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|  |  | ETG/137/5(proj.1)**ORIGINAL:** EnglishDATE: 2015-07-24 |
| INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS  |
| Geneva |
| DRAFT |

|  |  |  |
| --- | --- | --- |
|  |  **Blueberry** UPOV Code: VACCI\_ANG; VACCI\_COR; VACCI\_FOR; VACCI\_MYD; VACCI\_MYR; VACCI\_SIM; VACCI\_VIR Vaccinium angustifolium Aiton; Vaccinium corymbosum L.; Vaccinium formosum Andrews; Vaccinium myrtilloides Michx.; Vaccinium myrtillus L.; Vaccinium simulatum Small; Vaccinium virgatum Aiton | [[1]](#footnote-1)\* |

**GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

prepared by (an) expert(s) from Australia

to be considered by the

Technical Working Party for Fruit Crops
at its forty-sixth session

to be held in Mpumalanga, South Africa

from 2015-08-24

to 2015-08-28

| Alternative Names:\* |
| --- |
| *Botanical name* | *English* | *French* | *German* | *Spanish* |
| Vaccinium angustifolium Aiton, Vaccinium brittonii Porter ex Bickn. | Lowbush Blueberry, Upland lowbush blueberry |  |  |  |
| Vaccinium corymbosum L., Vaccinium-Corymbosum-Hybridae | Blueberry, High Bush Blueberry | Myrtille, Myrtille en Corymbe | Amerikanische Heidelbeere, Kulturheidelbeere | Arándano americano |
| Vaccinium formosum Andrews, Vaccinium australe Small | Swamp Highbush Blueberry |  |  |  |
| Vaccinium myrtilloides Michx. | Canada blueberry; Sourtop blueberry; Velvetleaf blueberry |  | Kanadische Heidelbeere |  |
| Vaccinium myrtillus L. | Bilberry, Blueberry, Whinberry, Whortleberry | Myrtille | Blaubeere, Heidelbeere | Arándano, Mirtillo |
| Vaccinium simulatum Small |  |  |  |  |
| Vaccinium virgatum Aiton, Vaccinium ashei J. M. Reade | Rabbit-eye blueberry, Southern black 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.

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# Subject of these Test Guidelines

 These Test Guidelines apply to all varieties of Vaccinium angustifolium Aiton, Vaccinium corymbosum L., Vaccinium formosum Andrews, Vaccinium myrtilloides Michx., Vaccinium myrtillus L., Vaccinium simulatum Small, Vaccinium virgatum Aiton.

# 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.

* 1. The material is to be supplied in the form of plants in pots 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.

# 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 In particular, it is essential that the fruit bodies produce a satisfactory crop of fruit in each of the two 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

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.

## 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.

# 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 / Parts of Plants to be Examined

 Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 3 plants or parts taken from each of 3 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 second 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. 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

* + 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 95% and an acceptance probability of at least 1% should be applied. In the case of a sample size of 5 plants, 0 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.

# 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 and document TGP/9 “Examining Distinctness”.

# 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.

## 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 4.1.5

(a)-(g) See Explanations on the Table of Characteristics in Chapter 8.

(+) See Explanations on the Table of Characteristics in Chapter 8.

(H) High chilling variety

(L) Low chilling variety

# 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** | **Plante: vigueur** | **Pflanze: Wuchsstärke** | **Planta: vigor** |  |  |
| weak | faible | schwach | débil | Bluetta, Weymouth | 3 |
| medium | moyenne | mittel | medio | Bluejay, Patriot | 5 |
| strong | forte | stark | fuerte | Bluecrop, Duke(H), Earliblue(H) | 7 |
|  |
|  |  |  |  |  |  |
| 2. (\*) PQ VG (a) |
| **Plant: growth habit** | **Plante: port** | **Pflanze: Wuchsform** | **Planta: porte** |  |  |
| upright | dressé | aufrecht | erecto | Ivanhoe | 1 |
| semi upright | demi dressé | halbaufrecht | semierecto | Bluetta | 2 |
| spreading | étalé | breitwüchsig | rastrero | Jersey, Scintilla(L) | 3 |
|  |
|  |  |  |  |  |  |
| 3. PQ VG (a) |
| **One-year-old shoot: color** | **Rameau d’un an: couleur** | **Einjähriger Trieb: Farbe** | **Rama de un año: color** |  |  |
| 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(H) | 5 |
| dark red | rouge foncé | dunkelrot | rojo oscuro | Aron | 6 |
|  |
|  |  |  |  |  |  |
| 4. QN VG (+) (a) |
| **One-year-old shoot: length of internode** |  |  |
| 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. (\*) QN MS VG (b) |
| **Leaf: length** | **Feuille: longueur** | **Blatt: Länge** | **Hoja: longitud** |  |  |
| short | courte | kurz | corta | Darrow | 3 |
| medium | moyenne | mittel | media | Bluecrop, Patriot | 5 |
| long | longue | lang | larga | Berkeley, Collins , Toro | 7 |
|  |
|  |  |  |  |  |  |
| 6. QN MS VG (b) |
| **Leaf: width** | **Feuille: largeur** | **Blatt: Breite** | **Hoja: anchura** |  |  |
| narrow | étroite | schmal | estrecha | Emil, Heerma, Putte | 3 |
| medium | moyenne | mittel | media | Ama, Bluecrop | 5 |
| broad | large | breit | ancha | Berkeley, Collins | 7 |
|  |
|  |  |  |  |  |  |
| 7. QN MS VG (b) |
| **Leaf: ratio length/width** | **Feuille: rapport longueur/largeur** | **Blatt: Verhältnis Länge/Breite** | **Hoja: relación longitud/anchura** |  |  |
| small | petit | klein | pequeña | Gretha | 3 |
| medium | moyen | mittel | media | Patriot | 5 |
| large | grand | groß | grande | Heerma | 7 |
|  |
|  |  |  |  |  |  |
| 8. (\*) PQ VG (b) |
| **Leaf: shape** | **Feuille: forme** | **Blatt: Form** | **Hoja: forma** |  |  |
| lanceolate | lancéolée | lanzettlich | lanceolada | Weymouth | 1 |
| ovate | ovale | eiförmig | oval | Puru | 2 |
| elliptic | elliptique | elliptisch | elíptica | Earliblue(H), Rancocas | 3 |
| oblong | oblongue | rechteckig | oblonga | Berkeley, Bluetta, Jersey | 4 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  |
|  |  |  |  |  |  |
| 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. (\*) QN VG (b) |
| **Only varieties with green leaf color: Leaf: intensity of green color on upper side** | **Seulement variétés à feuilles de couleur verte: Feuille: inten­sité de la couleur verte sur la face supérieure** | **Nur Sorten mit grüner Blattfarbe: Blatt: Intensität der Grünfärbung an der Oberseite** | **Sólo variedades con hoja de color verde: Hoja: intensidad del color verde del haz** |  |  |
| light | claire | hell | clara | Earliblue(H) | 3 |
| medium | moyenne | mittel | media | Berkeley, Toro | 5 |
| dark | foncée | dunkel | oscura | Darrow, Weymouth | 7 |
|  |
|  |  |  |  |  |  |
| 11. (\*) QL VG (b) |
| **Leaf: margin** | **Feuille: bord** | **Blatt: Rand** | **Hoja: margen** |  |  |
| entire | entier | ganzrandig | entero | Blueray, Jersey | 1 |
| serrate | denté | gesägt | serrado | Brigitta, Rancocas | 2 |
|  |
|  |  |  |  |  |  |
| 12. QN VG (a) |
| **Flower bud: antho­cyanin coloration** | **Bourgeon: pigmenta­tion anthocyanique** | **Blütenknospe: Anthocyanfärbung** | **Botón floral: pigmen­tación antociánica** |  |  |
| weak | faible | gering | débil | Hele | 3 |
| medium | moyenne | mittel | media | Patriot | 5 |
| strong | forte | stark | fuerte | Bluecrop | 7 |
| very strong |  |  |  | Brigitta, Collins | 9 |
|  |
|  |  |  |  |  |  |
| 13. QN MS VG (c) |
| **Inflorescence: length (excluding peduncle)** | **Inflorescence: longueur (à l’ex­clusion du pédoncule)** | **Blütenstand: Länge (ohne Blütenstandsstiel)** | **Inflorescencia: longitud (excluido el pedúnculo)** |  |  |
| short | courte | kurz | corta | Bluetta, Collins | 3 |
| medium | moyenne | mittel | media | Duke(H), Earliblue(H) | 5 |
| long | longue | lang | larga | Berkeley, Bluecrop | 7 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  |
|  |  |  |  |  |  |
| 14. PQ VG (c) |
| **Flower: shape of corolla** | **Fleur: forme de la corolle** | **Blüte: Form der Krone** | **Flor: forma de la corola** |  |  |
| urceolate | urcéolée | urnenförmig | urceolada | Maru | 1 |
| campanulate | campanulée | glockenförmig | acampanada |  | 2 |
| cylindrical | cylindrique | zylindrisch | cilíndrica | Reka | 3 |
|  |
|  |  |  |  |  |  |
| 15. (\*) 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 | 3 |
| medium | moyen | mittel | medio | Heerma | 5 |
| large | grand | groß | grande | Collins | 7 |
|  |
|  |  |  |  |  |  |
| 16. (\*) QN VG (c) |
| **Flower: anthocyanin coloration of corolla tube** | **Fleur: pigmentation anthocyanique du tube de la corolle** | **Blüte: Anthocyan­färbung der Kronenröhre** | **Flor: pigmentación antociánica del tubo de la corola** |  |  |
| 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. (\*) QN VG (c) |
| **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** |  |  |
| absent | absentes | fehlend | ausentes | Ventura (L) | 1 |
| medium |  |  |  | Camellia (L) | 5 |
| high |  |  |  | Corona, FL 02-40 (L) | 7 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  |
|  |  |  |  |  |  |
| 18. QN VG (d) |
| **Fruit cluster: density** | **Bouquet de fruit: densité** | **Fruchtgruppe: Dichte** | **Racimos de fruto: densidad** |  |  |
| sparse | lâche | locker | baja | Rahi | 3 |
| medium | moyenne | mittel | media | Toro | 5 |
| dense | dense | dicht | alta | Tifblue | 7 |
|  |
|  |  |  |  |  |  |
| 19. (\*) 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 | 3 |
| medium | moyenne | mittel | media | Ama | 5 |
| dark | foncée | dunkel | oscura | Berkeley | 7 |
|  |
|  |  |  |  |  |  |
| 20. (\*) QN VG (d) |
| **Fruit: size** | **Fruit: taille** | **Frucht: Größe** | **Fruto: tamaño** |  |  |
| very small |  |  |  | ZF08-095 (L) | 1 |
| small | petit | klein | pequeño | Ama, Sweetcrisp (L) | 3 |
| medium | moyen | mittel | medio | Concord, Emerald (L) | 5 |
| large | gros | groß | grande | Darrow, FL05-627 (L) | 7 |
|  |
|  |  |  |  |  |  |
| 21. (\*) 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 | 1 |
| round | arrondi | rund | redonda | Bluecrop, Jersey | 2 |
| oblate | aplati | breitrund | oblata | Earliblue(H) | 3 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  |
|  |  |  |  |  |  |
| 22. 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 | 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. QN VG (d) |
| **Fruit: type of sepals** | **Fruit: type de sépales** | **Frucht: Typ der Kelchblätter** | **Fruto: tipo de sépalos** |  |  |
| incurving | incurvé | aufgebogen | incurvado | Delite | 1 |
| straight | droit | gerade | recto | Powderblue | 2 |
| reflexed | récurvé | zurückgebogen | recurvado | Tifblue | 3 |
|  |
|  |  |  |  |  |  |
| 24. 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 | 3 |
| medium | moyen | mittel | medio | Bluecrop | 5 |
| large | grand | groß | grande | Darrow | 7 |
|  |
|  |  |  |  |  |  |
| 25. QN VG (d) |
| **Fruit: depth of calyx basin** | **Fruit: profondeur de la cuvette du calice** | **Frucht: Tiefe der Kelchhöhle** | **Fruto: profundidad de la cavidad del cáliz** |  |  |
| shallow | peu profonde | flach | poco profunda | Collins | 3 |
| medium | moyenne | mittel | media | Blueray | 5 |
| deep | profonde | tief | profunda | Heidi, Jersey | 7 |
|  |
|  |  |  |  |  |  |
| 26. (\*) QN VG (d) |
| **Fruit: intensity of bloom** | **Fruit: intensité de la pruine** | **Frucht: Intensität der Bereifung** | **Fruto: intensidad de la pruina** |  |  |
| 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 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  |
|  |  |  |  |  |  |
| 27. (\*) PQ VG (d) |
| **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)** |  |  |
| 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. (\*) QN MG VG (+) (d) |
| **Fruit: firmness** | **Fruit: fermeté** | **Frucht: Festigkeit** | **Fruto: firmeza** |  |  |
| soft | mou | weich | blando |  | 3 |
| soft to medium |  |  |  | Darrow | 4 |
| medium | intermédiaire | mittel | medio | O’Neil | 5 |
| firm | ferme | fest | firme | Duke(H) | 7 |
| very firm | très ferme | sehr fest | muy firme | Rahi | 9 |
|  |
|  |  |  |  |  |  |
| 29. (\*) QN VG (d) (e) |
| **Fruit: sweetness** | **Fruit: goût sucré** | **Frucht: Süße** | **Fruto: dulzor** |  |  |
| low | faible | gering | bajo | Bluetta | 3 |
| medium | moyen | mittel | medio | Collins | 5 |
| high | fort | stark | alto | Goldtraube | 7 |
|  |
|  |  |  |  |  |  |
| 30. (\*) QN VG (d) (e) |
| **Fruit: acidity** | **Fruit: acidité** | **Frucht: Säure** | **Fruto: acidez** |  |  |
| low | faible | gering | baja | Gretha | 3 |
| medium | moyenne | mittel | media | Darrow | 5 |
| high | forte | stark | alta | Ascorba, Bluecrop | 7 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  |
|  |  |  |  |  |  |
| 31. (\*) QL VG (c) |
| **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, Patriot | 1 |
| on one-year-old and current season shoots |  |  |  | Burlington, Concord | 2 |
|  |
|  |  |  |  |  |  |
| 32. (\*) QN MG (+) |
| **Time of vegetative bud burst** | **Époque de débourrement** | **Zeitpunkt des Aufbruchs der vegetativen Knospe** | **Época de aparición de la yema de madera** |  |  |
| early | précoce | früh | temprana | Patriot, Weymouth | 3 |
| medium | moyenne | mittel | media | Bluecrop | 5 |
| late | tardive | spät | tardía | Blueray | 7 |
|  |
|  |  |  |  |  |  |
| 33. (\*) QN MG (f) |
| **Time of beginning of flowering on one-year-old shoot** |  |  |
| 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 |
|  |
|  |  |  |  |  |  |
| 34. (\*) QN MG (f) |
| **Only varieties which fruit on one-year-old and current season's shoots: Time of beginning of flowering on current year’s shoot** |  |  |
| early |  |  |  | O’Neil | 3 |
| medium |  |  |  | JU83 | 5 |
| late |  |  |  |  | 7 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  |
|  |  |  |  |  |  |
| 35. (\*) QN MG (g) |
| **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 |
|  |
|  |  |  |  |  |  |
| 36. (\*) QN MG (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** |  |  |
| early |  |  |  | O’Neil | 3 |
| medium |  |  |  | JU83 | 5 |
| late |  |  |  |  | 7 |
|  |
|  |  |  |  |  |  |
| 37. PQ VG |
| **Corolla tube: color of outer side** | **Tube de la corolle : couleur de la face externe** | **Kronröhre: Farbe der Außenseite** | **Tubo de la corola: color de la cara externa** |  |  |
| white |  |  |  | Southmoon (L) | 1 |
| greenish white |  |  |  | Heerma | 2 |
| cream |  |  |  | Collins | 3 |

# 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.

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

(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

Observed on 4th internode from the tip.

Ad. 19: Unripe fruit: intensity of green color

Observe on late green fruit with bloom

Ad. 21: Fruit: shape in longitudinal section

|  |
| --- |
| Alternative text |
|  |

Ad. 28: Fruit: firmness

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

Ad. 32: Time of vegetative bud burst

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

# Literature

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

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

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

# Technical Questionnaire

| TECHNICAL QUESTIONNAIRE | Page {x} of {y} | Reference Number: |
| --- | --- | --- |
|  |  |  |
|  |  | Application date: |
|  |  | (not to be filled in by the applicant) |
| TECHNICAL QUESTIONNAIREto be completed in connection with an application for plant breeders’ rights |
|  |  |  |
| 1. Subject of the Technical Questionnaire |
| 1.1.1 | Botanical Name | Vaccinium angustifolium Aiton | [ ] |
| 1.1.2 | Common Name | Lowbush Blueberry, Upland lowbush blueberry |  |
| 1.2.1 | Botanical Name | Vaccinium corymbosum L. | [ ] |
| 1.2.2 | Common Name | Blueberry, High Bush Blueberry |  |
| 1.3.1 | Botanical Name | Vaccinium formosum Andrews | [ ] |
| 1.3.2 | Common Name | Swamp Highbush Blueberry |  |
| 1.4.1 | Botanical Name | Vaccinium myrtilloides Michx. | [ ] |
| 1.4.2 | Common Name | Canada blueberry; Sourtop blueberry; Velvetleaf blueberry |  |
| 1.5.1 | Botanical Name | Vaccinium myrtillus L. | [ ] |
| 1.5.2 | Common Name | Bilberry, Blueberry, Whinberry, Whortleberry |  |
| 1.6.1 | Botanical Name | Vaccinium simulatum Small | [ ] |
| 1.6.2 | Common Name |  |  |
| 1.7.1 | Botanical Name | Vaccinium virgatum Aiton | [ ] |
| 1.7.2 | Common Name | Rabbit-eye blueberry, Southern black blueberry |  |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 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 schemeVariety 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)

|  |
| --- |
|  |

 |
|  |

|  |
| --- |
| 4.2 Method of propagating the variety4.2.1 Vegetative propagation(a) cuttings [ ](b) in vitro propagation [ ](c) Other (state method) [ ]..................................................................................................................................................: :: ::................................................................................................................................................:4.2.2 Other [ ] (please provide details)..................................................................................................................................................: :: ::................................................................................................................................................:  |

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

|  |
| --- |
| 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:  |
| 7. Additional information which may help in the examination of the variety7.1 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 information7.4 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.] |
| 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. |

| TECHNICAL QUESTIONNAIRE | Page {x} of {y} | Reference Number: |
| --- | --- | --- |
| 9. Information on plant material to be examined or submitted for examination9.1 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 nameSignature Date |

[End of document]

1. \* 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](http://www.upov.int)), for the latest information.] [↑](#footnote-ref-1)