The TWV and the TWA agreed that the proposed guidance did not present enough examples for examining DUS in bulk samples. Therefore, the TWV and the TWA requested the drafter to further elaborate on the proposal and to include more examples, as requested by the TC at its fifty-second session.

30. The TWV noted that the expert from France planned to provide other examples of characteristics based on bulk samples for vegetable crops (see document TWV/50/25 “Report”, paragraphs 34 to 38).

31. The TWA agreed that further development of guidance on bulk samples should be subject to the availability of appropriate examples with data from routine measurement of characteristics such as chemical content or 1000 seed weight (see document TWA/45/25 “Report”, paragraphs 33 to 36).

Revision of document TGP/8: Part II: New Section: Data Processing for the Assessment of Distinctness and for Producing Variety Descriptions

32. The TWC, TWO, TWV and TWA considered documents TWC/34/12, TWC/34/12 Add, TWO/49/12, TWV/50/12 and TWA/45/12, respectively.

33. The TWC and TWA agreed to request the expert from France to continue developing the study on the comparison of methods used for producing variety descriptions to provide further information to explain the results obtained in the practical exercise.

34. The TWC agreed to invite the experts from France, Germany, Italy and Japan to provide a short description of their methods to transform measurements into notes and to provide examples where the methods would not be appropriate using a similar structure to the information submitted by the United Kingdom, as presented in document TWC/34/12 Add.. The TWC agreed that the description of the methods and example situations where they could or should not be used could form the basis for future guidance.

35. The TWC received an oral presentation by an expert from the United Kingdom and noted that the method used for peas used a combination of delineating example varieties and crop expert judgement. The TWC noted the explanation that example varieties were not used when the range of values was not continuous, to avoid distortion in the division of the scale of notes into equally spaced states (“notes stretching”).

36. The TWC noted that in China some quantitative characteristics without normal distribution were transformed (e.g. log) before dividing the range of expression into equally spaced states for the conversion of observations into notes (see document TWC/34/32 "Report", paragraphs 39 to 43).

37. The TWO and the TWA noted that the expert from the United Kingdom in the practical exercise to determine the aspects in common and divergence among methods had provided information to the TWC on the reasons and situations in which example varieties, crop expert judgement and equal-spaced states would/would not be appropriate for transforming observations into notes (see documents TWO/49/25 "Report", paragraphs 35 to 37 and TWA/45/25 "Report", paragraph 38), respectively.

38. The TWV considered the information provided by the participants in the practical exercise on the reasons and situations in which example varieties, crop expert judgement and equal-spaced states would/would not be appropriate for transforming observations into notes.

39. The TWV agreed on the different relevant elements that need to be taken into consideration when transforming measurements into notes, as the importance of a good set of example varieties (in UPOV Test Guidelines and regional or national set of example varieties), the expert's knowledge about the influence of the environment and the variation within the specie. Therefore the TWV agreed that a case by case approach is needed in relation to assessment of distinctness and for producing variety descriptions when processing data (see document TWV/50/25 "Report", paragraphs 39 to 41).

40. The TWA agreed with the TWC that the study on the comparison of methods used for producing variety descriptions should continue to be developed to provide further information to explain the results obtained in the practical exercise.

41. The TWA considered the table presented in document TWA/45/12, Annex I, page 2, "Results by Method" with the notes attributed to the 31 candidate varieties using the methods described in the practical exercise. The TWA noted that candidate varieties were sorted by "average note by variety" values and agreed to propose sorting by values in the "over-years means" column to facilitate interpretation of results.

42. The TWA agreed with the TWC that participants in the practical exercise should provide a short description of the methods used to transform measurements into notes and examples where the methods would and would not be appropriate. The TWA noted the report by an expert from the United Kingdom that information had already been provided to the TWC.

43. The TWA received a presentation on "Genotype by Environment Interaction (GEI) - DUS test and data transformation into notes" by an expert from Italy. A copy of the presentation is provided in the Annex to document TWA/45/12 Add. The TWA agreed on the relevance of the information provided on genotype by environment interaction for possible future guidance on converting observations into notes and for producing variety descriptions (see document TWA/45/25 "Report", paragraphs 37 to 42).

TGP/10: Examining Uniformity

Revision of document TGP/10: New Section: Assessing uniformity by off-types on basis of more than one growing cycle or on the basis of sub-samples

44. The TWC, TWO, TWV and TWA considered documents TWC/34/13, TWC/34/27, TWO/49/13, TWV/50/13, TWV/50/13 Add. and TWA/45/13, TWA/45/13 Add. and TWA/45/13 Add.2, respectively.

45. The TWC and TWV noted that the TWA had agreed to request a video link with experts from the TWC to discuss the new proposed "Approach 3: Combining the results of two growing cycles" at its forty-fifth session, to be held in 2016.

46. The TWC considered the draft guidance as presented in document TWC/34/13, Annexes I and II, for inclusion in a future revision of document TGP/10, and agreed that cost of trials, consistency of results, time required for decisions and technical aspects of each approach could influence the selection of the most suitable approach for each situation.

47. The TWC agreed that the future guidance should provide parameters for decisions on the most suitable approach based on experience from members and agreed to invite examples of different types of crops and the criteria for selecting the approach used for the assessment of off-types. The TWC welcomed

the offers from Germany, the Netherlands and the United Kingdom to provide examples to be presented at its thirty-fifth session.

48. The TWC noted the importance of identifying whether differences in number of off-types between cycles was due to biological reasons or sampling variation and agreed that the relevant part of approach 2 and 3 of the draft guidance should be amended to read as follows, respectively:

“Care is needed when considering results that are very different in each of the growing cycles, such as when a type of off-type is observed at a high level in one growing cycle and is absent in another growing cycle. A statistical test for consistency should be applied when appropriate.”

“Care is needed when considering results that are very different in each of the growing cycles, such as when a type of off-type is observed at a high level in one growing cycle and is absent in another growing cycle. A statistical test for consistency is ~~possible~~ should be applied when appropriate.”

49. The TWC considered document TWC/34/27 “Practical experience of assessing uniformity by off-types on oilseed rape and cauliflower” and received a presentation by an expert from France, a copy of which is reproduced in the Annex to document TWC/34/27.

50. The TWC noted the simulation of decisions using approaches 1 and 3 on different crops and agreed on the usefulness of the worked examples. The TWC noted that cases of diverging results between 2 growing cycles are not common as most varieties would either meet or fail to meet requirements in both cycles.

51. The TWC noted the explanation of the notion of “independent growing cycle” by an expert from France and the preference for a third growing cycle to increase reliability of observations (see document TWC/34/32 “Report”, paragraphs 44 to 51).

52. The TWO considered the draft guidance as presented in Annex I of document TWO/49/13 and agreed that the term “clear” should be clarified in the sentence: “Furthermore, on the basis of a clear lack of uniformity, a variety may be rejected after a single growing cycle”. The TWO agreed to propose that the sentence in approaches 1 and 2 should read as follows:

“Furthermore, if a variety exceeds in the first growing cycle the allowed number of off-types in two growing cycles, the variety may be rejected after a single growing cycle.”

53. The TWO agreed that it should be clarified in the draft guidance whether there was an assumption of assessing two growing cycles using plant material from a single submission by the breeder (e.g. seeds from the same seed lot) (see document TWO/49/25 “Report”, paragraphs 38 to 41).

54. The TWV received a presentation on “Practical experience of assessing Uniformity by off-types: Reject after the 1st cycle on the official DUS seed lot” by an expert from France. A copy of the presentation is provided in document TWV/50/13 Add.

55. The TWV considered the draft guidance as presented in Annexes I and II to document TWV/50/13 for inclusion in a future revision of document TGP/10.

56. The TWV and the TWA noted the concern expressed by the representatives of ESA and CropLife about Approach 3, and noted the importance they attached to consistency in results for the assessment of uniformity throughout all members of the Union.

57. The TWV considered the different approaches and noted that in the vegetable sector, Approach 1 was the most commonly used.

58. The TWV and the TWA agreed that, in conjunction with the revision of document TGP/10: “Assessing uniformity by off-types on basis of more than one growing cycle or on the basis of sub-samples”, it would be important to review the following guidance provided in document TGP/8/2: Part II: 8: “The method of uniformity assessment on the basis of off-types”, because it did not reflect the practice within members of the Union:

“8.1.7 Method for more than one single test (year)

“8.1.7.1 Introduction

“8.1.7.1.1 Often a candidate variety is grown in two (or three years). The question then arises of how to combine the uniformity information from the individual years. Two methods will be described:

- (a) “Make the decision after two (or three) years based on the total number of plants examined and the total number of off-types recorded. (A combined test).
- (b) “Use the result of the first year to see if the data suggests a clear decision (reject or accept). If the decision is not clear then proceed with the second year and decide after the second year. (A two-stage test).

“8.1.7.1.2 However, there are some alternatives (e.g. a decision may be made in each year and a final decision may be reached by rejecting the candidate variety if it shows too many off-types in both (or two out of three years)). Also there are complications when more than one single year test is done. It is therefore suggested that a statistician should be consulted when two (or more) year tests have to be used.”

59. The TWA received a presentation on “Assessing uniformity by off-types on the basis of more than one growing cycle. Drafting guidance” by experts from Germany and the United Kingdom by electronic means. A copy of the presentation is provided in document TWA/45/13 Add.

60. The TWA also received a presentation on “Practical experience of assessing uniformity by off-types on oilseed rape and cauliflower” by an expert from France. A copy of the presentation is provided in document TWA/45/13 Add.2.

61. The TWA, in conjunction with TWC experts via video link, considered the draft guidance as presented in Annexes I and II to document TWA/45/13 for inclusion in a future revision of document TGP/10, including the new proposed “Approach 3: Combining the results of two growing cycles”.

62. The TWA agreed with the TWC that guidance should provide parameters for decisions on the most suitable approach based on experience from members. The TWA agreed to provide examples comparing the possible effect on uniformity decisions between Approach 3 and other approaches. The TWA welcomed the offers from France, Germany, the Netherlands, Poland and the United Kingdom to provide examples to be presented at its forty-sixth session.

63. The TWA agreed with the TWC on the importance of identifying whether differences in number of off-types between growing cycles were due to biological reasons or sampling variation and agreed that results from growing cycles using different lots of plant material should not be combined.

64. The TWA noted the concern expressed by some members that the assessment of uniformity on the basis of combining different growing cycles may not be consistent with existing guidance in document TGP/8, Part I, Section 1.2.2 and in particular 1.2.2.7 on independent growing cycles and agreed to further consider this issue on the basis of examples to be provided at its forty-sixth session (see document TWA/45/25 “Report”, paragraphs 43 to 51).

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