UPOV
International Union for the Protection of New Varieties of Plants

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Technical Working Party for Fruit Crops **TWF/48/13**

Forty-Eighth Session
Kelowna, British Columbia, Canada, September 18 to 22, 2017

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REPORT

adopted by the Technical Working Party for Fruit Crops

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Opening of the session

1. The Technical Working Party for Fruit Crops (TWF) held its forty-eighth session in Kelowna, British Columbia, Canada, from September 18 to 22, 2017. The list of participants is reproduced in Annex I to this report.

2. The session was opened and chaired by Mr. Jean Maison (European Union), on behalf of Mr. Katsumi Yamaguchi (Japan), Chairman of the TWF, on the morning of September 18, 2017. Mr. Maison welcomed the participants and thanked Canada for hosting the TWF session. Mr. Yamaguchi chaired the session from the afternoon of September 18, 2017.

3. The TWF was welcomed by Mr. Anthony Parker, Commissioner, Plant Breeders' Rights Office, Canadian Food Inspection Agency (CFIA).

4. The TWF received a presentation by Mr. Anthony Parker and Mr. Marc de Wit, Examiner, Plant Breeders' Rights Office, CFIA, on the fruit sector in Canada and the Canadian PBR system. A copy of the presentation is provided in Annex II to this report.

Adoption of the agenda

5. The TWF adopted the agenda as reproduced in document TWF/48/1 Rev.

Short reports on developments in plant variety protection

(a) Reports on developments in plant variety protection from members and observers

6. The TWF noted the information on developments in plant variety protection from members and observers provided in document TWF/48/3 Prov. The TWF noted that reports submitted to the Office of the Union after September 11, 2017, would be included in the final version of document TWF/48/3.

7. The TWF noted the report and presentation prepared by an expert from the Netherlands on “Increasing participation of new members of the Union in the work of the TC and TWPs”, reproduced in document TWP/1/19.

8. 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;

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

(b) Reports on developments within UPOV

10. The TWF received a presentation from the Office of the Union on latest developments within UPOV, a copy of which is provided in document TWF/48/4.

Organization of the UPOV sessions

11. The TWF considered document TWP/1/24.

12. The TWF noted that the Council had decided:

(a) to organize a single set of sessions of the bodies that meet in Geneva from 2018, in the period of October/November;

(b) that the Enlarged Editorial Committee (TC-EDC) would meet twice a year, once in the period March/April and once in conjunction with the TC sessions later in the year;

(c) that Test Guidelines that could not be prepared in time for adoption by the TC at its session could be adopted by correspondence on the basis of the recommendations by the TC-EDC;

(d) to adopt the following contingency measures for 2018:

(i) for Test Guidelines proposed for adoption in 2018, to use a procedure for adoption by correspondence as follows:

- Draft Test Guidelines would be prepared as agreed by the TWPs and circulated with the recommendations of the TC-EDC;
- In the absence of any objections the Test Guidelines would be adopted;
- In the case of objections, the objections would be referred to the relevant TWP for consideration at their 2018 session, and the Test Guidelines considered for adoption by the TC at its fifty-fourth session, in 2018;
- TC-EDC to meet on March 26 and 27, 2018, and in conjunction with the TC at its fifty-fourth session, in 2018, if necessary.

(ii) for TGP documents, to invite the TC-EDC to consolidate comments made by the TWPs at their sessions in 2017 and, in the absence of consensus between the TWPs, formulate proposals for further consideration by the TWPs at their sessions in 2018;

(iii) all other matters to be considered at the fifty-fourth session of the TC in 2018 in the normal way.

13. The TWF noted that the TC had agreed to propose that the meetings of the BMT be held on an annual basis.

14. The TWF noted that the TC had agreed to propose that consideration be given to organizing the sessions of the TWC and BMT back-to-back in the same location to facilitate exchange of information.

15. The TWF noted that the TC had agreed that the preparatory workshops in 2018 should be organized on the Monday/Tuesday of the TWPs sessions to encourage participation by all TWP participants.

16. The TWF noted that from 2017, for certain documents, the TWPs would be invited to consider the same document on a particular topic, using a common document code.

17. The TWF noted that in some cases it would be difficult for the TC to consider the view of all TWPs, especially when sessions of the TWPS took place before and after the TC. It recommended to consider the possibility to consult TWPs by correspondence, for relevant matters.

TGP documents

18. The TWF considered documents TWP/1/1 Rev., TWP/1/9, TWP/1/11, TWP/1/12, TWP/1/13, TWP/1/15, TWP/1/17 Rev., TWP/1/18, TWF/48/5 and TWF/48/6.

19. The TWF noted the revisions to documents TGP/7, TGP/8 and TGP/14 agreed by the TC, as set out in document TWP/1/1 Rev., paragraphs 6 to 14 and Annexes I and II.

20. The TWF noted the proposals for future revisions of TGP documents to be discussed by the TWPs at their sessions in 2017, which would be dealt with under separate documents.

21. The TWF noted the program for the development of TGP documents, as set out in document TWP/1/1 Rev., Annex III.

TGP/5: Section 1: Model Administrative Agreement for International Cooperation in the Testing of Varieties

Confidentiality of molecular information

22. The TWF considered document TWP/1/9.

23. The TWF considered the proposed guidance on confidentiality of molecular information for inclusion in document TGP/5, Section 1, as set out in document TWP/1/9, paragraph 4 (reproduced below).

> "4. It is proposed that Articles 4 and 6 of document TGP/5, Section 1 be revised to read as follows (proposed insertion of text indicated by highlighting and underlining):
>
> 'Article 4
>
> '(1) The Authorities shall take all necessary steps to safeguard the rights of the applicant.
>
> '(2) Except with the specific authorization of the Receiving Authority and the applicant, the Executing Authority shall refrain from passing on to a third person any material or molecular information of the varieties for which testing has been requested.
>
> […]
>
> 'Article 6
>
> 'Practical details arising out of this Agreement –regarding in particular the provisions relating to the considerations, application forms, technical questionnaires and requirements as to propagating material, testing methods, exchange of reference samples, exchange of molecular information, maintenance of reference collections and the presentation of the results– shall be specified in this Agreement or settled between the Authorities by correspondence.'"

24. The TWF agreed with the TWA, TWV and the TWO that clarification was needed to make sure that the term "material" includes "DNA material" and agreed to propose that Article 4(2) should read as follows:

> "(2) Except with the specific authorization of the Receiving Authority and the applicant, the Executing Authority shall refrain from passing on to a third person any material, including DNA, or molecular information of the varieties for which testing has been requested."

25. The TWF noted that certain information provided by the applicant might not be available due to trade secret agreement signed between the authority in charge of DUS and the applicant. In contrast, national legislation regarding official information may require passing other information to a third person.

TGP/7: Development of Test Guidelines

Duration of DUS tests

26. The TWF considered document TWP/1/11.

27. The TWF considered the proposed revision of document TGP/7 to clarify the duration of DUS testing, as set out in document TWP/1/11, paragraph 11:

> "11. The following proposal has been developed on the basis of the comments of the TC:
>
> "ASW 2(a):
>
> '3. Method of Examination
>
> '3.1 Number of Growing Cycles
>
> 'The ~~minimum~~ duration of tests should [normally]/[typically] be a single growing cycle.
>
> 'However, the testing of a variety may be terminated earlier if a negative conclusion on distinctness, uniformity or stability has already been reached.'
>
> 'Alternatively, the testing of a variety may be continued if a conclusion on distinctness, uniformity or stability has not been reached after the [normal]/[typical] duration of tests.
>
> "ASW 2(b):
>
> '3. Method of Examination
>
> '3.1 Number of Growing Cycles
>
> 'The ~~minimum~~ duration of tests should [normally]/[typically] be two independent growing cycles.
>
> 'However, the testing of a variety may be terminated earlier if a negative conclusion on distinctness, uniformity or stability has already been reached.'
>
> 'Alternatively, the testing of a variety may be continued if a conclusion on distinctness, uniformity or stability has not been reached after the [normal]/[typical] duration of tests.' "

28. The TWF agreed with the TWA, TWV and the TWO that the term "normally" was preferred and should be used throughout the guidance in ASW 2.

29. The TWF agreed with the TWV that the reference to a negative conclusion should be deleted as it remained exceptional cases, and that in most of the cases the testing of a variety may be terminated with a positive conclusion on DUS. In that respect the TWF noted that the TWA, TWV and the TWO agreed that the current standard wording in Test Guidelines allowed the examination of a candidate variety to be terminated earlier in case the differences observed between varieties were so clear that more than one growing cycle was not necessary.

30. The TWF noted that the TWA and the TWV had agreed that it should be possible to terminate earlier the examination of a candidate variety (e.g. during the establishment period of the trial) and agreed to propose that particular situations should be addressed in a Guidance Note in document TGP/7 instead of amending the standard wording, clarifying that it is the decision of the Authorities to decide whether or not to terminate the examination earlier.

31. The TWF agreed with the TWO that it should also be possible to terminate the examination of a candidate variety before the normal duration for reasons other than having achieved a conclusion on DUS examination, such as when there were problems with the plant material submitted.

32. The TWF noted the concern expressed by the TWO that the term "growing cycle" was not precise for explaining the duration of DUS examination as it referred primarily to the life cycle of a crop. The TWF noted the proposal of the TWO to consider the possibility of replacing the term "growing cycle" by "testing cycle" in ASW 2(a) and (b) to clarify that the duration of DUS examination was related to the period of testing of a variety, regardless of the number of life cycles the crop would have completed during DUS examination. The TWF agreed that in the case of fruit the growing cycle did not necessarily correspond to the life cycle of

the crop and acknowledged that there was a difference between the establishment period and the evaluation period.

33. The TWF noted the different views expressed from the TWA, TWV and TWO and agreed to suggest to the TC to keep ASW2 as it is, but to propose to amend the GN 8 as follows (proposed insertion of text indicated by highlighting and underlining):

> GN 8 (TG Template: Chapter 3.1.2) – Explanation of the growing cycle
>
> Chapter 3.1 makes reference to the number of growing cycles. In some cases it may be necessary to clarify what is meant by a growing cycle. Additional standard wording has been developed for some situations (see ASW 3).
>
> 'The testing of a variety may be concluded earlier or later at the moment when the competent authority can determine with certainty the outcome of the test.'

Characteristics which only apply to certain varieties

34. The TWF considered document TWP/1/12.

35. The TWF agreed with the TWA, TWV and the TWO on the possibility to exclude varieties from observation on the basis of a preceding pseudo-qualitative or quantitative characteristic under particular circumstances, such as the impossibility to describe an organ that was not present in a variety or when variation existed only within a particular group of a crop.

36. The TWF agreed with the TWV and the TWO that the approach of excluding varieties from observation on the basis of preceding PQ or QN characteristics should be used carefully and based on experience and discussions during the drafting of Test Guidelines, in order to be fully aware on the consequences.

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

The Combined-Over-Years Uniformity Criterion (COYU)

37. The TWF noted the report on developments concerning the improved method of calculation of the Combined-Over-Years Uniformity Criterion (COYU), as set out in document TWP/1/13. The TWF noted that the expert from the United Kingdom would report on the progress of development of probability levels for the improved method of calculation of COYU to the TWC, at its thirty-fifth session.

38. The TWF agreed to suggest to the TC to conduct a survey among members of the Union to assess the number of authorities using the COYU method for each crop sector, in order to assess how best to present information in relation to COYU to the TWPs, especially when not relevant for the crop sector.

Data Processing for the Assessment of Distinctness and for Producing Variety Descriptions

39. The TWF considered document TWP/1/15.

40. The TWF considered the updated version of the "Comparison of methods used for producing variety descriptions: Results of the practical exercise" provided by experts from France, as set out in document TWP/1/15, Annex II.

41. The TWF noted that the TC had agreed to invite the experts from France to check the highlighted values in the table in document TWP/1/15, Annex II "Comparison of methods used for producing variety descriptions: results of the practical exercise", paragraph 6, for possible data inconsistency. The TWF noted that the expert from France planned to provide further information to the TWC, at its thirty-fifth session.

42. The TWF noted that the TC had agreed to invite participants in the practical exercise to provide a short description of their methods to transform measurements into notes and provide examples when these methods might be used, such as for particular characteristics, types of propagation or different situations, on the basis of the short descriptions provided by France and the United Kingdom, as set out in document TWP/1/15, Annexes III to V.

TGP/10: Examining Uniformity

Assessing Uniformity by Off-Types on the Basis of More than One Growing Cycle or on the Basis of Sub-Samples

43. The TWF considered document TWP/1/17 Rev., and document TWF/48/5.

44. The TWF considered the draft guidance presented in Annexes I and II of document TWP/1/17 Rev. as amended by the TWPs, at their sessions in 2016, for inclusion in a future revision of document TGP/10.

45. The TWF considered information provided by members of the Union on the criteria for selecting the most suitable approach for the assessment of off-types on different types of crops.

46. The TWF agreed to propose that the new sentence introduced in the draft guidance, Annex I, should be amended to read as follows:

> "It is important to identify whether differences in number of off-types between growing cycles were not due to ~~biological~~ environmental reasons or sampling variation."

47. The TWF agreed to propose to modify the sentence for Approach 1 as follows:

> "Furthermore, ~~on the basis of a clear lack of uniformity, a~~ if a variety clearly 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.

48. The TWF noted that a proposal for revision of guidance in document TGP/8/2: Part II: Section 8: "The method of uniformity assessment on the basis of off-types", would be considered in document TWP/1/1 Rev. "TGP Documents".

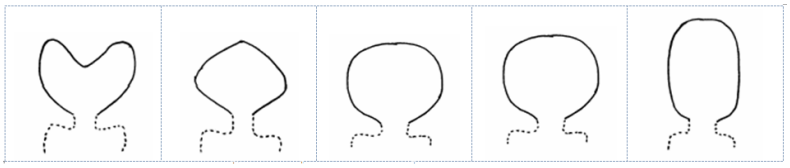
TGP/14: Glossary of Terms Used in UPOV Documents

Illustrations for shape and ratio characteristics

49. The TWF considered document TWP/1/18.

50. The TWF agreed that no additional examples were available at this time for improving the guidance on providing illustrations for shape and ratio characteristics in document TGP/14.

51. The TWF agreed with the TWO that guidance on providing illustrations for shape and ratio characteristics in document TGP/14 should be amended to clarify that the base of a structure was at the point of attachment. The TWF further agreed that the example 6 of Shape-Related Characteristics in document TGP/14: "Variation between range of shapes indicated by the illustrations", reproduced in document TWP/1/18, may be put upside-down in order to make clear that the base on shape illustration should preferably be represented the same way, and as follows:



52. The TWF noted the existing guidance in document TGP/14 on "2. Developing Shape-Related Characteristics", as reproduced below:

> "2.1.3 Notwithstanding the difficulty in using a difference in Notes to establish distinctness for a pseudo-qualitative characteristic (see Section 1), it may be appropriate to develop a single pseudo-qualitative characteristic for shape. In such cases, it is important that the difference between the states of expression is indicated in an illustration. The illustration should, as far as possible, place the states with the least difference closest together, regardless of their notes, e.g. the illustrations for notes 1 and 5 might be positioned side-by-side and notes 2 and 4 might be further apart. Where the overall shape is presented as a single pseudo-qualitative characteristic, the order of states should be: primary order, broadest part below middle to broadest part above middle; secondary order, narrow to broad (low to high ratio length/width) (see Section 2.2, Example 5, Alternative 2)."

53. It further agreed that clarification might be needed on the reasons to produce a grid when illustrating shape. The TWF invited the experts of New Zealand and Germany to check whether to develop a wording to explain when it is appropriate to use a grid in Test Guidelines, and to circulate a proposal by correspondence by end of December 2017 to the TWF for its approval. The proposal will be then presented to the TC-EDC at its session in March 2018, for consideration by the TC at its session in October 2018.

Guidance for drafters of Test Guidelines

54. The TWF considered document TWP/1/8.

55. The TWF noted the items resolved in Version 1.0 of the web-based TG template, as set out in document TWP/1/8, paragraph 18.

56. The TWF noted that a general revision of the software code was underway to eliminate remaining reported malfunctioning issues and to stabilize the system.

57. The TWF noted the issues to be considered for inclusion in Version 2 of the web-based TG Template, as set out in document TWP/1/8, paragraph 21.

58. The TWF noted the issues on the web-based TG template agreed by the TC, at its fifty-third session, as set out in document TWP/1/8, paragraphs 25 to 27 (reproduced below).

> "25. The TC agreed that UPOV codes and botanical names in draft Test Guidelines should, in general, be displayed in alphabetical order. However, the TC agreed that the web-based TG Template should allow the Leading Expert to change the order, if appropriate.
>
> *"Order of methods of observation*
>
> "26. The TC agreed that the methods of observation of a characteristic should continue to be presented in alphabetical order, thereby avoiding any indication of order of preference.
>
> *"Subsequent explanations covering several characteristics*
>
> "27. The TC agreed that characteristics with the same explanation could be displayed in Chapter 8.2 "Explanations for individual characteristics" with subsequent explanations being cross-referenced to the first characteristic displaying the appropriate information, as follows (see document TC/53/31 "Report", paragraphs 107 to 110):
>
> e.g.: Ad. 10 "[explanation text/illustration]"
>
> Ad. 11 "See Ad. 10"
>
> […]
>
> Ad. 50 "See Ad. 10".

59. The TWF agreed with the TWO that explanations covering all characteristics should be able to be displayed before Chapter 8.1 "Explanations covering several characteristics" without a note in the Table of Chars, as set out in document TWP/1/8, paragraphs 28 and 29.

60. The TWF noted that the following issues were currently addressed on the web-based TG template for inclusion during the second semester of 2017:

> "Issues currently being addressed
>
> "30. Solutions for the following issues are currently being developed for inclusion on the web-based TG template during the second semester of 2017:
>
> - to specify information for more than one method of propagation in Chapter 3.4 "Test Design";
> - addition of new SW paragraph at Chapter 4.2 "Uniformity" to specify type of propagation considered in the Test Guidelines;

- example variety master list: addition of a pop up window with related characteristics before confirming the deletion of a variety from the master list of example varieties;
- improved functionality to move characteristics up and down in the table of characteristics (drag and drop);
- addition of characteristics not contained in the table of characteristics at the end of the Technical Questionnaire (TQ);
- separation of color characteristics in TQ to be indicated as RHS Colour Chart reference or color group;
- addition of a possibility to edit the scope of the Test Guidelines on the cover page (e.g. for excluding species and UPOV Codes)."

61. The TWF noted that training on the use of the web-based TG template would be offered to the TWPs at their sessions in 2017, during the preparatory workshops of the sessions and during discussions on agenda item "guidance for drafters of Test Guidelines".

62. The TWF noted that feedback and questions could be provided directly to the Office of the Union via the web-based TG template using "Feedback" button on the dashboard.

63. The TWF appreciated the improvement of Version 1 and highlighted the importance of the development of Version 2 of the web-based TG Template for the creation of national Test Guidelines. The TWF agreed that members of the Union should be involved in the development of Version 2 to assure that individual authorities' needs be taken into account, as far as possible.

Procedure for partial revision of UPOV Test Guidelines

64. The TWF considered document TWP/1/20.

65. The TWF noted the procedures for notification of new characteristics or states expression in document TGP/5, Section 10: "Notification of additional characteristics and states of expression".

66. The TWF noted that the TC had encouraged authorities to notify the use of new characteristics or states expression using the procedure established in document TGP/5, Section 10.

67. The 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.

68. 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.

Variety denominations

69. The TWF considered document TWP/1/6.

70. The TWF noted the developments concerning a possible revision of document UPOV/INF/12 "Explanatory Notes on Variety Denominations under the UPOV Convention", as set out in document TWP/1/6, paragraphs 5 to 12.

71. The TWF noted the developments concerning a UPOV similarity search tool for variety denomination purposes, as set out in document TWP/1/6, paragraphs 13 to 20.

72. The TWF noted the developments concerning the possible expansion of the content of the PLUTO Database, as set out in document TWP/1/6, paragraphs 21 to 26.

73. The TWF noted the developments concerning non-acceptable terms, as set out in document TWP/1/6, paragraphs 27 to 32.

74. The TWF noted the agenda of the fourth meeting of the Working Group on Variety Denominations (WG-DEN), as set out in document TWP/1/6, and noted that the meeting would be held in Geneva, on October 27, 2017.

Development of calculated thresholds for excluding varieties of common knowledge from the second growing cycle when COYD is used

75. The TWF considered document TWP/1/22.

76. The TWF noted that further developments on calculated thresholds for excluding varieties of common knowledge from the second growing cycle when COYD was used would be reported to the TWC at its thirty-fifth session, to be held in 2017.

Statistical methods for visually observed characteristics

77. The TWF considered document TWP/1/23.

78. The TWF noted that an expert from France would make a report to the TWC, at its thirty-fifth session, on the study to develop software to implement the method developed by experts from Denmark and Poland.

79. The TWF noted that the TC, at its fifty-third session, had agreed that the appropriate naming and drafting of guidance on the method developed by experts from Denmark and Poland should be considered once further experience had been acquired and software had been made available to facilitate its use in DUS examination.

80. The TWF noted that China had made a presentation at the thirty-fourth session of the TWC to describe the statistical methods used in the DUSTC software package for the analysis of distinctness and uniformity.

Number of growing cycles in DUS examination

81. The TWF considered documents TWP/1/21 and TWF/48/7.

82. The TWF noted the presentations made to the TWPs at their sessions in 2016, simulating the impact of using different numbers of growing cycles on DUS decisions using actual data, as set out in the Annexes to document TWP/1/21.

83. The TWF noted that the TC had agreed that the number of growing cycles for DUS examination should be the minimum necessary for a robust DUS decision and the establishment of a reliable variety description.

84. The TWF noted that the TC had agreed that it was not appropriate to generalize that ornamental varieties should be examined in a single growing trial while other types of crops should be examined in two growing cycles. It noted further that the TC had agreed that the typical number of growing cycles should be established on a crop-by-crop basis. However the TWF agreed to clarify to the TC that, in some cases in the fruit sector, the normal number of growing cycles needed to be established on variety-type by variety-type basis (for example rootstock varieties, male-female varieties).

Calibration book for harmonized variety description in apple

85. The TWF considered document TWF/48/8.

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

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 Ad..

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.

Image analysis

89. The TWF considered document TWP/1/10 and noted the invitation of China for experts to join its project for the improvement of software for image analysis and the plans of the TWC to discuss image analysis during its thirty-fifth session.

Management of variety collections

90. The TWF considered document TWP/1/14 and noted the developments reported to the TWC, at its thirty-fourth session in 2016, and the TC, at its fifty-third session in 2017, on management of variety collections.

91. 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.

92. 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.

Software for statistical analysis

93. The TWF considered document TWP/1/16 and noted the developments concerning software for statistical analysis in DUS examination, as set out in document TWP/1/16, paragraphs 3 to 7.

Minimum distance between varieties

94. The TWF considered document TWF/48/11 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 Rev., 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 Ad..

95. 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.

96. The TWF noted with the TWO 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.

97. 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.

98. The TWF agreed with the TWO 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.

99. 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.

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

DUS examination of mutant varieties of apple

101. The TWF considered document TWF/48/9, and received a presentation on a "DUS examination of mutant varieties of apple" by an expert from the European Union, a copy of which is provided in document TWF/48/9 Ad..

102. 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.

103. 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.

104. 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.

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

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

106. The TWF considered document TWF/48/10 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.

Matters to be resolved concerning Test Guidelines adopted by the Technical Committee

Corrections

107. The TWF noted the corrections to be made to the Test Guidelines for Almond (document TG/56/4) regarding the spelling of the example variety "Uhm L Fahem" to be amended to read "Umm al-Fahm" and the numbering of Section 5 of the Technical Questionnaire.

108. The TWF agreed that a correction be made to the coverage of the Test Guidelines for Blackberry (document TG/73/7) and agreed that the current botanical name *Rubus* subg. *Eubatus* sect. *Moriferi & Ursini* be corrected to read *"Rubus* subg. *Rubus".*

Matters to be resolved concerning Test Guidelines adopted by the Technical Committee in 2017

109. The TC adopted the Test Guidelines for Chestnut, Walnut and Papaya on the basis of the following issues being approved by correspondence by the TWF (see Circular E-17/144) (see document TC/53/31 "Report", Annex II):

Chestnut (*Castanea sativa* Mill.; *Castanea crenata* Sieold & Zucc.; *Castanea mollissima* Blume)

4.2	to be numbered 4.2.1 and add new paragraph as 4.2.2 (see document TGP/7/5): "These Test Guidelines have been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species", Section 4.5 "Testing Uniformity" should be followed."
Char. 3	to check whether really MG *Leading Expert: to be indicated as MS/VG*
Char. 9	to add explanation *Leading Expert: explanation to read "The length of the filament of the male flower should be observed on the longest filament on the middle third catkin at full flowering time."*
TQ 4.2.1	to be completed as follows: "4.2.1 Vegetative propagation (a) cuttings [ ] (b) grafting [ ] (c) other (state method) [ ]"

(see documents TG/124/4(PROJ.4) and TC/53/31)

Walnut (*Juglans regia* L.)

4.2	to be numbered 4.2.1 and add new paragraph as 4.2.2 (see document TGP/7/5): "These Test Guidelines have been developed for the examination of cross-pollinated varieties. For varieties with other types of propagation the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species", Section 4.5 "Testing Uniformity" should be followed."
Char. 3	- to check wording of state 2 and whether to be improved *Leading Expert: state 2 to read "flabellate"* - to check whether to add illustrations in Ad. 3 *provided by Leading Expert*
Char. 10	- to check whether "ventral view" (see Ad. 10) *Leading Expert: agreed* - to review order of states and grid according to TGP/14 *provided by Leading Expert*
Char. 11	- to check whether "lateral view" (see Ad. 11) *Leading Expert: agreed* - to review order of states and grid according to TGP/14 *provided by Leading Expert*
Char. 24	- to check method of observation (MG only?), otherwise adapt explanation *Leading Expert: to delete VG*
Char. 29	to check whether to be deleted (additional information provided in relation to Chars. 28 and 30?) *Leading Expert: to delete Char. 29*

8.1 (e)	to explain how to measure and reword explanation (how is the precise water content determined?) *Leading Expert: explanation to read "10 g of kernels should be randomly taken and the water content should be determined at 100 °C (±2 °C) in a stove until constant weight is reached."*
Ad. 27	to check explanation versus states off expression Leading Expert: *explanation to read "Crack the shell and assess the ease of removal of the kernel."*

(see documents TG/125/7(PROJ.5) and TC/53/31)

Papaya (*Carica papaya* L.)

4.2	to be numbered 4.2.1 and add new paragraph as 4.2.2 (see document TGP/7/5): "These Test Guidelines have been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species", Section 4.5 "Testing Uniformity" should be followed."
Chars. 27, 28	to review order of states of expression (see grid Ad. 27, 28) and have same states of expression for both characteristics or have two separate grids Leading Expert: order reviewed; both example varieties to have same states of expression
Char. 49	to review method of observation to be consistent with explanation given in Ad. 49 *Leading Expert: to delete MS*
TQ 4.2	to be completed *provided by Leading Expert*

(see documents TG/264/2(PROJ.9) and TC/53/31)

110. The TWF noted that the following comments and objections have been received by the Office in reply to Circular E-17/144:

Chestnut (*Castanea sativa* Mill.; *Castanea crenata* Sieold & Zucc.; *Castanea mollissima* Blume)

- Characteristic 3 "Current season's shoot: thickness" to be indicated as MG/MS

111. The TWF noted that this sentence should read "Characteristic 3 "Current season's shoot: thickness" to be indicated as MS/VG", according to document TC/53/31 "Report", Annex II.

- TQ 4.2 to be completed

112. The TWF noted that this item was wrongly presented in Circular E-17/144 and should read as follows according to document TC/53/31 "Report", Annex II.

4.2 Method of propagating the variety

4.2.1 Vegetative propagation
(a) cuttings [ ]
(b) grafting [ ]
(c) other (state method) [ ]
4.2.2 Other (please provide details) [ ]

Walnut (*Juglans regia* L.)

- Chapter 4.2 "Uniformity"

113. The TWF noted that an objection was received with regard to the new Standard Wording paragraph to be added to Chapter 4.2. The TWF agreed that this paragraph should read "These Test Guidelines have been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species", Section 4.5 "Testing Uniformity" should be followed."

- To delete method of observation VG from Characteristic 24 “Nut: thickness of shell”

114. The TWF noted that an objection to the deletion of the method of observation VG was received and agreed that VG should be kept as method of observation for this characteristic.

Papaya (*Carica papaya* L.)

- Chapter 4.2 “Uniformity”

115. The TWF noted that an objection was received with regard to the new Standard Wording paragraph to be added to Chapter 4.2. The TWF agreed that this paragraph should read “These Test Guidelines have been developed for the examination of cross pollinated, hybrid and vegetatively propagated varieties. For varieties with other types of propagation the recommendations in the General Introduction and document TGP/13 “Guidance for new types and species”, Section 4.5 “Testing Uniformity” should be followed.”

116. The TWF noted that, subject to approval of the changes above by the Leading Experts of the relevant Test Guidelines, a circular would be issued to the TWF. It further noted that, if no objections were received, the Test Guidelines for Chestnut, Walnut and Papaya would be considered as adopted by the TC on the above basis.

Discussion on draft Test Guidelines

*Argania (*Argania spinosa *(L.) Skeels)*

117. The subgroup discussed document TG/ARGAN(proj.2), presented by Ms. Ibtihaj Belmehdi (Morocco), and agreed the following:

cover page	to delete “Other associated documents…”
2.2	to delete “the material is to be supplied in the form”
3.3.2	to be deleted
4.2.2	to read “For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, no off-types are allowed.”
5.3	to add the following characteristics: Growth habit (characteristic 3) Shoot: insertion angle (characteristic 9) Leaf: shape (characteristic 13) Fruit: shape (characteristic 26) Stone: weight (characteristic 30) Stone: shape (characteristic 31)
Table of characteristics	to check whether all characteristics are needed and useful for DUS examination to add example varieties to add (*)
Char. 1	- to read “Tree: vigor” - to be indicated as QN - to add explanation (use standard definition for vigor)
Char. 2	- to read “Tree: fluting of trunk” - to be indicated as QN and VG - to have states (1) weak, (2) medium, (3) strong
Char. 4	- to be indicated as QL - to have notes 1 and 9
Char. 5	- to be indicated as VG - to have states (1) sparse, (2) medium, (3) dense
Char. 6	- to read “Shoot: zigzag” - to be indicated as QL and VG - to have states (1) absent, (9) present
Char. 7	to be deleted
Char. 8	to read “Shoot: length of internode”

Char. 9	- to read “Shoot: attitude in relation to stem” - to have states (1) upwards, (2) outwards, (3) downwards
Char. 10	- to read “leaf: density of foliage” - to have states (1) sparse, (2) medium, (3) dense
Char. 11	- to read “Leaf blade: length” - to have states “short”, “medium”, “long”
Char. 12	- to be indicated as VG - to read “leaf blade: green color of upper side” - to have states “light green”, “medium green”, “dark green”
Char. 13	- to be indicated as PQ and VG - to have states “narrow elliptic”, “broad elliptic”, “narrow obovate”, “broad obovate” - to add a grid
Char. 14	- state 2 to read “obtuse” - state 3 to read “rounded”
Char. 15	to have states (1) attenuate, (2) acute, (3) obtuse
Char. 16	- to be indicated as MG/VG - to add explanation to read “Observations on the leaves should be made on mature leaves from current season’s shoot.”
Char. 17	- to be indicated as MG/VG - to add explanation to read “See Ad. 16”
Char. 18	- to be indicated as MG - to have states “low”, “medium”, “high”
Char. 19	to be deleted
Char. 20	- to be indicated as MG/VG - to add state (5) medium
Char. 21	- to be indicated as PQ - to read “Inflorescence location” - to have states (1) leaves axils, (2) on the branches, (3) on leaves axils and on the branches - to check whether to improve the characteristic - to add illustration
Char. 22	- to check whether to improve the characteristic - to move to the end of T.o.C - to have states (3) early, (5) medium, (7) late
Char. 23	to add explanation
Char. 25	- to read “color” - state 1 to read “medium brown” - to delete state 5
Char. 26	- to be checked according to TGP/14 - to check whether to have states (1) fusiform, (2) elliptic, (3) ovate, (4) globular
Char. 28	- state 3 to read “narrow” - state 7 to read “broad”
Char. 29	- state 3 to read “low” - state 7 to read “high”
Char. 30	to add illustration
Char. 31	to add illustration
Char. 32	to be indicated as MG/VG
Char. 33	- to be indicated as MG/VG - state 3 to read “narrow” - state 7 to read “broad”
Char. 34	- state 3 to read “low” - state 7 to read “high”
Char. 36	- state 3 to read “strong”
char. 39	- to be indicated as MG/VG - state “long” to have note 7

Char. 40	- to be indicated as MG/VG - to have states (3) narrow, (5) medium, (7) broad
Char. 41	- state 3 to read “low” - state 7 to read “high”
Char. 42	to have states (1) oblong, (2) ovoid, (3) ellipsoid
Char. 43	state 4 to read “more than 3”
Char. 44	to review state 4
Char. 45	- to add explanation how to measure - to move information in brackets to Ad. 45
8.1	to add explanations/illustrations
9.	to be completed
TQ 4.1	to be completed
TQ 4.2	to be completed
TQ 5	to be completed
TQ 6	to be completed

**Blueberry (Revision)*

118. The subgroup discussed document TG/137/5(proj.3), presented by Mr. Nik Hulse (Australia), and agreed the following:

Cover page, Ch. 1, TQ 1	to delete *Vaccinium elliottii* Chapm.
3.1.1	to check whether to be indicated “two growing cycles”
3.1.3	to be deleted
5.3	to delete Char. 1
6.4	to check whether to add explanation on chilling requirements (H) (L)
T.o.C	to check whether to complete example varieties and indicate whether (H) or (L)
Char. 1	- to delete (*) - to check whether 9 notes are needed
Char. 2	to check whether “Scintilla” to be moved to state 2
Char. 3	state 4 to be moved to 2 state 5 to be moved to 6
Chars. 5 and 6	to be indicated as MG/VG
Char. 7	to be indicated as MS/VG
Char. 9	to be deleted
Char. 10	- to add state new state (1) yellow with example variety “Geerdens” - to have states (2) light green, (3) medium green, (4) dark green
Char. 12	- to read “Leaf: red color of margin” - to have states (1) absent and (9) present with example variety “Drisblueten” - to check whether to add illustration
Char. 14	to have states “absent or very weak” to “very strong” with notes 1 to 5
Char. 15	- to be indicated as MS/VG - to reduce scale to 1, 2, 3 - to add (+) (to illustrate peduncle) - to move explanation in brackets to 8.2
Char. 18	to add example variety “SunshineBlue” for state 4
Char. 19	to improve illustration
Char. 26	state 1 to read “incurved”
Char. 28	- state 1 to read “absent or shallow” and to add example variety “Collins (H) - to delete state 2 “shallow”
Char. 31	to have states (1) soft, (2) medium, (3) firm, (4) very firm

Char. 33	- to be indicated as MG/VG - to have notes 1, 3, 5
Char. 37	- to read “Time of beginning of flowering on current season’s shoot” - to replace example variety for state 5
Char. 39	to read Time of beginning of fruit ripening on current year’s shoot”
Char. 40	- to be moved after Char. 19 - to add example varieties
8.1 (c)	to read “Observations on the inflorescence and flower should be made at the beginning of fruit fall”
8.1 (e)	- to be moved to 8.2 as Ad. 33 - to read “Sweetness should be observed by tasting in comparison to the example varieties.”
Ad. 4	to read “Observation should be made on upper half of shoot.”
Ad. 16	to improve illustration
Ad. 19	to add illustrations for all states of expression
Ad. 21	to delete “late”
Ad. 28	to read “See Ad. 27”
Ad. 30	to read “Observations should be made on fruit after removal of bloom.”
Ad. 33	to read “Acidity is determined by titration of titratable acids or by eating.”
Ad. 35	to read “The time of beginning of vegetative growth is when the first vegetative buds begin to burst.”

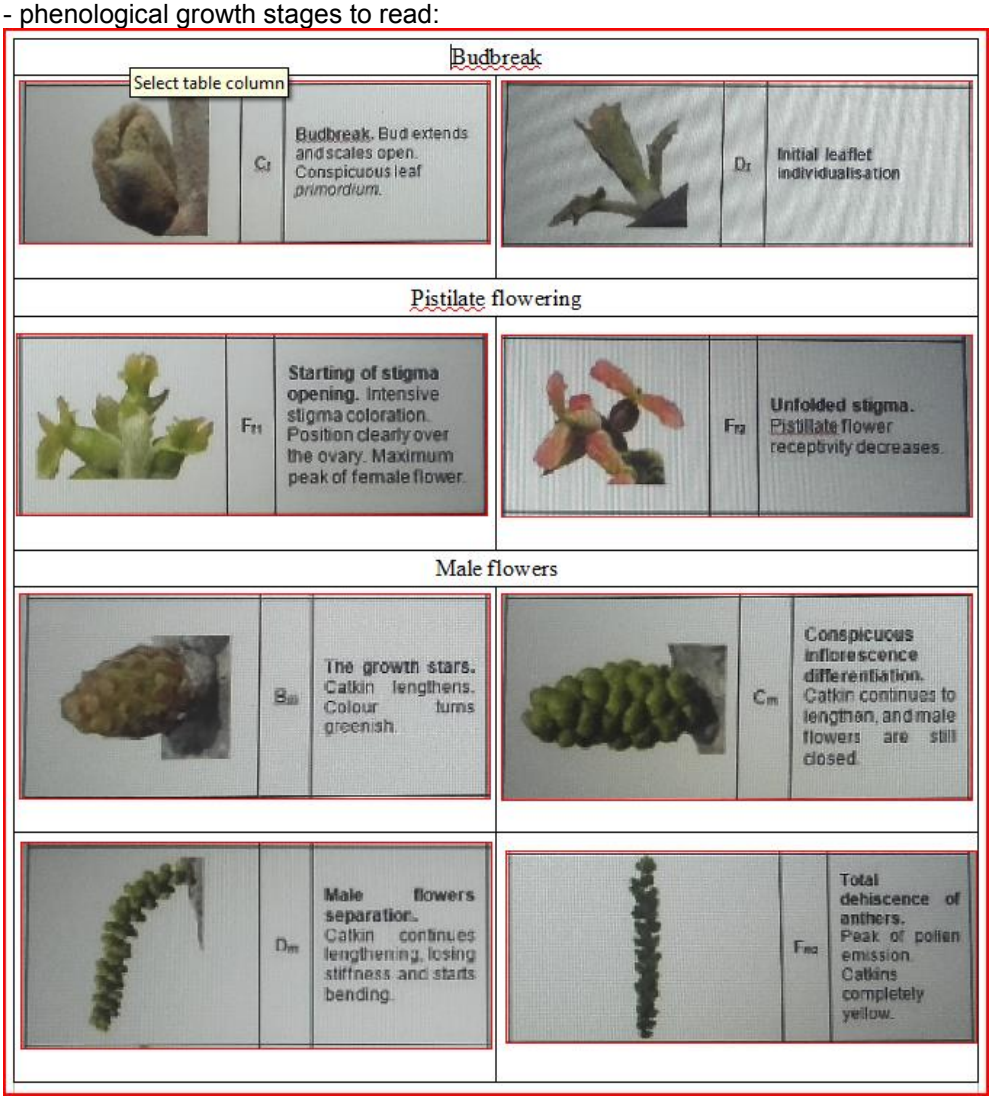
*Black Walnut (*Juglans nigra *L.)*

119. The subgroup discussed document TG/JUGLA(proj.3), presented by Ms. Ana Álvarez Linarejos (Spain) on behalf of Ms. Victoria Colombo (Spain), and agreed the following:

cover page	- alternative names to be completed - to add German common name “Schwarznuss” for *Juglans nigra* L. - to add “*Juglans hindsii* x *Juglans regia*”, “*Juglans major* x *Juglans regia*” and “*Juglans nigra* x *Juglans regia*” to coverage of Test Guidelines
1.	to delete “and also to the varieties of the hybrids of those species with *Juglans regia L.*”
4.2	to add new paragraph “4.2.2 to read “These Test Guidelines have been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation the recommendations in the General Introduction and document TGP/13 “Guidance for new types and species”, Section 4.5 “Testing Uniformity” should be followed.
Char. 2	- to be indicated as MS/VG - to have states (1) very few to (5) very many
Char. 3	to read “Leaf: terminal leaflet”
Char. 4	to move example varieties “IRTA X-80, Eurowalnut B07, Eurowalnut B03” from state (2) same size to state (3) bigger
Char. 5	- to clarify what bark is (in Ad. 5) - to read “Trunk: bark color” - to be moved after Char. 1
Char. 6	- to delete full stop - to spell “conspicuousness” with small “s” - to have states (1) absent, (9) present
Char. 7	- to read “Female flower: predominant number of flowers per inflorescence” - state 1 to read “one” (small “o”)
Char. 13	to review states and their order according to TGP/14
Chars. 16, 17, 18, 20	to have notes 1 to 5
Char. 19	to move wording in brackets to 8.2

8.1	- to move phenological stages to Chapter 8.3 (only stages used in TG) - to add the following explanations: (a) Observations on tree should be made in dormant season (Chars. 1 and 5) (b) Observations on leaflets should be made on lateral leaves from the middle part of the canopy. (Chars. 2, 3 and 4) (c) Observations on flowers should be carried out during full-blossom period.(Chars. 6, 7, 8, 9, 10, 11, 12, 17, 18 and 19) (d) Observations on nuts should be made on physiological ripe nuts excluding the pericarp. (Chars. 13, 14 and 15)
8.2	to add to all explanations referring to phenological stages reference to 8.3 (to read "(see 8.3)"
Ad. 2	to read "Number of leaflets should be …"
Ad. 5	to read "Observations should be made when the tree is less than five years old."
Ad. 6	to read "Female flower is considered conspicuous at stage Df. Female flower is considered non conspicuous when the flowers are observed when the leaves are fully developed."
Ad. 7	to be deleted
Ad. 10	to read "The attitude of stigma should be observed when it is completely unfolded, at Ff2 stage."
Ad. 11	to read "The presence of fully developed catkins should be observed at stage Bm, Cm and even Dm."
Ad. 12	to read "Catkins shape should be observed at Bm - Cm stages."
Ad. 13	to review grid (see comment on Char. 13)
Ad. 16	to read "…when more than 50%..."
Ad. 18	to read "The period of female flowering is between Ff1 and Ff2 stages."

8.3	- growth stage (1) to read “second year after planting” - phenological growth stages to read:



9.	to review format

**Japanese Plum (*Prunus salicina *Lindl.) (Partial revision)*

120. The subgroup discussed document TWF/48/12, presented by Ms. Urszula Braun-Mlodecka (European Union), and agreed the following:

Char. 42	- state 1 to read “none” - to add title “Ad. 42: Fruit: over color of skin” to existing explanation Ad. 40, 41

**Macadamia (*Macadamia integrifolia *Maiden et Betche,* Macadamia tetraphylla *L.A.S. Johnson) (Revision)*

121. The subgroup discussed document TG/111/4(proj.3), presented by Mr. Nik Hulse (Australia), and agreed the following:

4.1.6	to be moved to Chapter 8 as explanation covering all characteristics to read “Unless otherwise indicated, observations should be made on at least 3 year old trees.”
4.2	to add new Standard Wording paragraph
T.o.C	to add more example varieties
Char. 9	to add illustration

Char. 13	- to be indicated as PQ - to add illustration - to correct note of state “mucronate” from 5 to 4
Char. 23	- to be indicated as PQ - to check whether to reduce scale (combine state 1 and 2)
Char. 25	to add (a)
Char. 29	to add a grid
Char. 30	state 2 to read “slightly rough”
Char. 33	to add example varieties
Char. 35	to add explanation to read “The micropyle is the white spot at the end of the nut that allows water to enter for the initiation of germination (see 8.1).”
8.1	to invert (a) and (b)
8.1 (b)	to read “Observations on leaves should…”
Ad.19	to read “Observations should be made on terminal leaves…”
Ad. 37	to read “See Ad. 36”
TQ 4.2	to be completed
TQ 5	to add Chars. 2 and 3

*Pistachio (*Pistacia *L.)*

122. The subgroup discussed document TG/PISTA(proj.2), presented by Ms. Urszula Braun-Mlodecka (European Union), and agreed the following:

2.2 and 2.3	to be consistent “a clonal or the clonal rootstock”
2.3	to read “5 plants on their own roots from vegetative propagation or, 5 plants on a clonal rootstock as specified by the authority.”
3.1.1, 3.1.2	to be deleted
4.1.6	to be deleted
T.o.C	to add more example varieties
Char. 12	- to add new state “obtuse” - to check whether to keep or delete state “rounded”
Char. 15	- to have states (1) ovate, (2) circular, (3) elliptic - to add illustration(s)
Char. 17	to add illustration(s)
Char. 18	to add illustration(s)
Char. 20	to review name of characteristic and states of expression
Char. 25	to add illustration(s)
Char. 27	to add illustration(s)
Char. 29	to add illustration(s)
Char. 30	to add illustration(s)
Char. 32	to add explanation
Char. 34	to add (*)
Char. 35	- to add (*) - to read “Time of beginning of vegetative bud burst”
Char. 36	- to add (*) - to read “Time of maturity”
8.1 (d)	to read “…minimum sample of 20 fruits, at harvest maturity.”
8.1 (e)	to be moved to 8.2
Ad. 5	to delete “One-year-old shoot:”
Ad. 12	to improve illustration
Ad. 37	- to check whether to improve explanation - to delete “for harvest”

9.	to review format
TQ 4.2	to be completed

123. The TWF noted that, due to adverse climatic conditions, the Leading Expert would not be in the position to gather all necessary information in time to elaborate a new draft for consideration by the TWF at its forty-ninth session in 2018. The TWF noted that a new draft of the Test Guidelines for Pistachio would be available in 2019.

*Physic Nut (*Jatropha curcas *L.)*

124. The subgroup discussed document TG/JATRO_CUR(proj.2), presented by Mr. Alejandro Barrientos-Priego (Mexico), and agreed the following:

alternative names	- to add Spanish common name “Piñon” - to add German common name “Purgiernuss, Purgierstrauch”
3.4.1	to read “ In the case of vegetatively propagated varieties, each test should be designed to result in a total of at least 5 plants.”
3.4.2	to read “In the case of seed-propagated varieties, each test should be designed to result in a total of at least 15 trees.”
Char. 1	state 3 to read “spreading”
Char. 3	to delete (a)
Char. 8	to add explanation
Char. 11	state 1 to read “absent or weak”
Char. 12	to be indicated as PQ
Char. 13	to add a grid
Char. 18	to read “Immature”
Char. 19	to add explanation
Char. 29	to add explanation
Char. 31	to be deleted
8.1 (c)	to read “… at the first flowering.”
8.1 (d)	to read “…of the plant at the time of the fruit ripening.”
TQ 4.2	to be completed
TQ 5	to have full scales

Recommendations on draft Test Guidelines

(a) Test Guidelines to be put forward for adoption by the Technical Committee

125. The TWF agreed that the following draft Test Guidelines should be submitted to the TC for adoption following the procedure adopted by the Council at its thirty-fourth extraordinary session as reported in paragraph 12 (d)(i) and reproduced below, on the basis of the following documents and the comments in this report:

> “(i) for Test Guidelines proposed for adoption in 2018, to use a procedure for adoption by correspondence as follows:
>
> • Draft Test Guidelines would be prepared as agreed by the TWPs and circulated with the recommendations of the TC-EDC;
> • In the absence of any objections the Test Guidelines would be adopted;
> • In the case of objections, the objections would be referred to the relevant TWP for consideration at their 2018 session, and the Test Guidelines considered for adoption by the TC at its fifty-fourth session, in 2018;
> • TC-EDC to meet on March 26 and 27, 2018, and in conjunction with the TC at its fifty-fourth session, in 2018, if necessary.”

Subject	Relevant document(s)
Black Walnut (*Juglans nigra* L.)	TG/JUGLA(proj.3)
*Japanese Plum (*Prunus salicina* Lindl.) (Partial revision: Characteristic 42)	TG/84/4 Corr., TWF/48/12

(b) Test Guidelines to be discussed at the forty-ninth session

126. The TWF agreed to discuss the following draft Test Guidelines at its forty-ninth session:

Apricot (*Prunus armeniaca* L.) (Revision)
Almond (*Prunus amygdalus* Batsch) (Partial revision: Characteristic 43)
Apple (fruit varieties) (Revision) (*Malus domestica* Borkh.)
Argania (*Argania spinosa* (L.) Skeels)
*Blueberry (*Vaccinium angustifolium* Aiton; *V. corymbosum* L.; *V. formosum* Andrews; *V. myrtilloides* Michx.; *V. myrtillus* L.; *V. virgatum* Aiton; *V. simulatum* Small) (Revision)
Coconut (*Cocos nucifera* L.) (Partial revision: example varieties of Chars. 5 and 11; Ad. 11)
Date Palm (*Phoenix dactylifera*)
Grapevine (*Vitis* L.) (Revision)
Guava (*Psidium guajava* L.) (Revision)
Kiwifruit (*Actinidia* Lindl.) (Partial revision: Characteristics 18, 25 and 49; addition of new char. after Char. 28 “Petiole: pubescence”)
*Macadamia *(Macadamia integrifolia* Maiden et Betche, *Macadamia tetraphylla* L.A.S. Johnson) (Revision)
*Physic Nut (*Jatropha curcas* L.)
Sweet Cherry (*Prunus avium* L.) (Revision)

127. The leading experts, interested experts and timetables for the development of the Test Guidelines are set out in Annex V of this report.

(c) Possible Test Guidelines to be discussed in 2019

128. A list of Test Guidelines the TWF agreed to possibly discuss at its session in 2019 is presented in Annex V of this report.

Information and databases

UPOV information databases

129. The TWF considered document TWP/1/4.

GENIE database

130. The TWF noted that a specification document explaining the data structure and functions of the GENIE database was being developed by the Office of the Union in order that IT related maintenance could be provided in the future.

UPOV code system

131. The TWF noted that:

(a) 173 new UPOV codes had been created in 2016 and that a total of 8,149 UPOV codes were included in the GENIE database.

(b) the Office of the Union had received a request from the OECD to create new UPOV codes for 191 forest-tree species moving in international trade under the OECD certification schemes.

(c) the TC, at its fifty-third session, had agreed that it would not be appropriate to revise the Guide to the UPOV Code System in relation to the principal botanical name for inter-generic and interspecific hybrids, as set out in document TWP/1/4, paragraph 18.

(d) the TC had noted that, in order to avoid any misinterpretation, the CPVO would make it clear that the information provided to the Office of the Union would be in alphabetical order.

132. The TWF noted the invitation to check the amendments to UPOV codes, the new UPOV codes or new information added for existing UPOV codes, and the UPOV codes used in the PLUTO database for the first time, which were provided in Annex II of document TWP/1/4. The TWF noted that comments were to be submitted to the Office of the Union by October 31, 2017.

PLUTO database

133. The TWF noted the summary of contributions to the PLUTO database from 2013 to 2016 and the current situation of members of the Union on data contribution, as presented in document TWP/1/4, Annex I.

134. The TWF noted that the WG-DEN, at its third meeting, held in Geneva on April 7, 2017, agreed that agenda item 5 “Expansion of the content of the PLUTO database” would be considered at a later meeting on the basis of the document presented at its second meeting.

Variety description databases

135. The TWF considered document TWP/1/2.

136. The TWF noted the information on presentations on databases made at the BMT, TWC and TWV at their sessions in 2016, and that the expert from Germany had offered to report on the potato database currently under development within European Union to the TWV, at its session in 2017.

137. The TWF noted that the TC had agreed that UPOV would be able to facilitate cooperation in the establishment of common databases containing molecular information by the provision of training and sharing of information. It further noted that the TC had agreed on the value of inviting the contribution of breeders and academic institutions to UPOV’s work on the constitution and maintenance of databases.

138. The TWF noted that the TC had agreed to request the Office of the Union to collect data on existing databases with morphological and/or molecular data. The TWF noted that information collected could be included in the GENIE database, subject to the availability of resources for the modification of the GENIE database.

139. The TWF noted the work done by France for the GEMMA Database for Peach and agreed that the initial step before building any database should be to agree on the information to be shared, and the format to exchange and store the information.

Exchange and use of software and equipment

140. The TWF considered document TWP/1/5.

141. The TWF noted that the Council, at its fiftieth ordinary session, held in Geneva, on October 28, 2016, had adopted document UPOV/INF/16/6 “Exchangeable Software”, with the deletion of the SIVAVE software.

142. The TWF noted that the TC, at its fifty-third session, had agreed that the proposed revision of document UPOV/INF/16/6 in conjunction with the comments of the TC, as set out in Annex I of document TWP/1/5, be reported to the CAJ at its seventy-fourth session, on October 23 and 24, 2017 and, if agreed by

the CAJ, that a draft document UPOV/INF/16/7 “Exchangeable Software” would be presented for adoption by the Council at its fifty-first ordinary session, on October 26, 2017, on that basis.

143. The TWF noted that the TC had agreed that the information presented in document UPOV/INF/16 should be made available in a searchable form on the UPOV website, and had noted that the Office of the Union would investigate a tool for that purpose.

Electronic application systems

144. The TWF considered document TWP/1/3 and noted the developments concerning the development of an electronic application form.

145. The TWF received a presentation on the “UPOV PBR Application Tool - Electronic Application Form (EAF) - Report to Technical Working Parties” by the Office of the Union and a demonstration of the new features of the tool, available at: http://www.upov.int/upoveaf/en/tutorials.html.

146. The TWF noted that Version 1 of the EAF had been available online since January 2017 at http://www.upov.int/upoveaf, and that a new Version 1.1 has been released in July 2017, offering the possibility for users to submit PBR application data in more authorities. The TWF noted that a future version (Version 2.0) would contain more functionalities (e.g. payment options and link to the Genie Database information) and would cover more authorities and more crops.

147. The TWF agreed on the need to communicate more about the UPOV PBR Application Tool and to invite the authorities in charge of DUS examination to publicize the EAF, using communication tools available (e.g. leaflet in different languages, posters, link to the EAF on their website).

148. The TWF noted that the EAF tool is offering advantages for PVP Offices in term of accuracy of data and cost efficiency for the management of the applications, and suggested to welcome any proposal from PVP Offices participating in the EAF to think about new proposals to support the cost of the tool.

149. The TWF noted the comment made by the expert from the European Union on the possibility in the future to exchange application data in both ways, meaning from the EAF tool to the PVP Offices but also from the PVP Offices to the EAF tool. This functionality would allow the applicant to retrieve application data to submit in other countries and regions.

Experiences with new types and species

150. The TWF received a presentation on Guarana (*Paullinia cupana* Kunth) by an expert from Brazil. A copy of this presentation will be provided in document TWF/48/3.

Molecular Techniques

151. The TWF considered documents TWP/1/7 and TWF/48/2.

Developments in the TC, the TWPs and the BMT in 2016

152. The TWF noted the report on developments in the TC, the TWPs and the BMT, as set out in document TWP/1/7, paragraphs 5 to 24.

OECD/UPOV/ISTA/AOSA Joint Workshop on Molecular Techniques

153. The TWF noted that a Joint OECD/UPOV/ISTA/AOSA Workshop on Biochemical and Molecular Methods had been held in Paris on June 8, 2016, and that the recommendations of the Joint OECD/UPOV/ISTA/AOSA Workshop, as reproduced copied below, had been approved by the Annual Meeting of the OECD Seed Schemes, held in Paris on June 9 and 10, 2016:

(a) “To develop a joint document explaining the principal features (e.g. DUS, variety identification, variety purity, etc.) of the systems of OECD, UPOV, AOSA and ISTA and, for mutual understanding, to repeat the joint workshop at relevant meetings of the OECD and ISTA;

(b) "To carry out a joint inventory by UPOV, OECD, AOSA and ISTA of the use of molecular marker techniques, by crop, with a view to developing a document containing that information. The OECD will contribute to the document by sharing the ongoing list of molecular techniques used by National Designated Authorities (NDAs) and continuously collected by the Secretariat;

(c) "To develop a list of terms and their definitions as used by OECD, UPOV, AOSA and ISTA and to make an attempt to harmonize these;

(d) "To consider organizing another similar workshop in three years' time; and

(e) "To consider replacing the term used in the OECD Seed Schemes for the status of DNA based techniques from "internationally validated" to another term such as "internationally harmonized."

Presentation of information on the situation in UPOV with regard to the use of molecular techniques

154. The TWF noted that the following question and answer (FAQ) concerning the information on the situation in UPOV with regard to the use of molecular techniques for a wider audience, including the public in general, had been adopted by the Council, at its fiftieth ordinary session held in Geneva on October 28, 2016:

"Is it possible to obtain protection of a variety on the basis of its DNA-profile?

"For a variety to be protected, it needs to be clearly distinguishable from all existing varieties on the basis of characteristics that are physically expressed, e.g. plant height, time of flowering, fruit color, disease resistance etc. The DNA-profile is not the basis for obtaining the protection of a variety, although this information may be used as supporting information.

"A more detailed explanation is provided in the FAQ 'Does UPOV allow molecular techniques (DNA profiles) in the examination of Distinctness, Uniformity and Stability ('DUS')?

"See also: 'What are the requirements for protecting a new plant variety?'"

155. The TWF noted that the TC, at its session in 2017, had agreed that possible future collaboration between UPOV, the Organization for Economic Co-operation and Development (OECD) and the International Seed Testing Association (ISTA) might include the harmonization of terms and methodologies used for different crops and the possible development of standards, after agreement by those organizations.

156. The TWF noted that a first practical workshop "DNA Techniques and Variety Identification" had been held in Roelofarendsveen, Netherlands, from May 8 to 10, 2017, and that a second practical workshop was planned for September 20 to 22, 2017.

157. The TWF noted that the TC had agreed that UPOV and the OECD should consider making progress in collaboration on the matters above if ISTA was unable to participate in the near future.

158. The TWF noted that the TC had agreed to propose that the meetings of the BMT be held on an annual basis and that consideration be given to organizing the sessions of the TWC and BMT back-to-back in the same location to facilitate exchange of information.

159. The TWF noted the comment made by an expert from the European Union on a possible project in the European Union on the use of molecular techniques in relation to mutant varieties in apple, in order to link the phenotype with the genotype. The TWF welcomed the proposal to report, if appropriate, on the latest developments on this project at its next session.

Date and place of the next session

160. At the invitation of Chile, the TWF agreed to hold its forty-ninth session in Santiago de Chile, Chile, from November 19 to 23, 2018, with the preparatory workshop on the morning of November 19, 2018.

Chairperson

161. The TWF thanked Mr. Katsumi Yamaguchi for his chairmanship and noted that he was awarded a UPOV bronze medal in recognition of his chairmanship of the TWF from 2015 to 2017.

Future program

162. The TWF proposed to discuss the following items at its next session:

1. Opening of the Session

2. Adoption of the agenda

3. Short reports on developments in plant variety protection

   (a) Reports from members and observers (written reports to be prepared by members and observers

   (b) Reports on developments within UPOV (oral report by the Office of the Union)

4. Molecular Techniques (document to be prepared by the Office of the Union)

5. TGP documents (documents to be prepared by the Office of the Union)

6. Variety denominations (document to be prepared by the Office of the Union)

7. Information and databases

   (a) UPOV information databases (documents to be prepared by the Office of the Union)

   (b) Variety description databases (documents to be prepared by the Office of the Union)

   (c) Exchangeable software (document to be prepared by the Office of the Union)

   (d) Electronic application systems (document to be prepared by the Office of the Union)

8. Experiences with new types and species (oral reports invited)

9. Management of variety collections (presentations by the Netherlands, France and China and oral reports invited)

10. DUS examination of mutant varieties of apple (document to be prepared by the European Union)

11. Impact of revisions of states of expression of existing characteristics in the revision of Test Guidelines (document to be prepared by France and presentations invited)

12. Review of the proposal for guidance for the development of grids for shape illustration in Test Guidelines (document to be prepared by Germany and New Zealand)

13. Matters relevant in DUS examination for the fruit sector (presentations invited from members of the Union)

14. Guidance for drafters of Test Guidelines

15. Matters to be resolved concerning Test Guidelines adopted by the Technical Committee

16. Proposals for partial revision/corrections of Test Guidelines

17. Discussion on draft Test Guidelines (Subgroups)

18. Recommendations on draft Test Guidelines

19. Date and place of the next session

20. Future program

21. Adoption of the Report of the session (if time permits)

22. Closing of the session

Visit

163. During the afternoon of September 21, 2017, the TWF visited the Summerland Research and Development Centre, Agriculture and Agri-Food Canada, in Summerland, British Columbia. The TWF was welcomed by Ms. Erin Wallich, Research Project Administrator, Summerland Varieties Corp. (SVC). The TWF received a presentation by Ms. Wallich on the activities of SVC, a copy of which is provided in Annex III to this document. The TWF further received a presentation by Mr. Chris Pagliocchini, Biologist, Tree Fruit Germplasm Development, Agriculture and Agri-Food Canada, Summerland Research and Development Center, on the sweet cherry and apple breeding program of Agriculture and Agri-Food Canada. A copy of the presentation is provided in Annex IV to this document. The TWF visited apple and cherry orchards of different selection stages of the apple and cherry breeding programs, as well as the apple germplasm repository. During the visit to the orchards, the TWF was guided by Mr. Chris Pagliocchini and Mr. Nick Ibuki, Operations Manager, SVC.

164. The TWF adopted this report at the end of the session.

[Annexes follow]

ANNEX I

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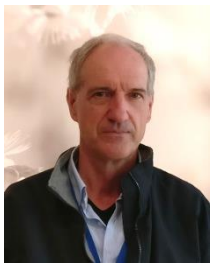

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III. ORGANIZATIONS

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Jean MAISON (Mr.), Acting Chair on Monday, September 18, 2017

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[Annex II follows]


Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments
Overview - Canada's Fruit Sector and PBR Office
UPOV 48th TWF – 2017/09/18
Kelowna, Canada
Canada
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Welcome to Kelowna!

Canadian Agriculture

Canadian Agriculture

Agriculture & Agri-food System (AAFS)

- Generates $108.8 billion annually, 6.6% GDP (2014)
- 1 in 8 jobs linked to the sector
- Canada is the 5th largest exporter of agri-products globally

Horticulture

- $5 billion in direct farm receipts (2015)

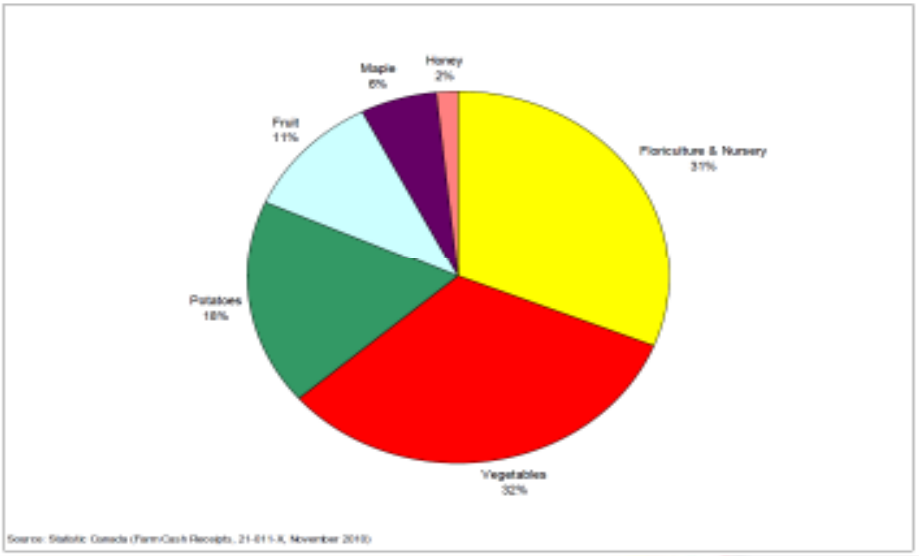
Ornamental/nursery

- $14.5 billion in economic output (2009)
- Employees 110,750 full time equivalent jobs

Seed Industry

- $5.6 billion in economic output (2014)
- $120 million private sector annual investment plant breeding (2017)

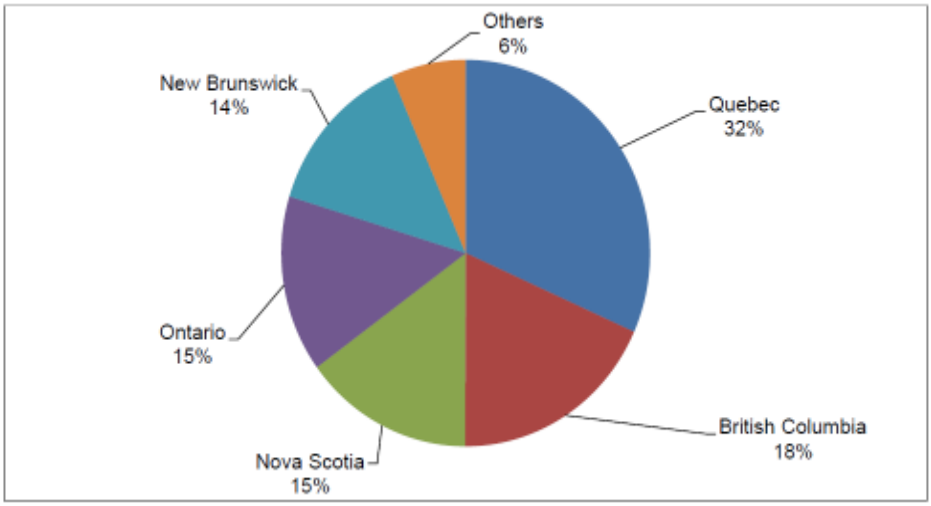
Canadian Horticulture/Products by Sector (2009)



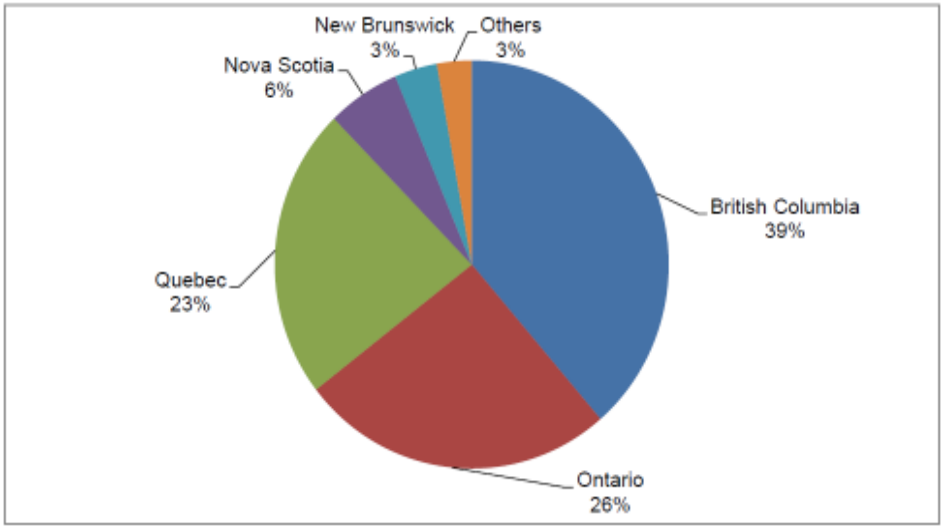
Canadian Fruit Crops – Cultivated Area (2016)

	2012	2013	2014	2015	2016
Blueberries[2]	72,657	73,445	73,704	77,129	79,515
Apples	17,154	17,284	17,661	17,594	17,377
Grapes[3]	12,283	12,355	12,643	12,360	12,480
Cranberries	6,489	7,121	7,143	7,316	7,402
Strawberries	4,064	3,694	3,458	3,650	3,789
Peaches	2,758	2,491	2,308	2,483	2,567
Raspberries	2,518	2,352	2,294	2,201	2,076
Cherries, sweet	1,614	1,563	1,569	1,614	1,793
Cherries, sour	1,064	1,028	1,015	996	1,027
Saskatoon berries	1,174	1,015	950	964	1,015
Pears	746	707	626	726	777
Plums and prunes	487	443	425	550	585
Nectarines	376	330	306	340	336
Apricots	100	96	91	100	113
Other fruits	..	..	511	472	554
Total	**123,484**	**123,924**	**124,704**	**128,495**	**131,406**

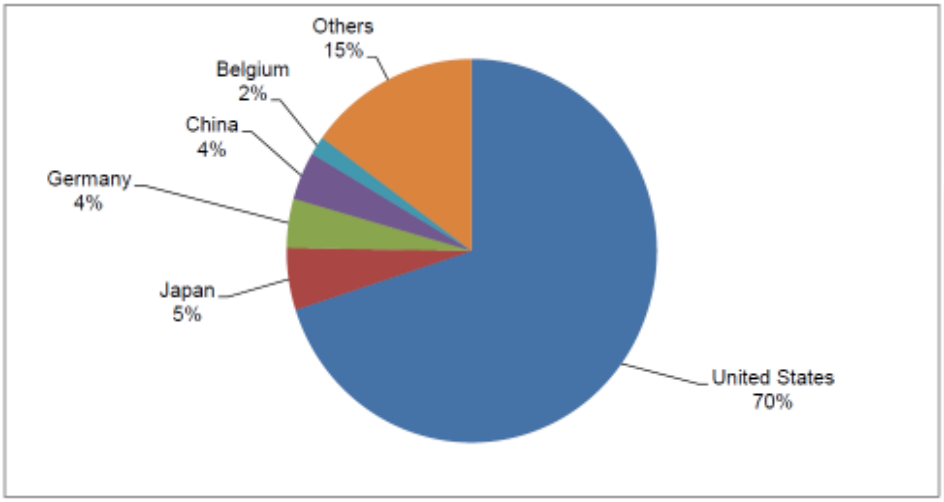
Fruit Crop Cultivation by Region (2016)



Fruit Crop Value by Region (2016)



Canadian Fruit Crop Export Markets (2016)

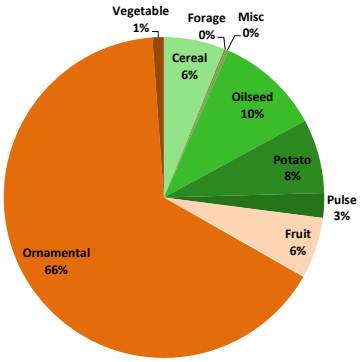


Trends since UPOV'91

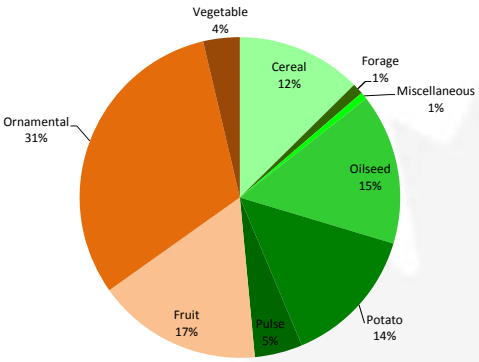
- The number of agricultural varieties seeking PBR protection appears to be increasing:
  - UPOV'78/*PBR Act* average = 93/year
  - UPOV'91/*PBR Act* average = 123/year (32% increase)
- The overall number of potato applications is increasing:
  - UPOV'78/*PBR Act* average = 26/year
  - UPOV'91/*PBR Act* average = 40/year (54% increase)
- Ornamental applications have been decreasing, but vegetable has been increasing
- Fruit crop diversity appears to be increasing.

Recent Trends

All applications since 1992

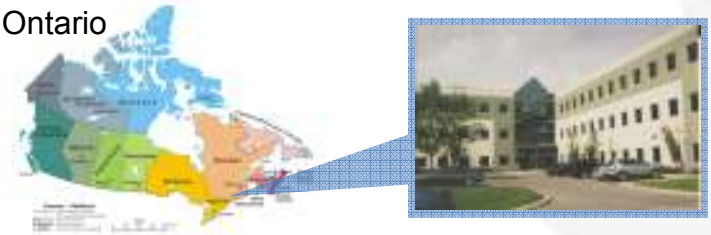


Applications for 2016



Canadian PBR System

- The PBR Office
  - The *PBR Act* is administered by the Commissioner and Examiners of the PBR Office, contained within the Canadian Food Inspection Agency (CFIA)
  - PBR Office is located at 59 Camelot Dr., Ottawa, Ontario



Canadian PBR System

- The PBR Office
  - Anthony Parker - Commissioner
  - Michel Cormier - Senior Examiner
  - Elizabeth Prentice-Hudson – Senior Examiner
  - Ashley Balchin (Maternity leave) – Examiner
  - Renée Cloutier - Examiner
  - Jennifer Roach - Examiner
  - Lisa LeDuc - Examiner
  - Marc de Wit - Examiner

Canadian PBR System

- Canadian PBR Framework

Application Phase	Examination Phase	Grant of Rights Phase
• Complete and submit application form with required attachments (origin and breeding history; statement of DUS along with authorization of agent form and / or assignment form, as needed • Submit seed sample for seed reproduced varieties only	• 1 or 2 growing seasons of trials depending on variety (agricultural vs horticultural) • complete Test Guideline (one copy per growing season and combined over 2, if applicable) using data from plants examined by PBR Office OR • Purchase DUS test report from other UPOV member country, if possible • Draft description and publication in the Plant Variety Journal (PVJ)	• After 6 month (PVJ publication) and confirmation of rights information – Rights Granted • Annual renewal of rights

Canadian PBR System

- Canadian PBR Framework

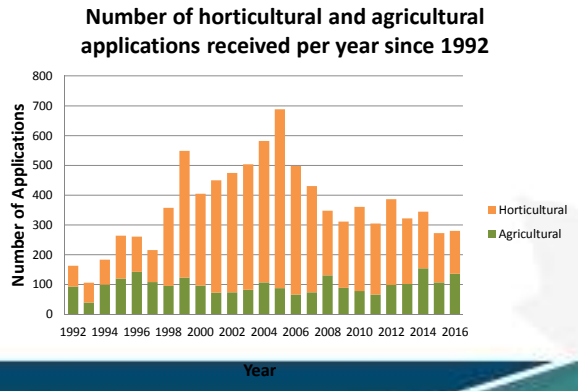
Application Phase

- Collect filing fee $250
- Determine suitability of the Denomination (variety name)
- Validate Origin and Breeding History
- Review information on prior sales and/or prior applications in other countries
- Verify appropriateness of Reference Varieties (suggest changes)
- Share Test Guidelines and answer any questions

Canadian PBR System

- Canadian PBR Framework

Application Phase



Canadian PBR System

- Top 10 applications/crop group

Top 10 Agricultural Applications Filed	
Variety	Applications filed
Potato	684
Canola	587
Soybean	287
Wheat	275
Pea	163
Barley	155
Oat	84
Flax	47
Corn	31
Bean	29

Top 10 Ornamental Applications Filed	
Variety	Applications filed
Rose	591
Pelargonium	580
Chrysanthemum	541
Impatiens	541
Calibrachoa	342
Petunia	331
Verbena	266
Poinsettia	257
Osteospermum	165
Dahlia	109

Top 10 Fruit and Vegetable Applications Filed	
Variety	Applications filed
Strawberry	139
Apple	135
Raspberry	43
Cherry	40
Blueberry	36
Grapevine	26
Pear	23
Blue Honeysuckle	19
Lettuce	18
Black Currant	17

Agriculture

Horticulture

Canadian PBR System

- Canadian PBR Framework

Examination Phase

- Examiner from PBR Office visits <u>all</u> trials to confirm they are conducted properly (in accordance with UPOV test guidelines) and that the new variety is distinct & uniform
- Examiner takes observations, measurements and notes on the distinguishing characteristics and assess the appropriateness of the reference varieties




Canadian PBR System

- Canadian PBR Framework

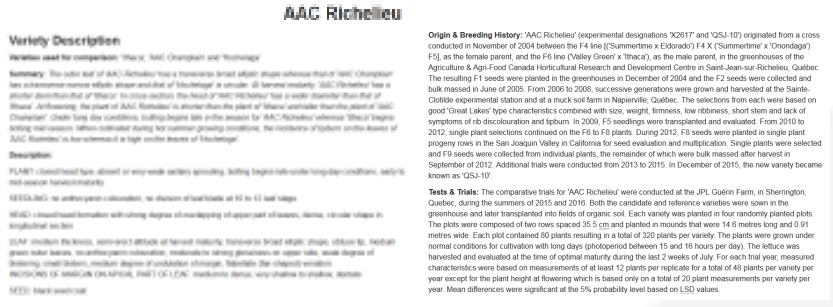
Examination Phase

- Breeder/trial coordinator submits completed variety description and comparative photos to PBR Office
- Submitted information is compared to Examination Report by the PBR Office
- Description is drafted based on the submitted information and is validated by the breeder/trial coordinator
- Description published in *Plant Variety Journal* for a period of 6 months, as mandated by legislation, for peer review and possible objections

Canadian PBR System

- Canadian PBR Framework

Examination Phase



AAC Richelieu

Variety Description

Origin & Breeding History: 'AAC Richelieu' (experimental designations 'X2617' and 'QSJ-10') originated from a cross conducted in November of 2004 between the F4 line [('Summertime x Eldorado') F4 X ('Summertime' x 'Onondaga') F5], as the female parent, and the F6 line ('Valley Green' x 'Ithaca'), as the male parent, in the greenhouses of the Agriculture & Agri-Food Canada Horticultural Research and Development Centre in Saint-Jean-sur-Richelieu, Québec. The resulting F1 seeds were planted in the greenhouses in December of 2004 and the F2 seeds were collected and bulk massed in June of 2005. From 2006 to 2008, successive generations were grown and harvested at the Sainte-Clotilde experimental station and at a muck soil farm in Napierville, Québec. The selections from each were based on good 'Great Lakes' type characteristics combined with size, weight, firmness, low ribbiness, short stem and lack of symptoms of rib discolouration and tipburn. In 2009, F5 seedlings were transplanted and evaluated. From 2010 to 2012, single plant selections continued on the F6 to F8 plants. During 2012, F8 seeds were planted in single plant progeny rows in the San Joaquin Valley in California for seed evaluation and multiplication. Single plants were selected and F9 seeds were collected from individual plants, the remainder of which were bulk massed after harvest in September of 2012. Additional trials were conducted from 2013 to 2015. In December of 2015, the new variety became known as 'QSJ-10'.

Tests & Trials: The comparative trials for 'AAC Richelieu' were conducted at the JPL Guérin Farm, in Sherrington, Quebec, during the summers of 2015 and 2016. Both the candidate and reference varieties were sown in the greenhouse and later transplanted into fields of organic soil. Each variety was planted in four randomly planted plots. The plots were composed of two rows spaced 35.5 cm and planted in mounds that were 14.6 metres long and 0.91 metres wide. Each plot contained 80 plants resulting in a total of 320 plants per variety. The plants were grown under normal conditions for cultivation with long days (photoperiod between 15 and 16 hours per day). The lettuce was harvested and evaluated at the time of optimal maturity during the last 2 weeks of July. For each trial year, measured characteristics were based on measurements of at least 12 plants per replicate for a total of 48 plants per variety per year except for the plant height at flowering which is based only on a total of 20 plant measurements per variety per year. Mean differences were significant at the 5% probability level based on LSD values.

Canadian PBR System

- Canadian PBR Framework

Examination Phase

AAC Richelieu

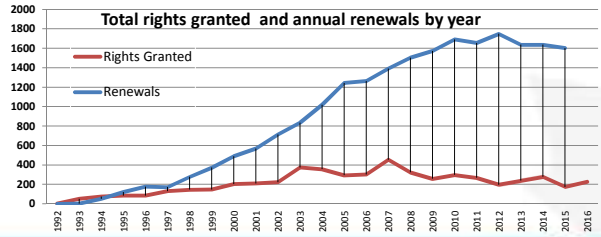
Comparison tables for 'AAC Richelieu' with reference varieties 'Ithaca', 'AAC Champlain' and 'Hochelaga'

Canadian PBR System

- Canadian PBR Framework

Grant of Rights Phase

- After the 6 month peer review period, rights are granted if no objections
- Rights are maintained by paying an annual maintenance fee of $300 (up to 20yrs, and 25yrs for tree and grapevine).



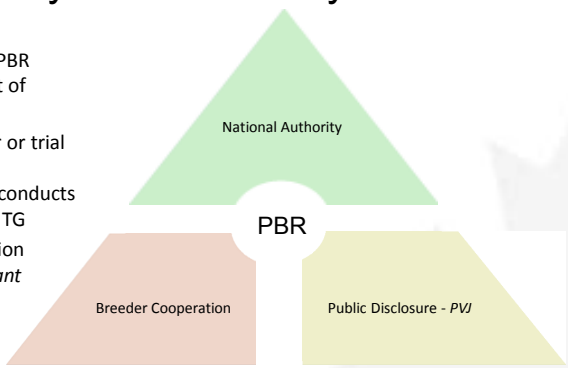
Canadian PBR System

- Canadian PBR system summary

National Authority - PBR Office conducts site examination and PBR Commissioner decides on Grant of Rights

Breeder Cooperation – breeder or trial coordinator provides detailed information on the variety and conducts DUS Testing in accordance with TG

Public Disclosure – all information about a variety is available – *Plant Varieties Journal (PVJ)* for public scrutiny and input



Thank You!
Questions?

[Annex III follows]

Summerland Varieties Corp

We're in the business of growing

TECHNICAL VISIT PRESENTATION

Erin Wallich for Summerland Varieties Corp.

Presentation at UPOV TWF/48
September 20, 2017

SUMMERLAND, BRITISH COLUMBIA

AGRICULTURE AND AGRI-FOOD CANADA

APPLE AND CHERRY BREEDING PROGRAM

- Program started in 1924
- Developed sweet cherry varieties with high-value attributes
  - Self-fertile
  - Early and late harvest
- Cherry varieties include Stella, Lapins, Sweetheart, Santina, Skeena, Staccato™ cherry, Sentennial™ cherry
- Apple varieties include Spartan, Sunrise, Creston, Silken, Nicola, Aurora Golden Gala, Salish™ apple

ORIGIN OF SUMMERLAND VARIETIES CORP

- Opportunity to protect new varieties with PBR
- Incorporated in 1993
- Fully owned subsidiary of British Columbia Fruit Growers' Association (established in 1889)
- Originally named Okanagan Plant Improvement Corp (PICO)

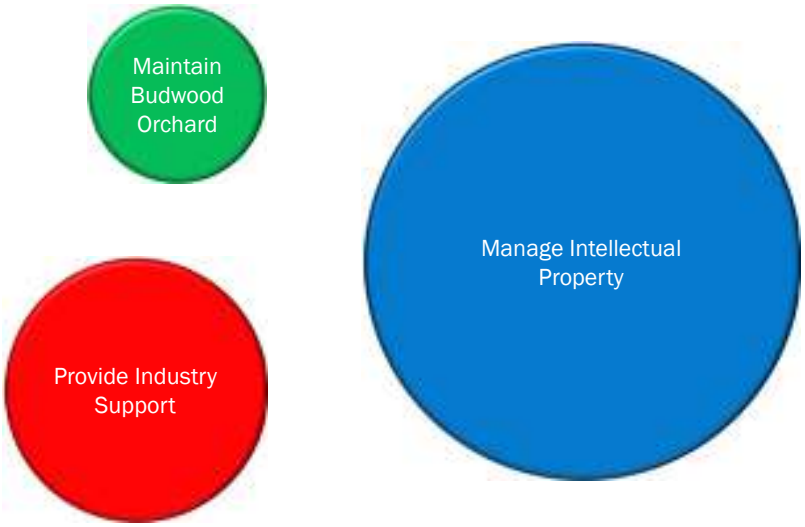
- Mandate to protect and commercialize new varieties to enhance grower returns and contribute to the viability of the fruit industry in Canada

SVC HIGH-VALUE VARIETIES

Staccato™ cherries
Sentennial™ cherries

Ambrosia apples

SVC BUSINESS



SVC BUDWOOD ORCHARD

- Certified virus-free
- Inventory for commercial propagation
- Export and import of plant material
- Repository for unique varieties

INDUSTRY SUPPORT

- Testing and developing new varieties
- Funding research programs
- Subsidising industry initiatives
- Grower support services

IP MANAGEMENT

- Filing for Plant Breeders' Rights, patents and trademarks
- Licensing domestic and global partners
- Royalty collection
- Compliance

[Annex IV follows]

Summerland Research and Development Centre

Sweet Cherry and Apple Breeding Program

Brief History of the Program

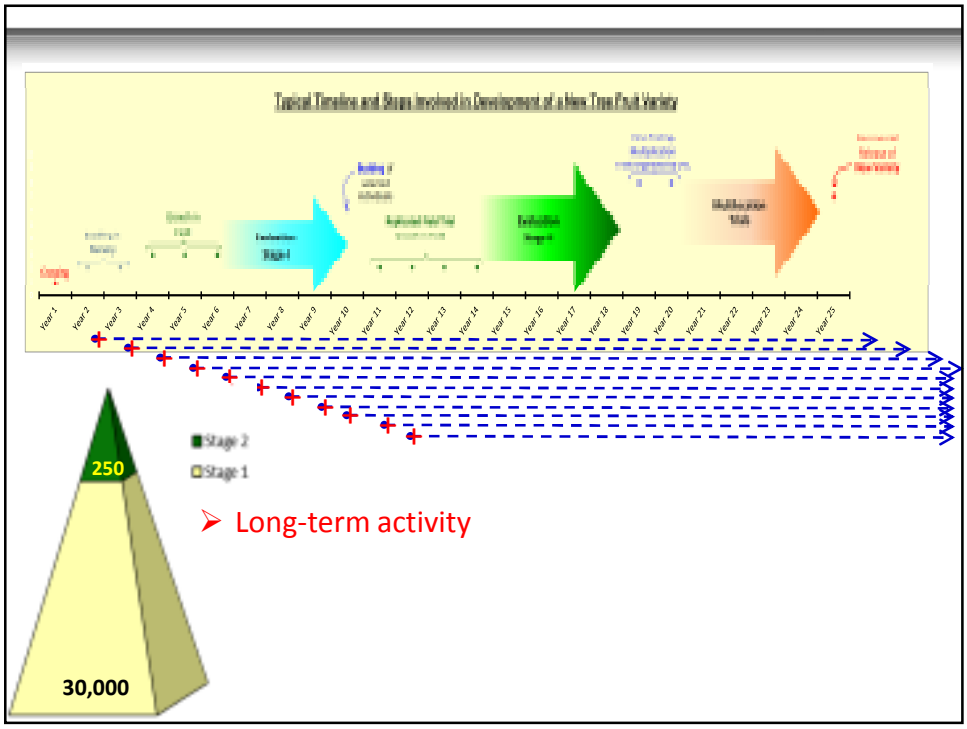
- Apple breeding started in 1924
  - Spartan
  - Sunrise
  - Aurora Golden Gala
- Cherry breeding started in 1936
  - Stella
  - Lapins
  - Sweetheart
  - Staccato

Sweet Cherry and Apple Breeding Program at SRDC

- Approx. 24 acres: 13 cherry and 11 apple
- First two stages of selection are done on site
- All cultivar finishing done by industry: on-farm testing across Canada, cultivar protection, global testing/ distribution, commercialization and licensing
- 98% of research funding from industry since 2009, but staff salaries and science facilities provided by AAFC
- We also collaborate with other researchers at SuRDC, Kentville RDC, VRIC, etc. on various projects

Breeding Goals

- Fruit quality (paramount)
- Post-harvest attributes
- Tree growth habit
- Disease resistance
- Climatic adaptation
- Productivity
- Fruit size
- Crop-specific goals, e.g. self-fertility in cherries


Typical Timeline and Steps Involved in Development of a New Tree Fruit Variety
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8
Year 9
Year 10
Year 11
Year 12
Year 13
Year 14
Year 15
Year 16
Year 17
Year 18
Year 19
Year 20
Year 21
Year 22
Year 23
Year 24
Year 25
250
30,000
Stage 2
Stage 1
Long-term activity


Pollination

Stage 1 ("Seedling")

- Trees planted at high densities in field nursery

Buds from each nursery tree are direct-budded onto rootstock Discard poor nursery trees (mildew, low vigor).

>>>

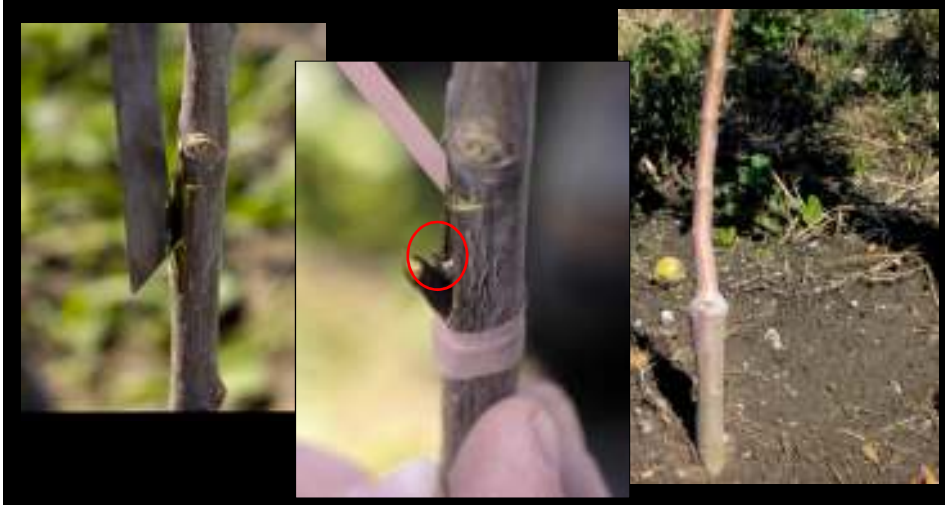
<< 3 years in nursery

Trees are juvenile at this stage (no reproduction = no apples)

Each nursery tree is budded in-place onto M.9 rootstock (one tree of each, ~3000 types annually).

Evaluate Stage 1

Back to the Nursery



Selections (Stage 2)

Stage 3 History

- Released to licensee (SVC) to arrange on-farm testing in BC, ON, QC, NS.
- Still unknown at this stage:
  - Packing line issues
  - Consumer response (limited)
  - Response to other climates and different types of management e.g. winter hardiness, specific diseases

Evaluate

Marker-Assisted Breeding

- Markers are currently available for a limited number of genes e.g. ethylene genes, some disease-resistance genes, red-flesh trait, columnar tree habit, acidity, etc.
- They can be used at greenhouse phase to cull relevant populations.
- Resources are required to do this. Must complete work between March and mid-May
- Decide: plant fewer trees or same number but better trees (cost implications)

Export Revenue, BC Cherries

- Most of 1990s: **CDN $500,000**
- In 2014: **CDN $49,000,000**

- Largely attributable to the production of late-season cherries developed by our breeding program
- Strong industry uptake of AAFC cherry cultivars: ≥90% of cherry acreage in BC planted to Summerland cultivars
- Most of the new plantings in the world are also in Summerland cherry cultivars

[Annex V follows]

ANNEX V

LIST OF LEADING EXPERTS

DRAFT TEST GUIDELINES TO BE SUBMITTED TO THE TECHNICAL COMMITTEE IN 2018

All requested information to be submitted to the Office of the Union

by November 3, 2017

Species	Basic Document(s)	Leading expert(s)
Black Walnut (*Juglans nigra* L.)	TG/JUGLA(proj.3)	Ms. Victoria Colombo (ES)
*Japanese Plum (*Prunus salicina* Lindl.) (Partial revision: Characteristic 42)	TG/84/4 Corr., TWF/48/12	Ms. Urszula Braun-Mlodecka (QZ)

DRAFT TEST GUIDELINES TO BE DISCUSSED AT TWF/49
(* indicates possible final draft Test Guidelines)

(Guideline date for Subgroup draft to be circulated by Leading Expert: August 10, 2018
Guideline date for comments to Leading Expert by Subgroup: September 7, 2018)

New draft to be submitted to the Office of the Union
before October 5, 2018

Species	Basic Document(s)	Leading expert(s)	Interested experts (States/Organizations) [1]
Apricot (*Prunus armeniaca* L.) (Revision)	TG/70/5(proj.1)	Mr. Hennie Venter (ZA)	AU, BG, CN, CZ, ES, FR, HU, IL, JP, KR, MA, NZ, PL, QZ, RO, CIOPORA, Office
Almond (*Prunus amygdalus* Batsch) (Partial revision: Characteristic 43)	TG/56/4	Ms. Victoria Colombo (ES)	CN, CZ, QZ, CIOPORA, Office
Apple (fruit varieties) (Revision) (*Malus domestica* Borkh.)	TG/14/9	Mr. Erik Schulte (DE)	AU, BR, CA, CN, CZ, FR, HU, JP, KR, MX, NL, NZ, PL, QZ, ZA, CIOPORA, Office
Argania (*Argania spinosa* (L.) Skeels)	TG/ARGAN(proj.2)	Ms. Ibtihaj Belmehdi (MA)	IL, Office
*Blueberry (*Vaccinium angustifolium* Aiton; *V. corymbosum* L.; *V. formosum* Andrews; *V. myrtilloides* Michx.; *V. myrtillus* L.; *V. virgatum* Aiton; *V. simulatum* Small) (Revision)	TG/137/5(proj.3)	Mr. Nik Hulse (AU)	BR, CA, CZ, DE, IT, JP, KR, MX, NZ, PL, PT, QZ, RO, ZA, CIOPORA, Office
Coconut (*Cocos nucifera* L.) (Partial revision: example varieties of Chars. 5 and 11; Ad. 11)	TG/314/1	Ms. Stefânia Palma Araujo (BR)	MX, Office
Date Palm (*Phoenix dactylifera*)	TG/PHOEN_DAC (proj.1)	Mr. Rashid Al-Yahyai (OM)	BR, IL, MA, MX, TN, Office
Grapevine (*Vitis* L.) (Revision)	TG/50/9	Mr. Luca Aggio (IT)	AU, BR, CA, CN, CZ, DE, ES, FR, HU, JP, KR, MX, NZ, QZ, ZA, CIOPORA, Office
Guava (*Psidium guajava* L.) (Revision)	TG/110/3	Ms. Ling Gao (CN)	BR, MX, QZ, Office
Kiwifruit (*Actinidia* Lindl.) (Partial revision: Characteristics 18, 25 and 49; addition of new char. after Char. 28 “Petiole: pubescence”)	TG/98/7	Mr. Chris Barnaby (NZ)	AU, CN, IT, JP, KR, QZ, CIOPORA, Office
*Macadamia *(Macadamia integrifolia* Maiden et Betche, *Macadamia tetraphylla* L.A.S. Johnson) (Revision)	TG/111/4(proj.3)	Mr. Nik Hulse (AU)	BR, KE, MX, ZA, Office
*Physic Nut (*Jatropha curcas* L.)	TG/JATRO_CUR (proj.2)	Mr. Alejandro Barrientos-Priego (MX)	BR, IL, QZ, Office
Sweet Cherry (*Prunus avium* L.) (Revision)	TG/35/7	Ms. Carensa Petzer (ZA)	AU, BG, CA, CZ, ES, FR, HU, IT, JP, KR, NZ, PL, QZ, RO, SK, CIOPORA, Office

[1] for name of experts, see List of Participants

Possible Test Guidelines To Be Discussed In 2019

Species	Basic Document(s)
Carambola (*Averrhoa carambola* L.)	NEW
Pistachio (*Pistacia* L.)	TG/PISTA(proj.2)
Pear hybrids	TG/PYRUS(proj.2)
Sour Cherry (*Prunus cerasus* L.); Duke Cherry (*Prunus ×gondouinii* (Poit. & Turpin) Rehder) (Revision)	TG/230/1
Strawberry (*Fragaria* L.)	TG/22/10 Rev.

[End of Annex V and of document]