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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

BLUEBERRY*

UPOV Code(s): VACCI_AMC; VACCI_ANG; VACCI_CAN; VACCI_CAV; VACCI_COR; VACCI_FOR; VACCI_MYD; VACCI_MYR; VACCI_VIR; VACCI_SIM

Vaccinium angustifolium x *Vaccinium myrsinites* x *Vaccinium corymbosum*;
Vaccinium angustifolium Aiton;
Hybrids between *Vaccinium corymbosum* and *Vaccinium angustifolium;*
Vaccinium corymbosum x *Vaccinium angustifolium* x *Vaccinium virgatum*;
Vaccinium corymbosum L.;
Vaccinium formosum Andrews;
Vaccinium myrtilloides Michx.;
Vaccinium myrtillus L.;
Vaccinium simulatum Small;
Vaccinium virgatum Aiton

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Australia
to be considered by the
Technical Working Party for Fruit Crops
at its forty-ninth session, to be held in Santiago de Chile, Chile,
from 2018-11-19 to 2018-11-23

Disclaimer: this document does not represent UPOV policies or guidance

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
V. angustifolium x *V. myrsinites* x *V. corymbosum*				
V.angustifolium Aiton, *V. angustifolium* var. *hypolasium* Fernald, *V. angustifolium* var. *laevifolium* House, *V. angustifolium* var. *nigrum* (Alph. Wood) Dole, *V. brittonii* Porter ex E. P. Bicknell, *V. lamarckii* Camp, *V. pensylvanicum* Lam., *V. pensylvanicum* var. *nigrum* Alph. Wood	Lowbush Blueberry, Upland lowbush blueberry			
Hybrids between *V.corymbosum* and *V.angustifolium,* *V.angustifolium* x *V.corymbosum,* *V.corymbosum* x *V.angustifolium*				
V. corymbosum x *V. angustifolium* x *V. virgatum*				
V. corymbosum L., *V. atlanticum* E. P. Bicknell, *V. constablaei* A. Gray	Blueberry, High Bush Blueberry	Myrtille, Myrtille en Corymbe	Amerikanische Heidelbeere, Kulturheidelbeere	Arándano americano
V. formosum Andrews, *V. australe* Small	Swamp Highbush Blueberry			
V. myrtilloides Michx., *V.* Kalm ex Richardson	Canada blueberry, Sourtop blueberry. Velvetleaf blueberry		Kanadische Heidelbeere	
V. myrtillus L., *V. yatabei* Makino	Bilberry, Blueberry, Whinberry, Whortleberry	Myrtille	Blaubeere, Heidelbeere	Arándano, Mirtillo
V. simulatum Small				
V. virgatum Aiton, *V. amoenum* Aiton, *V. ashei* J. M. Reade				

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

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1. Subject of these Test Guidelines

1.1 These Test Guidelines apply to all varieties of *Vaccinium angustifolium* Aiton, *Vaccinium corymbosum* L., *Vaccinium formosum* Andrews, *Vaccinium myrtilloides* Michx., *Vaccinium myrtillus* L., *Vaccinium virgatum* Aito and *Vaccinium simulatum* Small , *Vaccinium darrowii* Camp., *Vaccinium elliottii* Chapm. and hybrids of these species.

1.2 In the case of ornamental varieties, in particular, it may be necessary to use additional characteristics or additional states of expression to those included in the Table of Characteristics in order to examine Distinctness, Uniformity and Stability.

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of plants.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

5 plants.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 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.

3. Method of Examination

3.1 Number of Growing Cycles

3.1.1 The minimum duration of tests should normally be two independent growing cycles.

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

3.1.3 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.

3.2 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”.

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 Additional Tests

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

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 Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 Number of Plants or 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 of plants 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 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. color 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 these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 For the assessment of uniformity of vegetatively propagated varieties, a population standard of 95% and an acceptance probability of at least 1% should be applied. In the case of a sample size of 5 plants, no off-types are allowed.

4.3 Stability

4.3.1 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 Organization 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 organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Plant: vigor (characteristic 1)
(b) Plant: growth habit (characteristic 2)
(c) One-year-old shoot: color (characteristic 3)
(d) Infructescence: density (characteristic 21)
(e) Plant: fruiting type (characteristic 35)
(f) Time of beginning of flowering on one-year-old shoot (characteristic 37)
(g) Only varieties which fruit on one-year-old and current season's shoots: Time of beginning of flowering on current year's shoot (characteristic 38)
(h) Time of beginning of fruit ripening on one-year-old shoot (characteristic 39)
(i) Time of beginning of fruit ripening on current year's shoot (characteristic 40)

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

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

6.2.1 States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), 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

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

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 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 45 ºF (7 ºC).
(H) - example variety with high chilling requirements (greater than 750 hours)
(L) - example variety with low chilling requirements (less than 600 hours)

6.5 Legend

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 2	**3 4**	**5 6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

5 (+) See Explanations on the Table of Characteristics in Chapter 8.2

6 (a)-(g) See Explanations on the Table of Characteristics in Chapter 8.1

7 Not applicable

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	**(*)**	**QN VG**	**(+) (a)**				
		Plant: vigor					
		weak				Bluetta (H), Weymouth (H)	3
		medium				Bluejay (H), Patriot (H)	5
		strong				Bluecrop (H), Duke(H), Earliblue(H)	7
2.	**(*)**	**QN VG**	**(a)**				
		Plant: growth habit					
		upright				Cargo (H), Ivanhoe (H), Spartan (H)	1
		semi upright				Bluetta (H), Draper (H)	2
		spreading				Blue Ribbon (H), Jersey (H)	3
3.		**PQ VG**	**(a)**				
		One-year-old shoot: color					
		green				Puru (H)	1
		reddish yellow				Heerma (H)	2
		greenish red				Reka (H)	3
		greyish red				Berkeley (H)	4
		dark red				Aron (H)	5
		reddish brown				Earliblue(H)	6
4.		**QN VG**	**(+) (a)**				
		One-year-old shoot: length of internode					
		short				DrisBlueTen (H)	1
		short to medium					2
		medium				DrisBlueFifteen	3
		medium to long					4
		long				DrisBlueSeven (L)	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.	**(*)**	**QN MG/VG**	**(b)**				
		Leaf: length					
		short				Darrow (H)	3
		medium				Bluecrop (H), Patriot (H)	5
		long				Berkeley (H), Collins (H), Toro (H)	7
6.		**QN MG/VG**	**(b)**				
		Leaf: width					
		narrow				Emil (H), Heerma (H), Putte (H)	3
		medium				Ama (H), Bluecrop (H)	5
		broad				Berkeley (H), Collins (H)	7
7.	**(*)**	**QN MG/VG**	**(b)**				
		Leaf: ratio length/width	**Feuille: rapport longueur/largeur**	**Blatt: Verhältnis Länge/Breite**	**Hoja: relación longitud/anchura**		
		low				Gretha (H)	3
		medium	moyen	mittel	media	Patriot (H)	5
		high				Heerma (H)	7
8.	**(*)**	**PQ VG**	**(+) (b)**				
		Leaf: shape	**Feuille: forme**	**Blatt: Form**	**Hoja: forma**		
		lanceolate	lancéolée	lanzettlich	lanceolada	Weymouth (H)	1
		ovate	ovale	eiförmig	oval	Puru (H)	2
		elliptic	elliptique	elliptisch	elíptica	Earliblue(H)	3
		oblong	oblongue	rechteckig	oblonga	Berkeley (H), Bluetta (H), Jersey (H)	4
9.		**QL VG**	**(b)**				
		Leaf: color of upper side	**Feuille: couleur de la face supérieure**	**Blatt: Farbe der Oberseite**	**Hoja: color del haz**		
		yellow	jaune	gelb	amarillo	Geerdens	1
		green	verte	grün	verde		2
10.	**(*)**	**PQ VG**	**(b)**				
		Leaf: color of upper side					
		yellow				Geerdens	1
		light green				Earliblue(H)	2
		medium green				Berkeley (H), Toro (H)	3
		dark green				Darrow (H), Weymouth (H)	4

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11.	**(*)**	**QL**	**VG**		**(b)**				
		Leaf: margin		**Feuille: bord**		**Blatt: Rand**	**Hoja: margen**		
		entire		entier		ganzrandig	entero	Blueray (H), Jersey (H)	1
		serrate		denté		gesägt	serrado	Brigitta (H), Rancocas (H)	2
12.		**QL**	**VG**						
		Leaf: color of edge of margin							
		green							1
		red						DrisBlueTen (H)	2
13.		**QN**	**VG**		**(b)**				
		Leaf:glaucosity on upper side							
		absent or weak						Puru (H), Reka (H)	1
		medium						Dolce Blue (L), Magnolia (L)	2
		strong						Maru (L), Takahe (L)	3
14.		**QN**	**VG**		**(c)**				
		Flower bud: anthocyanin coloration							
		absent or very weak							1
		weak						Hele	2
		medium						Patriot (H)	3
		strong						Bluecrop (H)	4
		very strong						Brigitta (H), Collins (H)	5
15.		**QN**	**MS/VG**	**(+)**	**(c)**				
		Inflorescence: length							
		short						Bluetta (H), Collins (H)	1
		medium						Duke(H), Earliblue(H)	2
		long						Berkeley (H), Bluecrop (H)	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16.	**PQ VG**	**(+) (c)**				
	Flower: shape of corolla	**Fleur: forme de la corolle**	**Blüte: Form der Krone**	**Flor: forma de la corola**		
	globose	urcéolée	urnenförmig	urceolada	EB 12-19, Farthing	1
	ellipsoid	campanulée	glockenförmig	acampanada	Ridley	2
	cylindric				Reka (H)	3
	ovoid				Suziblue	4
	urceolate				Maru (L)	5
	campanulate				Magnolia (L), Scintilla(L), Velluto Blue, Victoria	6
17.	**QN VG**	**(c)**				
	Flower: size of corolla tube	**Fleur: taille du tube de la corolle**	**Blüte: Größe der Kronenröhre**	**Flor: tamaño del tubo de la corola**		
	small	petit	klein	pequeño	Blueray (H)	1
	medium	moyen	mittel	medio	Heerma (H)	3
	large	grand	groß	grande	Collins (H)	5
18.	**QN VG**	**(c)**				
	Flower: anthocyanin coloration of corolla tube on outer side					
	absent or very weak				Camellia (L)	1
	weak				Ama (H)	2
	medium				Gretha (H)	3
	strong				Bluecrop (H), Sunshine Blue (L)	4
19.	**QN VG**	**(+) (c)**				
	Flower: conspicuousness of ridges on corolla tube	**Fleur: cannelures sur le tube de la corolle**	**Blüte: Rippen an der Kronenröhre**	**Flor: aristas en el tubo de la corola**		
	absent or weak				Ventura (L)	1
	medium				Atlantic (H), Camellia (L)	2
	strong				Bluejay (H), Corona (L), FL 02-40 (L)	3
20.	**PQ VG**	**(c)**				
	Flower: color of receptacle					
	green					1
	pink					2
	red					3
	blue					4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21.		**QN VG**	**(d)**				
		Infructescence: density					
		sparse				Rahi (L)	3
		medium				Toro (H)	5
		dense				Tifblue (L)	7
22.		**QN VG**	**(+)**				
		Unripe fruit: intensity of green color	**Fruit non mûr: intensité de la couleur verte**	**Unreife Frucht: Intensität der Grünfärbung**	**Fruto no maduro: intensidad del color verde**		
		light	claire	hell	clara	Heerma (H)	1
		medium	moyenne	mittel	media	Ama (H)	3
		dark	foncée	dunkel	oscura	Berkeley (H)	5
23.	**(*)**	**QN VG**	**(d)**				
		Fruit: size	**Fruit: taille**	**Frucht: Größe**	**Fruto: tamaño**		
		very small				Emil (H), Putte (H), ZF08-095 (L)	1
		small	petit	klein	pequeño	Ama (H), Sweetcrisp (L)	3
		medium	moyen	mittel	medio	Concord (H), Emerald (L)	5
		large	gros	groß	grande	Darrow (H), FL05-627 (L)	7
24.	**(*)**	**PQ VG**	**(+)** **(d)**				
		Fruit: shape in longitudinal section	**Fruit: forme en section longitudinale**	**Frucht: Form im Längsschnitt**	**Fruto: forma en sección longitudinal**		
		elliptic	elliptique	elliptisch	elíptica	Northland (H)	1
		circular				Bluecrop (H), Jersey (H)	2
		oblate	aplati	breitrund	oblata	Earliblue(H)	3
25.	**(*)**	**QN VG**					
		Fruit: height/width ratio					
		low				Magnolia (L)	1
		medium				Island Blue (L)	2
		high				Primadonna (L), Sunset Blue (H)	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
26.		**QN VG**	**(d)**				
		Fruit: attitude of sepals	**Fruit: port des sépales**	**Frucht: Haltung der Kelchblätter**	**Fruto: porte de los sépalos**		
		erect	dressé	aufrecht	erecto	Powderblue (L)	1
		erect to semi-erect	dressé à demi-dressé	aufrecht bis halbaufrecht	entre erecto y semierecto	Camellia (L), Sunset Blue (H)	2
		semi-erect	demi-dressé	halbaufrecht	semierecto	Tifblue (L)	3
		horizontal				Magnolia (L), Maru (L), Springhigh (L)	4
27.		**QN VG**	**(d)**				
		Fruit: curvature of sepals					
		incurved				Delite (L)	1
		straight				Powderblue (L)	2
		reflexed				Tifblue (L)	3
28.		**QN VG**	**(+) (d)**				
		Fruit: diameter of calyx basin	**Fruit: diamètre de la cuvette du calice**	**Frucht: Durchmesser der Kelchhöhle**	**Fruto: diámetro de la cavidad del cáliz**		
		small	petit	klein	pequeño	Blueray (H)	1
		medium	moyen	mittel	medio	Bluecrop (H)	3
		large	grand	groß	grande	Darrow (H)	5
29.		**QN VG**	**(+) (d)**				
		Fruit: depth of calyx basin					
		absent or shallow				Clockwork (H), Collins (H), Nelson (H), Olympia (H)	1
		medium				Blueray (H)	2
		deep				Denis (H), Heidi, Jersey (H)	3
30.	**(*)**	**QN VG**	**(d)**				
		Fruit: intensity of bloom	**Fruit: intensité de la pruine**	**Frucht: Intensität der Bereifung**	**Fruto: intensidad de la pruina**		
		absent or very weak				Goldtraube (H), ZF08-095 (L)	1
		weak	faible	gering	débil	Gretha (H)	3
		medium	moyenne	mittel	media	Ama (H), Bluetta (H)	5
		strong	forte	stark	fuerte	Darrow (H), Gila	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31.	**(*)**	**PQ VG**	**(+) (d)**				
		Fruit: color of skin					
		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, Putte (H)	6
32.		**QN MG/VG**	**(+) (d)**				
		Fruit: firmness					
		soft					1
		medium				O'Neal (L)	2
		firm				Duke(H)	3
		very firm				Rahi (L)	4
33.		**QN VG**	**(+) (d)**				
		Fruit: sweetness	**Fruit: goût sucré**	**Frucht: Süße**	**Fruto: dulzor**		
		low	faible	gering	bajo	Bluetta (H)	1
		medium	moyen	mittel	medio	Collins (H)	3
		high	fort	stark	alto	Goldtraube (H)	5
34.		**QN MG/VG**	**(+) (d)**				
		Fruit: acidity					
		low				Gretha (H)	1
		medium				Darrow (H)	3
		high				Ascorba (H), Bluecrop (H)	5
35.		**QL VG**					
		Plant: fruiting type	**Plante: type de fructification**	**Pflanze: Fruchtungstyp**	**Planta: tipo de fructificación**		
		on one-year-old shoots only	seulement sur des rameaux d'un an	nur an einjährigen Trieben	sólo en ramas de un año	Darrow (H), Patriot (H)	1
		on one-year-old and current season shoots				Burlington (H), Concord (H)	2

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
36.	**(*)**	**QN** **MG/VG**	**(+)**				
		Time of beginning of vegetative growth	**Époque de débourrement**	**Zeitpunkt des Aufbruchs der vegetativen Knospe**	**Época de aparición de la yema de madera**		
		early	précoce	früh	temprana	Patriot (H), Weymouth (H)	3
		medium	moyenne	mittel	media	Bluecrop (H)	5
		late	tardive	spät	tardía	Blueray (H)	7
37.	**(*)**	**QN** **MG/VG**		**(f)**			
		Time of beginning of flowering on one-year-old shoot	**Époque du début de la floraison sur les rameaux d'un an**	**Zeitpunkt des Blühbeginns am einjährigen Trieb**	**Época de inicio de la floración en la rama de un año**		
		very early	très précoce	sehr früh	muy temprana	Patriot (H)	1
		early	précoce	früh	temprana	Weymouth (H)	3
		medium	moyenne	mittel	media	Berkeley (H)	5
		late	tardive	spät	tardía	Darrow (H)	7
		very late	très tardive	sehr spät	muy tardía	Jersey (H)	9
38.	**(*)**	**QN** **MG/VG**		**(f)**			
		<u>Only varieties which fruit on one-year-old and current season's shoots</u>: Time of beginning of flowering on current year's shoot					
		early				O'Neal (L)	3
		medium				Bluecrop (H)	5
		late					7
39.	**(*)**	**QN** **MG/VG**		**(g)**			
		Time of beginning of fruit ripening on one-year-old shoot					
		very early				Bluetta (H)	1
		early				Blueray (H)	3
		medium				Heerma (H)	5
		late				Darrow (H)	7
		very late				Elizabeth (H)	9
40.	**(*)**	**QN** **MG/VG**		**(g)**			
		Time of beginning of fruit ripening on current year's shoot					
		early				O'Neal (L)	3
		medium				JU83 (L)	5
		late					7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
41.	**PQ** **VG**					
	Flower: Color of corolla tube					
	white					1
	whitish green					2
	whitish yellow					3
	whitish red					4
42.	**PQ** **VG**					
	Flower: Color of corolla tube					
	white				Ridley 1607	1
	whitish green				Ridley 1403	2
	whitish yellow				Chickadee	3
	whitish red				Flicker	4

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) Observations on the plant should be made on unpruned bushes in the dormant season.
(b) Observations on the leaf should be made on fully developed leaves.
(c) Observations on the inflorescence and flowers should be made when at least 50% of the flowers have opened.
(d) Unless otherwise stated, observations on the fruit should be made on physiologically ripe fruits.
(f) The time of beginning of flowering is when 10% of the flowers are fully open.
(g) The time of beginning of fruit ripening is when 10% of the fruits are ripe.

8.2 Explanations for individual characteristics

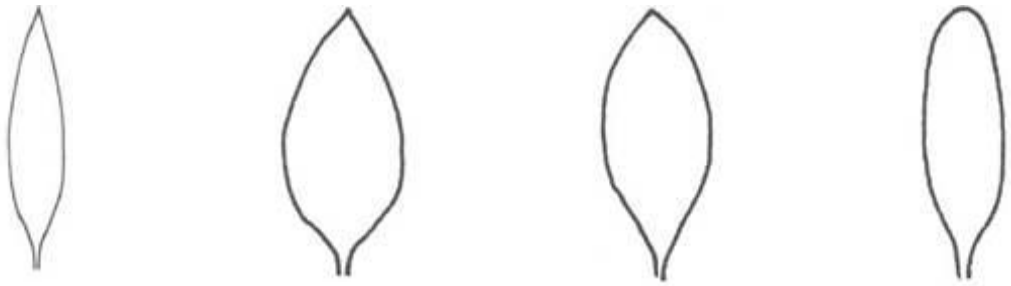
Ad. 1: Plant: vigor

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

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

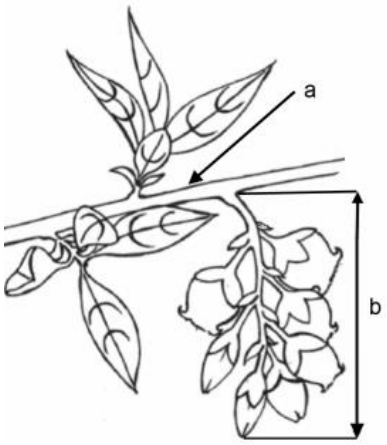
Observation should be made on upper half of shoot.

Ad. 8: Leaf: shape



1 lanceolate | 2 ovate | 3 elliptic | 4 oblong

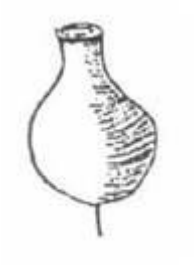
Ad. 15: Inflorescence: length



a: shoot
b: Inflorescence length

Observations should be made on middle third of shoot.

Ad. 16: Flower: shape of corolla



1
urceolate

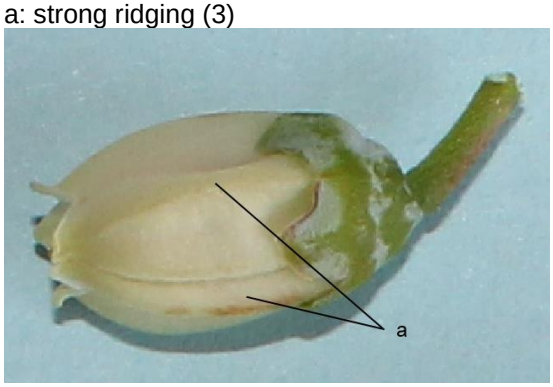
2
campanulate

3
cylindric

Ad. 19: Flower: conspicuousness of ridges on corolla tube

Observations should be made on outer side

a: strong ridging (3)

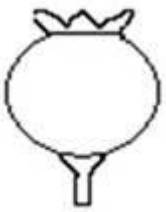


Ad. 22: Unripe fruit: intensity of green color

Observations should be made on green fruit with bloom

Ad. 24: Fruit: shape in longitudinal section

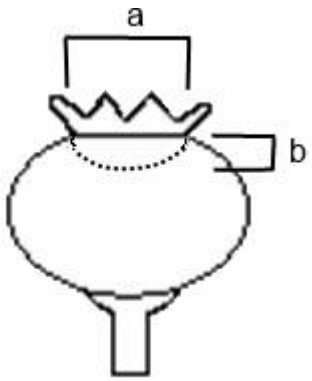
1
elliptic



2
circular

3
oblate

Ad. 28: Fruit: diameter of calyx basin



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

Ad. 29: Fruit: depth of calyx basin

See Ad. 28

Ad. 31: Fruit: color of skin

Observations should be made on fruit color after removal of bloom.

Ad. 32: Fruit: firmness

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

Ad. 33: Fruit: sweetness

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

Ad. 34: Fruit: acidity

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

Ad. 36: Time of beginning of vegetative growth

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

9. Literature

Ebert, G., 2005: Anbau von Heidelbeeren und Cranberries. Ulmer Verlag, Stuttgart, DE.

Liebster, G., 1961: Die Kulturheidelbeere. Parey Verlag, Berlin und Hamburg, DE.

Rejman, A., 1994: Pomologia. PWRiL, Warszawa, PL.

Rejman, A., Pliszka, K., 1988: Borówka wysoka. PWRiL, Warszawa, PL.

Sękowski, B., 1993: Pomologia systematyczna. PWN, Warszawa, PL.

Sorge, P., 1984: Beerenobstsorten. J. Neumann-Neudamm, Melsungen, DE.

Trehane, J., 2004: Blueberries, Cranberries, and Other Vacciniums. Royal Horticultural Society, Plant Collector Guide. Timber Press, Cambridge, UK.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1.1	Botanical name	*Vaccinium angustifolium* x *Vaccinium myrsinites* x *Vaccinium corymbosum*	[ ]
1.1.2	Common name		
1.2.1	Botanical name	*Vaccinium angustifolium* Aiton	[ ]
1.2.2	Common name	Lowbush Blueberry, Upland lowbush blueberry	
1.3.1	Botanical name	Hybrids between *Vaccinium corymbosum* and *Vaccinium angustifolium*	[ ]
1.3.2	Common name		
1.4.1	Botanical name	*Vaccinium corymbosum* x *Vaccinium angustifolium* x *Vaccinium virgatum*	[ ]
1.4.2	Common name		
1.5.1	Botanical name	*Vaccinium corymbosum* L.	[ ]
1.5.2	Common name	Blueberry, High Bush Blueberry	
1.6.1	Botanical name	*Vaccinium formosum* Andrews	[ ]
1.6.2	Common name	Swamp Highbush Blueberry	
1.7.1	Botanical name	*Vaccinium myrtilloides* Michx.	[ ]
1.7.2	Common name	Canada blueberry; Sourtop blueberry; Velvetleaf blueberry	
1.8.1	Botanical name	*Vaccinium myrtillus* L.	[ ]
1.8.2	Common name	Bilberry, Blueberry, Whinberry, Whortleberry	
1.9.1	Botanical name	*Vaccinium virgatum* Aiton	[ ]
1.9.2	Common name	Rabbit-eye blueberry, Southern black blueberry	
1.10.1	Botanical name	*Vaccinium simulatum* Small	[ ]
1.10.2	Common name		

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]

(please state parent varieties)

(……..……..…) x (……..……..…)

female parent male parent

(b) partially known cross [ ]

(please state known parent variety(ies))

(……..……..…) x (……..……..…)

female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]

(please state parent variety)

4.1.3 Discovery and development [ ]

(please state where and when discovered and how developed)

4.1.4 Other [ ]

(please provide details)

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

4.2 Method of propagating the variety

4.2.1 Vegetative propagation

(a) Cuttings [ ]
(b) *In vitro* propagation [ ]
(c) Other (state method) [ ]

4.2.2 Other [ ]
(Please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (1)	**Plant: vigor**		
	very weak		1 [ ]
	very weak to weak		2 [ ]
	weak	Bluetta (H), Weymouth (H)	3 [ ]
	weak to medium		4 [ ]
	medium	Bluejay (H), Patriot (H)	5 [ ]
	medium to strong		6 [ ]
	strong	Bluecrop (H), Duke(H), Earliblue(H)	7 [ ]
	strong to very strong		8 [ ]
	very strong		9 [ ]
5.2 (2)	**Plant: growth habit**		
	upright	Cargo (H), Ivanhoe (H), Spartan (H)	1 [ ]
	semi upright	Bluetta (H), Draper (H)	2 [ ]
	spreading	Blue Ribbon (H), Jersey (H)	3 [ ]
5.3 (3)	**One-year-old shoot: color**		
	green	Puru (H)	1 [ ]
	reddish yellow	Heerma (H)	2 [ ]
	greenish red	Reka (H)	3 [ ]
	greyish red	Berkeley (H)	4 [ ]
	dark red	Aron (H)	5 [ ]
	reddish brown	Earliblue(H)	6 [ ]
5.4 (21)	**Infructescence: density**		
	very sparse		1 [ ]
	very sparse to sparse		2 [ ]
	sparse	Rahi (L)	3 [ ]
	sparse to medium		4 [ ]
	medium	Toro (H)	5 [ ]
	medium to strong		6 [ ]
	dense	Tifblue (L)	7 [ ]
	strong to very strong		8 [ ]
	very strong		9 [ ]

	Characteristics	Example Varieties	Note
5.5 (25)	**Fruit: height/width ratio**		
	low	Magnolia (L)	1 [ ]
	medium	Island Blue (L)	2 [ ]
	high	Primadonna (L), Sunset Blue (H)	3 [ ]
5.6 (31)	**Fruit: color of skin**		
	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, Putte (H)	6 [ ]
5.7 (35)	**Plant: fruiting type**		
	on one-year-old shoots only	Darrow (H), Patriot (H)	1 [ ]
	on one-year-old and current season shoots	Burlington (H), Concord (H)	2 [ ]
5.8 (37)	**Time of beginning of flowering on one-year-old shoot**		
	very early	Patriot (H)	1 [ ]
	very early to early		2 [ ]
	early	Weymouth (H)	3 [ ]
	early to medium		4 [ ]
	medium	Berkeley (H)	5 [ ]
	medium to late		6 [ ]
	late	Darrow (H)	7 [ ]
	late to very late		8 [ ]
	very late	Jersey (H)	9 [ ]
5.9 (38)	**Only varieties which fruit on one-year-old and current season's shoots: Time of beginning of flowering on current year's shoot**		
	very early		1 [ ]
	very early to early		2 [ ]
	early	O'Neal (L)	3 [ ]
	early to medium		4 [ ]
	medium	Bluecrop (H)	5 [ ]
	medium to late		6 [ ]
	late		7 [ ]
	late to very late		8 [ ]
	very late		9 [ ]

	Characteristics	Example Varieties	Note
5.10 (39)	**Time of beginning of fruit ripening on one-year-old shoot**		
	very early	Bluetta (H)	1 [ ]
	very early to early		2 [ ]
	early	Blueray (H)	3 [ ]
	early to medium		4 [ ]
	medium	Heerma (H)	5 [ ]
	medium to late		6 [ ]
	late	Darrow (H)	7 [ ]
	late to very late		8 [ ]
	very late	Elizabeth (H)	9 [ ]
5.11 (40)	**Time of beginning of fruit ripening on current year's shoot**		
	very early		1 [ ]
	very early to early		2 [ ]
	early	O'Neal (L)	3 [ ]
	early to medium		4 [ ]
	medium to late		5 [ ]
	medium	JU83 (L)	5 [ ]
	late		7 [ ]
	late to very late		8 [ ]
	very late		9 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Fruit: size*	*small*	*medium*

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

#7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)"

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (http://www.upov.int/tgp/en/).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

7.3.1 What are the chilling requirements for the variety? (also indicate number of chilling hours)

[ ] low chilling _____

[ ] mid chilling _____

[ ] high chilling _____

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

9. Information on plant material to be examined or submitted for examination

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 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 the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

Please provide details for where you have indicated “yes”.

.....

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

[End of document]