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UPOV

# INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

# DRAFT

**AVOCADO**

*Persea americana* Mill.

*

**GUIDELINES**

**FOR THE CONDUCT OF TESTS**

**FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

*to be considered by the*
*Technical Working Party for Fruit Crops at its thirty-fourth session,*
*to be held in Niagara Falls, Canada, from September 29 to October 3, 2003*

Alternative Names:*

| *Latin* | *English* | *French* | *German* | *Spanish* |
|---|---|---|---|---|
| *Persea americana* Mill. | Avocado | Avocatier | Avocado | Aguacate, Palta |

## ASSOCIATED DOCUMENTS

These guidelines should be read in conjunction with document TG/1/3, "General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants" (hereinafter referred to as the "General Introduction") and its associated "TGP" documents.

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

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## 1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Persea americana* Mill. (*Lauraceae*).

## 2. Material Required

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

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

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

8 graft sticks, to be tested on a standard, vegetatively propagated rootstock.

The rootstock to be used is specified by the competent authority.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease. It should preferably not be obtained from *in vitro* propagation. If it has been produced by *in vitro* propagation this fact has to be stated by the applicant.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

## 3. Method of Examination

### *3.1 Duration of Tests*

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

### *3.2 Testing Place*

The tests should normally be conducted at one place. If any characteristics of the variety, which are relevant for the examination of DUS, cannot be seen at that place, the variety may be tested at an additional place.

### *3.3 Conditions for Conducting the Examination*

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination. In particular, it is essential that the trees produce a satisfactory crop of fruit in each of the two growing cycles.

3.3.2 When resistance or tolerance characteristics are used for the examination of distinctness, uniformity and stability, tests should be done under controlled conditions.

*3.4 Test Design*

3.4.1 Each test should be designed to result in a total of, at least, five 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 Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations determined by measuring or counting should be made on five plants or two parts taken from each of five plants.

*3.6 Additional Tests*

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

## 4. Assessment of Distinctness, Uniformity and Stability

*4.1 Distinctness*

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

The minimum duration of tests recommended in section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

*4.2 Uniformity*

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

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

*4.3 Stability*

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

4.3.2 Where appropriate, or in cases of doubt, stability may be tested, either by growing a further generation, or by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

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

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness is 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) Leaf blade: anise aroma (characteristic 20);

(b) Ripe fruit: thickness of skin (characteristic 52);

(c) Time of fruit maturity for harvesting (characteristic 74).

Varieties exhibiting characteristics of more than one group should be tested in each of the appropriate groups.

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

## 6. Introduction to the Table of Characteristics

*6.1 Categories of Characteristics*

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

*6.2 States of Expression and Corresponding Notes*

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

*6.3 Types of Expression*

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

*6.4 Example Varieties*

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

*6.5 Legend*

(*) Asterisked characteristic – see Section 6.1.2

(QL) Qualitative characteristic – see Section 6.3
(QN) Quantitative characteristic – see Section 6.3
(PQ) Pseudo-Qualitative characteristic – see Section 6.3

(a)–(h) See Explanations on the Table of Characteristics in Chapter 8, Section 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8, Section 8.2

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

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **1.**<br>**(*)** | | **Young shoot: color of tip** | | | | | |
| **PQ** | **(a)** | yellow-green | | | | Collinson | 1 |
| | | green | | | | Benedict, Ferdyn, G-22, Teague | 2 |
| | | reddish | | | | Duke 6 | 3 |
| **2.** | | **Young shoot: distribution of anthocyanin coloration** | | | | | |
| **PQ** | **(a)** | absent | | | | Benedict, Collinson | 1 |
| | | uneven | | | | Fuerte | 2 |
| | | even | | | | Duke 6 | 3 |
| **3.** | | **Young shoot: color of lenticels** | | | | | |
| **PQ** | **(a)** | yellow | | | | | 1 |
| | | green | | | | Collinson, G-22 | 2 |
| | | red | | | | Bendict, Duke 6 | 3 |
| | | purple | | | | | 4 |
| **4.** | | **Young leaf: bloom** | **(MÉXICO: does it mean young leaf on inflorescence? if it is, it should go in inflorescence section.)** | **(ISRAEL: to be checked)** | | | |
| **QL** | **(a)** | absent | | | | Collinson | 1 |
| | | present | | | | Fuerte | 9 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **5.** | | **Young leaf: color of pubescence of petiole** | | | | | |
| **PQ** | **(a)** | white | | | | Edranol | 1 |
| | **(b)** | yellow | | | | Duke 6 | 2 |
| | | brown | | | | | 3 |
| | | red brown | | | | Fuerte | 4 |
| **6.** | | **Leaf: attitude (during active growth)** | | | | | |
| **QN** | **(c)** | erect | | | | G-6 | 3 |
| | | horizontal | | | | | 5 |
| | | drooping | | | | | 7 |
| **7.** | | **Leaf: twisting** | | | | | |
| **(+)** | | | | | | | |
| **QL** | **(c)** | absent | | | | Fuerte | 1 |
| | | present | | | | Zutano | 9 |
| **8.** | | **Leaf blade: folding** | **(TO BE CHECKED)** | | | | |
| **(+)** | | | | | | | |
| **PQ** | **(c)** | unfolded | | | | Fuerte | 1 |
| | | completely folded | | | | Santana | 2 |
| | | asymmetrically folded | | | | Collinson | 3 |
| **9.** | | **Leaf blade: length** | **(TO ADD EXAMPLE VARIETIES)** | | | | |
| **QN** | **(c)** | short | | | | | 3 |
| | | medium | | | | | 5 |
| | | long | | | | | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **10.** | | **Leaf blade: width** | **(TO ADD EXAMPLE VARIETIES)** | | | | |
| **QN** | **(c)** | narrow | | | | | 3 |
| | | medium | | | | | 5 |
| | | broad | | | | | 7 |
| **11.** | | **Leaf blade: length/ width ratio** | **(TO ADD EXAMPLE VARIETIES)** | | | | |
| **QN** | **(c)** | small | | | | | 3 |
| | | medium | | | | | 5 |
| | | large | | | | | 7 |
| **12.** | | **Leaf blade: shape** | | | | | |
| **(+)** | | | | | | | |
| **PQ** | **(c)** | elliptic | | | | Duke | 1 |
| | | lanceolate | | | | Collinson | 2 |
| | | ovate | | | | Teague | 3 |
| | | obovate | | | | Dilly | 4 |
| | | circular | | | | Santana | 5 |
| **13.** | | **Leaf blade: shape of apex** | | | | | |
| **(+)** | | | | | | | |
| **PQ** | **(c)** | attenuate | | | | Ettinger | 1 |
| | | acuminate | | | | Fuerte | 2 |
| | | acute | | | | | 3 |
| | | obtuse to rounded | | | | Santana | 4 |
| **14.** | | **Leaf blade: twisting of tip** | | | | | |
| **(+)** | | | | | | | |
| **QL** | **(c)** | absent | | | | Fuerte | 1 |
| | | present | | | | Collinson | 9 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **15.** | | **Leaf blade: undulation of margin** | | | | | |
| **PQ** | **(c)** | absent or very weak | | | | Duke | 1 |
| | | weak | | | | | 3 |
| | | medium | | | | Ettinger | 5 |
| | | strong | | | | Pinkerton | 7 |
| | | very strong | | | | Arturo | 9 |
| **16.** | | **Leaf blade: conspicuity of venation of upper surface** | | | | | |
| **QL** | **(c)** | inconspicuous | | | | Duke | 1 |
| | | conspicuous | | | | Teague | 2 |
| **17.** | | **Leaf blade: ratio number of secondary veins/ length of leaf blade** | **(TO PUT EXAMPLE VARIETIES)** | | | | |
| **QN** | **(c)** | small | | | | | 3 |
| | | medium | | | | | 5 |
| | | large | | | | | 7 |
| **18.** | | **Leaf blade: relief of venation on upper surface** | | | | | |
| **QL** | **(c)** | sunken | | | | Topa Topa | 1 |
| | | medium | | | | Fuerte | 2 |
| | | raised | | | | Edranol, Teague | 3 |
| **19.** | | **Leaf blade: density of pubescence on the lower surface** | | | | | |
| **QL** | **(b)** | absent or sparse | | | | Hass | 1 |
| | **(c)** | medium | | | | Edranol | 2 |
| | | dense | | | | Duke | 3 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **20.**<br>**(*)** | | **Leaf blade: anise aroma** | | | | | |
| **QL** | **(c)** | absent | | | | Edranol, Pollock | 1 |
| | | present | | | | Duke | 9 |
| **21.**<br>**(+)** | | **Inflorescence: length of axis** | | | | | |
| **QN** | **(d)** | short | | | | Bacon | 3 |
| | | medium | | | | Fuerte | 5 |
| | | long | | | | Pinkerton | 7 |
| **22.** | | **Inflorescence: color of lenticels** | | | | | |
| **QL** | **(d)** | green | | | | Topa Topa | 1 |
| | | red | | | | Teague | 2 |
| **23.**<br>**(+)** | | **Inflorescence: flowering type** | | | | | |
| **QL** | **(d)** | type A | | | | Hass | 1 |
| | | type B | | | | Fuerte | 2 |
| **24.** | | **Flower: pubescence presence of sepal** | | | | | |
| **QL** | **(b)** | absent | | | | Pollock | |
| | **(e)** | present | | | | Duke, Hass | |
| **25.** | | **Flower: density of pubescence of sepal** | | | | | |
| **PQ** | **(b)** | sparse | | | | Hass | 3 |
| | **(e)** | medium | | | | | 5 |
| | | dense | | | | Duke | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **26.**<br>**(+)** | | **Flower: nectaries (dissected, with magnifying glass)** | | | | | |
| **QL** | **(e)** | sessile | | | | Ettinger | 1 |
| | | stalked | | | | Fuerte | 9 |
| **27.** | | **Flower: style** | | | | | |
| **(+)** | | | | | | | |
| **QL** | **(e)** | straight | | | | Fuerte | 1 |
| | | kinked | | | | Collinson | 2 |
| **28.** | | **Flower: pollen** | | | | | |
| **QL** | **(f)** | absent | | | | Collinson | 1 |
| | | present | | | | Fuerte | 9 |
| **29.**<br>**(*)** | | **Mature fruit: size** | **(TO CHECK)** | | | | |
| **QN** | **(g)** | small | | | | Duke, Topa Topa | 3 |
| | | medium | | | | Fuerte | 5 |
| | | large | | | | Collinson, Ferdyn, Santana | 7 |
| **30.** | | **Mature fruit: shape of basal part of fruit** | **(TO CLARIFY)** | | | | |
| **PQ** | **(g)** | broadly rounded | | | | G-22, Nabal | 1 |
| | | rounded | | | | Bacon, Ferdyn | 2 |
| | | oblong | | | | Alboyce, Ettinger | 3 |
| | | pointed | | | | Santana | 4 |
| | | necked | | | | Horshim | 5 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **31.** | | **Mature fruit: ratio length/maximum diameter** | | | | | |
| **QN** | **(g)** | low | | | | G-22, Nabal | 3 |
| | | medium | | | | Bacon | 5 |
| | | high | | | | Horshim | 7 |
| **32.**<br>**(+)** | | **Mature fruit: stalk cavity** | | | | | |
| **QL** | **(g)** | absent | | | | Sharwil, Wurtz | 1 |
| | | present | | | | Bacon, Etttinger | 9 |
| **33.** | | **Mature fruit: ratio neck length/width (at bending point)** | **(TO PUT EXAMPLE VARIETIES)** | | | | |
| **QN** | **(g)** | low | | | | | 3 |
| | | medium | | | | | 5 |
| | | high | | | | | 7 |
| **34.**<br>**(+)** | | **Mature fruit: shape of stylar region** | | | | | |
| **PQ** | **(g)** | deeply depressed | | | | Duke | 1 |
| | | slightly depressed | | | | Fuerte | 2 |
| | | flat | | | | Ettinger, Ferdy | 3 |
| | | rounded | | | | Ahaheim, Wurtz | 4 |
| | | pointed | | | | | 5 |
| **35.** | | **Mature fruit: size of lenticels** | | | | | |
| **QN** | **(g)** | small | | | | Rincon | 3 |
| | | medium | | | | Fuerte | 5 |
| | | large | | | | Ettinger | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **36.** | | **Mature fruit: color of lenticels** | | | | | |
| **PQ** | **(g)** | whitish | | | | | 1 |
| | | light green | | | | | 2 |
| | | yellow | | | | Fuerte | 3 |
| | | brown | | | | | 4 |
| | | red | | | | | 5 |
| **37.** | | **Mature fruit: conspicuousness of lenticels** | | | | | |
| **QL** | **(g)** | inconspicuous | | | | Topa Topa | 1 |
| | | conspicuous | | | | Ettinger | 2 |
| **38.** | | **Mature fruit: distribution of lenticels** | | | | | |
| **QL** | **(g)** | diffused | | | | Duke, Rincon | 1 |
| | | in linear bands | | | | Sharwil | 2 |
| **39.** | | **Mature fruit: glossiness** | | | | | |
| **PQ** | **(g)** | weak | | | | Fuerte, Horshim | 1 |
| | | medium | | | | Ettinger, Zutano | 2 |
| | | strong | | | | Duke, Santana, Topa Topa | 3 |
| **40.** **(*)** | | **Mature fruit: relief of surface** | | | | | |
| **PQ** | **(g)** | very smooth | | | | Duke, Ferdyn, Teague, Topa Topa | 1 |
| | | smooth | | | | Bacon, Ettinger | 3 |
| | | medium | | | | Alboyce, Fuerte, Horshim | 5 |
| | | rough | | | | Hass | 7 |
| | | very rough | | | | Pinkerton | 9 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **41.** | | **Mature fruit: persistence of perianth** | | | | | |
| **PQ** | **(g)** | weak | | | | Hass | 3 |
| | | medium | | | | | 5 |
| | | strong | | | | Fuerte | 7 |
| **42.** | | **Mature fruit: width of stalk cavity** | | | | | |
| **QN** | **(g)** | narrow | | | | Ettinger | 3 |
| | | medium | | | | Fuerte | 5 |
| | | broad | | | | Collinson | 7 |
| **43.** | | **Mature fruit: position of stalk** | | | | | |
| **QL** | **(g)** | along axis | | | | G-22, Nabal | 1 |
| | | oblique | | | | Fuerte, Wurtz | 2 |
| **44.** **(*)** | | **Pedicel: length** | | | | | |
| **QN** | **(h)** | very short | | | | | 1 |
| | | short | | | | Pollock | 3 |
| | | medium | | | | Fuerte | 5 |
| | | long | | | | G-22, Hass | 7 |
| | | very long | | | | Pinkerton | 9 |
| **45.** | | **Pedicel: conspicuousness of junction with peduncle** | | | | | |
| **QL** | **(h)** | inconspicuous | | | | Alboyce | 1 |
| | | conspicuous | | | | Hass, Nabal, Topa Topa | 2 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **46.**<br>**(+)** | | **Pedicel: diameter compared to peduncle** | | | | | |
| **QL** | **(h)** | same | | | | Ettinger | 1 |
| | | larger | | | | Duke, Ferdyn, Sharwil | 2 |
| **47.**<br>**(*)**<br>**(+)** | | **Pedicel: shape** | | | | | |
| **QL** | **(h)** | cylindrical | | | | Ferdyn, Horshim, Teague | 1 |
| | | conical | | | | Edranol | 2 |
| **48.**<br>**(*)**<br>**(+)** | | **Pedicel: "nailhead"** | | | | | |
| **QL** | **(h)** | absent | | | | Duke, Edranol, Wurtz | 1 |
| | | present | | | | Pollock | 9 |
| **49.** | | **Pedicel: color** | | | | | |
| **PQ** | **(h)** | yellow | | | | Duke | 1 |
| | | yellow green | | | | Hass | 2 |
| | | green | | | | Alboyce | 3 |
| | | reddish | | | | Wurtz | 4 |
| **50.** | | **Pedicel: surface** | | | | | |
| **QL** | **(h)** | smooth | | | | Duke, Ferdyn, Topa Topa | 1 |
| | | wrinkled | | | | Edranol, Ettinger | 2 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **51.** | | **Ripe fruit: color of skin:** | | | | | |
| **PQ** | **(i)** | dark green | | | | Ahaheim, Pinkerton | 1 |
| | | green | | | | | 2 |
| | | yellow green | | | | Duke, Ferdyn, Teague | 3 |
| | | red | | | | | 4 |
| | | purple | | | | | 5 |
| | | purple black | | | | Hass, Topa Topa | 6 |
| **52.**<br>**(*)** | | **Ripe fruit: thickness of skin** | | | | | |
| **QN** | **(i)** | very thin | | | | Ettinger, Topa Topa | 1 |
| | | thin | | | | Fuerte | 3 |
| | | medium | | | | Edranol | 5 |
| | | thick | | | | Hass | 7 |
| | | very thick | | | | Dickinson (to delete G-22) | 9 |
| **53.** | | **Ripe fruit: texture of skin** | | | | | |
| **QL** | **(i)** | membranous | | | | Ettinger, Teague, Topa Topa | 1 |
| | | leathery | | | | Edranol, Pollock, Santana | 2 |
| | | corky | | | | G-22, Nabal | 3 |
| **54.** | | **Ripe fruit: adherence of skin to flesh** | | | | | |
| **PQ** | **(i)** | weak | | | | Edranol, Fuerte | 3 |
| | | medium | | | | Sharwil | 5 |
| | | strong | | | | Ettinger, Nabal, Teague | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **55.** | | **Ripe fruit: main color of flesh** | | | | | |
| **PQ** | **(i)** | whitish | | | | Bacon, Ettinger, Teague | 1 |
| | | pale green | | | | G-6 | 2 |
| | | cream | | | | Alboyce, Fuerte | 3 |
| | | yellow | | | | Nabal | 4 |
| **56.** | | **Ripe fruit: color of flesh next to skin** | | | | | |
| **PQ** | **(i)** | pale green | | | | Santana | 1 |
| | | green | | | | Fuerte, Sharwil | 2 |
| | | yellow green | | | | Duke | 3 |
| **57.** | | **Ripe fruit: width of colored layer of flesh next to skin** | | | | | |
| **QN** | **(i)** | narrow | | | | Duke, Santana | 3 |
| | | medium | | | | Fuerte | 5 |
| | | wide | | | | Edranol | 7 |
| **58.** | | **Ripe fruit: conspicuousness of fibers in flesh** | | | | | |
| **QL** | **(i)** | inconspicuous | | | | Fuerte, Santana | 1 |
| | | conspicuous | | | | Edranol, Ettinger, Ryan | 2 |
| **59.** | | **Ripe fruit: firmness of flesh** | | | | | |
| **PQ** | **(i)** | weak | | | | Santana (MX: to be cheked) | 3 |
| | | medium | | | | Fuerte, Santana (MX: to be cheked) | 5 |
| | | strong | | | | | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **60.** | | **Ripe fruit: anise aroma of flesh** | | | | | |
| **QL** | **(i)** | absent | | | | Hass | 1 |
| | | present | | | | Mexicola | 9 |
| **61.** | | **Ripe fruit: bitterness of flesh** | | | | | |
| **QL** | **(i)** | absent | | | | Fuerte | 1 |
| | | present | | | | Aguilar | 9 |
| **62.** | | **Ripe fruit: setting of seed in cavity** | | | | | |
| **QL** | **(i)** | loose | | | | | 1 |
| | | tight | | | | Nabal | 2 |
| **63.** | | **Seed: length (size) compared to fruit length (size)** | | | | | |
| **QN** | | small | | | | Pinkerton | 3 |
| | | medium | | | | Fuerte | 5 |
| | | large | | | | G-22, Topa Topa | 7 |
| **64.** | | **Seed: width** | **(TO PUT EXAMPLE VARIETIES** | | | | |
| **QN** | | narrow | | | | | 3 |
| | | medium | | | | | 5 |
| | | broad | | | | | 7 |

| | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|
| **65.**<br>**(+)** | **Seed: shape in longitudinal section** | **(TO CHECK)**<br>**(MX, Seed: shape)** | | | | |
| **PQ** | elliptic | | | | Alboyce, Topa Topa **(TO CHECK because the figure was broadly ovate)** | 1 |
| | ovate | | | | Wurtz | 2 |
| | circular | | | | Mayapan | 3 |
| | oblate | | | | Edranol, G-22 | 4 |
| | base flattened, apex rounded | | | | Bacon, Ferdyn | 5 |
| | base flattened, apex conical | | | | Ettinger, Fuerte | 6 |
| | broadly ovate **(MX: new)** | **(SEE DRAWING)** | | | | 7 |
| **66.** | **Seed: shape in cross section** | | | | | |
| **QL** | circular | | | | Fuerte | 1 |
| | elliptic | | | | Ryan | 2 |
| **67.** | **Seed: multiple sprouting** | | | | | |
| **QL** | absent | | | | Hass | 1 |
| | present | | | | Lula | 9 |
| **68.** | **Seed coat: adherence** | | | | | |
| **QL** | to embryo | | | | Edranol | 1 |
| | to flesh | | | | Ettinger | 2 |
| | to neither | | | | Horshim | 3 |
| **69.** | **Seed coat: surface** | **(TO PUT EXAMPLE VARIETIES)** | | | | |
| **QL** | smooth | | | | | 1 |
| | wrinkled | | | | | 2 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **70.** | | **Seed coat: color (on fresh seed)** | **(TO PUT EXAMPLE VARIETIES)** | | | | |
| **PQ** | | light brown | | | | | 1 |
| | | medium brown | | | | | 2 |
| | | dark brown | | | | | 3 |
| | | black brown | | | | | 4 |
| **71.** | | **Cotyledon: surface** | | | | | |
| **PQ** | | smooth | | | | Bacon | 1 |
| | | slightly wrinkled | | | | | 2 |
| | | wrinkled | | | | Collinson, Zutano | 3 |
| **72.** | | **Time of beginning of flowering** | | | | | |
| **QL** | | early | | | | Duke | 3 |
| | | medium | | | | Fuerte | 5 |
| | | late | | | | Hass | 7 |
| **73.** | | **Duration of flowering** | **(TO PUT EXAMPLE VARIETIES)** | | | | |
| **QL** | | short | | | | | 3 |
| | | medium | | | | | 5 |
| | | long | | | | | 7 |
| **74. (*)** | | **Time of fruit maturity for harvesting** | | | | | |
| **QL** | **(g)** | very early | | | | Topa Topa | 1 |
| | | early | | | | Ettinger | 3 |
| | | medium | | | | Fuerte | 5 |
| | | late | | | | Hass, Ryan | 7 |
| | | very late | | | | Reed | 9 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **75.** | | **Mature fruit: storage on tree** | **(TO PUT EXAMPLE VARIETIES)** | | | | |
| **QL** | **(g)** | very short | | | | | 1 |
| | | short | | | | | 3 |
| | | medium | | | | | 5 |
| | | long | | | | | 7 |
| | | very long | | | | | 9 |

## 8. Explanations on the Table of Characteristics

### *8.1 Explanations covering several characteristics*

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

(a) Young shoot / Young leaf: All 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) Pubescence: All observations on pubescence should be made with the aid of a magnifying glass.

(c) Leaf: Unless otherwise indicated, all observations on the leaf should be made on mature leaves from branches which are neither bearing fruit nor showing signs of new flush on the outside of the tree. They should be made in the middle third of the current season's growth.

(d) Inflorescence: All observations on the inflorescence should be made at the time of full flowering.

(e) Flower: All observations on the flower should be made during female opening. To determine the flowering type of a variety, the average night and day minimum temperatures should not be below 15 °C and 25 °C, respectively.

(f) Pollen: Observations on the pollen should be made at anther dehiscence of the flower.

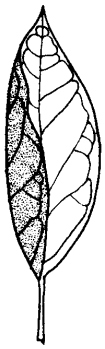
(g) Mature fruit: The mature fruit is defined as the fruit ready for harvesting.

(h) Pedicel: All observations on the pedicel should be made on mature fruits.

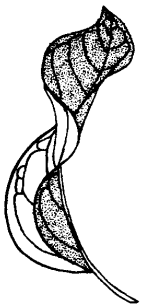
(i) Ripe fruit: The ripe fruit is defined as the fruit ready for eating .

*8.2 Explanations for individual characteristics*

Ad. 7: Leaf blade: twisting

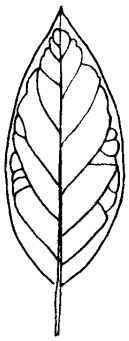


1
absent



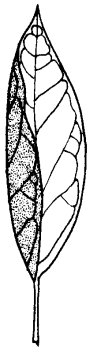
9
present

Ad. 8: Leaf blade: folding



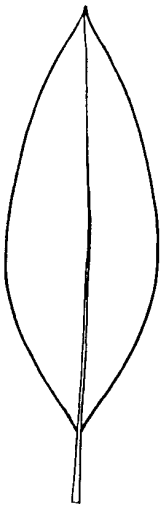
1
unfolded

2
Completely folded

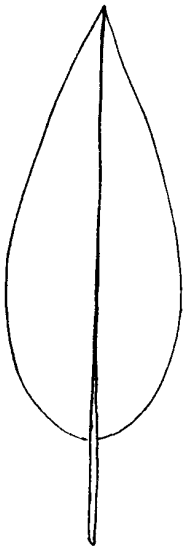


3
asymmetrically folded

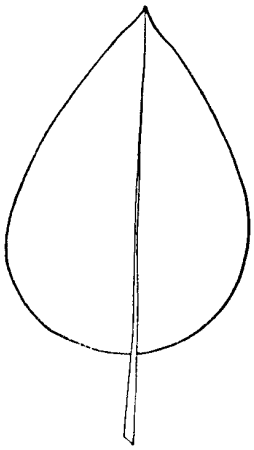
Ad. 12: Leaf blade: shape



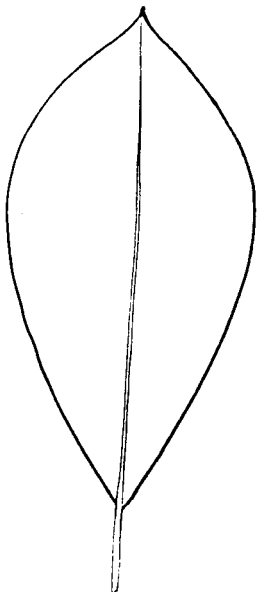
1
elliptic



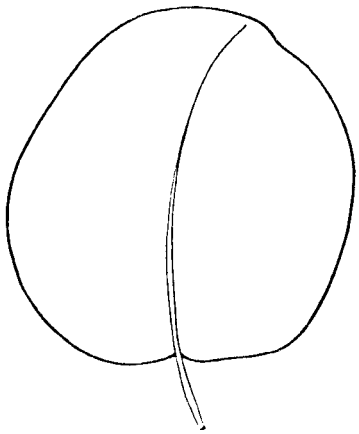
2
lanceolate



3
ovate

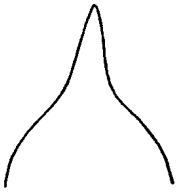


4
obovate



5
circular

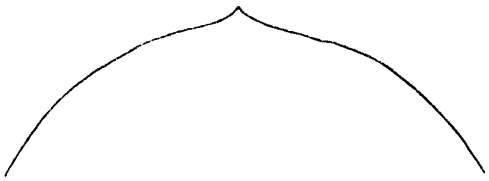
Ad. 13: Leaf blade: shape of apex



1
attenuate

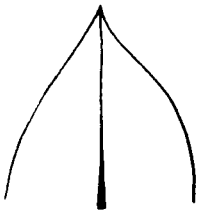
2
acuminate

3
acute

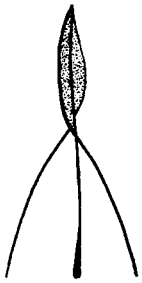


4
obtuse or rounded

Ad. 14: Leaf blade: twisting of tip

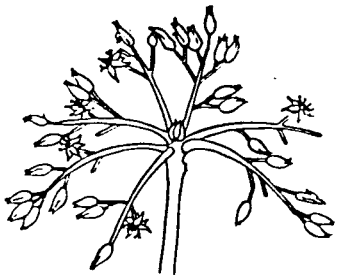


1
absent



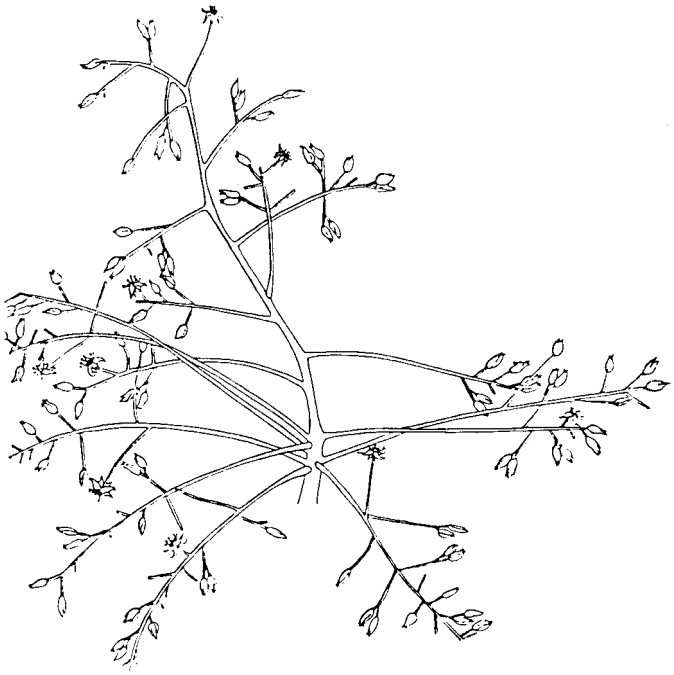
9
present

Ad. 21: Inflorescence: length of axis



3
short

5
medium



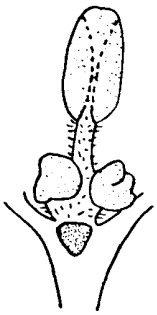
7
long

Ad. 23: Inflorescence: type

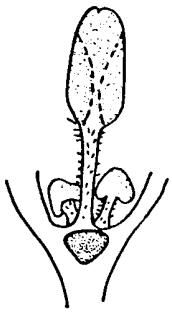
A flower from inflorescence

| Type | | A | B |
|---|---|---|---|
| Day 1 | a.m. | open with female parts functional | closed |
| | p.m. | closed | open with female parts functional |
| Day 2 | a.m. | closed | open with male parts functional |
| | p.m. | open with male parts functional | closed |

Ad. 26: Flower: nectary (dissected, with magnifying glass)



1
sessile



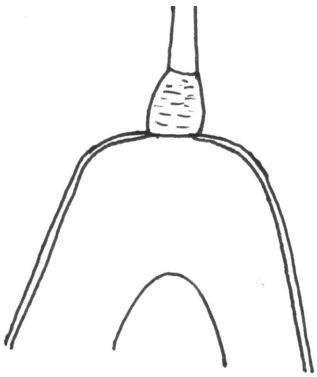
9
stalked

Ad. 27: Flower: style

1
straight

9
kinked

Ad. 32: Mature fruit: stalk cavity



1
Absent

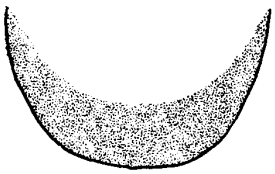
9
Present

Ad. 34: Mature fruit: shape of stylar region

1
deeply depressed

2
slightly depressed

3
flat



4
rounded

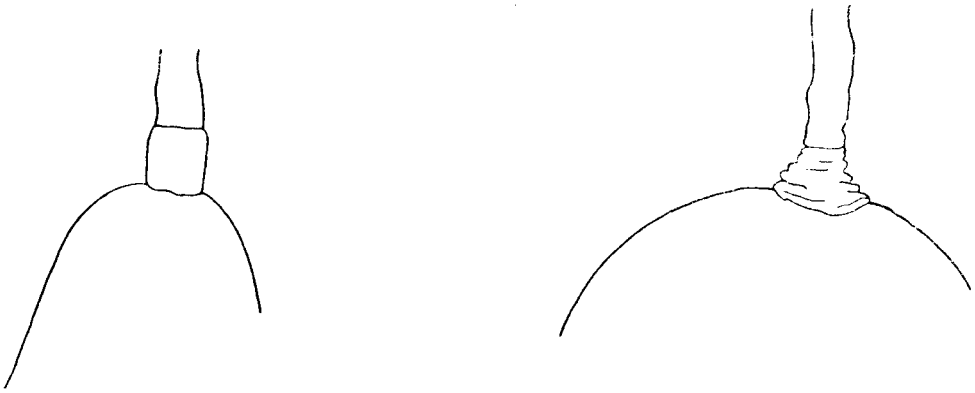
5
pointed

Ad. 46: Pedicel: diameter compared to peduncle

1
same

2
larger

Ad. 47: Pedicel: shape



1
cylindrical

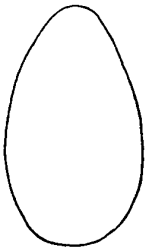
2
conical

Ad. 48: Pedicel: "nailhead"

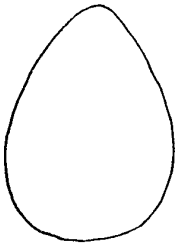
1
absent

9
present

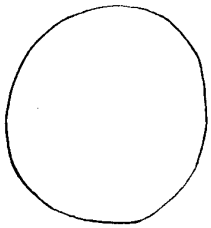
Ad. 66: Seed: shape in longitudinal section



1
elliptic

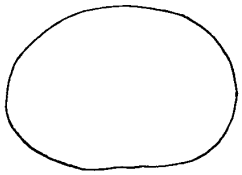


2
ovate

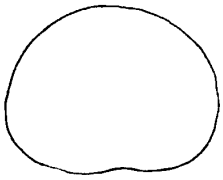


3
circular

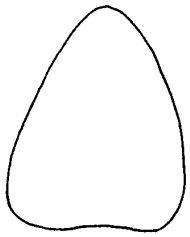
**(MX: to check drawing, it looks like broadly ovate that should be included as NEW)**



4
oblate



5
base flattened, apex rounded



6
base flattened, apex conical

## 9. Literature

IPGRI. 1995. "Descriptors for Avocado (*Persea* spp.)." International Plant Genetic Resources Institute. Rome, Italy. 52 p.

10. Technical Questionnaire

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

| | Application date:<br>(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 *Latin Name* | *Persea americana* Mill. |
| 1.2 Common Name | AVOCADO |

2. Applicant

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

3. Proposed denomination and breeder's reference

| | |
|---|---|
| Proposed denomination (if available) | |
| Breeder's reference | |

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

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

4.1 Breeding Scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)
(b) partially known cross [ ]
(please state known parent variety(ies))
(c) totally unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery [ ]
(please state where, when and how developed)

4.1.4 Other [ ]
(please provide details)

4.2 Method of Propagating the Variety

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)** | **Young shoot: color of the tip** | | |
| | yellow-green | Collinson | 1[ ] |
| | green | Benedict, Ferdyn, G-22, Teague | 2[ ] |
| | reddish | Duke 6 | 3[ ] |
| **5.2 (20)** | **Leaf blade: anise aroma** | | |
| | absent | Edranol, Pollock | 1[ ] |
| | present | Duke | 9[ ] |

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

| | | | |
|---|---|---|---|
| **5.3 (47)** | **Pedicel: shape** | | |
| | cylindrical | Ferdyn, Horshim, Teague | 1[ ] |
| | conical | Edranol | 2[ ] |
| **5.4 (48)** | **Pedicel: "nailhead"** | | |
| | absent | Duke, Edranol, Wurtz | 1[ ] |
| | present | Pollock | 9[ ] |
| **5.5 (52)** | **Ripe fruit: thickness of skin** | | |
| | very thin | Ettinger, Topa Topa | 1[ ] |
| | thin | Fuerte | 3[ ] |
| | medium | Edranol | 5[ ] |
| | thick | Hass | 7[ ] |
| | very thick | Dickinson | 9[ ] |

6. Similar varieties and differences from these varieties

| 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: height* | *e.g.* | *note 3* | *note 7* |
| | | *e.g.* | *short* | *tall* |
| | | *e.g.* | *2 m* | *10 m* |
| | | | | |
| | | | | |
| | | | | |

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Special conditions for the examination of the variety

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

Yes [ ] No [ ]

7.2.2 If yes, please give 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.

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 or pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

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

……

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

Applicant’s name

Signature Date

[End of document]