|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | |  | E  TG/PERSE(proj.2)  **ORIGINAL:** English  DATE: 2015-07-24 | |
| INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS | | | | |
| Geneva | | | | |
| DRAFT | | |

|  |  |  |
| --- | --- | --- |
|  | **Avocado Rootstocks**  UPOV Code: PERSE\_AME  Persea americana Mill. | [[1]](#footnote-1)\* |

**GUIDELINES  
  
FOR THE CONDUCT OF TESTS  
  
FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

prepared by (an) expert(s) from Mexico

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* |
| Persea americana Mill. | Avocado Rootstocks | Porte-greffes d'avocatier | Avocado-Unterlagen | Portainjertos de aguacate, Portainjertos de palto |

|  |
| --- |
| 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.

Other associated UPOV documents: Test Guidelines for Avocado (TG/97/4).

TABLE OF CONTENTS PAGE

1. Subject of these Test Guidelines 3

2. Material Required 3

3. Method of Examination 3

3.1 Number of Growing Cycles 3

3.2 Testing Place 3

3.3 Conditions for Conducting the Examination 3

3.4 Test Design 3

3.5 Additional Tests 3

4. Assessment of Distinctness, Uniformity and Stability 4

4.1 Distinctness 4

4.2 Uniformity 5

4.3 Stability 5

5. Grouping of Varieties and Organization of the Growing Trial 5

6. Introduction to the Table of Characteristics 5

6.1 Categories of Characteristics 5

6.2 States of Expression and Corresponding Notes 6

6.3 Types of Expression 6

6.4 Example Varieties 6

6.5 Legend 6

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

8. Explanations on the Table of Characteristics 16

9. Literature 25

10. Technical Questionnaire 26

# Subject of these Test Guidelines

These Test Guidelines apply to all varieties of Persea americana Mill..

These Test Guidelines apply to all varieties used as rootstocks of all species of Persea

# 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 vegetatively propagated trees on their own roots..

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

5 trees.

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.

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

# Method of Examination

## 3.1 Number of Growing Cycles

3.1.1 The minimum duration of tests should normally be a single growing cycle.

## 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 trees.

## 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 5 plants or parts taken from each of 5 plants and any other observations made on all plants in the test, disregarding any off-type plants. In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 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

* + 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 in a sample of 5 plants, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, no off‑types are allowed.

## 4.3 Stability

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

4.3.2 Where appropriate, or in cases of doubt, stability may be 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) Shoot: length of internode (characteristic 6)

(c) Shoot: pubescence of terminal bud (characteristic 15)

(d) Young leaf: color (characteristic 17)

(e) Leaf blade: length (characteristic 19)

(f) Leaf blade: pubescence of the lower surface on principal vein (characteristic 31)

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

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

# 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 (+) |
| **Plant: vigor** | **Plante : vigueur** | **Pflanze: Wuchsstärke** | **Planta: vigor** |  |  |
| weak | faible | gering | débil |  | 1 |
| medium | moyenne | mittel | medio | Merensky 2 | 3 |
| strong | forte | stark | fuerte | G 755c | 5 |
|  | | | | | |
|  |  |  |  |  |  |
| 2. (\*) QN VG (+) |
| **Plant: habit** | **Plante : port** | **Pflanze: Wuchsform** | **Planta: porte** |  |  |
| upright | dressé | aufrecht | erguido | Bounty | 1 |
| spreading | étalé | breitwüchsig | abierto | Borchard, Merensky 2 | 3 |
| drooping | retombant | hängend | colgante | Filtro 9 | 5 |
|  | | | | | |
|  |  |  |  |  |  |
| 3. QN VG |
| **Plant: branching** | **Plante : ramification** | **Pflanze: Verzweigung** | **Planta: ramificación** |  |  |
| weak | faible | gering | débil | ComCarr 1 | 3 |
| medium | moyenne | mittel | medio | Velvick | 5 |
| strong | forte | stark | fuerte | Duke 7 | 7 |
|  | | | | | |
|  |  |  |  |  |  |
| 4. QN VG (+) (a) |
| **Young shoot: anthocyanin coloration of stem apex** |  |  |  |  |  |
| absent or very weak |  |  |  | Filtro 7, Filtro 9 | 1 |
| weak |  |  |  |  | 2 |
| medium |  |  |  |  | 3 |
| strong |  |  |  |  | 4 |
| very strong |  |  |  |  | 5 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
|  |  |  |  |  |  |
| 5. QN VG (b) |
| **Shoot: thickness** |  |  |  |  |  |
| thin |  |  |  |  | 1 |
| medium |  |  |  | Velvick | 3 |
| thick |  |  |  | G 755c | 5 |
|  | | | | | |
|  |  |  |  |  |  |
| 6. (\*) QN MS VG (b) |
| **Shoot: length of internode** |  |  |  |  |  |
| short |  |  |  |  | 1 |
| medium |  |  |  | Merensky 2 | 3 |
| long |  |  |  |  | 5 |
|  | | | | | |
|  |  |  |  |  |  |
| 7. QN VG (+) (b) |
| **Shoot: pubescence on internodes** |  |  |  |  |  |
| absent or weak |  |  |  | Duke 7 | 1 |
| medium |  |  |  |  | 2 |
| strong |  |  |  |  | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 8. QN VG (b) |
| **Shoot: number of lenticels** |  |  |  |  |  |
| few |  |  |  |  | 1 |
| medium |  |  |  | ComCarr 1, Duke 7, Filtro 9 | 2 |
| many |  |  |  |  | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 9. PQ VG (b) |
| **Shoot: color of lenticels** |  |  |  |  |  |
| yellow |  |  |  |  | 1 |
| green |  |  |  | G-22 | 2 |
| red |  |  |  | Bounty, Duke 6 | 3 |
| purple |  |  |  | Merensky 2 | 4 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
|  |  |  |  |  |  |
| 10. (\*) QN VG (+) (b) |
| **Shoot: position of vegetative lateral bud in relation to shoot** |  |  |
| adpressed |  |  |  |  | 1 |
| slightly held out |  |  |  | Thomas | 2 |
| markedly held out |  |  |  | Duke 7 | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 11. QN VG (b) |
| **Shoot: size of vegetative lateral bud** |  |  |
| small | petit | klein | pequeña | M14 | 1 |
| medium | moyen | mittel | mediana | Velvick | 3 |
| large | grand | groß | grande |  | 5 |
|  | | | | | |
|  |  |  |  |  |  |
| 12. PQ VG (+) (b) |
| **Shoot: shape of vegetative lateral bud** |  |  |
| acute |  |  |  | ComCarr 1, Velvick | 1 |
| obtuse |  |  |  | M14, Thomas | 2 |
| rounded |  |  |  |  | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 13. QN VG (+) (b) |
| **Shoot: size of terminal bud** |  |  |  |  |  |
| small |  |  |  |  | 1 |
| medium |  |  |  |  | 2 |
| large |  |  |  |  | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 14. PQ VG (+) (b) |
| **Shoot: shape of terminal bud** |  |  |  |  |  |
| acute |  |  |  | Velvick | 1 |
| obtuse |  |  |  | Duke 7 | 2 |
| rounded |  |  |  |  | 3 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
|  |  |  |  |  |  |
| 15. (\*) QN VG (+) (b) |
| **Shoot: pubescence of terminal bud** |  |  |  |  |  |
| absent or very weak |  |  |  | M14 | 1 |
| weak |  |  |  | Duke 7 | 2 |
| medium |  |  |  | Velvick | 3 |
| strong |  |  |  | Thomas | 4 |
| very strong |  |  |  | G 755c | 5 |
|  | | | | | |
|  |  |  |  |  |  |
| 16. PQ VG (a) |
| **Young leaf: color of pubescence of petiole** | **Jeune feuille: couleur de la pilosité du pétiole** | **Junges Blatt: Farbe der Behaarung des Blattstiels** | **Hoja joven: color de la pubescencia del peciolo** |  |  |
| white |  |  |  | Bounty | 1 |
| yellow |  |  |  | Duke 6, Merensky 2 | 2 |
| brown |  |  |  | Thomas | 3 |
| red brown |  |  |  |  | 4 |
|  | | | | | |
|  |  |  |  |  |  |
| 17. (\*) PQ VG (a) |
| **Young leaf: color** |  |  |  |  |  |
| yellow green |  |  |  |  | 1 |
| green |  |  |  | G-22 | 2 |
| reddish |  |  |  | Duke 6 | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 18. QN VG (b) |
| **Leaf: attitude relative to shoot** | **Feuille: orientation par rapport à la tige** | **Blatt: Haltung im Verhältnis zum Trieb** | **Hoja: porte en relación con el brote** |  |  |
| upwards | vers le haut | aufwärts gerichtet | hacia arriba | Duke 7, G-6 | 1 |
| outwards | perpendiculaire | abstehend | perpendicular | Bounty, Merensky 2 | 2 |
| downwards | vers le bas | abwärts gerichtet | hacia abajo |  | 3 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
|  |  |  |  |  |  |
| 19. (\*) QN MS VG (b) |
| **Leaf blade: length** | **Limbe : longueur** | **Blattspreite: Länge** | **Limbo: longitud** |  |  |
| short | court | kurz | corto | Duke 7 | 3 |
| medium | moyen | mittel | mediano | Merensky 2 | 5 |
| long | long | lang | largo | Filtro 7 | 7 |
|  | | | | | |
|  |  |  |  |  |  |
| 20. QN MS VG (b) |
| **Leaf blade: width** | **Limbe: largeur** | **Blattspreite: Breite** | **Limbo: anchura** |  |  |
| very narrow | très étroit | sehr schmal | muy estrecho | Duke 7 | 1 |
| narrow | étroit | schmal | estrecho | Thomas | 3 |
| medium | moyen | mittel | medio | Merensky 2 | 5 |
| broad | large | breit | ancho | Bounty | 7 |
| very broad | très large | sehr breit | muy ancho | Filtro 9, G 755c | 9 |
|  | | | | | |
|  |  |  |  |  |  |
| 21. QN MG VG (+) (b) |
| **Leaf blade: ratio length/width** | **Limbe: rapport longueur/largeur** | **Blattspreite: Ver­hältnis Länge/Breite** | **Limbo: relación entre la longitud y la anchura** |  |  |
| small | faible | klein | pequeña | G 755c | 3 |
| medium | moyen | mittel | media | Merensky 2 | 5 |
| large | élevé | groß | grande | Filtro 7 | 7 |
|  | | | | | |
|  |  |  |  |  |  |
| 22. (\*) PQ VG (+) (b) |
| **Leaf blade: shape** | **Limbe: forme** | **Blattspreite: Form** | **Limbo: forma** |  |  |
| lanceolate | lancéolé | lanzettlich | lanceolada | Filtro 7 | 1 |
| ovate | ovale | eiförmig | oval | G 755c, Velvick | 2 |
| narrow elliptic |  |  |  | Thomas | 3 |
| medium elliptic |  |  |  | Merensky 2 | 4 |
| circular |  |  |  |  | 5 |
| obovate |  |  |  |  | 6 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
|  |  |  |  |  |  |
| 23. PQ VG (+) (b) |
| **Leaf blade: shape of apex (excluding tip)** |  |  |  |  |  |
| acute |  |  |  | Duke 7, Thomas | 1 |
| obtuse |  |  |  | Day, G 755c, Velvick | 2 |
| rounded |  |  |  |  | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 24. (\*) QN VG (+) (b) |
| **Leaf blade: length of tip** | **Limbe: longueur de la pointe** | **Blattspreite: Länge der aufgesetzten Spitze** | **Limbo: longitud de la punta** |  |  |
| very short |  |  |  |  | 1 |
| short |  |  |  |  | 2 |
| medium |  |  |  |  | 3 |
| long |  |  |  | Velvick | 4 |
|  | | | | | |
|  |  |  |  |  |  |
| 25. PQ VG (+) (b) |
| **Leaf blade: shape of base** | **Limbe : forme de la base** | **Blattspreite: Form der Basis** | **Limbo: forma de la base** |  |  |
| acute | pointue | spitz | aguda | Duke 7, Thomas, Velvick | 1 |
| obtuse | obtuse | stumpf | obtusa | Filtro 7 | 2 |
| rounded | arrondie | abgerundet | redondeada | G 755c | 3 |
| truncate |  |  |  |  | 4 |
|  | | | | | |
|  |  |  |  |  |  |
| 26. (\*) QL VG (+) (b) |
| **Leaf blade: twisting along whole length** | **Limbe: torsion sur toute la longueur** | **Blattspreite: Verdrehung auf der ganzen Länge** | **Limbo: torsión en toda la longitud** |  |  |
| absent | absente | fehlend | ausente | Duke 7, Thomas | 1 |
| present | présente | vorhanden | presente |  | 9 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
|  |  |  |  |  |  |
| 27. QL VG (+) (b) |
| **Leaf blade: twisting of tip** |  |  |  |  |  |
| absent |  |  |  | Duke 7, Thomas | 1 |
| present |  |  |  | Bounty | 9 |
|  | | | | | |
|  |  |  |  |  |  |
| 28. QN VG (+) (b) |
| **Leaf blade: undulation of margin** | **Limbe: ondulation du bord** | **Blattspreite: Wellung des Randes** | **Limbo: ondulación del borde** |  |  |
| absent or very weak | nulle ou très faible | fehlend oder sehr gering | ausente o muy débil | Duke 7 | 1 |
| weak | faible | gering | débil | Thomas | 3 |
| medium | moyenne | mittel | media | Velvick | 5 |
| strong | forte | stark | fuerte | Filtro 7 | 7 |
| very strong | très forte | sehr stark | muy fuerte |  | 9 |
|  | | | | | |
|  |  |  |  |  |  |
| 29. QN VG (b) |
| **Leaf blade: venation on upper side** |  |  |  |  |  |
| sunken |  |  |  | ComCarr 1, G 755c | 1 |
| level |  |  |  | Duke 7 | 2 |
| raised |  |  |  | Merensky 2 | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 30. (\*) QN VG (b) |
| **Leaf blade: number of secondary veins** | **Limbe: nombre de nervures secondaires** | **Blattspreite: Anzahl sekundärer Adern** | **Limbo: número de nervios secundarios** |  |  |
| few | petit | gering | bajo | Velvick | 1 |
| medium |  |  |  | Duke 7, Thomas | 2 |
| many |  |  |  | ComCarr 1, G 755c | 3 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
|  |  |  |  |  |  |
| 31. (\*) QN VG (b) |
| **Leaf blade: pubescence of the lower surface on principal vein** |  |  |  |  |  |
| absent or sparse |  |  |  | Day | 1 |
| medium |  |  |  | G 755c, Velvick | 2 |
| dense |  |  |  | Thomas | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 32. (\*) QN VG (+) (b) |
| **Leaf blade: anise aroma** | **Limbe: arôme anisé** | **Blattspreite: Anisaroma** | **Limbo: aroma de anís** |  |  |
| absent or weak | absent ou faible | fehlend oder gering | ausente o débil | Day | 1 |
| medium | moyen | mittel | medio | Duke 7, Merensky 2 | 2 |
| strong | fort | stark | fuerte | Thomas | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 33. (\*) QN MS VG (b) |
| **Petiole: length** | **Pétiole : longueur** | **Blattstiel: Länge** | **Peciolo: longitud** |  |  |
| short | court | kurz | corto | Duke 7, Merensky 2 | 3 |
| medium | moyen | mittel | medio | Bounty, G 755c | 5 |
| long | long | lang | largo | Filtro 7 | 7 |
|  | | | | | |
|  |  |  |  |  |  |
| 34. (\*) QN VG (b) |
| **Petiole: pubescence on upper side** | **Pétiole : pubescence sur la face supérieure** | **Blattstiel: Behaarung der Oberseite** | **Pecíolo: pubescencia en la parte superior** |  |  |
| absent or very sparse | absente ou très éparse | fehlend oder sehr locker | ausente o muy escasa | Day | 1 |
| sparse | éparse | locker | escasa | Duke 7 | 2 |
| dense | dense | dicht | densa | Thomas | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 35. QN VG (+) (b) |
| **Petiole: depth of groove** | **Pétiole : profondeur du sillon** | **Blattstiel: Tiefe der Rinne** | **Pecíolo: profundidad de la acanaladura** |  |  |
| shallow | peu profond | flach | poco profunda | Duke 7 | 1 |
| medium | moyen | mittel | media | Day | 2 |
| deep | profond | tief | profunda | Velvick | 3 |
|  |  |  |  |  |  |

| English | français | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
|  |  |  |  |  |  |
| 36. PQ MS VG (+) (b) |
| **Petiole: cross section** |  |  |  |  |  |
| broader than tall |  |  |  | G 755c | 1 |
| as broad as tall |  |  |  | Duke 7 | 2 |
| taller than broad |  |  |  | ComCarr 1 | 3 |
|  | | | | | |
|  |  |  |  |  |  |
| 37. QN MG VG (b) |
| **Leaf blade: length relative to petiole length** | **Limbe : longueur par rapport à la longueur du pétiole** | **Blattspreite: Länge im Verhältnis zur Länge des Blattstiels** | **Limbo: longitud con relación a la longitud del pecíolo** |  |  |
| short | court | kurz | corto |  | 1 |
| medium | moyen | mittel | medio | Duke 7 | 3 |
| long | long | lang | largo | Filtro 9 | 5 |

# 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) Young shoot / Young leaf: Observations on the young shoot and young leaf should be made on the current season’s growth, during a period of active growth (flush).

(b) Shoot / leaf / lateral bud / terminal bud: Observations on shoots, mature leaves and buds should be made on branches or stem which are not showing signs of new flush on the outside of the tree. They should be made in the middle third of the last current season's growth and close to next budbreak.

*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. 2: Plant: habit

|  |
| --- |
| Alternative text |
| 1 - upright |
| Alternative text |
| 3 - spreading |
| Alternative text |
| 5 - drooping |

Ad. 4: Young shoot: anthocyanin coloration of stem apex

Should be assessed upper third on the shoot and without considering the color of lenticels on the stem.

Ad. 7: Shoot: pubescence on internodes

Should be assessed at the upper third of the shoot.

Ad. 10: Shoot: position of vegetative lateral bud in relation to shoot

|  |
| --- |
| Alternative text |
| 1 - adpressed |
| Alternative text |
| 2 - slightly held out |
| Alternative text |
| 3 - markedly held out |

Ad. 12: Shoot: shape of vegetative lateral bud

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

Ad. 13: Shoot: size of terminal bud

Should be assessed at the upper third of the shoot.

Ad. 14: Shoot: shape of terminal bud

Should be assessed at the upper third of the shoot.

Ad. 15: Shoot: pubescence of terminal bud

Should be assessed at the upper third of the shoot.

Ad. 21: Leaf blade: ratio length/width

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

Ad. 22: Leaf blade: shape

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

Ad. 23: Leaf blade: shape of apex (excluding tip)

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

Ad. 24: Leaf blade: length of tip

|  |
| --- |
| Alternative text |
| 1 - very short |
| Alternative text |
| 2 - short |
| Alternative text |
| 3 - medium |
| Alternative text |
| 4 - long |

Ad. 25: Leaf blade: shape of base

|  |
| --- |
| Alternative text |
| 1 - acute |
| Alternative text |
| 2 - obtuse |
| Alternative text |
| 3 - rounded |
| Alternative text |
| 4 - truncate |

Ad. 26: Leaf blade: twisting along whole length

|  |
| --- |
| Alternative text |
| 1 - absent |
| Alternative text |
| 9 - present |

Ad. 27: Leaf blade: twisting of tip

|  |
| --- |
| Alternative text |
| 1 - absent |
| Alternative text |
| 9 - present |

Ad. 28: Leaf blade: undulation of margin

|  |
| --- |
| Alternative text |
| 1 - absent or very weak |
| Alternative text |
| 3 - weak |
| Alternative text |
| 5 - medium |
| Alternative text |
| 7 - strong |
| Alternative text |
| 9 - very strong |

Ad. 32: Leaf blade: anise aroma

Should be assessed by crushing the leaf and then smell.

Ad. 35: Petiole: depth of groove

|  |
| --- |
| Alternative text |
| 1 - shallow |
| Alternative text |
| 2 - medium |
| Alternative text |
| 3 - deep |

Ad. 36: Petiole: cross section

|  |
| --- |
| Alternative text |
| 1 - broader than tall |
| Alternative text |
| 2 - as broad as tall |
| Alternative text |
| 3 - taller than broad |

# Literature

Barrientos-Priego, A. F., Muñoz-Pérez, R., Borys, M. W., Martínez-Damián, Ma. T. 2006: Taxonomía, cultivares y portainjertos. In: El Aguacate y su Manejo Integrado. 2ª edición. D. Téliz, A. Mora (eds.). Mundi-Prensa México, S.A. de C.V. D.F., México. pp. 30-62.

Crane, J. H., Douhan, G., Faber, B. A., Arpaia, M. L, Bender, G. S., Balerdi, C. F., Barrientos-Priego, A. F. 2013: Cultivars and rootstocks. In: The Avocado Botany, and Uses. B. A. Schaffer, A. W. Whiley, B. N. Wolstenholme. CAB International Publishing. Oxfordshire, UK. pp. 200-233.

UPOV, 2006: Test guideline for avocado. UPOV. Geneva, Switzerland, 39 p.

# Technical Questionnaire

| TECHNICAL QUESTIONNAIRE | | Page {x} of {y} | Reference Number: | |
| --- | --- | --- | --- | --- |
|  | |  |  | |
|  | |  | Application date: | |
|  | |  | (not to be filled in by the applicant) | |
| TECHNICAL QUESTIONNAIRE  to be completed in connection with an application for plant breeders’ rights | | | | |
|  |  | | |  |
| 1. Subject of the Technical Questionnaire | | | | |
| 1.1.1 | Botanical Name | Persea Mill. | | [ ] |
| 1.1.2 | Common Name | Avocado Rootstocks | |  |
| 1.2.1 | Botanical Name | P. americana Mill. | | [ ] |
| 1.2.2 | Common Name | avocado | |  |
| 1.3.1 | Botanical Name | P. schiedeana Nees | | [ ] |
| 1.3.2 | Common Name | Chinini, Coyo | |  |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 2. Applicant | | |
|  |  |  |
| Name |  |  |
|  |  |  |
| Address |  |  |
|  |  |  |
| Telephone No. |  |  |
|  |  |  |
| Fax No. |  |  |
|  |  |  |
| E-mail address |  |  |
|  |  |  |
| Breeder (if different from applicant) | |  |
|  |  |  |
|  |  |  |
|  |  |  |
| 3. Proposed denomination and breeder’s reference | | |
|  |  |  |
| Proposed denomination |  |  |
| (if available) |  |  |
| Breeder’s reference |  |  |
|  |  |  |

| TECHNICAL QUESTIONNAIRE | | Page {x} of {y} | Reference Number: | |
| --- | --- | --- | --- | --- |
|  |  | | |  |
|  |  | | |  |
| 4. Information on the breeding scheme and propagation of the variety  4.1 Breeding scheme  Variety resulting from:  4.1.1 Crossing  (a) controlled cross [ ]  (please state parent varieties)  (…………………..……………..…) x (……………..…………………..…)  female parent male parent  (b) partially known cross [ ]  (please state known parent variety(ies))  (…………………..……………..…) x (……………..…………………..…)  female parent male parent  (c) unknown cross [ ]  4.1.2 Mutation [ ]  (please state parent variety)     |  | | --- | |  |   4.1.3 Discovery and development [ ]  (please state where and when discovered and how developed)   |  | | --- | |  |   4.1.4 Other [ ]  (please provide details)   |  | | --- | |  | | | | | |
|  | | | | |

|  |
| --- |
| 4.2 Method of propagating the variety  4.2.1 Vegetative propagation  (a) cuttings [ ]  (b) etiolation layering [ ]  (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 (1)** | **Plant: vigor** |  |  |
|  | **weak** |  | 1[ ] |
|  | **medium** | Merensky 2 | 3[ ] |
|  | **strong** | G 755c | 5[ ] |
| **5.2 (6)** | **Shoot: length of internode** |  |  |
|  | **short** |  | 1[ ] |
|  | **medium** | Merensky 2 | 3[ ] |
|  | **long** |  | 5[ ] |
| **5.3 (15)** | **Shoot: pubescence of terminal bud** |  |  |
|  | **absent or very weak** | M14 | 1[ ] |
|  | **weak** | Duke 7 | 2[ ] |
|  | **medium** | Velvick | 3[ ] |
|  | **strong** | Thomas | 4[ ] |
|  | **very strong** | G 755c | 5[ ] |
| **5.4 (17)** | **Young leaf: color** |  |  |
|  | **yellow green** |  | 1[ ] |
|  | **green** | G-22 | 2[ ] |
|  | **reddish** | Duke 6 | 3[ ] |
| **5.5 (19)** | **Leaf blade: length** |  |  |
|  | **short** | Duke 7 | 3[ ] |
|  | **medium** | Merensky 2 | 5[ ] |
|  | **long** | Filtro 7 | 7[ ] |
| **5.6 (31)** | **Leaf blade: pubescence of the lower surface on principal vein** |  |  |
|  | **absent or sparse** | Day | 1[ ] |
|  | **medium** | G 755c, Velvick | 2[ ] |
|  | **dense** | Thomas | 3[ ] |

|  |  |  |  |
| --- | --- | --- | --- |
| 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* | *Shoot: thickness* | *thin* | *thick* |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Comments: | | | |
| 7. Additional information which may help in the examination of the variety  7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?  Yes [ ] No [ ]  (If yes, please provide details)  7.2 Are there any special conditions for growing the variety or conducting the examination?  Yes [ ] No [ ]  (If yes, please provide details)  7.3 Other information | | | |
| 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 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 [ ]  Sunblotch viroid | | |
| 10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:  Applicant’s name  Signature Date | | |

[End of document]

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)