



These Test Guidelines have been superseded by a later version. The latest adopted version of Test Guidelines can be found at http://www.upov.int/test_guidelines/en/list.jsp

Ces principes directeurs d'examen ont été remplacés par une version ultérieure. La version adoptée la plus récente des principes directeurs d'examen figure à l'adresse suivante : http://www.upov.int/test_guidelines/fr/list.jsp

Diese Prüfungsrichtlinien wurden durch eine neuere Fassung ersetzt. Die neueste angenommene Fassung von Prüfungsrichtlinien ist unter http://www.upov.int/test_guidelines/de/list.jsp zu finden.

Las presentes directrices de examen han sido reemplazadas por una versión posterior. La versión de las directrices de examen de más reciente aprobación está disponible en http://www.upov.int/test_guidelines/es/list.jsp.



TG/137/4

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

BLUEBERRY

UPOV Codes: VACCI_ANG; VACCI_COR; VACCI_FOR; VACCI_MYD;
VACCI_MYR; VACCI_VIR; VACCI_SIM

(Vaccinium angustifolium Aiton; *V. corymbosum* L.; *V. formosum* Andrews;
V. myrtilloides Michx.; *V. myrtillus* L.; *V. virgatum* Aiton; *V. simulatum* Small)

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

| <i>Botanical name</i> | <i>English</i> | <i>French</i> | <i>German</i> | <i>Spanish</i> |
|---|---|--|--|--|
| <i>Vaccinium angustifolium</i> Aiton; <i>Vaccinium brittoni</i> Porter | Lowbush Blueberry; Upland Lowbush Blueberry | Bleuet; Bleuet nain; Petite myrtille sauvage; Airelle à feuilles étroites | | Arándano bajo, Arándano salvaje |
| <i>Vaccinium corymbosum</i> L. | Highbush Blueberry; Northern Highbush | Myrtille géante américaine; Myrtille d'Amérique; Myrtille géante; Bleuet cultivé; Bleuet en corymbe; Bleuet à corymbes; Airelle en corymbe; Airelle à corymbes; Myrtille arbustive; Corymbelle | Kulturheidelbeere; Amerikanische Heidelbeere | Arándano americano, Arándano alto, Arándano gigante |
| <i>Vaccinium formosum</i> Andrews, <i>Vaccinium australe</i> Small | Swamp Highbush Blueberry; Swamp or Southern Highbush | | | |
| <i>Vaccinium myrtilloides</i> Michx. | Canada Blueberry; Sourtop Blueberry; Velvetleaf Blueberry | Bleuet; Airelle fausse-myrtille; Airelle du Canada; Bleuet du Canada | Kanadische Heidelbeere | |
| <i>Vaccinium myrtillus</i> L. | Bilberry; Whinberry; Whortleberry | Myrtille; Airelle fausse-myrtille; Airelle à tige mince | Blaubeere, Heidelbeere | Arándano, Mirtillo, Ráspano |
| <i>Vaccinium virgatum</i> Aiton, <i>Vaccinium ashei</i> Reade | Rabbit-eye Blueberry; Southern Black Blueberry | | | Arándano ojo de conejo |
| <i>Vaccinium simulatum</i> Small | Upland Highbush Blueberry | | | |

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.

* These names were corrected 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.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Vaccinium angustifolium* Aiton (*Vaccinium brittoni* Porter); *Vaccinium corymbosum* L.; *Vaccinium formosum* Andrews (*Vaccinium australe* Small); *Vaccinium myrtilloides* Michx.; *Vaccinium myrtillus* L.; *Vaccinium virgatum* Aiton (*Vaccinium ashei* Reade); and *Vaccinium simulatum* Small, including their hybrids, of the family *Ericaceae*.

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 with at least three well-developed shoots.

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

5 plants with at least three well-developed shoots.

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 growing cycle is considered to be the duration of a single growing season, beginning with bud burst, 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*

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

3.3.2 Type of observation

The recommended method of observing the characteristic is indicated by the following key in the second column of the Table 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

3.4 *Test Design*

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

3.5 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations should be made on 5 plants or parts taken from each of 5 plants. In the case of parts of plants, the number to be taken from each of the plants should be 2.

3.6 *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.

4.2 *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, 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.

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 tested, either by growing a further generation, or by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the previous 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: growth habit (characteristic 2)
- (b) Fruit: color of skin (after removal of bloom) (characteristic 27)
- (c) Plant: fruiting type (characteristic 31)
- (d) Time of beginning of flowering on one-year-old shoot (characteristic 33)
- (e) Only varieties which fruit on one-year-old and current season's shoots: Time of beginning of flowering on current year's shoot (characteristic 34)
- (f) Time of beginning of fruit ripening on one-year-old shoot (characteristic 35)
- (g) Only varieties which fruit on one-year-old and current season's shoots: Time of beginning of fruit ripening on current year's shoot (characteristic 36).

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

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*

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.

6.3 *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.

6.5 *Legend*

(*) Asterisked characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3

QN: Quantitative characteristic – see Chapter 6.3

PQ: Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS: see Chapter 3.3.2

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

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

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

| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
|--------------|---|--|---|--|---|---------------|
| 1. VG | Plant: vigor | Plante: vigueur | Pflanze: Wuchsstärke | Planta: vigor | | |
| (*) (+) | | | | | | |
| QN | (a) weak | faible | schwach | débil | Bluetta, Weymouth | 3 |
| | medium | moyenne | mittel | medio | Patriot, Bluejay | 5 |
| | strong | forte | stark | fuerte | Bluecrop, Duke, Earliblue | 7 |
| 2. VG | Plant: growth habit | Plante: port | Pflanze: Wuchsform | Planta: porte | | |
| (*) | | | | | | |
| PQ | (a) upright | dressé | aufrecht | erecto | Ivanhoe | 1 |
| | semi upright | demi dressé | halbaufrecht | semierecto | Bluetta | 2 |
| | spreading | étalé | breitwüchsig | rastrero | Jersey | 3 |
| 3. VG | One-year-old shoot: color | Rameau d'un an: couleur | Einjähriger Trieb: Farbe | Rama de un año: color | | |
| PQ | (a) green | verte | grün | verde | Puru | 1 |
| | greenish red | rouge verdâtre | grünlichrot | rojo verdoso | Reka | 2 |
| | greyish red | rouge grisâtre | gräulichrot | rojo grisáceo | Berkeley | 3 |
| | reddish yellow | jaune rougeâtre | rötlichgelb | amarillo rojizo | Heerma | 4 |
| | reddish brown | brun rougeâtre | rötlichbraun | marrón rojizo | Earliblue | 5 |
| | dark red | rouge foncé | dunkelrot | rojo oscuro | Aron | 6 |
| 4. VG | One-year-old shoot: length of internode (upper half) | Rameau d'un an: longueur de l'entre- nœud (moitié supérieure) | Einjähriger Trieb: Länge des Inter- nodiums (obere Hälfte) | Rama de un año: longitud del entre- nudo (mitad superior) | | |
| QN | (a) short | court | kurz | corta | | 3 |
| | medium | moyen | mittel | media | | 5 |
| | long | long | lang | larga | | 7 |

| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
|----------------------|----------------------------------|---|---------------------------------------|--|---|---------------|
| 5. MS/ VG (*) | Leaf: length | Feuille: longueur | Blatt: Länge | Hoja: longitud | | |
| QN (b) | short | courte | kurz | corta | Darrow | 3 |
| | medium | moyenne | mittel | media | Bluecrop, Patriot | 5 |
| | long | longue | lang | larga | Collins, Berkeley, Toro | 7 |
| 6. MS/ VG | Leaf: width | Feuille: largeur | Blatt: Breite | Hoja: anchura | | |
| QN (b) | narrow | étroite | schmal | estrecha | Emil, Heerma, Putte | 3 |
| | medium | moyenne | mittel | media | Ama, Bluecrop | 5 |
| | broad | large | breit | ancha | Collins, Berkeley | 7 |
| 7. MS/ VG | Leaf: ratio length/width | Feuille: rapport longueur/largeur | Blatt: Verhältnis Länge/Breite | Hoja: relación longitud/anchura | | |
| QN (b) | small | petit | klein | pequeña | Gretha | 3 |
| | medium | moyen | mittel | media | Patriot | 5 |
| | large | grand | groß | grande | Heerma | 7 |
| 8. VG (*) | Leaf: shape | Feuille: forme | Blatt: Form | Hoja: forma | | |
| PQ (b) | lanceolate | lancéolée | lanzettlich | lanceolada | Weymouth | 1 |
| | ovate | ovale | eiförmig | oval | Puru | 2 |
| | elliptic | elliptique | elliptisch | elíptica | Rancocas, Earliblue | 3 |
| | oblong | oblongue | rechteckig | oblonga | Berkeley, Bluetta, Jersey | 4 |
| 9. VG | Leaf: color of upper side | Feuille: couleur de la face supérieure | Blatt: Farbe der Oberseite | Hoja: color del haz | | |
| QL (b) | yellow | jaune | gelb | amarillo | Geerdens | 1 |
| | green | verte | grün | verde | | 2 |

| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
|-------------------|--|---|--|---|---|---------------|
| 10. VG (*) | <u>Only varieties with green leaf color:</u> Leaf: intensity of green color on upper side | <u>Seulement variétés à feuilles de couleur verte:</u> Feuille: intensité de la couleur verte sur la face supérieure | <u>Nur Sorten mit grüner Blattfarbe:</u> Blatt: Intensität der Grünfärbung an der Oberseite | <u>Sólo variedades con hoja de color verde:</u> Hoja: intensidad del color verde del haz | | |
| QN (b) | light | claire | hell | clara | Earliblue | 3 |
| | medium | moyenne | mittel | media | Berkeley, Toro | 5 |
| | dark | foncée | dunkel | oscura | Weymouth, Darrow | 7 |
| 11. VG (*) | Leaf: margin | Feuille: bord | Blatt: Rand | Hoja: margen | | |
| QL (b) | entire | entier | ganzrandig | entero | Blueray, Jersey | 1 |
| | serrate | denté | gesägt | serrado | Brigitta, Rancocas | 2 |
| 12. VG | Flower bud: anthocyanin coloration | Bourgeon: pigmentation anthocyanique | Blütenknospe: Anthocyanfärbung | Botón floral: pigmentación antocianica | | |
| QN (a) | weak | faible | gering | débil | Hele | 3 |
| | medium | moyenne | mittel | media | Patriot | 5 |
| | strong | forte | stark | fuerte | Bluecrop | 7 |
| 13. MS/ VG | Inflorescence: length (excluding peduncle) | Inflorescence: longueur (à l'exclusion du pédoncule) | Blütenstand: Länge (ohne Blütenstandsstiel) | Inflorescencia: longitud (excluido el pedúnculo) | | |
| QN (c) | short | courte | kurz | corta | Bluetta, Collins | 3 |
| | medium | moyenne | mittel | media | Duke, Earliblue | 5 |
| | long | longue | lang | larga | Berkeley, Bluecrop | 7 |
| 14. VG | Flower: shape of corolla | Fleur: forme de la corolle | Blüte: Form der Krone | Flor: forma de la corola | | |
| PQ (c) | urceolate | urcéolée | urnenförmig | urceolada | Maru | 1 |
| | campanulate | campanulée | glockenförmig | acampanada | | 2 |
| | cylindrical | cylindrique | zylindrisch | cilíndrica | Reka | 3 |

| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
|-------------------|---|--|---|---|---|---------------|
| 15. VG (*) | Flower: size of corolla tube | Fleur: taille du tube de la corolle | Blüte: Größe der Kronenröhre | Flor: tamaño del tubo de la corola | | |
| QN (c) | small | petit | klein | pequeño | Blueray | 3 |
| | medium | moyen | mittel | medio | Heerma | 5 |
| | large | grand | groß | grande | Collins | 7 |
| 16. VG (*) | Flower: anthocyanin coloration of corolla tube | Fleur: pigmentation anthocyanique du tube de la corolle | Blüte: Anthocyanfärbung der Kronenröhre | Flor: pigmentación antocianica del tubo de la corola | | |
| QN (c) | absent or very weak | nulle ou très faible | fehlend oder sehr gering | ausente o muy débil | Maru | 1 |
| | weak | faible | gering | débil | Ama | 3 |
| | medium | moyenne | mittel | media | Gretha | 5 |
| | strong | forte | stark | fuerte | Bluecrop | 7 |
| 17. VG | Flower: 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 | | |
| QL (c) | absent | absentes | fehlend | ausentes | | 1 |
| | present | présentes | vorhanden | presentes | | 9 |
| 18. VG | Fruit cluster: density | Bouquet de fruit: densité | Fruchtgruppe: Dichte | Racimos de fruto: densidad | | |
| QN (d) | sparse | lâche | locker | baja | Rahi | 3 |
| | medium | moyenne | mittel | media | Toro | 5 |
| | dense | dense | dicht | alta | Tifblue | 7 |
| 19. 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 | | |
| QN | light | claire | hell | clara | Heerma | 3 |
| | medium | moyenne | mittel | media | Ama | 5 |
| | dark | foncée | dunkel | oscura | Berkeley | 7 |

| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
|---------------|---|--|---|--|---|---------------|
| 20. VG | Fruit: size | Fruit: taille | Frucht: Größe | Fruto: tamaño | | |
| (*) | | | | | | |
| QN | (d) small | petit | klein | pequeño | Ama | 3 |
| | medium | moyen | mittel | medio | Concord | 5 |
| | large | gros | groß | grande | Darrow | 7 |
| 21. VG | Fruit: shape in longitudinal section | Fruit: forme en section longitudinale | Frucht: Form im Längsschnitt | Fruto: forma en sección longitudinal | | |
| (*) | | | | | | |
| (+) | | | | | | |
| PQ | (d) elliptic | elliptique | elliptisch | elíptica | Northland | 1 |
| | round | arrondi | rund | redonda | Bluecrop, Jersey | 2 |
| | oblate | aplatis | breitrund | oblata | Earliblue | 3 |
| 22. VG | Fruit: attitude of sepals | Fruit: port des sépales | Frucht: Haltung der Kelchblätter | Fruto: porte de los sépalos | | |
| QN | (d) erect | dressé | aufrecht | erecto | Powderblue | 1 |
| | erect to semi-erect | dressé à demi-dressé | aufrecht bis halbaufrecht | entre erecto y semierecto | | 2 |
| | semi-erect | demi-dressé | halbaufrecht | semierecto | Tifblue | 3 |
| 23. VG | Fruit: type of sepals | Fruit: type de sépales | Frucht: Typ der Kelchblätter | Fruto: tipo de sépalos | | |
| QN | (d) incurving | incurvé | aufgebogen | incurvado | Delite | 1 |
| | straight | droit | gerade | recto | Powderblue | 2 |
| | reflexed | récurvé | zurückgebogen | recurvado | Tifblue | 3 |
| 24. VG | Fruit: diameter of calyx basin | Fruit: diamètre de la cuvette du calice | Frucht: Durchmesser der Kelchhöhle | Fruto: diámetro de la cavidad del cáliz | | |
| QN | (d) small | petit | klein | pequeño | Blueray | 3 |
| | medium | moyen | mittel | medio | Bluecrop | 5 |
| | large | grand | groß | grande | Darrow | 7 |

| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
|------------|-------------------|--|--|---|---|-----------------|
| 25. | VG | Fruit: depth of calyx basin | Fruit: profondeur de la cuvette du calice | Frucht: Tiefe der Kelchhöhle | Fruto: profundidad de la cavidad del cáliz | |
| QN | (d) | shallow | peu profonde | flach | poco profunda | Collins 3 |
| | | medium | moyenne | mittel | media | Blueray 5 |
| | | deep | profonde | tief | profunda | Heidi, Jersey 7 |
| 26. | VG | Fruit: intensity of bloom | Fruit: intensité de la pruine | Frucht: Intensität der Bereifung | Fruto: intensidad de la pruina | |
| QN | (d) | very weak | très faible | sehr gering | muy débil | Goldtraube 1 |
| | | weak | faible | gering | débil | Gretha 3 |
| | | medium | moyenne | mittel | media | Ama, Bluetta 5 |
| | | strong | forte | stark | fuerte | Darrow, Gila 7 |
| 27. | VG | Fruit: color of skin (after removal of bloom) | Fruit: couleur de l'épiderme (après retrait de la pruine) | Frucht: Farbe der Schale (nach Entfernung der Bereifung) | Fruto: color de la epidermis (tras quitar la pruina) | |
| PQ | (d) | light blue | bleu clair | hellblau | azul claro | Berkeley 1 |
| | | medium blue | bleu moyen | mittelblau | azul medio | Patriot 2 |
| | | dark blue | bleu foncé | dunkelblau | azul oscuro | Heerma 3 |
| | | blue red | bleu rouge | blaurot | rojo azulado | Delite 4 |
| 28. | VG/ MG | Fruit: firmness | Fruit: fermeté | Frucht: Festigkeit | Fruto: firmeza | |
| QN | (d) | soft | mou | weich | blando | 3 |
| | | medium | intermédiaire | mittel | medio | O'Neil 5 |
| | | firm | ferme | fest | firme | Duke 7 |
| | | very firm | très ferme | sehr fest | muy firme | Rahi 9 |
| 29. | VG | Fruit: sweetness | Fruit: goût sucré | Frucht: Süße | Fruto: dulzor | |
| QN | (d) | low | faible | gering | bajo | Bluetta 3 |
| | | medium | moyen | mittel | medio | Collins 5 |
| | | high | fort | stark | alto | Goldtraube 7 |

| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
|----------------------------|---|--|---|---|---|---------------|
| 30. VG (* (+) | Fruit: acidity | Fruit: acidité | Frucht: Säure | Fruto: acidez | | |
| QN | (d) low | faible | gering | baja | Gretha | 3 |
| | medium | moyenne | mittel | media | Darrow | 5 |
| | high | forte | stark | alta | Ascorba, Bluecrop | 7 |
| 31. VG (* (+) | Plant: fruiting type | Plante: type de fructification | Pflanze: Fruchtungstyp | Planta: tipo de fructificación | | |
| QL | (c) on one-year-old shoots only | seulement sur des rameaux d'un an | nur an einjährigen Trieben | sólo en ramas de un año | Darrow, Patriot | 1 |
| | on one-year-old and current season's shoots | sur des rameaux d'un an et des rameaux en croissance | an einjährigen Trieben und an Jahrestrieben | en ramas de un año y en ramas de la estación | Concord, Burlington | 2 |
| 32. MG (* (+) | Time of vegetative bud burst | Époque de débourrement | Zeitpunkt des Aufbruchs der vegetativen Knospe | Época de aparición de la yema de madera | | |
| QN | early | précoce | früh | temprana | Patriot, Weymouth | 3 |
| | medium | moyenne | mittel | media | Bluecrop | 5 |
| | late | tardive | spät | tardía | Blueray | 7 |
| 33. MG (* (+) | 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 | | |
| QN | very early | très précoce | sehr früh | muy temprana | Patriot | 1 |
| | early | précoce | früh | temprana | Weymouth | 3 |
| | medium | moyenne | mittel | media | Berkeley | 5 |
| | late | tardive | spät | tardía | Darrow | 7 |
| | very late | très tardive | sehr spät | muy tardía | Jersey | 9 |

| | English | français | Deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
|------------|---|---|--|---|---|---------------|
| 34. | MG | <u>Only varieties which fruit on one-year-old and current season's shoots:</u> | <u>Seulement variétés avec fruit sur les rameaux d'un an et les rameaux en croissance :</u> | <u>Nur Sorten, die am einjährigen Trieb und am Jahrestrieb Früchte tragen:</u> | <u>Sólo variedades que fructifican en ramas de un año y en ramas de la estación:</u> | |
| (*) | Time of beginning of flowering on current year's shoot | Époque du début de la floraison sur les rameaux en croissance | Zeitpunkt des Blühbeginns am Jahrestrieb | Época de inicio de la floración en la rama del corriente año | | |
| (+) | | | | | | |
| QN | early | précoce | früh | temprana | O'Neal | 3 |
| | medium | moyenne | mittel | media | JU83 | 5 |
| | late | tardive | spät | tardía | | 7 |
| 35. | MG | <u>Time of beginning of fruit ripening on one-year-old shoot</u> | <u>Zeitpunkt des Beginns der Fruchtreife am einjährigen Trieb</u> | <u>Época de inicio de la madurez del fruto en la rama de un año</u> | | |
| (*) | | Époque du début de la maturation des fruits sur les rameaux d'un an | | | | |
| (+) | | | | | | |
| QN | very early | très précoce | sehr früh | muy temprana | Bluetta | 1 |
| | early | précoce | früh | temprana | Blueray | 3 |
| | medium | moyenne | mittel | media | Heerma | 5 |
| | late | tardive | spät | tardía | Darrow | 7 |
| | very late | très tardive | sehr spät | muy tardía | Elizabeth | 9 |
| 36. | MG/ QN | <u>Only varieties which fruit on one-year-old and current season's shoots:</u> | <u>Nur Sorten, die am einjährigen Trieb und am Jahrestrieb Früchte tragen:</u> | <u>Sólo variedades que fructifican en ramas de un año y en ramas de la estación:</u> | | |
| (*) | Time of beginning of fruit ripening on current year's shoot | <u>Seulement variétés avec fruit sur les rameaux d'un an et les rameaux en croissance:</u> | <u>Zeitpunkt des Beginns der Fruchtreife am Jahrestrieb</u> | <u>Época de inicio de la madurez del fruto en la rama del corriente año</u> | | |
| (+) | | Époque du début de la maturation des fruits sur les rameaux en croissance | | | | |
| QN | early | précoce | früh | temprana | O'Neal | 3 |
| | medium | moyenne | mittel | media | JU83 | 5 |
| | late | tardive | spät | tardía | | 7 |

8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

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

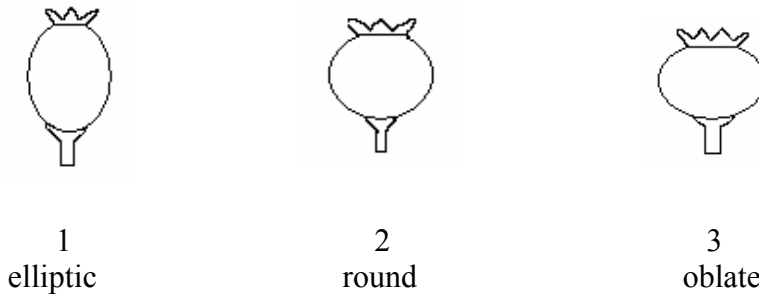
- (a) Observations on the plant should be made on unpruned bushes in the dormant season.
- (b) Observations on the leaf should be made on fully developed leaves in early summer.
- (c) Observations on the inflorescence and flower should be made at the time of full flowering.
- (d) Unless otherwise stated, observations on the fruit should be made on physiologically ripe fruits.

8.2 *Explanations for individual characteristics*

Ad. 1: Plant: vigor

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

Ad. 21: Fruit: shape in longitudinal section



Ad. 28: Fruit: firmness

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

Ad. 29: Fruit: sweetness

Ad. 30: Fruit: acidity

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

Ad. 32: Time of vegetative bud burst

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

Ad. 33: Time of beginning of flowering on one-year old shoot

Ad. 34: Only varieties which fruit on one-year-old and current season's shoots: Time of beginning of flowering on current year's shoot

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

Ad. 35: Time of beginning of fruit ripening on one-year-old shoot

Ad. 36: Only varieties which fruit on one-year-old and current season's shoots: Time of beginning of fruit ripening on current year's shoot

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

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.

10. Technical Questionnaire

| | | |
|--|--|---|
| TECHNICAL QUESTIONNAIRE | Page {x} of {y} | Reference Number: |
| | | Application date: (not to be filled in by the applicant) |
| <p>TECHNICAL QUESTIONNAIRE</p> <p>to be completed in connection with an application for plant breeders' rights</p> | | |
| <p>1. Subject of the Technical Questionnaire</p> | | |
| 1.1.1 Botanical name | <i>Vaccinium angustifolium</i> Aiton, <i>Vaccinium brittoni</i> Porter | [] |
| 1.1.2 Common name | Lowbush Blueberry, Upland Lowbush Blueberry | |
| 1.2.1 Botanical name | <i>Vaccinium corymbosum</i> L. | [] |
| 1.2.2 Common name | Highbush Blueberry; Northern Highbush | |
| 1.3.1 Botanical name | <i>Vaccinium formosum</i> Andrews, <i>Vaccinium australe</i> Small | [] |
| 1.3.2 Common name | Swamp Highbush Blueberry; Swamp or Southern Highbush | |
| 1.4.1 Botanical name | <i>Vaccinium myrtilloides</i> Michx. | [] |
| 1.4.2 Common name | Canada Blueberry, Sourtop Blueberry, Velvetleaf Blueberry | |
| 1.5.1 Botanical name | <i>Vaccinium myrtilus</i> L. | [] |
| 1.5.2 Common name | Bilberry, Whinberry, Whortleberry | |
| 1.6.1 Botanical name | <i>Vaccinium virgatum</i> Aiton, <i>Vaccinium ashei</i> Reade | [] |
| 1.6.2 Common name | Rabbit-eye Blueberry, Southern Black Blueberry | |
| 1.7.1 Botanical name | <i>Vaccinium simulatum</i> Small | [] |
| 1.7.2 Common name | Upland Highbush Blueberry | |
| 1.8 Hybrid: please indicate name(s) of species used in the crossing | | |
| Botanical 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)

(b) partially known cross []
(please state known parent variety(ies))

(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)

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)

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: |
|-------------------------|-----------------|-------------------|

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 | Plant: growth habit | | |
| (2) | | | |
| | upright | Ivanhoe | 1[] |
| | semi upright | Bluetta | 2[] |
| | spreading | Jersey | 3[] |
| 5.2 | Fruit: color of skin (after removal of bloom) | | |
| (27) | | | |
| | light blue | Berkeley | 1[] |
| | medium blue | Patriot | 2[] |
| | dark blue | Heerma | 3[] |
| | blue red | Delite | 4[] |
| 5.3 | Plant: fruiting type | | |
| (31) | | | |
| | on one-year-old shoots only | Darrow, Patriot | 1[] |
| | on one-year-old and current season's shoots | Concord, Burlington | 2[] |
| 5.4 | Time of beginning of flowering on one-year-old shoot | | |
| (33) | | | |
| | very early | Patriot | 1[] |
| | early | Weymouth | 3[] |
| | medium | Berkeley | 5[] |
| | late | Darrow | 7[] |
| | very late | Jersey | 9[] |
| 5.5 | <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 | | |
| (34) | | | |
| | early | O'Neal | 3[] |
| | medium | JU83 | 5[] |
| | late | | 7[] |

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

| | Characteristics | Example Varieties | Note |
|---------------------|---|-------------------|------|
| 5.6 (35) | Time of beginning of fruit ripening on one-year-old shoot | | |
| | very early | Bluetta | 1[] |
| | early | Blueray | 3[] |
| | medium | Heerma | 5[] |
| | late | Darrow | 7[] |
| | very late | Elizabeth | 9[] |
| 5.7 (36) | <u>Only varieties which fruit on one-year-old and current season's shoots:</u> Time of beginning of fruit ripening on current year's shoot | | |
| | early | O'Neal | 3[] |
| | medium | JU83 | 5[] |
| | late | | 7[] |

| | | |
|-------------------------|-----------------|-------------------|
| 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 |
|---|---|--|--|
| <i>Example</i> | <i>Fruit: size</i> | <i>small</i> | <i>medium</i> |
| | | | |
| | | | |
| | | | |
| | | | |

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 should accompany the Technical Questionnaire.

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.

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: |
|-------------------------|-----------------|-------------------|

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".

.....

9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes []

(please provide details as specified by the Authority)

No []

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]