

Technical Committee**TC/54/3****Fifty-Fourth Session
Geneva, October 29 and 30, 2018****Original:** English
Date: October 15, 2018**MATTERS ARISING FROM THE TECHNICAL WORKING PARTIES***Document prepared by the Office of the Union**Disclaimer: this document does not represent UPOV policies or guidance***EXECUTIVE SUMMARY**

1. This document summarizes matters arising from the 2017 and 2018 sessions of the Technical Working Parties (TWPs), up to September 2018, which are not expressly covered by specific agenda items. 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. The second section, "Matters for information", is provided for the information of the TC but does not require decisions at this stage.

2. The TC is invited to:

- (a) consider the proposals by the TWPs, at their sessions in 2017, on increasing participation on new members of the Union in the work of the TC and the TWPs;
- (b) consider whether to revise the procedure for partial revisions of Test Guidelines, on the basis of the proposal set out in paragraph 25 of this document;
- (c) consider discussions on minimum distances between varieties at the TWPs, at their sessions in 2017 and 2018, as set out in paragraphs 26 to 41 of this document;
- (d) consider discussions on disease resistance characteristics in DUS examination at the TWPs, at their sessions in 2017 and 2018, as set out in paragraphs 43 to 55 of this document; and
- (e) note developments in the TWPs concerning:
 - (i) Experiences with new types and species
 - (ii) Management of variety collections
 - (iii) Experience in the management of reference collections with the SELECT method
 - (iv) Regional set of example varieties in Wheat for South America
 - (v) Impact of revisions of states of expression of existing characteristics in the revision of Test Guidelines
 - (vi) Experience with using two locations by one year for DUS decisions
 - (vii) Characteristic expression between years or environments for ornamental varieties
 - (viii) Nomination of novel plant pest races
 - (ix) Impact of endophytes on DUS characteristics in grasses
 - (x) DUS examination of mutant varieties of apple
 - (xi) Calibration book for harmonized variety description in apple
 - (xii) Experience with the RHS Colour Chart and possible future addition of colors
 - (xiii) Consideration of possible reorganization of TGP/8
 - (xiv) Excluding varieties of common knowledge from the second growing cycle
 - (xv) Implementation of a Document Management System for Variety Files
 - (xvi) Software for statistical analysis
 - (xvii) A single tool for DUS computation process
 - (xviii) Management of databases

- (xix) Web services provided by UPOV and members of the Union
- (xx) Image analysis
- (xxi) Report on court cases dealing with technical matters

3. The following abbreviations are used in this document:

CAJ:	Administrative and Legal Committee
TC:	Technical Committee
TC-EDC:	Enlarged Editorial 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
TWPs:	Technical Working Parties
TWV:	Technical Working Party for Vegetables

4. The structure of this document is as follows:

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MATTERS FOR INFORMATION AND FOR A POSSIBLE DECISION TO BE TAKEN BY THE TECHNICAL COMMITTEE (TC)

Increasing participation of new members of the Union in the work of the TC and TWPs*Background*

5. The TC, at its fifty-third session, held in Geneva from April 3 to 5, 2017, received the following presentations on increasing participation of new members of the Union in the work of the TC and TWPs (in order of presentation) (see document TC/53/31 "Report", paragraphs 216 to 218):

UPOV – How to increase participation of new Members	Netherlands (Mr. Marien Valstar)
"Intervención de Perú en la sesión del Comité Técnico de la UPOV"	Peru (Mr. Roger Becerra)

6. The TC agreed to invite the Netherlands to draft a paper on increasing participation of new members of the Union in the work of the TC and the TWPs, taking into consideration the survey of UPOV members reported at the fiftieth session of the TC (see: document TC/50/35: "Improving the effectiveness of the Technical Committee, Technical working Parties and the Preparatory Workshops", available at: http://www.upov.int/edocs/mdocs/upov/en/tc_50/tc_50_35.pdf).

7. The TC agreed that the program for the TWPs at their sessions in 2017 should include an item for presentations to be made by new members of the Union.

Consideration by the Technical Working Parties

8. The TWA, TWV, TWO, TWF and TWC, at their sessions in 2017, considered document TWP/1/19 "Increasing the participation of new members in the technical work of UPOV". The TWA received a presentation by an expert from the Netherlands on "Increasing participation of new members of the Union in the work of the TC and TWPs", a copy of which is reproduced in the Annex to document TWP/1/19 (see documents TWA/46/10 "Report", paragraph 7; TWV/51/16 "Report", paragraphs 7 to 10; TWO/50/14 "Report", paragraphs 7 and 8; TWF/48/13 "Report", paragraphs 7 to 9; and TWC/35/21 "Report", paragraphs 5 and 6).

9. The TWA noted that cost of travel was a limiting factor for participating at UPOV meetings for both new and existing members alike. The TWA agreed that the provision of capacity-building activities to new members could overcome the perceived high technical threshold at TWP sessions and increase their participation in the work of UPOV.

10. The TWV agreed on the importance to increase participation in TWPs, and especially in the TWV, to share knowledge among UPOV members and DUS examiners and to bring more and new expertise within the TWV. The TWV recommended the TC to consider investigating the following ideas:

- to discuss more technical and practical problems (e.g. practical exercise in the field or blind tests with same varieties grown in different DUS stations) to encourage the participation of experts who would be willing to join the TWV to share problems and solutions with other members;
- to shorten the guidance and technical documentation (e.g. TGP documents) to make it more understandable for new comers, and to invite TWPs to envisage the production of a "light" version of all UPOV documents/ collection (e.g. key summary) that could be presented during preparatory workshops;
- to encourage the mentoring between experienced experts and new comers, in order to facilitate their understanding of existing guidance and vocabulary;
- to organize, as far as possible, TWPs sessions in conjunction or back-to-back to other international meetings, such as OECD or ISTA, as experts involved in DUS matters are often involved in other plant variety matters related to seeds;
- to encourage interested experts to investigate support programs to facilitate their participation (e.g. resource partners, international cooperation funds, funds in trust...);
- to explain on other national, regional or international events, trainings or seminars what is being discussed in TWPs and the interest for experts all over the world to join the TWPs (i.e. as members or observers);
- to develop communication tools (PowerPoint or short videos) explaining the work of the TWPs including testimonials of experts attending TWPs (new comers and experienced experts) to be used in writing or on the UPOV Website to raise awareness on the technical work of UPOV and its benefits;

- to encourage an entrustment program of DUS examiners or DUS offices to increase harmonization and collaboration.

11. The TWV considered a proposal to support participation in the TWPs by electronic means and agreed that it was not in favor to recommend full participation by electronic means, as it would not allow sufficient interaction among experts and would complicate the work of the host. However, on exceptional basis, the TWV was in favor to allow experts to join some technical discussions for specific matters to be clarified or addressed, when technical requirements allow.

12. The TWV noted that not only for new members the participation is important but also for existing members.

13. The TWO agreed to propose that the Technical Committee (TC) explore possibilities to improve communication as a means of increasing the participation of experts currently not attending TWP sessions, such as the establishment of video-links for the discussion of certain draft Test Guidelines. The TWO agreed to propose that another seminar on DUS examination be held in Geneva to raise awareness of the work of the TC and the TWPs for participants usually attending other meetings of UPOV bodies. The TWO also agreed to propose the allocation of an experienced UPOV member to act as a mentor to new UPOV members.

14. The TWF agreed on the importance of increasing participation in TWPs to share knowledge among UPOV members and DUS examiners and to bring more and new expertise to the TWF. The TWF recommended the TC to consider investigating the following ideas:

- to raise awareness at a high level at the level of UPOV members on the work done at the technical level by the Technical Working Parties (TWPs);
- to organize in Geneva a Seminar on DUS, to explain and promote the importance of the coordination and collaboration among DUS experts;
- to review the content of the preparatory workshop before the TWPs to allow new comers to understand more quickly all the available UPOV guidance and materials;
- to set TWP agendas with relevant technical items to be discussed and addressed by the group, and add a general item "matters relevant in DUS examination for the fruit sector" to allow open discussion and exchange of views;

15. The TWF recognized the attendance of new and existing members at its forty-eighth session, and appreciated the interactive technical discussion during the session.

16. The TWC considered how to increase participation of new members of the Union in the work of the TC and the TWPs and agreed to propose the following issues for further consideration:

- Cost of attendance to meetings, the timing during the year and venue location (field trials)
- Language difficulty (simultaneous interpretation in some cases),
- To use clear terminology in meetings (acronyms, technical terms)
- Relevance and quantity of topics to be discussed during TWP meetings
- To facilitate hosting of TWP meetings by new members
- Availability of information explaining the role and importance of TWPs (share information via YouTube; create a TWP LinkedIn page)
- To improve targeting of invitations to meetings (reaching the right experts along with information on relevance of work of the TWPs).

17. The TC is invited to consider the proposals by the TWPs, at their sessions in 2017, on increasing participation on new members of the Union in the work of the TC and the TWPs.

Procedure for partial revision of UPOV Test Guidelines

18. The TWA, TWV, TWO and TWF, at their sessions in 2017, considered document [TWP/1/20](#) "Procedure for partial revision of UPOV Test Guidelines" (see documents TWA/46/10 "Report", paragraphs 58 to 60; TWV/51/16 "Report", paragraphs 62 to 65; TWO/50/14 "Report", paragraphs 84 to 87; and TWF/48/13 "Report", paragraphs 64 to 68).

19. The TWA, TWV, TWO and TWF noted the procedures for notification of new characteristics or states of expression in document TGP/5, Section 10: "Notification of additional characteristics and states of expression".
20. The TWA, TWV, TWO and TWF noted that the TC had encouraged authorities to notify the use of new characteristics or states of expression using the procedure established in document TGP/5, Section 10.
21. The TWV and TWF noted the clarification given by the TC and the flexibility to use additional characteristics at the national or regional level before considering a revision of Test Guidelines.
22. The TWV agreed on the importance to notify the use of new characteristics to all members of UPOV using the template provided in the Annex to document TWP/1/20. However, the TWV expressed some concerns about a possible lack of harmonization at the international level, due to this procedure.
23. The TWO noted the concern expressed by the European Union that the notification of additional states of expression by different authorities for the same characteristic could lead to inconsistent variety descriptions in the case that an identical note was attributed to different states of expression.
24. The TWF agreed that the current procedure for partial revisions: announcement of a partial revision at a TWP session until the adoption by the TC and publication on the UPOV website, particularly in the case of minor changes, might be shortened (see document "TGP/7/4 – Section 2: Procedure for the Introduction and Revision of UPOV Test Guidelines"). The TWF agreed to suggest to the TC the following proposals in order to simplify and shorten the procedure for partial revisions of Test Guidelines:
- to accept any new proposal for partial revision of TGs by correspondence during the course of the year between two TWP sessions, with a deadline of 2 months before the session in order to prepare the document and circulate to the experts;
 - to approve the addition of partial revision of Test guidelines by correspondence, giving 4 weeks for any objections;
 - as the interested experts will not have been listed during the adoption of the report under agenda item "Proposals for partial revision of Test Guidelines", it is proposed to send the document for comments to all relevant TWP experts;
 - to restrict this rule only to partial revisions.

25. The TC is invited to consider whether to revise the procedure for partial revisions of Test Guidelines, on the basis of the proposal set out in paragraph 24 of this document.

Minimum distance between varieties

26. The TWA, at its forty-sixth session, held in Hanover, Germany, from June 19 to 23, 2017, considered document [TWA/46/6](#) "New method to guarantee minimum distance between varieties in measured quantitative characteristics for distinctness and harmonization between UPOV members" and received a presentation by an expert from the Republic of Korea, as reproduced in document [TWA/46/6 Add](#) (see document TWA/46/10 "Report", paragraphs 61 and 62).
27. The TWA, at its forty-sixth session, noted that the new method was a form of calculating coefficient of variance and agreed to propose that it be considered further by the TWC.
28. The TWO, at its fiftieth session, held in Victoria, Canada, from September 11 to 15, 2017, considered document TWO/50/8 "Case study on minimum distances between vegetatively reproduced ornamental and fruit varieties" and received a presentation by an expert from the Netherlands (see document TWO/50/14 "Report", paragraphs 47 to 51).
29. The TWF, at its forty-eighth session, held in Kelowna, Canada, from September 18 to 22, 2017, considered document [TWF/48/11](#) "Minimum distance between varieties" and received a presentation on a "Case study on minimum distances between vegetatively reproduced ornamental and fruit varieties" by an expert from the European Union, a copy of which is provided in the Annex to document TWF/48/11, and a presentation from the representative of the International Community of Breeders of Asexually Reproduced Ornamental and Fruit Plants (CIOPORA), reproduced in document TWF/48/11 Add. (see document TWF/48/13 "Report", paragraphs 94 to 100).

30. The TWO noted the results of the case study provided in document TWO/50/8 and agreed that further discussions were necessary on the basis of living plants and real cases of possible lack of distinctness for improving mutual understanding.

31. The TWO and TWF noted that one of the outcomes of the case study was a request for clarification on whether characteristics used for uniformity and stability could differ from those used for distinctness.

32. The TWO and TWF agreed that breeders' organizations should ensure stronger involvement of breeders in discussions for drafting and revising Test Guidelines and noted that the results of the case study would be reported to the TC, at its fifty-fourth session.

33. The TWO agreed to invite presentations at its next session, to be held in Christchurch, New Zealand, from February 18 to 22, 2019, to explain the approach used by breeders of vegetatively reproduced ornamental varieties for defining the importance of a characteristic to be used in the examination of distinctness.

34. The TWF noted that the results of the case study provided in document TWF/48/11 were also presented at the TWO at its fiftieth session and reproduced in document TWO/50/8.

35. The TWF noted that breeders in the fruit sector were defining the importance of a characteristic by the commercial value the characteristic could express. It further noted that some breeders (e.g. flower and fruit) are looking for larger differences between varieties (e.g. broad distance) when in other crops (e.g. agricultural or vegetables) breeders are looking for smaller differences (i.e. small distance). The TWF recalled that the General Introduction stated that characteristics used for DUS examination should exhibit sufficient variation between varieties to be able to establish distinctness. The TWF agreed that such an approach may have an implication on the use of the General Introduction.

36. The TWF agreed that the Test Guidelines for apple fruit varieties (document TG/14/9) will be proposed for a future revision, and that special attention will be taken when choosing relevant characteristics for DUS examination, taking into consideration breeder's view on the importance of the characteristic.

37. The TWF agreed not to pursue further this discussion and therefore to delete this item from the draft agenda for its next session.

38. The TWA, at its forty-seventh session, held in Naivasha, Kenya, from May 21 to 25, 2018, received a presentation by an expert from the European Union on "Case study on minimum distances between vegetatively reproduced ornamental and fruit varieties", a copy of which is presented in document [TWA/47/4](#) "Minimum distance between varieties" (see document TWA/47/7 "Report", paragraphs 51 to 54).

39. The TWA noted that the project had been based on the analysis of distinctness using a sub-set of Test Guidelines characteristics that were considered to be important by breeders of the crops studied ("mock protocol").

40. The TWA noted the conclusions of the project, which had been completed, that the "mock protocol" could require an increase in the size of field trials due to lack of clear distinctness between a larger number of varieties.

41. The TWA noted that a follow-up project based on field trials was being considered with the participation of breeders of protected varieties.

42. *The TC is invited to consider discussions on minimum distances between varieties at the TWPs, at their sessions in 2017 and 2018, as set out in paragraphs 26 to 41 of this document.*

Use of disease and insect resistance characteristics in DUS examination

43. The TWA, at its forty-sixth session, held in Hannover, Germany, from June 19 to 23, 2017, received the following presentations on the use of disease resistance characteristics in DUS examination, as reproduced in document [TWA/46/7](#) (see document TWA/46/10 "Report", paragraphs 65 and 66):

- | |
|---|
| (a) "Rust Resistance as DUS Characteristics in Wheat", presentation prepared by an expert from Australia |
| (b) "Use of disease and insect resistance characteristics in DUS examination: experience of Brazil with soybean", document prepared by an expert from Brazil |
| (c) "Harmonization of resistance tests for DUS testing: 'Harmores 2'", presentation prepared by an expert from the European Union |
| (d) "Phasing-in period for asterisked disease resistance characteristics in CPVO vegetable technical protocols", presentation prepared by an expert from the European Union |

44. The TWA noted that disease and insect resistance characteristics used by members of the Union in individual authorities' test guidelines could be notified to the Office of the Union using the procedure established in document TGP/5 Section 10 "Notification of additional characteristics and states of expression". The TWA agreed there were many requirements that should be considered before considering the inclusion of disease resistance characteristics in UPOV Test Guidelines for agricultural crops.

45. The TWV, at its fifty-first session, held in Roelofarendsveen, Netherlands, from July 3 to 7, 2017, considered document [TWV/51/12](#) "New issues arising for DUS examination" (see document TWV/51/16 "Report", paragraphs 83 to 89).

46. The TWV, at its fifty-first session, received a presentation on the "Use of disease and insect resistance characteristics in DUS examination" by an expert from France. A copy of the presentation is provided in Annex I to document [TWV/51/12 Add.](#)

47. The TWV, at its fifty-first session, noted the possibilities to use methodologies that could improve disease resistance tests for DUS examination, even when protected by IP rights (e.g. patent), provided the methodologies to be available for all members for DUS examination.

48. The TWV, at its fifty-first session, received a presentation on the "Improvement of the assessment of the Squash resistance to 3 virus and CORKYRES project" by an expert from France. A copy of the presentation is provided in Annex II to document [TWV/51/12 Add.](#)

49. The TWV, at its fifty-first session, agreed that before revising Test Guidelines for disease resistance characteristics, it was important to reach agreement by experts on the level of resistance and possible intermediate resistance. In that respect, the TWV encouraged collaborative work among experts to ensure common agreement on important matters, such as standard varieties for threshold in disease resistance tests, to ensure harmonization at UPOV level.

50. The TWV, at its fifty-first session, agreed on the importance of the use and availability of standard varieties that are used to set limits between different disease tolerance levels. It further agreed that in case of quantitative resistance such standard varieties should not be confused with the example varieties that represent a state of expression.

51. The TWV, at its fifty-first session, agreed on the importance to report on current work or projects done on disease resistance tests among expert and DUS Offices to keep the experts informed at UPOV level, and therefore would welcome any new presentations to be made at a subsequent session.

52. The TWV, at its fifty-second session, held in Beijing, China, from September 17 to 21, 2018, received the following presentations by an expert from France, copies of which are provided in document [TWV/52/13](#) "New issues arising for DUS examination" (see document TWV/52/20 "Report", paragraphs 50 to 53):

- "MILAROM project: Study of Downy Mildew caused by a *Peronospora belbahrii* on Basil in France"
- "Pathotyping Melon necrotic spot virus (MNSV) in Melon"
- "*Meloidogyne incognita* disease resistance test protocol on Pepper"
- "*Pyrenochaeta lycopersici*, causal agent of the corky root disease of Tomato / RT Tomato - FR test protocol"

53. The TWV, at its fifty-second session, agreed that, looking at the increase of the use of disease resistance characteristics in DUS examination for vegetables, it would be useful to add a new agenda item in that respect.

In particular, it proposed to invite presentations from France, the Netherlands, ISF and any other members and observers on the topic of standardization of the methodology, to understand better the different approaches used by pathologists, breeders and DUS examiners.

54. The TWV, at its fifty-second session, received a presentation on “Aberrant phenotypes in *Brassica oleracea* var. *botrytis*” from an expert from France, a copy of which would be provided as an addendum to document TWV/52/13. The TWV noted the results of the study made in France and in the Czech Republic, Netherlands and Spain, about aberrant plants in cauliflower DUS trials, which are not considered as a specific type of off-type, and the possible measures to assess uniformity. The TWV agreed that the problem was not, for the time being, relevant at the international level but invited all DUS examiners to observe potential similar behavior on plants and report to the TWV if need be.

55. The TWV, at its fifty-second session, noted that the representative from Crop Life International would consult Crop Life International members to assess whether the problem is relevant in plant breeding programs globally.

56. *The TC is invited to consider discussions on disease resistance characteristics in DUS examination at the TWPs, at their sessions in 2017 and 2018, as set out in paragraphs 43 to 55 of this document.*

MATTERS FOR INFORMATION

Experiences with new types and species

Technical Working Party for Ornamental Plants and Forest Trees

57. The TWO, at its fiftieth session, held in Victoria, Canada, from September 11 to 15, 2017, received a presentation on “Difficulties in the application of TG/296/1 Eucalyptus” by an expert from the European Union, as reproduced in document [TWO/50/10](#). The TWO noted the practical difficulties reported with the scope of the Test Guidelines and total duration of tests. The TWO noted that the European Union would develop regional test guidelines for the crop focusing on the assessment of juvenile characteristics.

The TWO suggested consideration of the following possibilities:

- to assess older plant material at a testing site in cooperation with the applicant;
- to use biochemical and molecular techniques to complement DUS information;
- to use examination offices outside of the European Union.

58. An expert from Australia reported on an application for a new hybrid variety of Lavender with large bracts along the full length of the spike. The TWO agreed that the experts from Australia, France and New Zealand should discuss the need for the establishment of new inflorescence characteristics and report to the TWO at its fifty-first session.

Technical Working Party for Fruit Crops

59. The TWF, at its forty-eighth session, held in Kelowna, Canada, from September 18 to 22, 2017, received a presentation on Guarana (*Paullinia cupana* Kunth) by an expert from Brazil. A copy of this presentation would be provided in document TWF/48/3 (see document TWF/48/13 “Report”, paragraph 150).

Technical Working Party for Agricultural Crops

60. The TWA, at its forty-seventh session, held in Naivasha, Kenya, from May 21 to 25, 2018, noted the report by an expert from the United States of America that 3 applications for the protection of new varieties of “Chia” (*Salvia hispanica* L.) had recently been filed (see document TWA/47/7 “Report”, paragraph 60).

Technical Working Party for Vegetables

61. The TWV, at its fifty-second session, held in Beijing, China, from September 17 to 21, 2018, received the following presentations, copies of which are provided in document [TWV/52/14](#) (see document TWV/52/20 "Report", paragraph 49).

- Presentation on *Solanum sisymbriifolium* Lam. by an expert from France
- Presentation on *Solanum torvum* Sw. by an expert from France
- Presentation on a new type of Kale in Japan by an expert from Japan

Management of variety collections

62. The TWF, at its forty-eighth session, held in Kelowna, Canada, from September 18 to 22, 2017, considered document [TWP/1/14](#) "Management of variety collections" and noted the developments reported to the TWC, at its thirty-fourth session, held in 2016, and the TC, at its fifty-third session, held in 2017, on management of variety collections (see document TWF/48/13 "Report", paragraphs 90 to 92).

63. The TWF noted the increasing use of molecular markers in the management of variety collections, especially to identify the most similar varieties, and the possible impact this could have on the information provided in the TQ in the future. It further agreed on the need to build a joint database for the management of variety collections. The TWF noted the project currently developed on french bean in the Netherlands and on tomato and rose by France, China and the Netherlands and invited experts to report on the development of those projects at its next session.

64. The TWF noted that the World Intellectual Property Organization (WIPO) had developed an international standard for DNA databasing and agreed that it would be useful to have a presentation on that topic, by the Office of the Union, at its next session.

65. The TWC, at its thirty-fifth session, held in Buenos Aires, Argentina, from November 14 to 17, 2017, considered document TWP/1/14 and noted the developments reported to the TC, at its fifty-third session, on management of variety collections (see document TWC/35/21 "Report", paragraphs 113).

Experience in the management of reference collections with the SELECT method

66. The TWC, at its thirty-sixth session, held in Hanover, Germany, from July 2 to 6, 2018, considered document [TWC/36/13](#) "Experience in the management of reference collections with the SELECT method" and received a presentation by an expert from Germany, a copy of which would be provided as document TWC/36/13 Add. (see document TWC/36/15 "Report", paragraphs 88 and 89).

67. The TWC noted that the SELECT method was used for cereals with a high number of applications filed per year to select varieties from the collection of varieties for the growing trial, by attributing different weights to differences in states of expression for characteristics using non-orthogonal data.

Regional set of example varieties in Wheat for South America

68. The TWA, at its forty-sixth session, held in Hanover, Germany, from June 19 to 23, 2017, considered the information presented in document TWA/46/9 "Regional set of example varieties in Wheat for South America" and received a presentation by an expert from Brazil on the regional trial carried out by some members of the Union in South America to establish a regional set of example varieties in wheat. The TWA noted that a copy of the presentation by an expert from Brazil would be reproduced as an addendum to document TWA/46/9 (see document TWA/46/10 "Report", paragraph 64).

Impact of revisions of states of expression of existing characteristics in the revision of Test Guidelines

69. The TWF, at its forty-eighth session, held in Kelowna, Canada, from September 18 to 22, 2017, considered document [TWF/48/10](#) "Impact of revisions of states of expression of existing characteristics in the revision of Test Guidelines" and noted that no presentations had been received by the Office and therefore agreed to postpone discussions on this agenda item to its forty-ninth session, to be held in 2018 (see document TWF/48/13 "Report", paragraph 106).

Experience with using two locations by one year for DUS decisions

70. The TWC, at its thirty-sixth session, held in Hanover, Germany, from July 2 to 6, 2018, considered document [TWC/36/5](#) "Experience with using two locations by one year for DUS decisions" and received a presentation by an expert from the Netherlands (see document TWC/36/15 "Report", paragraphs 29 to 32).

71. The TWC noted that the Netherlands had formal collaboration with other examination offices for second location for growing trials.

72. The TWC noted the report by the Netherlands about the increasing demand by vegetable breeders to have two growing cycles in one year.

73. The TWC agreed to invite France and Kenya to make presentations at its next session on using different locations in one year for DUS growing trials.

Characteristic expression between years or environments for ornamental varieties

74. The TWO, at its fiftieth session, held in Victoria, Canada, from September 11 to 15, 2017, considered document [TWO/50/13](#) "Characteristic expression between years or environments for ornamental varieties" and received a presentation on "Using variety descriptions as an examination tool: Interpreting variety variation" by an expert from New Zealand, a copy of which would be provided as an addendum to document TWO/50/13 (see document TWO/50/14 "Report", paragraphs 55 to 58).

75. The TWO agreed that additional information accompanying the variety description such as the example varieties used could be relevant to interpret test results and the environmental influence over certain characteristics.

76. The TWO noted document TGP/5 Section 6 "UPOV report on technical examination and UPOV variety description" required some information on the growing trial and agreed that Authorities exchanging DUS test reports should be able to obtain additional information upon request.

77. The TWO noted that, in Australia, information on varieties excluded from the growing trial was usually recorded.

Nomination of novel plant pest races

78. The TWV, at its fifty-second session, held in Beijing, China, from September 17 to 21, 2018, received a presentation from the representative from the International Seed Federation (ISF) on the work currently done by the ISF Working Group Disease Resistance Terminology in relation to ISF guidelines on the nomination of novel plant pest races. The TWV invited the representative of ISF to report on any new developments in that regard at the next TWV session (see document TWV/52/20 "Report", paragraph 7).

Impact of endophytes on DUS characteristics in grasses

79. The TWA, at its forty-sixth session, held in Hanover, Germany, from June 19 to 23, 2017, received the following presentations on the impact of endophytes on DUS characteristics in grasses, as reproduced in documents [TWA/46/5](#) and TWA/46/5 Add. (see document TWA/46/10 "Report", paragraph 63):

(a) "Impact of endophyte on DUS characteristics of grasses: New Zealand's experience of fungal endophyte in grass variety DUS testing", prepared by an expert from New Zealand;

(b) "Impact of endophytes on DUS characteristics in grasses", prepared by an expert from the European Union.

DUS examination of mutant varieties of apple

80. The TWF, at its forty-eighth session, held in Kelowna, Canada, from September 18 to 22, 2017, considered document [TWF/48/9](#) "DUS examination of mutant varieties of apple" and received a presentation by an expert from the European Union, a copy of which is provided in document TWF/48/9 Add. (see document TWF/48/13 "Report", paragraphs 101 to 105).

81. The TWF agreed that in the case of DUS examination of mutant varieties of apple the exchange of information among DUS offices was important in order to ensure that the authorities were aware of all potentially existing similar varieties. It further agreed that the information provided in TQ Section 6 was not always sufficiently informative and, therefore, good coordination among offices was required.

82. The TWF agreed that the expert from the European Union should coordinate a project to exchange information among authorities involved in DUS testing for apple to share information on the following principle:

- by electronic means;
- twice a year, probably in January and July when trials are planned in the northern and southern hemisphere respectively;
- including information on Gala and Fuji types or other mutant types at a later stage;
- including information on the most similar varieties grown by the authorities in the DUS trials.

83. The TWF further agreed that it would be useful to approach the breeders to check availability of plant material from all varieties listed as mutants in each territory.

84. The TWF invited the expert from the European Union to report on the work done at its next session.

Calibration book for harmonized variety description in apple

85. The TWF, at its forty-eighth session, held in Kelowna, Canada, from September 18 to 22, 2017, considered document [TWF/48/8](#) "Calibration book for harmonized variety description in apple" (see document TWF/48/13 "Report", paragraphs 85 to 88).

86. The TWF received a presentation on the "UPOV study on the discriminating power of characteristics in the apple guideline" by an expert from the European Union. A copy of the presentation is provided in Annex I to document TWF/48/8.

87. The TWF received a presentation on "Harmonised Variety Descriptions for Apple - Discriminating Characters as a Factor" by an expert from New Zealand, as reproduced in document TWF/48/8 Add..

88. The TWF agreed that the initial idea of a calibration book for apple should not be pursued further, but that the Test Guidelines for apple fruit varieties (document TG/14/9), should be revised and that each characteristic should be reviewed according to the following criteria:

- reproducibility/ repeatability of the characteristic;
- discriminating power of the characteristic;
- breeders' view on the importance of the characteristic.

Experience with the RHS Colour Chart and possible future addition of colors

89. The TWO, at its fiftieth session, held in Victoria, Canada, from September 11 to 15, 2017, considered document TWO/50/12 "Experience with the RHS Colour Chart and possible future addition of colours" and received a presentation by an expert from the United Kingdom (see document TWO/50/14 "Report", paragraphs 53 and 54).

90. The TWO recalled the invitation by the Royal Horticultural Society (RHS) to suggest missing colors from the 6th Edition of the RHS Colour Charts based on practical experience. The TWO agreed that substantial gaps identified by experts from the members of the Union should be sent to the expert from the United Kingdom by August 31, 2018, along with the full name of the plant and part trying to color match and the nearest match on the RHS 6th Edition Colour Charts.

Consideration of possible reorganization of TGP/8

91. The TWC, at its thirty-fifth session, held in Buenos Aires, Argentina, from November 14 to 17, 2017, considered document [TWC/35/11](#) "Consideration of possible reorganization of TGP/8: a proposal from China" and agreed to invite experts from China to provide further information on the background to the proposed revision of document TGP/8. The TWC agree to invite experts from Germany to offer to cooperate with the experts from China in developing the proposal and agreed that the topic should be further discussed at its thirty-sixth session (see document TWC/35/21 "Report", paragraph 27).

Excluding varieties of common knowledge from the second growing cycle

92. The TWC, at its thirty-fifth session, held in Buenos Aires, Argentina, from November 14 to 17, 2017, considered documents [TWP/1/22](#) "Development of calculated thresholds for excluding varieties of common knowledge from the second growing cycle when COYD is used" and [TWC/35/13](#) "Thresholds for Excluding Varieties of Common Knowledge from the Second Growing Cycle when COYD is used" and received a presentation by an expert from the United Kingdom, a copy of which is reproduced in the Annex to document [TWC/35/13 Add](#) (see document TWC/35/21 "Report", paragraphs 73 to 76).

93. The TWC noted the recent developments and the indications of COYD thresholds for excluding varieties of common knowledge from the second growing cycle on the basis of data sets of meadow fescue, red clover, timothy, perennial ryegrass, pea (semi-leafless) and pea (conventional).

94. The TWC noted that the method was most applicable to crops with large numbers of varieties of common knowledge and where current trial sizes are large. The TWC noted the plans of the United Kingdom to test the method on a large data set of oilseed rape.

95. The TWC noted that the code had been developed using "R" software which could be linked to the GAIA software to support determining the thresholds for excluding varieties from the second growing cycle when COYD was used.

Implementation of a Document Management System for Variety Files

96. The TWC, at its thirty-fifth session, held in Buenos Aires, Argentina, from November 14 to 17, 2017, considered document TWC/35/16 "Implementation of a document management system for variety files" (see document TWC/35/21 "Report", paragraphs 107 and 108).

97. The TWC received an oral presentation by an expert from Germany and noted the new functions added to the system, such as separate post inboxes for users and groups and definition of favorite files. The TWC noted that the system provided electronic management of different types of documents, including applications for plant variety protection, internal communications and procurement files.

98. The TWC, at its thirty-sixth session, held in Hanover, Germany, from July 2 to 6, 2018, considered document [TWC/36/14](#) "Implementation of a document management system for variety files" (see document TWC/36/15 "Report", paragraphs 84 and 85).

99. The TWC noted the developments concerning the variety file system in Germany.

Software for statistical analysis

100. The TWC, at its thirty-fifth session, held in Buenos Aires, Argentina, from November 14 to 17, 2017, noted the developments reported in document TWP/1/16 "Software for statistical analysis in DUS examination", paragraphs 3 to 7 (see document TWC/35/21 "Report", paragraph 109).

A single tool for DUS computation process

101. The TWC, at its thirty-fifth session, held in Buenos Aires, Argentina, from November 14 to 17, 2017, considered document TWC/35/17 "A single tool for DUS computation process" and received a presentation by an expert from France, a copy of which is reproduced in the Annex to document TWC/35/17 (see document TWC/35/21 "Report", paragraphs 110 to 112).

102. The TWC noted the structure of the interface with the statistical parts of the COYD and COYU processes, storage of statistical data and reports generated by the GAIA software.

103. The TWC agreed to invite France to report on progress in the development of a single tool for DUS computation process at the thirty-sixth session of the TWC.

Management of databases

104. The TWC, at its thirty-fifth session, held in Buenos Aires, Argentina, from November 14 to 17, 2017, considered document TWC/35/4 "Information retrieval from UPOV databases using national systems" and received a presentation by the Office of the Union on "Information Retrieval from UPOV Databases using

national systems”, a copy of which would be made available as an addendum to document TWC/35/4 (see document TWC/35/21 “Report”, paragraphs 114 to 116).

105. The TWC noted that the use of robots to retrieve information from the GENIE database generated dense traffic, causing the UPOV server to crash. The TWC noted that UPOV offered web services (machine-to-machine communication) to exchange data with external systems based on defined input and output formats (contract).

106. The TWC suggested that the Office of the Union provide documentation on the UPOV website on the web services offered.

Web services provided by UPOV and members of the Union

107. The TWC, at its thirty-sixth session, held in Hanover, Germany, from July 2 to 6, 2018, considered document [TWC/36/8](#) “Web services provided by UPOV and members of the Union” and received a presentation by the Office of the Union, a copy of which would be provided as document TWC/36/8 Add. (see document TWC/36/15 “Report”, paragraphs 86 and 87).

108. The TWC noted the progress in the development of a new WIPO standard designed to guide Web Application Programming Interface (API) implementation.

Image analysis

109. The TWC, at its thirty-fifth session, held in Buenos Aires, Argentina, from November 14 to 17, 2017, considered document TWP/1/10 “Image analysis” and noted the invitation of China for experts to join its project for the improvement of software for image analysis (see document TWC/35/21 “Report”, paragraphs 85 to 89).

110. The TWC agreed that it would be useful to have information on latest developments on the project for improving the software by China and agreed to invite China to make presentation at its thirty-sixth session. The TWC agreed that the translation of user interfaces using Roman alphabet could facilitate future cooperation on the project.

111. The TWC noted the difficulty reported by members to establish algorithms that could adequately manage different shapes and plant structures (e.g. wavy leaves, wrinkled surfaces).

112. The TWC noted the experiences reported on the use of image analysis by the following members:

- Czech Republic – analysis in oilseed rape and pea with Matlab software;
- France – assessment of color in ornamental plants (RHS Colour Chart), estimation of foliar area for disease infection using softwares AIM and IMAGEJ;
- Finland – rye seed length using Image Tool software;
- Germany – some ornamentals and agricultural crops using in-house developed software;
- Italy – rice seed: length and width;
- Netherlands – flax length/width ratio, sugar beet cotyledons, pea, bean, shape of carrots and onions;
- United Kingdom – pea: pods, leaflets, stems; parsnip;

113. The TWC agreed that new advances on image analysis should be reported at its thirty-sixth session.

Report on court cases dealing with technical matters

114. The TWO, at its fiftieth session, held in Victoria, Canada, from September 11 to 15, 2017, noted document TWO/50/9 “Report on court cases dealing with technical matters” and received a presentation by an expert from the European Union (see document TWO/50/14 “Report”, paragraph 52).

115. *The TC is invited to note developments in the TWPs concerning:*

- (i) *Experiences with new types and species*
- (ii) *Management of variety collections*
- (iii) *Experience in the management of reference collections with the SELECT method*

- (iv) *Regional set of example varieties in Wheat for South America*
- (v) *Impact of revisions of states of expression of existing characteristics in the revision of Test Guidelines*
- (vi) *Experience with using two locations by one year for DUS decisions*
- (vii) *Characteristic expression between years or environments for ornamental varieties*
- (viii) *Nomination of novel plant pest races*
- (ix) *Impact of endophytes on DUS characteristics in grasses*
- (x) *DUS examination of mutant varieties of apple*
- (xi) *Calibration book for harmonized variety description in apple*
- (xii) *Experience with the RHS Colour Chart and possible future addition of colors*
- (xiii) *Consideration of possible reorganization of TGP/8*
- (xiv) *Excluding varieties of common knowledge from the second growing cycle*
- (xv) *Implementation of a Document Management System for Variety Files*
- (xvi) *Software for statistical analysis*
- (xvii) *A single tool for DUS computation process*
- (xviii) *Management of databases*
- (xix) *Web services provided by UPOV and members of the Union*
- (xx) *Image analysis*
- (xxi) *Report on court cases dealing with technical matters*

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