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| INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS  |
| Geneva |
| DRAFT |

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|  | **APPLE ROOTSTOCK**UPOV Code: MALUS*Malus* Mill. | [[1]](#footnote-1)\* |

**GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

prepared by an expert from South Africa

to be considered by the

*Enlarged Editorial Committee at its meeting*

*to be held in Geneva, on January 8 and 9, 2014*

Alternative Names:\*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Botanical name* | *English* | *French* | *German* | *Spanish* |
| *Malus* Mill. | Apple Rootstock | Porte-greffes de pommier | Apfel-Unterlagen | Portainjertos de manzano |

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| --- |
| 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 vegetatively propagated rootstock varieties of *Malus* Mill.*.*

# 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 one-year-old rooted trees, or in the form of one-year-old rooted plants (for stoolbeds).

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

5 one-year-old rooted trees and/or

10 one-year-old rooted plants for stoolbeds.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease. It should not be obtained directly from *in vitro* propagation.

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

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

## 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 for trees and 10 plants for stoolbeds.

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 should be made on 5 plants or parts taken from each of 5 plants for trees and 9 plants for stoolbeds disregarding any off-type plants. In the case of observations of parts of plants, the number of parts to be taken from each of the plants should be 2.

### 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

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-type is 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: vigor (characteristic 1)

(b) Plant: habit (characteristic 4)

(c) Young shoot: extent of anthocyanin coloration (characteristic 19)

(d) Leaf blade: attitude in relation to shoot (characteristic 20)

(e) Leaf blade: incisions of margin (characteristic 26)

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.

Example varieties are marked according to regions: South Africa¹, China (Asia)², Germany, France (Europe)³, New Zealand4.

 When marked in bold two or more regions have the same example variety for the same state of expression.

The example varieties provided for a particular region are not exclusive and might also be applicable in other regions.

## 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 - Applies only for stoolbeds

B - Applies only for fully grown trees

AB - Applies to stoolbed plants and fully grown trees

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

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

# Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| AB(\*)(+) | VG | Plant: vigor | Plante : vigueur | Pflanze: Wuchsstärke | Planta: vigor |  |  |
| QN | (a) | very weak | très faible | sehr gering | muy débil | CG 222¹ | 1 |
|  |  | weak | faible | gering | débil | J-TE-F3, M 94, **M 26¹4**, M 274 | 2 |
|  |  | medium | moyenne | mittel | medio | B93, G2024, J-TE-H3, JM74, M 7¹ | 3 |
|  |  | strong | forte | stark | fuerte | M 793¹, MM 1064 | 4 |
|  |  | very strong | très forte | sehr stark | muy fuerte | CG 934¹ | 5 |
| B | VG | Plant: number of branches  | Plante : nombre de ramifications | Pflanze: Anzahl Zweige | **Planta: número de ramas**  |  |  |
| QN | (a) | very few | très petit | sehr gering | muy bajo | G 222¹, M 274 | 1 |
|  |  | few | petit | gering | bajo | **M 9¹4** | 2 |
|  |  | medium | moyen | mittel | medio | JM7, **M 26¹4** | 3 |
|  |  | many | grand | groß | alto | **G202¹4**, G 707¹, MM 1064 | 4 |
|  |  | very many | très grand | sehr groß | muy alto | **M 25¹4**  | 5 |
| A | VG | Plant: number of shoots  | Plante : nombre de rameaux | Pflanze: Anzahl Triebe | **Planta: número de ramillas**  |  |  |
| QN | (a) | very few | très petit | sehr gering | muy bajo |  | 1 |
|  |  | few | petit | gering | bajo | M 91 | 2 |
|  |  | medium | moyen | mittel | medio | Joha3, Lancep3,Last Minute3, M 26¹, Supporter 13 | 3 |
|  |  | many | grand | groß | alto | MM 1111 | 4 |
|  |  | very many | très grand | sehr groß | muy alto | M 251 | 5 |
| AB(\*)(+) | VG | Plant: habit  | Plante : port | Pflanze: Haltung | Planta: hábito  |  |  |
| PQ | (a) | upright | dressé | aufrecht | erguido | M 7¹, M1164 | 1 |
|  |  | upright to spreading | dressé à étalé | aufrecht bis breitwüchsig | erguido a extendido | CG707¹ | 2 |
|  |  | spreading | étalé | breitwüchsig | extendido | Cepiland4, CG 222¹, M 93, M1164  | 3 |
|  |  | drooping  | retombant | hängend | colgante | Marubakaido¹ | 4 |
| B | VG | Plant: spines | Plante : épines | Pflanze: Dornen | Planta: espinas |  |  |
| QN | (a) | absent or few | absentes ou peu nombreuses | fehlend oder sehr wenige | ausente o bajo | M 9¹ | 1 |
|  |  | medium  | moyennement nombreuses | mittel | medio | M 25¹ | 2 |
|  |  | many | nombreuses | viele | alto | **G 202¹4** | 3 |
| AB(\*)(+) | VG | One-year-old shoot: growth | Rameau d’un an : croissance  | Einjähriger Trieb: Wuchs | Ramilla de un año: crecimiento |  |  |
| QN | (b) | straight | droite | gerade | recta | **M 9¹34** | 1 |
|  |  | moderately wavy | moyennement ondulée | leicht gewellt | moderadamente ondulada | **G 202¹4**, Mark3, M 263, M 793¹, Supporter 13 | 2 |
|  |  | strongly wavy  | fortement ondulée | stark gewellt | muy ondulada | M 25¹ | 3 |
| AB(\*)(+) | VG | One-year-old shoot: pubescence  | Rameau d’un an : pubescence | Einjähriger Trieb: Behaarung | Ramilla de un año: pubescencia |  |  |
| QN | (b) | absent or very weak | absente ou très faible | fehlend oder sehr gering | ausente o muy débil |  | 1 |
|  |  | weak | faible | gering | débil | B 93 | 2 |
|  |  | medium | moyenne | mittel | media | M 273, M 793¹ | 3 |
|  |  | strong | forte | stark | fuerte | Joha3, **M 9¹34** | 4 |
|  |  | very strong | très forte | sehr stark | muy fuerte | Crab C, MM106¹ | 5 |
| AB(\*) | VG | One-year-old shoot: glossiness | Rameau d’un an : brillance | Einjähriger Trieb: Glanz | **Ramilla de un año: brillo** |  |  |
| QN | (b) | absent or weak | absente ou faible | fehlend oder gering | ausente o débil | JM74 | 1 |
|  |  | medium | moyenne | mittel | medio | G202¹4, M 263 | 3 |
|  |  | strong | forte | stark | fuerte | **M 27¹4** | 5 |
| AB(\*) | VG/MG | One-year-old shoot: thickness  | Rameau d’un an : épaisseur | Einjähriger Trieb: Dicke | Ramilla de un año: grosor |  |  |
| QN | (b) | thin | mince | dünn | delgado | M 7¹ | 1 |
|  |  | medium | moyen | mittel | medio | B 93, Mark3, MM1064 | 2 |
|  |  | thick | épais | dick | grueso | Lizzy3 | 3 |
| AB(\*) | VG/MG | One-year-old shoot: length of internodes  | Rameau d’un an : longueur des entre‑nœuds  | Einjähriger Trieb: Länge der Internodien | Ramilla de un año: longitud de los entrenudos |  |  |
| QN | (b) | short | courts | kurz | corta | J-TE-H3, M 25¹, M274 | 1 |
|  |  | medium | moyens | mittel | media | M 26¹, M1164, Last Minute3 | 2 |
|  |  | long | longs | lang | larga | CG 707¹ | 3 |
| AB(\*) | VG | One-year-old shoot: number of lenticels | Rameau d’un an : nombre de lenticelles | Einjähriger Trieb: Anzahl Lentizellen | Ramilla de un año: número de lenticelas |  |  |
| QN | (b) | very few | très petit | sehr gering | muy bajo |  | 1 |
|  |  | few | petit | gering | bajo | **M 9¹4**, J-TE-F3, Lancep3 | 2 |
|  |  | medium | moyen | mittel | medio | Mark3, M 53, M 263, M 793¹, Supporter 13 | 3 |
|  |  | many | grand | groß | alto | CG 103, M 23, MM 111¹ | 4 |
|  |  | very many | très grand | sehr groß | muy alto | MM 104 | 5 |
| AB | VG | One-year-old shoot: size of lenticels | Rameau d’un an : taille des lenticelles | Einjähriger Trieb: Größe der Lentizellen | Ramilla de un año: tamaño de las lenticelas |  |  |
| QN | (b) | small | petites  | klein | pequeño | CG 6210¹, J-TE-F3 | 1 |
|  |  | medium | moyennes | mittel | medio | B 93, G2024, Joha3, Lizzy3, M 9¹ | 2 |
|  |  | large | grandes | groß | grande | MM107¹ | 3 |
| AB(\*) | VG | One-year-old shoot: color on sunny side | Rameau d’un an : couleur de la face exposée au soleil | Einjähriger Trieb: Farbe auf der Sonnenseite | Ramilla de un año: color de la parte soleada |  |  |
| PQ | (b) | greenish brown | brun verdâtre | grünlichbraun | marrón verdoso | **M9¹4**, M 43 | 1 |
|  |  | reddish brown | brun rougeâtre | rötlichbraun | marrón rojizo | Lizzy3, JM74, Mark3, **M 27¹4** | 2 |
|  |  | medium brown | brun moyen | mittelbraun | marrón medio | J-TE-H3, M 25¹, M 273 | 3 |
|  |  | dark brown | brun foncé | dunkelbraun | marrón oscuro | B 93, M 23, **M 26¹3** | 4 |
| AB(\*) | VG | One-year-old shoot: size of vegetative bud | Rameau d’un an : taille du bourgeon à bois | Einjähriger Trieb: Größe der vegetativen Knospe | Ramilla de un año: tamaño de la yema de madera |  |  |
| QN | (b) | small | petit | klein | pequeño | J-TE-H3, M 25¹, MM1064, MM 111 | 1 |
|  |  | medium | moyen | mittel | medio | **G202¹4**, M 263, M274 | 2 |
|  |  | large | grand | groß | grande | **M 9¹34**, M 27 | 3 |
| AB(+) | VG | One-year-old shoot: shape of apex of vegetative bud | Rameau d’un an : forme du sommet du bourgeon à bois | Einjähriger Trieb: Form der Spitze der vegetativen Knospe | Ramilla de un año: forma del ápice de la yema de madera |  |  |
| PQ | (b) | acute | aigu | spitz | agudo | CG 103, JM74, J-TE-H3, M 9¹ | 1 |
|  |  | obtuse | obtus | stumpf | obtuso | Last Minute3, Mark3, M 793¹, Supporter 13 | 2 |
|  |  | rounded | arrondi | abgerundet | redondeado | Bemali, **M 7¹3**, MM 111, MM1164 | 3 |
| A(+) | VG | One-year-old shoot: position of vegetative bud in relation to shoot | Rameau d’un an : position du bourgeon à bois par rapport au rameau | Einjähriger Trieb: Stellung der Knospe im Verhältnis zum Trieb | Ramilla de un año: posición de la yema de madera en relación con la ramilla |  |  |
| QN | (b) | adpressed | appliqué | anliegend | adpresa | JM74, M 7¹, MM 1064 | 1 |
|  |  | slightly held out | légèrement divergent | leicht abstehend | ligeramente divergente | **M 9¹4** | 2 |
|  |  | strongly held out | fortement divergent | deutlich abstehend | muy divergente | Cepiland3, M 23, M 43 | 3 |
| AB(+) | VG | One-year-old shoot: size of vegetative bud support | Rameau d’un an : taille du support du bourgeon à bois | Einjähriger Trieb: Größe des Wulstes der vegetativen Knospe | Ramilla de un año: tamaño del soporte de la yema de madera |  |  |
| QN | (b) | small | petit | klein | pequeño | JM74, **M 9¹4** | 1 |
|  |  | medium | moyen | mittel | medio | Last Minute3, M 7¹3 | 2 |
|  |  | large | grand | groß | grande | Mark3, M 23, **MM106¹4** | 3 |
| AB(\*)(+) | VG | Young shoot: color of upper part | Jeune rameau : couleur de la partie supérieure | Einjähriger Trieb: Farbe der Oberseite | Ramilla joven: color de la parte superior |  |  |
| PQ | (c) | whitish | blanchâtre | weißlich | blanquecino | M 25, M1164 | 1 |
|  |  | greenish | verdâtre | grünlich | verdoso | M 2, M 27, MM 106¹4 | 2 |
|  |  | reddish | rougeâtre | rötlich | rojizo | **M 9¹4** | 3 |
|  |  | blackish | noirâtre | schwärzlich | negruzco | B 9, M 10, M 26¹ | 4 |
| AB(\*) | VG | Young shoot: extent of anthocyanin coloration | Jeune rameau : étendue de la pigmentation anthocyanique | Junger Trieb: Ausdehnung der Anthocyanfärbung | Ramilla joven: extensión de la pigmentación antociánica |  |  |
| QN | (c) | absent or very small | absente ou très faible | fehlend oder sehr gering | ausente o muy pequeña | M 27¹, MM116 | 1 |
|  |  | small  | faible  | gering | pequeña | CG 222¹ | 2 |
|  |  | medium | moyenne | mittel | media | G 202¹ | 3 |
|  |  | large  | forte | groß | grande | M7¹ | 4 |
|  |  | very large  | très forte | sehr groß | muy grande | B 9, Marubakaido¹ | 5 |
| AB(\*)(+) | VG | Leaf blade: attitude in relation to shoot | Limbe : port par rapport au rameau | Blattspreite: Haltung im Verhältnis zum Trieb | Limbo: porte en relación con la ramilla |  |  |
| QN | (d) | upwards | dressé | aufrecht | hacia arriba | J-TE-E3, M 273, M 793¹, M1164 | 1 |
|  |  | outwards | perpendiculaire | waagerecht | horizontal | CG 707¹, G2024, M 7¹, MM 1064  | 2 |
|  |  | downwards | retombant | hängend | hacia abajo | CG 778¹, JM74 | 3 |
| AB(\*) | VG/MS | Leaf blade: length | Limbe : longueur | Blattspreite: Länge | Limbo: longitud |  |  |
| QN | (d) | short | court | kurz | corta | **M 26¹3**, M 273 | 3 |
|  |  | medium | moyen | mittel | media | M 793¹ | 5 |
|  |  | long | long | lang | larga | B 93, CG 778¹, M 93 | 7 |
| AB(\*) | VG/MS | Leaf blade: width | Limbe : largeur | Blattspreite: Breite | **Limbo: anchura** |  |  |
| QN | (d) | narrow | étroit | schmal | estrecha | M 26¹ | 3 |
|  |  | medium | moyen | mittel | media | M 9¹, M 273 | 5 |
|  |  | broad | large | breit | ancha | CG 778¹, P 14  | 7 |
| AB(\*) | VG/MS | Leaf blade: ratio length/width | Limbe : rapport longueur/largeur | Blattspreite: Verhältnis Länge/Breite | Limbo: relación entre la longitud y la anchura |  |  |
| QN | (d) | very low | très bas | sehr klein | muy pequeña | M 25¹ | 1 |
|  |  | low | bas | klein | pequeña | CG 222¹, **M 7¹3**, M 273 | 2 |
|  |  | medium | moyen | mittel | media | Last Minute3, MM 111¹, Supporter 13 | 3 |
|  |  | high | élevé | groß | grande | CG 778¹ | 4 |
|  |  | very high | très élevé | sehr groß | muy grande | M 9¹ | 5 |
| AB(\*)(+) | VG | Leaf blade: profile in cross section | Limbe : profil en section transversale | Blattspreite: Profil im Querschnitt | Limbo: perfil de la sección transversal |  |  |
| QN | (d) | concave | concave | konkav | cóncavo | CG778¹, M 273, M1164 | 1 |
|  |  | flat | plat | gerade | plano | CG 707¹, **M 7¹3**, **M 9¹34** | 2 |
|  |  | convex | convexe | konvex | convexo | M 25 | 3 |
| AB | VG | Leaf blade: length of tip | Limbe : longueur de la pointe | Blattspreite: Länge der Spitze | Limbo: longitud del extremo |  |  |
| QN | (d) | short | courte | kurz | corta | **M 26¹3**, M272, M1164 | 1 |
|  |  | medium | moyenne | mittel | media | **G20214**, M 92, MM 1063 | 2 |
|  |  | long | longue | lang | larga | CG 4214¹, Last Minute3, P 163  | 3 |
| AB(\*)(+) | VG | Leaf blade: incisions of margin  | Limbe : incisions du bord | Blattspreite: Randeinschnitte | Limbo: incisiones del borde |  |  |
| PQ | (d) | crenate | crénelées | gekerbt | crenadas | CG 707¹, J 9³, JM74 | 1 |
|  |  | bicrenate | bicrénelées | doppelt gekerbt | bicrenadas | CG 222¹, J-TE-G³, M 7¹, M 793¹  | 2 |
|  |  | serrate type 1 | dentelées type 1 | gesägt Typ 1 | serradas tipo 1 | J-TE-H³, M 9³, MM 109¹, M 274 | 3 |
|  |  | serrate type 2 | dentelées type 2 | gesägt Typ 2 | serradas tipo 2 | J-TE-A³ | 4 |
|  |  | biserrate | bidentelées | doppelt gesägt | biserradas | CG 778¹, MM 106¹, MM 112³, MM 114³ | 5 |
| AB | VG | Leaf blade: depth of incisions of margin | Limbe : profondeur des incisions du bord | Blattspreite: Tiefe der Randeinschnitte | Limbo: profundidad de las incisiones del margen |  |  |
| QN | (d) | very shallow | très peu profondes | sehr flach | muy poco profundas | M 26¹ | 1 |
|  |  | shallow | peu profondes | flach | poco profundas | CG 4204¹ | 2 |
|  |  | medium | moyennes | mittel | medias | CG 707¹ | 3 |
|  |  | deep | profondes | tief | profundas | CG 778¹ | 4 |
|  |  | very deep | très profondes | sehr tief | muy profundas |  | 5 |
| AB(\*) | VG | Leaf blade: undulation of margin | Limbe : ondulation du bord | Blattspreite: Randwellung | Limbo: ondulación del borde |  |  |
| QN | (d) | absent or very weak | absente ou très faible | fehlend oder sehr gering | ausente o muy débil | CG 222², **CG 778¹**², MM 105³, Pi 80³ | 1 |
|  |  | weak | faible | gering | débil | **M 9¹²**, **MM 106¹³,** MM 110³ | 2 |
|  |  | medium | moyenne | mittel | media | **Cepiland¹³**, J-TE-H³**, M 7¹², M 26¹²** | 3 |
|  |  | strong | forte | stark | fuerte | CG 24³, **CG 6210¹²,** M 18³ | 4 |
| AB | VG | Leaf blade: pubescence on lower side | Limbe : pubescence sur la face inférieure | Blattspreite: Behaarung der Unterseite | **Limbo: pubescencia del envés** |  |  |
| QN | (d) | weak | faible | gering | débil | G2024, M 73, M 9¹  | 1 |
|  |  | medium | moyenne | mittel | media  | M 27¹, Lizzy3, Supporter3 | 2 |
|  |  | strong | forte | stark | fuerte | MM 106¹ | 3 |
| AB(\*) | VG | Leaf blade: glossiness of upper side | Limbe : brillance de la face supérieure | Blattspreite: Glanz der Oberseite | Limbo: brillo en el haz |  |  |
| QN | (d) | absent or very weak | absente ou très faible | fehlend oder sehr gering | ausente o muy débil | CG 707², M 16³, **M 26¹²**, MM 114³, P 60³ | 1 |
|  |  | weak | faible | gering | débil | **MM 106¹²,** MM 111³ | 2 |
|  |  | medium | moyenne | mittel | medio | **M 9¹²,** M 14³, M 17³, MM 106³ | 3 |
|  |  | strong | forte | stark | fuerte | **CG 4202¹², Marubakaido¹²,** M 9³, MM 102³, MM 110³, MM 112³, Pi‑AU 9‑24³ | 4 |
| AB(\*) | VG | Leaf blade: intensity of green color | Limbe : intensité de la couleur verte | Blattspreite: Intensität der Grünfärbung | Limbo: intensidad del color verde |  |  |
| QN | (d) | light | claire | hell | clara | CG 778¹², J-TE-G³, M 7¹² | 1 |
|  |  | medium | moyenne | mittel | media | CG 24³, **CG 707¹²**, **M 9**¹²³ | 3 |
|  |  | dark | foncée | dunkel | oscura | CG 10³, **M 26¹²³**, **MM 109¹²**, P 60³ | 5 |
| AB(\*) | VG/MS | Petiole: length | Pétiole : longueur | Blattstiel: Länge | Pecíolo: longitud |  |  |
| QN | (d) | short | court | kurz | corta | M 26¹, M 273 | 1 |
|  |  | medium | moyen | mittel | media | JM74, **M 9¹3** | 3 |
|  |  | long | long | lang | larga | CG 707¹, MM 1063 | 5 |
| AB(\*)(+) | VG/MG | Leaf: length of petiole relative to length of blade  | Feuille : rapport longueur du pétiole/longueur du limbe | Blatt: Länge des Blattstiels im Verhältnis zur Länge der Blattspreite | Hoja: longitud del pecíolo en relación con la longitud del limbo |  |  |
| QN | (d) | short | court | kurz | corta | M 7¹ | 1  |
|  |  | medium | moyen | mittel | media | B 9, **G 202¹4**, M 9  | 3 |
|  |  | long  | long | lang | larga | CG 778¹, P 16 | 5 |
| AB(+) | VG | Petiole: extent of anthocyanin coloration from base | Pétiole : étendue de la pigmentation anthocyanique | Blattstiel: Ausbreitung der Anthocyanfärbung von der Basis | Pecíolo: extensión de la pigmentación antociánica desde la base |  |  |
| QN | (d) | small | faible | gering | pequeña | CG 222¹, J-TE-F³, M 9 | 1 |
|  |  | medium | moyenne | mittel | media | CG 778¹, M 9³, M 14³ | 2 |
|  |  | large | forte | groß | grande | B-9², CG 10³, Marubakaido¹ | 3 |
| AB (\*) | VG | Stipule: size | Stipule : taille | Nebenblatt: Größe | Estípula: tamaño |  |  |
| QN | (d) | small | petit | klein | pequeño | **M 27¹3** | 1 |
|  |  | medium | moyen | mittel | medio | **M 9¹3** | 2 |
|  |  | large | grand | groß | grande | **MM 106¹3** | 3 |
| B(+) | VG | Plant: number of flowers | Plante : nombre de fleurs | Pflanze: Anzahl Blüten | Planta: número de flores  |  |  |
| QN | (e) | absent or few | absentes ou peu nombreuses | fehlend oder gering | ausentes o bajo | Marubakaido¹ | 1 |
|  |  | medium | moyennement nombreuses | mittel | medio | M 7¹ | 2 |
|  |  | many | nombreuses | groß | alto | CG 707¹ | 3 |
| B(+) | VG | Flower: color at balloon stage | Fleur : couleur au stade ballon  | Blüte: Farbe im Ballonstadium | Flor: color en la fase de capullo |  |  |
| PQ | (e) | light pink  | rose pâle | hellrosa | rosa claro | CG 80³, JM74, **M 7¹²**, M 27² | 1 |
|  |  |  medium pink  | rose moyen | mittelrosa | rosa medio | J-TE-F³, **M 9¹²** | 2 |
|  |  | medium red | rouge moyen | mittelrot | rojo medio | CG 707¹, Supporter 1³ | 3 |
|  |  | dark red | rouge foncé | dunkelrot | rojo oscuro | B 9³, CG 228¹ | 4 |
|  |  | purple | pourpre | purpurn | púrpura | B 9², J 9³ | 5 |
| B(+) | VG | Flower: arrangement of petals | Fleur : disposition des pétales | Blüte: Anordnung der Blütenblätter | Flor: disposición de los pétalos |  |  |
| QN | (e) | free | disjoints | freistehend | libres | **Cepiland¹³**, **M 9¹²** | 1 |
|  |  | intermediate | intermédiaires | mittel | intermedios | **M 7¹²** | 2 |
|  |  | overlapping | se recouvrant | überlappend | solapados | CG 222¹, JM74, J-TE-B³, M 27² | 3 |
| B(+) | VG | Flower: diameter | Fleur : diamètre | Blüte: Durchmesser | Flor: diámetro |  |  |
| QN | (e) | very small | très petit | sehr klein | muy pequeño | CG 228¹ | 1 |
|  |  | small | petit | klein | pequeño | M 793¹ | 2 |
|  |  | medium | moyen | mittel | medio | CG 707¹ | 3 |
|  |  | large | grand | groß | grande | M 27¹ | 4 |
| B(+) | VG | Flower: position of stigmas relative to anthers | Fleur : position des stigmates par rapport aux anthères | Blüte: Stellung der Narben im Vergleich zu den Antheren | Flor: posición de los estigmas en relación con las anteras |  |  |
| QN | (e) | below | au-dessous | unterhalb | por debajo |  | 1 |
|  |  | same level | au même niveau | auf gleicher Höhe | al mismo nivel | M 7¹, P 92³ | 2 |
|  |  | above | au-dessus | oberhalb | por encima | CG 228¹, J-TE-B³, M 793**¹** | 3 |
| B | VG | Fruit: size | Fruit : taille | Frucht: Größe | Fruto: tamaño |  |  |
| QN | (f) | very small | très petit | sehr klein | muy pequeño | JM74 | 1 |
|  |  | small | petit | klein | pequeño | CG 222¹, G2024,J-TE-F³ | 3 |
|  |  | medium | moyen | mittel | medio | J-TE-H³, M 7¹, M 793¹  | 5 |
|  |  | large | gros | groß | grande | M 9³, MM 109¹ | 7 |
|  |  | very large | très gros | sehr groß | muy grande | MM1064 | 9 |
| B | VG | Fruit: ratio length/ width | Fruit : rapport longueur/largeur | Frucht: Verhältnis Länge/Breite | Fruto: relación entre la longitud y la anchura |  |  |
| QN | (f) | very low | très bas | sehr klein | muy pequeña | M 793¹ | 1 |
|  |  | low | bas | klein | pequeña | M 26¹ | 2 |
|  |  | medium | moyen | mittel | media | M 7¹ | 3 |
|  |  | high  | élevé | groß | grande | CG 222¹ | 4 |
| B(+) | VG | Fruit: shape  | Fruit : forme | Frucht: Form | Fruto: forma |  |  |
| PQ | (f) | conic waisted | conique étranglé | kegelförmig tailliert | cónica entallada |  | 1 |
|  |  | conic | conique | kegelförmig | cónica |  | 2 |
|  |  | ovate  | ovale | eiförmig | oval | Last Minute³ | 3 |
|  |  | oblate | aplati | breitrund | achatada | M 793¹ | 4 |
|  |  | circular | circulaire | rundlich | circular | Bemali³, JM74 | 5 |
|  |  | elliptic | elliptique | elliptisch | elíptica | M 11³ | 6 |
|  |  | oblong | oblong | rechteckig | oblonga |  | 7 |
| B | VG | Fruit: ribbing | Fruit : côtes | Frucht: Rippung | Fruto: acostillado |  |  |
| QN | (f) | absent or very weak | absentes ou très faibles | fehlend oder sehr gering | ausente o muy débil | Bemali³, CG 778¹ | 1 |
|  |  | weak | faibles | gering | débil | CG 24³, CG 228¹ | 2 |
|  |  | medium | moyennes | mittel | medio | CG 80³ | 3 |
|  |  | strong | fortes | stark | fuerte | CG 222¹, Lancep³ | 4 |
| B | VG | Fruit: crowning at calyx end  | Fruit : couronnement au sommet du calice | Frucht: Wülste oder Höcker am Kelchende | Fruto: remate del extremo del cáliz |  |  |
| QN | (f) | absent or very weak | absent ou très faible | fehlend oder gering | ausente o muy débil | CG 707¹, M 3³ | 1 |
|  |  | weak | faible | gering | débil | G 228¹, J-TE-A³ | 2 |
|  |  | medium | moyen | mittel | medio | Joha³, MM 106¹ | 3 |
|  |  | strong | fort | stark | fuerte | CG 80³, CG 222¹ | 4 |
| B | VG | Fruit: ground color  | Fruit : couleur de fond | Frucht: Grundfarbe | Fruto: color de fondo |  |  |
| PQ | (f) | not visible | non visible | nicht sichtbar | no visible | B9³ | 1 |
|  |  | whitish yellow | jaune blanchâtre | weißlichgelb | amarillo blanquecino  | CG 778¹, M 8³ | 2 |
|  |  | yellow | jaune | gelb | amarillo | G2024, **M 9¹4**, M264, MM1064, P 92³ | 3 |
|  |  | whitish green | vert blanchâtre | weißlichgrün | verde blanquecino | CG 24³, CG 228¹ | 4 |
|  |  | yellow green | vert jaune | gelbgrün | verde amarillento | M 1³, M 793¹ | 5 |
|  |  | green | vert | grün | verde | M 5³ | 6 |
| B(+) | VG | Fruit: over color | Fruit : couleur du lavis | Frucht: Deckfarbe | Fruto: color superior |  |  |
| PQ | (f) | orange red | rouge orangé | orangerot | rojo anaranjado | M 26³ | 1 |
|  |  | pink red | rouge-rose | rosarot | rojo rosado | CG 228¹, P 47³, P 60³ | 2 |
|  |  | red | rouge | rot | rojo | CG 222¹, CG 707¹ | 3 |
|  |  | purple red | rouge-pourpre | purpurnrot | rojo púrpura | MM 102³ | 4 |
|  |  | brown red | rouge-brun | braunrot | rojo amarronado  | Mark³ | 5 |
| B | VG | Fruit: relative area of over color  | Fruit : proportion de lavis | Frucht: Anteil der Deckfarbe | Fruto: zona relativa del color superior |  |  |
| QN | (f) | absent or very small | nulle ou très petite | fehlend oder sehr klein | ausente o muy pequeña | JM74, MM 109¹, MM 115³  | 1 |
|  |  | small | petite | klein | pequeña | CG 228¹, MM 105³, MM1164 | 3 |
|  |  | medium | moyenne | mittel | media | CG 707¹, MM 104³ | 5 |
|  |  | large | grande | groß | grande | M 26³, M 793¹ | 7 |
|  |  | very large | très grande | sehr groß | muy grande | B 9³ | 9 |
| B | VG | Fruit: length of stalk | Fruit : longueur du pédoncule | Frucht: Länge des Stieles | Fruto: longitud del pedúnculo |  |  |
| QN | (f) | very short | très court | sehr kurz | muy corto | Last Minute³, M 793¹ | 1 |
|  |  | short | court | kurz | corto | CG 778¹, P 92³ | 3 |
|  |  | medium | moyen | mittel | medio | MM 109¹, P 1³ | 5 |
|  |  | long | long | lang | largo | CG 228¹, JM74, SU57233³ | 7 |
|  |  | very long | très long | sehr lang | muy largo | CG 707¹, Supporter 1³ | 9 |
| B(+) | VG | Fruit: aperture of locules in transverse section  | Fruit : ouverture des loges carpellaires en section transversale | Frucht: Öffnung der Kernkammern im Querschnitt | Fruto: apertura de los lóculos en la sección transversal |  |  |
| QN | (f) | closed or slightly open | fermées ou légèrement ouvertes | geschlossen oder leicht offen | cerrados o ligeramente abiertos | M 5³, M 7¹ | 1 |
|  |  | moderately open | modérément ouvertes | leicht offen | moderadamente abiertos | G 228¹, Last Minute³ | 2 |
|  |  | fully open | complètement ouvertes | vollständig offen | completamente abiertos | J-TE-F³, MM 109¹ | 3 |
| (\*)(+) | VG/MG | Time of beginning of bud burst | Époque de début du débourrement | Zeitpunkt des Beginns des Knospenaufbruchs | Época de inicio de la apertura de yemas |  |  |
| QN |  | very early | très précoce | sehr früh | muy temprana | **G202¹4** | 1 |
|  |  | early | précoce | früh | temprana | M 43, M 9¹  | 3 |
|  |  | medium | moyenne | mittel | media | B 93, Cepiland3, M 25¹ | 5 |
|  |  | late | tardive | spät | tardía | Last Minute3, MM 111¹ | 7 |
|  |  | very late | très tardive | sehr spät | muy tardía | **M 26¹3** | 9 |
| B(+) | VG/MG | Time of beginning of flowering | Époque de début de la floraison | Zeitpunkt des Blühbeginns | Época de comienzo de la floración |  |  |
| QN |  | very early | très précoce | sehr früh | muy temprana | G202¹ | 1 |
|  |  | early  | précoce | früh | temprana | G 707¹ | 3 |
|  |  | medium | moyenne | mittel | media | M25¹ | 5 |
|  |  | late | tardive | spät | tardía | M 7¹, MM 111¹ | 7 |
|  |  | very late | très tardive | sehr spät | muy tardía | M 26¹ | 9 |

# 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) Plant: Observations on the plant should be made in the dormant season.

(b) One-year-old shoot: Unless otherwise indicated, observations on the shoot should be made on the middle third of the one-year-old shoot in the dormant season.

(c) Young shoot: Observation of the young shoot should be made on the upper third of the one-year-old shoot during rapid growth.

(d) Leaf: Observations on the leave should be made on fully developed leaves from the middle third of vigorous current season shoots.

(e) Flower: Observations on the flower should be done on fully grown trees. Observations on the flower should be made on the second or subsequent flowers, at the start of dehiscence.

(f) Fruit: Observations on the fruit should be done on fully grown trees. All observations of the fruit should be made on 10 typical fruits taken from a minimum sample of 20 fruits, at time of visual ripeness.

8.2 Explanations for individual characteristics

Ad. 1: Plant: vigor

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

Ad. 4: Plant: habit

**B**

|  |  |
| --- | --- |
| uj02 | uj03 |
| 1 | 2 |
| upright | upright to spreading |

|  |  |
| --- | --- |
| uj04c | uj05 |
| 3 | 4 |
| spreading | drooping |

Ad. 6: One-year-old shoot: growth

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1 | 2 | 3 |
| straight | moderately wavy | strongly wavy |

Ad. 7: One-year-old shoot: pubescence

 The pubescence should be observed on the distal half of the shoot.

Ad. 15: One-year-old shoot: shape of apex of vegetative bud

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1 | 2 | 3 |
| acute | obtuse | rounded |

Ad. 16: One-year-old shoot: position of vegetative bud in relation to shoot

|  |
| --- |
|  |
| 1 | 2 | 3 |
| adpressed | slightly held out | strongly held out |

Ad. 17: One-year-old shoot: size of vegetative bud support

|  |
| --- |
|  |
| 1 | 2 | 3 |
| small | medium | large |

Ad. 18: Young shoot: color of upper part

 The color observed should be of the underlying skin underneath the pubescence.

Ad. 20: Leaf blade: attitude in relation to shoot

|  |
| --- |
|  |
| 1 | 2 | 3 |
| upwards | outwards | downwards |

Ad 24: Leaf blade: profile in cross section

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1 | 2 | 3 |
| concave | flat | convex |

Ad. 26: Leaf blade: incisions of margin

Observations should be done on the upper half of the leaf blade.

|  |  |
| --- | --- |
| crenate2 | crenate |
| 1 | 2 |
| crenate | bicrenate |

|  |  |
| --- | --- |
| serrate | serrate2 |
| 3 | 4 |
| serrate type 1 | serrate type 2 |

|  |
| --- |
|  |
| 5 |
| biserrate |

Ad. 33: Leaf: length of petiole relative to length of blade

 Should be assessed regarding the length of the petiole compared to the length of the middle vein of the leaf.

Ad. 34: Petiole: extent of anthocyanin coloration from base

Should be assessed regarding the degree to which the amount of anthocyanin coloration extend from the petiole base towards the base of the leaf.

Ad. 36: Plant: number of flowers

 Should be assessed as the amount of flowers present during the flowering period.

Ad. 37: Flower: color at balloon stage

 Balloon stage is the phenological stage in the course of the flower development when the calyx is fully expanded and the petals are recognizable, having partially expanded and inflated but are closed, covering the internal organs. Balloon stage is usually 1-2 days before the petals unfold.

Ad. 38: Flower: arrangement of petals

|  |  |  |
| --- | --- | --- |
| petalsfree | petalsirregular | petalsoverlapping |
| 1 | 2 | 3 |
| free | intermediate | overlapping |

Ad. 39: Flower: diameter

 The observation on the flower should be done with the petals pressed into a horizontal position.

Ad. 40: Flower: position of stigmas relative to anthers

|  |
| --- |
| styles |
| 1 | 2 | 3 |
| below | same level | above |

Ad. 43: Fruit: shape

|  |  |  |
| --- | --- | --- |
|  |  |  🡨 broadest part 🡪  |
|  |  | (below middle) | at middle |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  broad (low)🡨 width (ratio length/width) 🡪 narrow (high) |  |  |  |  |
|  |  |  |  | 7oblong |
|  |  |  |  | APF_ellipsoid |
|  |  |  | 3ovate | 6elliptic |
|  |  |  |  | APF_globose |
|  |  | 1conic waisted | 2conic | 5circular |
|  |  |  |  | APF_obloid |
|  |  |  |  | 4oblate |

Ad. 47: Fruit: over color

 All observation should be done with the bloom removed.

Ad. 50: Fruit: aperture of locules in transverse section

|  |
| --- |
| pic7a |
| 1 | 2 | 3 |
| closed or slightly open | moderately open | fully open |

Ad. 51: Time of beginning of bud burst

 To be assessed when 10% of the buds show green point.

Ad. 52: Time of beginning of flowering

 To be assessed when 10% of the flowers on the 5 trees are fully open.

# Literature

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# 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 Botanical name | *Malus* Mill. |  |
|  |  |  |
| 1.2 Common name | Apple Rootstocks |  |
|  |  |  |
|  |  |  |
| 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 |  |  |
|  |  |  |
| [[2]](#footnote-2)#4. Information on the breeding scheme and propagation of the variety 4.1 Origin (a) Seedling of unknown parentage [ ] (b) Produced by controlled pollination [ ] (indicate parent varieties) − Seed bearing parent (indicate parent)  ................................................................................................ − Pollen parent (indicate parent)  ................................................................................................ (c) Produced by open pollination of [ ] (indicate seed bearing parent plant) ................................................................................................ (d) Mutation or sport from (indicate original parent variety) ................................................................................................ [ ]  (e) Discovery (indicate where and when) ................................................................................................ [ ] |
|  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) 4.3 Virus status1. The variety is free from all known viruses as follows: [ ] (indicate from which viruses)

 ...................................................................................................1. The plant material is virus tested [ ]

(indicate against which viruses)  ...................................................................................................1. The virus status is unknown [ ]

 4.4 Other information |
| 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 | CG 222¹ | 1[ ] |
|  | weak | J-TE-F3, M 94, **M 26¹4**, M 274 | 2[ ] |
|  | medium | B93, G2024, J-TE-H3, JM74, M 7¹ | 3[ ] |
|  | strong | M 793¹, MM 1064 | 4[ ] |
|  | very strong | CG 934¹ | 5[ ] |
| **5.2(3)** | **Plant: number of shoots** |  |  |
|  | very few |  | 1[ ] |
|  | few | M 91 | 2[ ] |
|  | medium | Joha3, Lancep3, Last Minute3, M 261, Supporter 13 | 3[ ] |
|  | many | MM 1111 | 4[ ] |
|  | very many | M 251 | 5[ ] |
| **5.3(4)** | **Plant: habit**  |  |  |
|  | upright | M 7¹, M1164 | 1[ ] |
|  | upright to spreading | CG707¹ | 2[ ] |
|  | spreading | Cepiland4, CG 222¹, M 93, M1164  | 3[ ] |
|  | drooping | Marubakaido¹ | 4[ ] |
| **5.4(6)** | **One-year-old- shoot: growth** |  |  |
|  | straight | **M 9¹34** | 1[ ] |
|  | moderately wavy | **G 202¹4**, Mark3, M 263, M 793¹, Supporter 13 | 2[ ] |
|  | strongly wavy | M 25¹ | 3[ ] |
|  | Characteristics | Example Varieties | Note |
| **5.5(19)** | **Young shoot: extent of anthocyanin coloration** |  |  |
|  | absent or very small | M 27¹, MM116 | 1[ ] |
|  | small | CG 222¹ | 2[ ] |
|  | medium | G 202¹ | 3[ ] |
|  | large | M7¹ | 4[ ] |
|  | very strong | B 9, Marubakaido¹ | 5[ ] |
| **5.6(20)** | **Leaf blade: attitude in relation to shoot** |  |  |
|  | upwards | J-TE-E3, M 273, M 793¹, M1164  | 1[ ] |
|  | outwards | CG 707¹, G2024, M 7¹, MM 1064  | 2[ ] |
|  | downwards | CG 778¹, JM74 | 3[ ] |
| **5.7(26)** | **Leaf blade: incisions of margin** |  |  |
|  | crenate | CG 707¹, J 9³, JM74 | 1[ ] |
|  | bicrenate | CG 222¹, J-TE-G³, M 7¹, M 793¹  | 2[ ] |
|  | serrate type 1 | J-TE-H³, M 9³, MM 109¹, M 274 | 3[ ] |
|  | serrate type 2 | J-TE-A³ | 4[ ] |
|  | biserrate | CG 778¹, MM 106¹, MM 112³, MM 114³ | 5[ ] |
| **5.8(51)** | **Time of beginning of bud burst** |  |  |
|  | very early | **G202¹4** | 1[ ] |
|  | very early to early |  | 2[ ] |
|  | early | M 43, M 9¹ | 3[ ] |
|  | early to medium |  | 4[ ] |
|  | medium | B 93, Cepiland3, M 25¹ | 5[ ] |
|  | medium to late |  | 6[ ] |
|  | late | Last Minute3, MM 111**¹** | 7[ ] |
|  | late to very late |  | 8[ ] |
|  | very late | **M 26¹3** | 9[ ] |
| 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* | *Plant: vigor* | *weak* | *strong* |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Comments:  |
| [[3]](#footnote-3)#7. Additional information which may help in the examination of the variety7.1 Resistance to pests and diseases7.2 Special conditions for the examination of the variety7.3 Other information |
| 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”.……………………………………………………………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 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)
2. # Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire. [↑](#footnote-ref-2)
3. # Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire. [↑](#footnote-ref-3)