CPVO · OCVV
Community Plant Variety Office
Office Communautaire des Variétés Végétales

PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

Vaccinium L.

BLUEBERRY

UPOV Code: VACCI

Adopted on 07/10/2021

Entry into force on 07/10/2021

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CPVO-TP/137/2

1. SUBJECT OF THE PROTOCOL AND REPORTING

1.1 Scope of the technical protocol

This Technical Protocol applies to all blueberry varieties of *Vaccinium* L.

The protocol describes the technical procedures to be followed in order to meet the requirements of Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on documents agreed by the International Union for the Protection of New Varieties of Plants (UPOV), such as the General Introduction to DUS (UPOV Document TG/1/3 http://www.upov.int/export/sites/upov/resource/en/tg_1_3.pdf), its associated TGP documents (http://www.upov.int/tgp/en/) and the relevant UPOV Test Guideline TG/137/5 dated 14.06.2019 (https://www.upov.int/edocs/tgdocs/en/tg137.pdf) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **07.10.2021**. Any ongoing DUS examination of candidate varieties for which the first growing cycle for the purpose of observations has started (following the adequate period of establishment) before the aforesaid date will not be affected by the approval of the Technical Protocol.

Technical examinations of candidate varieties are carried out according to the TP in force when the first growing cycle for the purpose of observations following the adequate period of establishment starts.

In cases where the Office requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process to be carried out at the moment of this request, such report can only be accepted if the technical examination has been carried out according to the CPVO TP which was in force at the moment when the first growing cycle for the purpose of observations following the adequate period of establishment started.

1.3 Reporting between Examination Office and CPVO and Liaison with Applicant

1.3.1 Reporting between Examination Office and CPVO

The Examination Office shall deliver to the CPVO a preliminary report ("the preliminary report") no later than two weeks after the date of the request for technical examination by the CPVO.

The Examination Office shall also deliver to the CPVO a report relating to each growing period ("the interim report") and, when the Examination Office considers the results of the technical examination to be adequate to evaluate the variety or the CPVO so requests, a report relating to the examination ("the final report").

The final report shall state the opinion of the Examination Office on the distinctness, uniformity and stability of the variety. Where it considers those criteria to be satisfied, or where the CPVO so requests, a description of the variety shall be added to the report. If a report is negative the Examination Office shall set out the detailed reasons for its findings.

The interim and the final reports shall be delivered to the CPVO as soon as possible and no later than on the deadlines as laid down in the designation agreement.

1.3.2 Informing on problems in the DUS test

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior permanent agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

1.3.3 Sample keeping in case of problems

If the technical examination has resulted in a negative report, the CPVO shall inform the Examination Office as soon as possible in case that a representative sample of any relevant testing material shall be kept.

2. MATERIAL REQUIRED

2.1 Plant material requirements

Information with respect to the agreed closing dates and submission requirements of plant material for the technical examination of varieties can be found on http://cpvo.europa.eu/en/applications-and-examinations/technical-examinations/submission-of-plant-material-s2-publication in the special issue S2 of the Official Gazette of the Office. General requirements on submission of samples are also to be found following the same link.

2.2 Informing the applicant of plant material requirements

The CPVO informs the applicant that

- he is responsible for ensuring compliance with any customs and plant health requirements.
- the plant material supplied should be visibly healthy, not lacking in vigour, nor affected by any important pest or disease.
- the plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

2.3 Informing about problems on the submission of material

The Examination Office shall report to the CPVO immediately in cases where the test material of the candidate variety has not arrived in time or in cases where the material submitted does not fulfil the conditions laid down in the request for material issued by the CPVO.

In cases where the examination office encounters difficulties to obtain plant material of reference varieties the CPVO should be informed.

3. METHOD OF EXAMINATION

3.1 Number of growing cycles

3.1.1 The duration of tests should be two independent growing cycles for the purpose of observation of characteristics following an adequate number of growing cycles for establishment of plants; at the end of each growing cycle for the purpose of observation of characteristics the competent authority will determine whether or not the following growing cycle is required.

In particular, it is essential that the plants produce a satisfactory crop of fruit in each of the two growing cycles.

The two independent growing cycles may be observed from a single planting, examined in two separate growing cycles.

3.1.2 The growing cycle is considered to be the duration of a single growing season, beginning with bud burst (flowering and/or vegetative), flowering and fruit harvest and concluding when the following dormant period ends with the swelling of new season buds.

3.1.3 The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test.

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 "Examining Distinctness" http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf.

3.3 Conditions for Conducting the Examination

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.4 Test design

3.4.1 Each test should be designed to result in a total of at least 5 plants.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 Special tests for additional characteristics

In accordance with Article 23 of Implementing Rules N° 874/2009 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

Special tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characters listed in the protocol.

3.6 Constitution and maintenance of a variety collection

The process for the constitution and the maintenance of a variety collection can be summarized as follows:

Step 1: Making an inventory of the varieties of common knowledge

Step 2: Establishing a collection ("variety collection") of varieties of common knowledge which are relevant for the examination of distinctness of candidate varieties

Step 3: Selecting the varieties from the variety collection which need to be included in the growing trial or other tests for the examination of distinctness of a particular candidate variety.

3.6.1 Forms of variety collection

The variety collection shall comprise variety descriptions and living plant material, thus a living reference collection. The variety description shall be produced by the EO unless special cooperation exists between EOs and the CPVO. The descriptive and pictorial information produced by the EO shall be held and maintained in a form of a database.

3.6.2 Living Plant Material

The EO shall obtain living plant material of reference varieties as and when those varieties need to be included in growing trials or other tests.

3.6.3 Range of the variety collection

The living variety collection shall cover at least those varieties that are suitable to climatic conditions of a respective EO.

3.6.4 Making an inventory of varieties of common knowledge for inclusion in the variety collection

The inventory shall include varieties protected under National and Community PBR, varieties of National Catalogues (where such catalogues exist) and varieties in trade or in commercial registers.
In addition to the above, the inventory shall be extended to the appropriate to:

- any commercial document in which varieties are marketed as propagating or harvested material, especially when there is no official registration system;
- any list including varieties which are publicly available within plant collections (varieties included in genetic resource collections, collection of old varieties, etc.);
- information provided by relevant plant experts;
- relevant example varieties referred to in the technical protocols.

3.6.5 Maintenance and renewal/update of a living variety collection

The EO shall maintain the variety collection under appropriate growing conditions (e.g. glasshouse, orchard, in vitro), where it shall be ensured that the plants are adequately irrigated, fertilised, pruned and protected from harmful pests and diseases. For the renewal of existing living material the identity of replacement living plant material shall be verified by conducting side-by-side plot comparisons between the material in the collection and the new material or by checking the identity of the new material against the variety description.

4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY

The prescribed procedure is to assess distinctness, uniformity and stability in a growing trial.

4.1 Distinctness

4.1.1 General recommendations

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 9 'Examining Distinctness' (http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf) prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in this Technical Protocol.

4.1.2 Consistent differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Technical Protocols are familiar with the recommendations contained in the UPOV-General Introduction to DUS prior to making decisions regarding distinctness.

4.1.4 Number of plants/parts of plants to be examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 5 plants or parts taken from each of 5 plants and any other observations made on all plants in the test, disregarding any off-type plants.

In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 3.

4.1.5 Method of observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the third column of the Table of Characteristics (see document TGP/9 "Examining Distinctness", Section 4 "Observation of characteristics"):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)
"Visual" observation (V) is an observation made on the basis of the expert's judgment. For the purposes of this document, "visual" observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. colour charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)
For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, "G" provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

4.2.1 It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 10 'Examining Uniformity' (http://www.upov.int/edocs/tgpdocs/en/tgp_10.pdf) prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in this Technical Protocol:

4.2.2 This Technical Protocol has been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation the recommendations in the UPOV-General Introduction to DUS and document TGP/13 "Guidance for new types and species", Section 4.5 "Testing Uniformity" should be followed.

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-type is allowed.

4.3 Stability

4.3.1 It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 11 'Examining Stability' (http://www.upov.int/edocs/tgpdocs/en/tgp_11.pd)

In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be further examined by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. GROUPING OF VARIETIES AND ORGANISATION OF THE GROWING TRIAL

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organise the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

a) Plant: vigour (characteristic 1)

b) Plant: growth habit (characteristic 2)

c) One-year-old shoot: colour (characteristic 3)

d) Infructescence: density (characteristic 20)

e) Plant: fruiting type (characteristic 32)

f) Time of beginning of flowering on one-year-old shoot (characteristic 34)

g) Time of beginning of flowering on current season's shoot (characteristic 35)

h) Time of beginning of fruit ripening on one-year-old shoot (characteristic 36)

i) Time of beginning of fruit ripening on current season's shoot (characteristic 37)

5.4 If other characteristics than those from the Technical Protocol are used for the selection of varieties to be included into the growing trial, the EO shall inform the CPVO and seek the prior consent of the CPVO before using these characteristics.

5.5 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the UPOV-General Introduction to DUS and document TGP/9 "Examining Distinctness".

6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS

6.1 Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in the table of characteristics. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted or by specific legislation on plant health. In the latter case, the CPVO should be informed.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N°874/2009, to insert additional characteristics and their expressions in respect of a variety.

6.2. States of expression and corresponding notes

In the case of qualitative and pseudo-qualitative characteristics, all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

Further explanation of the presentation of states of expression and notes is provided in UPOV document TGP/7 "Development of Test Guidelines".

6.3 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

Blueberry varieties require different numbers of chilling hours to ensure a sufficient amount of flowering and fruit set. Chilling hours are the number of hours below 45ºF (7ºC).
(H) - example variety with high chilling requirements (greater than 750 hours)
(L) - example variety with low chilling requirements (less than 600 hours)

6.4 Legend

For column 'CPVO N°':

G	Grouping characteristic	-see Chapter 5
QL	Qualitative characteristic	
QN	Quantitative characteristic	
PQ	Pseudo-qualitative characteristic	
(+)	Explanations for individual characteristics	-see Chapter 8.2

For column 'UPOV N°':
The numbering of the characteristics is provided as a reference to the UPOV guideline.
(*) UPOV Asterisked characteristic -Characteristics that are important for the international harmonization of variety descriptions.

For column 'Stage, method':

MG, MS, VG, VS		-see Chapter 4.1.5
(a)-(d)	Explanations covering several Characteristics	-see Chapter 8.1

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1. (+)	**1. (*)**	**VG**	**Plant: vigour**		
QN		**(a)**	very weak		1
			weak	Dolce Blue (L)	2
			medium	DrisBlueSeven (L)	3
			strong	Bluecrop (H)	4
G			very strong	Vernon (L)	5
2.	**2. (*)**	**VG**	**Plant: growth habit**		
QN		**(a)**	upright	Cargo (H), Ivanhoe (H), Spartan (H)	1
			semi-upright	Bluetta (H), Draper (H)	2
G			spreading	Blue Ribbon (H), Jersey (H)	3
3.	**3. (*)**	**VG**	**One-year-old shoot: colour**		
PQ		**(a)**	green	Puru (H)	1
			reddish yellow	Heerma (H)	2
			greenish red	Reka (H)	3
			greyish red	Berkeley (H)	4
			dark red	Aron (H)	5
G			reddish brown	Earliblue (H)	6
4. (+)	**4.**	**VG**	**One-year-old shoot: length of internode**		
QN		**(a)**	short	DrisBlueTen (H)	1
			medium	DrisBlueFifteen (H)	3
			long	DrisBlueSeven (L)	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
5.	**5. (*)**	**MG/VG**	**Leaf: length**		
QN		**(b)**	short	Darrow (H)	3
			medium	Bluecrop (H), Patriot (H)	5
			long	Berkeley (H), Collins (H), Toro (H)	7
6.	**6.**	**MG/VG**	**Leaf: width**		
QN		**(b)**	narrow	Emil (H), Heerma (H), Putte (H)	3
			medium	Ama (H), Bluecrop (H)	5
			broad	Berkeley (H), Collins (H)	7
7. (+)	**7. (*)**	**MG/VG**	**Leaf: ratio length/width**		
QN		**(b)**	low	Gretha (H)	3
			medium	Patriot (H)	5
			high	Heerma (H)	7
8. (+)	**8. (*)**	**VG**	**Leaf: shape**		
PQ		**(b)**	lanceolate	Weymouth (H)	1
			ovate	Puru (H)	2
			elliptic	Earliblue (H)	3
			oblong	Berkeley (H), Bluetta (H), Jersey (H)	4
9.	**9. (*)**	**VG**	**Leaf: colour of upper side**		
PQ		**(b)**	yellow	Geerdens (H)	1
			light green	Earliblue (H)	2
			medium green	Berkeley (H), Toro (H)	3
			dark green	Darrow (H), Weymouth (H)	4
10.	**10. (*)**	**VG**	**Leaf: margin**		
QL		**(b)**	entire	Blueray (H), Jersey (H)	1
			serrate	Brigitta (H), Rancocas (H)	2

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
11.	**11.**	**VG**	**Leaf: glaucosity on upper side**		
QN		**(b)**	absent or weak	Puru (H), Reka (H)	1
			medium	Dolce Blue (L), Magnolia (L)	2
			strong	Maru (L), Takahe (L)	3
12.	**12.**	**VG**	**Flower bud: anthocyanin coloration**		
QN		**(c)**	absent or very weak	Cipria (L), Hortblue Poppins (H), Palmetto (L)	1
			weak	Hele (H)	2
			medium	Patriot (H)	3
			strong	Bluecrop (H)	4
			very strong	Brigitta (H), Collins (H)	5
13. (+)	**13.**	**MS/VG**	**Inflorescence: length**		
QN		**(c)**	short	Bluetta (H), Collins (H)	1
			medium	Duke (H), Earliblue (H)	2
			long	Berkeley (H), Bluecrop (H)	3
14. (+)	**14.**	**VG**	**Flower: shape of corolla**		
PQ		**(c)**	globose	EB 12-19 (L), Farthing (L)	1
			ellipsoid		2
			cylindric	Reka (H)	3
			ovoid		4
			urceolate	Maru (L)	5
			campanulate	Magnolia (L), Velluto Blue (H), Victoria (L)	6
15.	**15.**	**VG**	**Flower: size of corolla tube**		
QN		**(c)**	small	Blueray (H)	1
			medium	Heerma (H)	3
			large	Collins (H)	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
16.	**16.**	**VG**	**Flower: colour of corolla tube**		
PQ		**(c)**	white	Bluetta (H), Ridley 1607 (L)	1
			whitish green	Blueray (H), Ridley 1403 (L)	2
			whitish yellow	Berkeley (H)	3
			whitish red	FL 96-43 (L), Tifblue (L)	4
17.	**17.**	**VG**	**Flower: anthocyanin coloration of corolla tube on outer side**		
QN		**(c)**	absent or very weak	Camellia (L)	1
			weak	Ama (H)	2
			medium	Gretha (H)	3
			strong	Bluecrop (H), Sunshine Blue (L)	4
			very strong		5
18. (+)	**18.**	**VG**	**Flower: conspicuousness of ridges on corolla tube**		
QN		**(c)**	absent or weak	Ventura (L)	1
			medium	Atlantic (H), Camellia (L)	2
			strong	Bluejay (H), Corona (L), FL 02-40 (L)	3
19.	**19.**	**VG**	**Flower: colour of receptacle**		
PQ		**(c)**	green		1
			pink		2
			red		3
			blue		4
20.	**20. (*)**	**VG**	**Infructescence: density**		
QN		**(d)**	sparse	Rahi (L)	3
			medium	Toro (H)	5
G			dense	Tifblue (L)	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
21. (+)	**21.**	**VG**	**Unripe fruit: intensity of green colour**		
QN			light	Heerma (H)	1
			medium	Ama (H)	3
			dark	Berkeley (H)	5
22.	**22. (*)**	**VG**	**Fruit: size**		
QN		**(d)**	very small	Emil (H), Putte (H), ZF08-095 (L)	1
			small	Ama (H)	3
			medium	Concord (H), Emerald (L)	5
			large	Darrow (H), FL05-627 (L)	7
23. (+)	**23. (*)**	**VG**	**Fruit: shape in longitudinal section**		
QN		**(d)**	elliptic	Northland (H)	1
			circular	Bluecrop (H), Jersey (H)	2
			oblate	Earliblue (H)	3
24.	**24.**	**VG**	**Fruit: attitude of sepals**		
QN		**(d)**	incurved	Delite (L)	1
			straight	Powderblue (L)	2
			reflexed	Tifblue (L)	3
25. (+)	**25.**	**VG**	**Fruit: diameter of calyx basin**		
QN		**(d)**	small	Blueray (H)	1
			medium	Bluecrop (H)	3
			large	Darrow (H)	5
26. (+)	**26.**	**VG**	**Fruit: depth of calyx basin**		
QN		**(d)**	absent or shallow	Clockwork (H), Collins (H), Nelson (H), Olympia (H)	1
			medium	Blueray (H)	2
			deep	Denis (H), Jersey (H)	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
27.	**27. (*)**	**VG**	**Fruit: intensity of bloom**		
QN		**(d)**	absent or very weak	Goldtraube (H), ZF08-095 (L)	1
			weak	Gretha (H)	3
			medium	Ama (H), Bluetta (H)	5
			strong	Darrow (H)	7
28. (+)	**28. (*)**	**VG**	**Fruit: colour of skin**		
PQ		**(d)**	pink	Pink Lemonade (L)	1
			blue red	Delite (L)	2
			light blue	Berkeley (H)	3
			medium blue	Patriot (H)	4
			dark blue	Heerma (H)	5
			blackish blue	Emil (H), Freda (H), Putte (H)	6
29. (+)	**29.**	**MG/VG**	**Fruit: firmness**		
QN		**(d)**	very soft		1
			soft	Elliott (H), Hortblue Poppins (H)	2
			medium	O'Neal (L)	3
			firm	Duke (H)	4
			very firm	Rahi (L)	5
30. (+)	**30.**	**VG**	**Fruit: sweetness**		
QN		**(d)**	low	Bluetta (H)	1
			medium	Collins (H)	3
			high	Goldtraube (H)	5
31. (+)	**31.**	**MG/VG**	**Fruit: acidity**		
QN		**(d)**	low	Gretha (H)	1
			medium	Darrow (H)	3
			high	Ascorba (H), Bluecrop (H)	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
32.	**32. (*)**	**VG**	**Plant: fruiting type**		
QL			on one-year-old shoots only	Darrow (H), Patriot (H)	1
G			on one-year-old and current season shoots	Burlington (H), Concord (H)	2
33. (+)	**33. (*)**	**MG/VG**	**Time of beginning of vegetative growth**		
QN			early	Patriot (H), Weymouth (H)	3
			medium	Bluecrop (H)	5
			late	Blueray (H)	7
34. (+)	**34. (*)**	**MG/VG**	**Time of beginning of flowering on one-year-old shoot**		
QN			very early	Patriot (H)	1
			early	Weymouth (H)	3
			medium	Berkeley (H)	5
			late	Darrow (H)	7
G			very late	Jersey (H)	9
35. (+)	**35. (*)**	**MG/VG**	**Time of beginning of flowering on current season's shoot**		
QN			early	O'Neal (L)	3
			medium	Bluecrop (H)	5
G			late		7
36. (+)	**36. (*)**	**MG/VG**	**Time of beginning of fruit ripening on one-year-old shoot**		
QN			very early	Bluetta (H)	1
			early	Blueray (H)	3
			medium	Heerma (H)	5
			late	Darrow (H)	7
G			very late	Elizabeth (H)	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
37. (+)	**37. (*)**	**MG/VG**	**Time of beginning of fruit ripening on current season's shoot**		
QN			early	O'Neal (L)	3
			medium	JU83 (L)	5
G			late		7

8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

8.1 Explanations covering several characteristics

Characteristics containing the following key in the third column of the Table of Characteristics should be examined as indicated below:

a) Observations should be made on unpruned bushes in the dormant season.

b) Observations should be made on fully developed leaves.

c) Observations should be made at the beginning of flowering.

d) Observations should be made on physiologically ripe fruits.

8.2 Explanations for individual characteristics

Ad. 1: Plant: vigour

The plant vigour should be considered as the overall abundance of vegetative growth.

Ad. 4: One-year-old shoot: length of internode

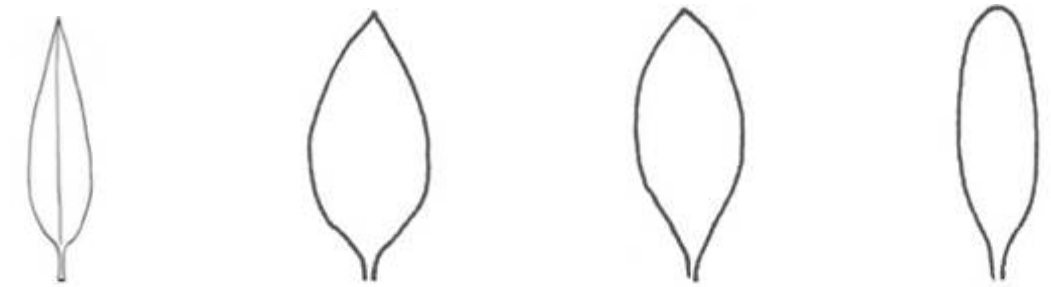
Observation should be made on upper half of shoot.

Ad. 7: Leaf: ratio length/width

3
low

7
high

Ad. 8: Leaf: shape



1
lanceolate

2
ovate

3
elliptic

4
oblong

Ad. 13: Inflorescence: length

Observations should be made on middle third of shoot.

Ad. 14: Flower: shape of corolla

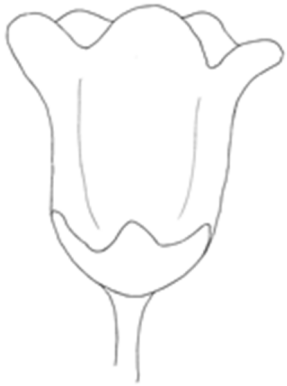
1
globose

2
ellipsoid

3
cylindric

4
ovoid

5
urceolate



6
campanulate

Ad. 18: Flower: conspicuousness of ridges on corolla tube

Observations should be made on outer side.

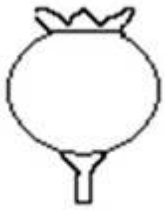
a: ridging

Ad. 21: Unripe fruit: intensity of green colour

Observations should be made on green fruit with bloom.

Ad. 23: Fruit: shape in longitudinal section

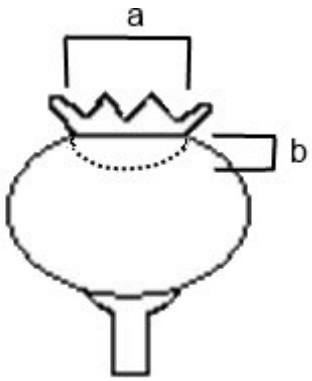
1
elliptic



2
circular

3
oblate

Ad. 25: Fruit: diameter of calyx basin
Ad. 26: Fruit: depth of calyx basin



a: diameter of calyx basin
b: depth of calyx basin

Ad. 28: Fruit: colour of skin

Observations should be made after removal of bloom.

Ad. 29: Fruit: firmness

Firmness should be determined by hand in comparison to the example varieties, or measured using a penetrometer.

Ad. 30: Fruit: sweetness

Sweetness should be observed by tasting in comparison to the example varieties.

Ad. 31: Fruit: acidity

Acidity is determined by titration of titratable acids or by tasting.

Ad. 33: Time of beginning of vegetative growth

The time of beginning of vegetative growth is when the first vegetative buds begin to burst.

Ad. 34: Time of beginning of flowering on one-year-old shoot
Ad. 35: Time of beginning of flowering on current season's shoot

The time of beginning of flowering is when 10% of the flowers are fully open.

Ad. 36: Time of beginning of fruit ripening on one-year-old shoot
Ad. 37: Time of beginning of fruit ripening on current season's shoot

The time of beginning of fruit ripening is when 10% of the fruits are ripe.

9. LITERATURE

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10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO-TQ/137/2 – *Vaccinium* L. - blueberry

e-TQ: https://applyfor.plantvarieties.eu/mypvr.oa/#!/en/oa/show/questionnaire/TQ/10982/en