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# INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

**MANDARINS**

UPOV Code(s): CITRU_AUM;
CITRU_RET

*Citrus* × *aurantium* L.;
*Citrus reticulata* Blanco
[to be reviewed]

**GUIDELINES**

**FOR THE CONDUCT OF TESTS**

**FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

*prepared by experts from Spain*
*to be considered by the*
*Technical Working Party for Fruit Crops*
*at its fifty-third session, to be held virtually,*
*from 2022-07-11 to 2022-07-15*

*Disclaimer: this document does not represent UPOV policies or guidance*

Alternative names:*

| *Botanical name* | *English* | *French* | *German* | *Spanish* |
|---|---|---|---|---|
| *Citrus* ×*aurantium* L. | | | | |
| *Citrus reticulata* Blanco | | | | |

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

## ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were 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.]

| UPOV Code | Principal botanical name | Other botanical name(s) |
|---|---|---|
| CITRU_AUM | Citrus ×aurantium L. | Citrus amara Link; Citrus bigarradia Loisel.; Citrus intermedia hort. ex Tanaka; Citrus taitensis Risso; Citrus vulgaris Risso; Citrus ×aurantium subsp. aurantium L.; Citrus ×aurantium subsp. jambiri Engl.; Citrus ×aurantium subsp. keonla Engl.; Citrus ×aurantium subsp. suntara Engl.; Citrus ×aurantium var. aurantium L.; Citrus ×aurantium var. citrina Lush.; Citrus ×bigarradia var. volkameriana Risso; Citrus ×clementina hort. ex Tanaka; Citrus ×crenatifolia Lush.; Citrus reticulata × C. maxima" |
| CITRU_RET | Citrus reticulata Blanco | Citrus benikoji hort. ex Tanaka; Citrus daoxianensis S. W. He & G. F. Liu; Citrus depressa var. vangasay (Bojer) H. Perrier; Citrus nobilis Andrews; Citrus vangasay Bojer |

To be reviewed:

GROUP 1 – ALTERNATIVE NAMES AND CORRESPONDING SUBGROUPS*

| *Latin* | *Subgroup* | *English* | *French* | *German* | *Spanish* |
|---|---|---|---|---|---|
| *Citrus amblycarpa* (Hassk.) Ochse | HMA | | | | |
| *Citrus benikoji* hort. ex Tanaka | PMN | | | | |
| *Citrus chuana* hort. ex Tseng | PMN | | | | |
| *Citrus clementina* hort. ex Tan. | CLE | Clementine | Clémentinier | Clementine | Clementina |
| *Citrus crenatifolia* Lush. | PMN | | | | |
| *Citrus deliciosa* Ten. | MMM | Mediterranean Mandarin | Mandarinier | Mandarine | Mandarina común |
| *Citrus depressa* Hayata | HMA | | | | |
| *Citrus genshokan* (Hayata) hort. ex Tanaka | PMN | | | | |
| *Citrus hainanensis* Tanaka | HMA | | | | |
| *Citrus haniana* hort. ex Tseng | PMN | | | | |
| *Citrus ichangensis* Swing. x *C. reticulata* Blanco | HMR | Ichandarin | | | |
| *Citrus ichangensis* Swing. x *C. unshiu* (Mak.) Marc. | HMR | Ichandarin | | | |
| *Citrus inflata* hort. ex Tanaka | HMA | | | | |
| *Citrus inflatorugosa* hort. ex Tanaka | HMA | | | | |
| *Citrus keraji* hort. ex Tanaka | HMA | | | | |
| *Citrus leiocarpa* hort. ex Tanaka | HMA | | | | |
| *Citrus lycopersicaeformis* (Lush.) hort. ex Tanaka | HMA | | | | |
| *Citrus madurensis* Lour. | HMA | Calamondin | | | |
| *Citrus maxima* (Burm.) Merr. x *C. ichangensis* Swing. | HMR | Ichangelo | | | |
| *Citrus nippokoreana* Tanaka | HMA | | | | |
| *Citrus nobilis* Lour. | HMA | | | | |
| *Citrus oto* hort. ex Yu. Tanaka | HMA | | | | |
| *Citrus paratangerina* hort. ex Tanaka | PMN | | | | |
| *Citrus platymamma* hort. ex Tanaka | PMN | | | | |

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| *Latin* | *Subgroup* | *English* | *French* | *German* | *Spanish* |
|---|---|---|---|---|---|
| *Citrus pseudo-aurantium* hort. ex Yu. Tanaka | HMA | | | | |
| *Citrus pseudosunki* hort. ex Tanaka | HMA | | | | |
| *Citrus reshni* hort. ex Tanaka | HMA | | | | |
| *Citrus reticulata* Blanco | PMN | Tangerine | Mandarinier | Tangerine | Mandarina Ponkan |
| *Citrus reticulata* Blanco x *C. paradisi* Macfad | TNL | Tangelo | Tangelo | Tangelo | Tangelo |
| *Citrus reticulata* Blanco x *C. sinensis* (L.) Osb. | TNR | Tangor | Tangor | Tangor | Tangor |
| *Citrus reticulata* Blanco x *Fortunella* sp. | HMR | Kumandarin | | | |
| *Citrus suavissima* hort. ex Tanaka | PMN | | | | |
| *Citrus succosa* hort. ex Tanaka | PMN | | | | |
| *Citrus suhuiensis* hort. ex Tanaka | PMN | | | | |
| *Citrus sunki (Hayata)* hort. ex Tanaka | HMA | | | | |
| *Citrus tangerina* hort. ex Tanaka | PMN | | | | |
| *Citrus tardiferax* hort. ex Tanaka | PMN | | | | |
| *Citrus tardiva* hort. ex Shirai | HMA | | | | |
| *Citrus tarogayo* hort. ex Yu. Tanaka | HMA | | | | |
| *Citrus temple* hort. ex Y. Tan. x *C. paradisi* Macfad | HMA | Siamelo | | | |
| *Citrus temple* hort. ex Yu. Tanaka | TNR | | | | |
| *Citrus tumida* hort. ex Tanaka | HMA | | | | |
| *Citrus unshiu* Marcow. | SAT | Satsuma | Satsuma | Satsuma | Satsuma |
| *Citrus yatsushiro* hort. ex Tanaka | HMA | | | | |
| *Citrus yuko* hort. ex Tanaka | HMA | | | | |
| Tangelo x *C. paradisi* Macfad | HMA | Tangelolo | | | |
| Tangor x *C. temple* hort. ex Y. Tan. | HMA | Tangorgelo | | | |

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Citrus* ×*aurantium* L. and *Citrus reticulata* Blanco.

2. Material Required

3. Method of Examination

4. Assessment of Distinctness, Uniformity and Stability

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

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”.

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*

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 All relevant states of expression are presented in the characteristic.

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*

| | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|
| **1 2** | **3 4** | **5 6** | **7** | | | |
| | **Name of characteristics in English** | **Nom du caractère en français** | **Name des Merkmals auf Deutsch** | **Nombre del carácter en español** | | |
| | states of expression | types d'expression | Ausprägungsstufen | tipos de expresión | | |

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

5 (+) See Explanations on the Table of Characteristics in Chapter 8.1

6 Not applicable

7 Not applicable

## 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.** | | **QL VG** | | **201** | | | |
| | | **Ploidy** | | | | | |
| | | diploid | | | | | 2 |
| | | triploid | | | | | 3 |
| | | tetraploid | | | | | 4 |
| **2.** | **(*)** | **PQ VG** | | **202** | | | |
| | | **Tree: growth habit** | | | | | |
| | | upright | | | | Marisol (CLE) | 1 |
| | | spreading | | | | Clemenules (CLE) | 2 |
| | | drooping | | | | Owari (SAT) | 3 |
| **3.** | | **QN VG** | | | | | |
| | | **Tree: density of spines** | | | | | |
| | | absent | | | | Owari (SAT) | 1 |
| | | sparse | | | | Okitsu (SAT) | 2 |
| | | intermediate | | | | Marisol (CLE) | 3 |
| | | dense | | | | | 4 |
| **4.** | | **QN VG** | | **204** | | | |
| | | **Tree: length of spines** | | | | | |
| | | short | | | | Marisol (CLE) | 3 |
| | | medium | | | | | 5 |
| | | long | | | | Gold Nugget (HMA) | 7 |
| **5.** | | **QN VG** | | **210** | | | |
| | | **Leaf blade: length (apical leaflet in case of compound leaf)** | | | | | |
| | | short | | | | Común (MMN) | 3 |
| | | medium | | | | Nova (HMA) | 5 |
| | | long | | | | Kara (HMA) | 7 |
| **6.** | | **QN VG** | | **211** | | | |
| | | **Leaf blade: width (as for 5)** | | | | | |
| | | narrow | | | | Común (MMN) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | broad | | | | Page (HMA) | 7 |

| | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|
| **7.** | **QN VG** | | **212** | | | |
| | **Leaf blade: ratio length/width (as for 5)** | | | | | |
| | small | | | | Orlando (TNL) | 3 |
| | medium | | | | Fino (CLE) | 5 |
| | large | | | | Clemenules (CLE) | 7 |
| **8.** | **PQ VG** | | **223** | | | |
| | **Leaf blade: incisions of margin** | | | | | |
| | absent | | | | | 1 |
| | crenate | | | | | 2 |
| | dentate | | | | | 3 |
| **9.** | **QN VG** | | **226** | | | |
| | **Petiole: length** | | | | | |
| | short | | | | Clemenules (CLE) | 3 |
| | medium | | | | Fortune (HMA) | 5 |
| | long | | | | Minneola (TNL) | 7 |
| **10** | **QL VG** | | **227** | | | |
| | **Petiole: presence of wings** | | | | | |
| | absent | | | | Clemenules (CLE) | 1 |
| | present | | | | Minneola (TNL) | 9 |
| **11** | **QN VG** | | **232** | | | |
| | **Flower: length of petal** | | | | | |
| | short | | | | Fino (CLE) | 3 |
| | medium | | | | Ellendale (TNR) | 5 |
| | long | | | | Owari (SAT) | 7 |
| **12** | **QN VG** | | **233** | | | |
| | **Flower: width of petal** | | | | | |
| | narrow | | | | | 3 |
| | medium | | | | Ellendale (TNR) | 5 |
| | broad | | | | Aoshima (SAT) | 7 |

| | | English | | français | | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|---|---|
| **13** | | **QN** | **VG** | | | **234** | | | |
| | | **Flower: ratio length/ width of petal** | | | | | | | |
| | | small | | | | | | Wilking (HMA) | 3 |
| | | medium | | | | | | Fino (CLE) | 5 |
| | | large | | | | | | Page (HMA) | 7 |
| **14** | | **QN** | **VG** | | | **235** | | | |
| | | **Flower: length of stamens** | | | | | | | |
| | | short | | | | | | Encore (HMA) | 3 |
| | | medium | | | | | | Owari (SAT) | 5 |
| | | long | | | | | | Page (HMA) | 7 |
| **15** | | **PQ** | **VG** | | | **238** | | | |
| | | **Anther: color** | | | | | | | |
| | | white | | | | | | Queen (HMA) | 1 |
| | | light yellow | | | | | | Owari (SAT) | 2 |
| | | medium yellow | | | | | | Fino (CLE) | 3 |
| **16** | | **QN** | **VG** | | | **240** | | | |
| | | **Style: length** | | | | | | | |
| | | short | | | | | | Pixie (HMA) | 3 |
| | | medium | | | | | | Fino (CLE) | 5 |
| | | long | | | | | | Owari (SAT) | 7 |
| **17** | | **QN** | **VG** | **(+)** | | **339** | | | |
| | | **Anther: viable pollen** | | | | | | | |
| | | absent or very low | | | | | | Owari (SAT) | 1 |
| | | medium | | | | | | Marisol (CLE) | 3 |
| | | high | | | | | | Murcott (HMA) | 5 |
| | | very high | | | | | | Fortune (HMA) | 7 |
| **18** | **(*)** | **QN** | **VG** | | | **244** | | | |
| | | **Fruit: length** | | | | | | | |
| | | short | | | | | | Wilking (HMA) | 3 |
| | | medium | | | | | | Clemenules (CLE) | 5 |
| | | long | | | | | | Minneola (TNL) | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **19** | **(*)** | **QN VG** | | **245** | | | |
| | | **Fruit: diameter** | | | | | |
| | | small | | | | Fino (CLE) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | large | | | | Ortanique (TNR) | 7 |
| **20** | **(*)** | **QN VG** | | **246** | | | |
| | | **Fruit: ratio length/diameter** | | | | | |
| | | small | | | | Encore (HMA) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | large | | | | Kara (HMA) | 7 |
| **21** | **(*)** | **QN VG** | | **247** | | | |
| | | **Fruit: position of broadest part** | | | | | |
| | | towards stalk end | | | | Kara (HMA) | 1 |
| | | at middle | | | | Clemenules (CLE) | 2 |
| | | towards distal end | | | | | 3 |
| **22** | | **PQ VG** | | **248** | | | |
| | | **Fruit: shape in transverse section** | | | | | |
| | | circular | | | | Ortanique (TNR) | 1 |
| | | somewhat angular | | | | Clemenules (CLE) | 2 |
| | | scalloped | | | | | 3 |
| **23** | **(*)** | **PQ VG** | | **249** | | | |
| | | **Fruit: general shape of proximal part (excluding neck, collar and depression at stalk end)** | | | | | |
| | | flattened | | | | Clemenules (CLE) | 1 |
| | | slightly rounded | | | | Ortanique (TNR) | 2 |
| | | strongly rounded | | | | | 3 |
| | | tapered | | | | | 4 |
| **24** | **(*)** | **QL VG** | | **250** | | | |
| | | **Fruit: presence of neck** | | | | | |
| | | absent | | | | Clemenules (CLE) | 1 |
| | | present | | | | Minneola (TNL) | 9 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **25** | **(*)** | **QL VG** | | **253** | | | |
| | | **<u>Only varieties without fruit neck</u>: Fruit: presence of depression at stalk end** | | | | | |
| | | absent | | | | Ortanique (TNR) | 1 |
| | | present | | | | Marisol (CLE) | 9 |
| **26** | | **QN VG** | | **257** | | | |
| | | **Fruit: number of radial grooves at stalk end** | | | | | |
| | | absent or few | | | | Nova (HMA) | 1 |
| | | intermediate | | | | Clemenules (CLE) | 2 |
| | | many | | | | Ellendale (TNR) | 3 |
| **27** | | **QL VG** | | **260** | | | |
| | | **Fruit: presence of collar** | | | | | |
| | | absent | | | | Clemenules (CLE) | 1 |
| | | present | | | | | 9 |
| **28** | **(*)** | **QN VG** | | **264** | | | |
| | | **Fruit: general shape of distal part (excluding nipple, bulging of navel and depression at distal end)** | | | | | |
| | | flattened | | | | Clemenules (CLE) | 1 |
| | | slightly rounded | | | | | 2 |
| | | strongly rounded | | | | Pixie (HMA) | 3 |
| **29** | **(*)** | **QL VG** | | **265** | | | |
| | | **Fruit: presence of depression at distal end** | | | | | |
| | | absent | | | | Ortanique (TNR) | 1 |
| | | present | | | | Arrufatina (CLE) | 9 |
| **30** | **(*)** | **QL VG** | | **270** | | | |
| | | **Fruit: presence of areola** | | | | | |
| | | absent | | | | Nova (HMA) | 1 |
| | | incomplete | | | | | 2 |
| | | complete | | | | Ortanique (TNR) | 3 |

| | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|
| **31** | **QL** **VG** | | **271** | | | |
| | **Fruit: type of areola** | | | | | |
| | smooth | | | | Fallglo (HMA) | 1 |
| | grooved | | | | Page (HMA) | 2 |
| | ridged | | | | Temple (HMA) | 3 |
| **32** | **QN** **VG** | | **272** | | | |
| | **Fruit: diameter of areola** | | | | | |
| | small | | | | Arrufatina (CLE) | 3 |
| | medium | | | | Owari (SAT) | 5 |
| | large | | | | Ortanique (TNR) | 7 |
| **33** | **QN** **VG** | | **273** | | | |
| | **Fruit: diameter of stylar scar** | | | | | |
| | small | | | | Clemenules (CLE) | 3 |
| | medium | | | | Owari (SAT) | 5 |
| | large | | | | | 7 |
| **34** | **PQ** **VG** | | **275** | | | |
| | **Fruit: persistence of style** | | | | | |
| | none | | | | | 1 |
| | partial | | | | Pixie (HMA) | 2 |
| | total | | | | | 3 |
| **35** | **PQ** **VG** | | **276** | | | |
| | **Fruit: presence of navel opening** | | | | | |
| | absent | | | | Clemenules (CLE) | 1 |
| | occasionally present | | | | Fortune (HMA) | 2 |
| | always present | | | | | 3 |
| **36** | **QL** **VG** | | **279** | | | |
| | **Fruit: presence of radial grooves at distal end** | | | | | |
| | absent | | | | Clemenules (CLE) | 1 |
| | present | | | | Wilking (HMA) | 9 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **37** | **(*)** | **PQ** **VG** | | | | | |
| | | **Fruit surface: predominant color(s)** | | | | | |
| | | green | | | | | 1 |
| | | yellow green | | | | | 2 |
| | | light yellow | | | | | 3 |
| | | medium yellow | | | | Mapo (TNL) | 4 |
| | | yellow orange | | | | Owari (SAT) | 5 |
| | | medium orange | | | | Clemenules (CLE) | 6 |
| | | dark orange | | | | Fortune (HMA) | 7 |
| | | orange red | | | | Nova (HMA) | 8 |
| | | red | | | | | 9 |
| **38** | **(*)** | **QN** **VG** | | **285** | | | |
| | | **Fruit surface: glossiness** | | | | | |
| | | absent or very weak | | | | | 1 |
| | | weak | | | | Clemenules (CLE) | 3 |
| | | medium | | | | Okitsu (SAT) | 5 |
| | | strong | | | | Afourer (TNR) | 7 |
| | | very strong | | | | | 9 |
| **39** | | **QN** **VG** | | **286** | | | |
| | | **Fruit surface: roughness** | | | | | |
| | | smooth | | | | Murcott (HMA) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | rough | | | | Temple (HMA) | 7 |
| **40** | | **PQ** **VG** | | **287** | | | |
| | | **Fruit surface: size of oil glands** | | | | | |
| | | all more or less the same size | | | | | 1 |
| | | larger ones interspersed by smaller ones | | | | | 2 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **41** | | **PQ VG** | **(+)** | **290** | | | |
| | | **Fruit surface: presence of pitting and pebbling** | | | | | |
| | | pitting and pebbling absent | | | | | 1 |
| | | pitting absent, pebbling present | | | | | 2 |
| | | pitting present, pebbling absent | | | | | 3 |
| | | pitting and pebbling present | | | | | 4 |
| **42** | **(*)** | **QN VG** | | **295** | | | |
| | | **Fruit rind: thickness** | | | | | |
| | | thin | | | | Murcott (HMA) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | thick | | | | Minneola (TNL) | 7 |
| **43** | **(*)** | **QN VG** | | **296** | | | |
| | | **Fruit rind: adherence to flesh** | | | | | |
| | | weak | | | | Clemenules (CLE) | 3 |
| | | medium | | | | Fortune (HMA) | 5 |
| | | strong | | | | Ortanique (TNR) | 7 |
| **44** | | **QN VG** | | **297** | | | |
| | | **Fruit rind: strength** | | | | | |
| | | weak | | | | Fairchild (HMA) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | strong | | | | Pixie (HMA) | 7 |
| **45** | | **QN VG** | | **298** | | | |
| | | **Fruit rind: oiliness** | | | | | |
| | | dry | | | | Minneola (TNL) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | oily | | | | Ortanique (TNR) | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **46** | | **PQ VG** | | **300** | | | |
| | | **Fruit: color of albedo** | | | | | |
| | | greenish | | | | | 1 |
| | | white | | | | Clemenules (CLE) | 2 |
| | | light yellow | | | | Seminole (TNL) | 3 |
| | | light orange | | | | Afourer (TNR) | 4 |
| | | pink | | | | | 5 |
| | | reddish | | | | | 6 |
| **47** | | **QN VG** | | **301** | | | |
| | | **Fruit: density of albedo** | | | | | |
| | | loose | | | | Clemenules (CLE) | 3 |
| | | medium | | | | Fortune (HMA) | 5 |
| | | dense | | | | Ortanique (TNR) | 7 |
| **48** | **(*)** | **QN VG** | | **302** | | | |
| | | **Fruit: amount of albedo adhering to flesh (strands excluded)** | | | | | |
| | | absent or very small | | | | Clemenules (CLE) | 1 |
| | | small | | | | | 3 |
| | | medium | | | | | 5 |
| | | large | | | | | 7 |
| | | very large | | | | | 9 |
| **49** | | **QL VG** | | **303** | | | |
| | | **Fruit: presence of albedo strands** | | | | | |
| | | absent | | | | | 1 |
| | | present | | | | Clemenules (CLE) | 9 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **50** | **(*)** | **PQ** **VG** | | **307** | | | |
| | | **Fruit: main color of flesh** | | | | | |
| | | whitish | | | | | 1 |
| | | light green | | | | | 2 |
| | | light yellow | | | | | 3 |
| | | medium yellow | | | | | 4 |
| | | light orange | | | | Orlando (TNL) | 5 |
| | | medium orange | | | | Clemenules (CLE) | 6 |
| | | dark orange | | | | Murcott (HMA) | 7 |
| | | red | | | | | 8 |
| | | purple | | | | | 9 |
| **51** | | **QN** **VG** | | **309** | | | |
| | | **Fruit: filling of core** | | | | | |
| | | absent or very sparse | | | | Fortune (HMA) | 1 |
| | | sparse | | | | Orlando (TNL) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | dense | | | | Murcott (HMA) | 7 |
| | | very dense | | | | | 9 |
| **52** | | **QN** **VG** | | **310** | | | |
| | | **Fruit: diameter of core** | | | | | |
| | | small | | | | Murcott (HMA) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | large | | | | Hernandina (CLE) | 7 |
| **53** | | **QN** **VG** | | **312** | | | |
| | | **Fruit: number of well developed segments** | | | | | |
| | | few | | | | Oroval (CLE) | 3 |
| | | medium | | | | Ortanique (TNR) | 5 |
| | | many | | | | Temple (HMA) | 7 |
| **54** | | **QN** **VG** | | **313** | | | |
| | | **Fruit: coherence of adjacent segment walls** | | | | | |
| | | weak | | | | Clemenules (CLE) | 3 |
| | | medium | | | | Fortune (HMA) | 5 |
| | | strong | | | | | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **55** | | **QN VG** | | **314** | | | |
| | | **Fruit: strength of segment walls** | | | | | |
| | | weak | | | | Mapo (TNL) | 3 |
| | | medium | | | | Fino (CLE) | 5 |
| | | medium strong | | | | Oronules (CLE) | 7 |
| **56** | | **QN VG** | | **316** | | | |
| | | **Fruit: thickness of juice vesicles** | | | | | |
| | | thin | | | | Clemenules (CLE) | 3 |
| | | medium | | | | | 5 |
| | | thick | | | | Mapo (TNL) | 7 |
| **57** | **(*)** | **PQ VG** | | **319** | | | |
| | | **Fruit: presence of navel (viewed internally)** | | | | | |
| | | absent or very rare | | | | Clemenules (CLE) | 1 |
| | | occasionally present | | | | Nova (HMA) | 2 |
| | | always present | | | | Orri (HMA) | 3 |
| **58** | | **QN VG** | | **321** | | | |
| | | **Fruit: juiciness** | | | | | |
| | | low | | | | Gold Nugget (HMA) | 3 |
| | | medium | | | | Campeona (HMA) | 5 |
| | | high | | | | Marisol (CLE) | 7 |
| **59** | **(*)** | **QN VG** | | **322** | | | |
| | | **Fruit juice: total soluble solids** | | | | | |
| | | low | | | | Okitsu (SAT) | 3 |
| | | medium | | | | Temple (HMA) | 5 |
| | | medium high | | | | Honey (HMA) | 7 |
| **60** | | **QN VG** | | **323** | | | |
| | | **Fruit juice: acidity** | | | | | |
| | | low | | | | Hernandina (CLE) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | high | | | | Fortune (HMA) | 7 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **61** | | **QN VG** | | **324** | | | |
| | | **Fruit: strength of fibre** | | | | | |
| | | weak | | | | Mapo (TNL) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | strong | | | | Murcott (HMA) | 7 |
| **62** | | **QN VG** | **(+)** | **326** | | | |
| | | **Fruit: number of seeds (open pollination)** | | | | | |
| | | absent or very few | | | | Clemenules (CLE) | 1 |
| | | few | | | | Ellendale (TNR) | 3 |
| | | medium | | | | | 5 |
| | | many | | | | Común (MMN) | 7 |
| **63** | **(*)** | **QL VG** | | **327** | | | |
| | | **Seed: polyembryony** | | | | | |
| | | absent | | | | Wilking (HMA) | 1 |
| | | present | | | | Común (MMN) | 9 |
| **64** | | **QN VG** | | **328** | | | |
| | | **Seed: length** | | | | | |
| | | short | | | | Temple (HMA) | 3 |
| | | medium | | | | | 5 |
| | | long | | | | Campeona (HMA) | 7 |
| **65** | | **QN VG** | | **329** | | | |
| | | **Seed: width** | | | | | |
| | | narrow | | | | Temple (HMA) | 3 |
| | | medium | | | | | 5 |
| | | broad | | | | Campeona (HMA) | 7 |
| **66** | | **QL VG** | | **330** | | | |
| | | **Seed: surface** | | | | | |
| | | smooth | | | | Kinow (HMA) | 1 |
| | | wrinkled | | | | Wilking (HMA) | 2 |

| | | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|---|
| **67** | | **PQ VG** | | **332** | | | |
| | | **Seed: external color** | | | | | |
| | | greenish | | | | | 1 |
| | | whitish | | | | Fairchild (HMA) | 2 |
| | | yellowish | | | | Murcott (HMA) | 3 |
| | | pinkish | | | | | 4 |
| | | brownish | | | | | 5 |
| **68** | | **PQ VG** | | **333** | | | |
| | | **Seed: color of inner seed coat** | | | | | |
| | | white | | | | | 1 |
| | | light yellow | | | | | 2 |
| | | light brown | | | | Murcott (HMA) | 3 |
| | | medium brown | | | | | 4 |
| | | dark brown | | | | | 5 |
| | | red | | | | | 6 |
| | | purple | | | | | 7 |
| **69** | | **PQ VG** | | **334** | | | |
| | | **<u>Only varieties with seed: polyembryony present:</u> Seed: color of cotyledons** | | | | | |
| | | white | | | | Murcott (HMA) | 1 |
| | | cream | | | | | 2 |
| | | light green | | | | Común (MMN) | 3 |
| | | dark green | | | | | 4 |
| **70** | **(*)** | **QN VG** | | **336** | | | |
| | | **Time of maturity of fruit for consumption** | | | | | |
| | | early | | | | Okitsu (SAT) | 3 |
| | | medium | | | | Clemenules (CLE) | 5 |
| | | late | | | | Murcott (HMA) | 7 |
| **71** | **(*)** | **QL VG** | | **337** | | | |
| | | **Fruit: parthenocarpy** | | | | | |
| | | absent | | | | Temple (HMA) | 1 |
| | | present | | | | Clemenules (CLE) | 9 |

| | English | français | deutsch | español | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---|---|---|---|---|---|---|
| **72** | **QL** **VG** | | **338** | | | |
| | **Plant: self-incompatibility** | | | | | |
| | absent | | | | Ellendale (TNR) | 1 |
| | present | | | | Clemenules (CLE) | 9 |

*8.1 Explanations for individual characteristics*

Ad. 17: Anther: viable pollen

Ad. 19 ([239]): Anther: pollen viability

There is variability during development of the floral bud. It must be observed during the period of full flowering. From the two years of observations, the highest value should be taken, as this would indicate the highest potential for pollination.

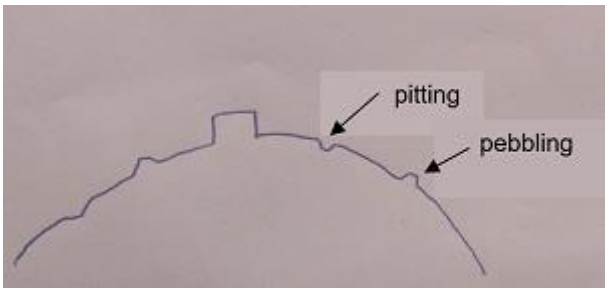
Method to determine the percentage of pollen viability:

The pollen should be collected when the petals begin to open (but with the anthers closed). The anthers should be introduced into a Petri dish and placed inside a silica gel dryer at room temperature, for 20-48 hours of darkness. When the anthers are open they should be moved to an 8 ºC chamber with a 70-80 % Relative Humidity for one hour. Afterwards, the pollen should be brushed onto a microscope slide with 2 ml of Brewbacker medium (Brewbaker and Kwack. 1963). Finally, the microscope slide should be placed in a 24 ºC chamber with a 75 % RH for 20 hours.

The percentage of pollen fertility is calculated as the average of germinated pollen grains observed with a binocular microscope in 15 visual fields from 2 different microscope slides.

Ad. 41: Fruit surface: presence of pitting and pebbling

Observations should be made on the proximal half of the fruit.




Ad. 62: Fruit: number of seeds (open pollination)

Ad. 67 ([325]): Fruit: number of seeds (open pollination)

Open pollination means natural pollination between trees of any variety.

9. Literature

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

| | | | |
|---|---|---|---|
| 1.1.1 | Botanical name | *Citrus ×aurantium* L. | [ ] |
| 1.1.2 | Common name | | |
| 1.2.1 | Botanical name | *Citrus reticulata* Blanco | [ ] |
| 1.2.2 | Common name | | |

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 variety)

(……..……..…) 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)

| |
|---|
| |

# Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

4.2 Method of propagating the variety

4.2.1 Other [ ]

(Please provide details)

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

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

| | Characteristics | Example Varieties | Note |
|---|---|---|---|
| **5.1 (18)** | **Fruit: length** | | |
| | short | Wilking (HMA) | 3 [ ] |
| | medium | Clemenules (CLE) | 5 [ ] |
| | long | Minneola (TNL) | 7 [ ] |
| **5.2 (19)** | **Fruit: diameter** | | |
| | small | Fino (CLE) | 3 [ ] |
| | medium | Clemenules (CLE) | 5 [ ] |
| | large | Ortanique (TNR) | 7 [ ] |
| **5.3 (24)** | **Fruit: presence of neck** | | |
| | absent | Clemenules (CLE) | 1 [ ] |
| | present | Minneola (TNL) | 9 [ ] |
| **5.4 (37)** | **Fruit surface: predominant color(s)** | | |
| | green | | 1 [ ] |
| | yellow green | | 2 [ ] |
| | light yellow | | 3 [ ] |
| | medium yellow | Mapo (TNL) | 4 [ ] |
| | yellow orange | Owari (SAT) | 5 [ ] |
| | medium orange | Clemenules (CLE) | 6 [ ] |
| | dark orange | Fortune (HMA) | 7 [ ] |
| | orange red | Nova (HMA) | 8 [ ] |
| | red | | 9 [ ] |

| | Characteristics | Example Varieties | Note |
|---|---|---|---|
| **5.5 (50)** | **Fruit: main color of flesh** | | |
| | whitish | | 1 [ ] |
| | light green | | 2 [ ] |
| | light yellow | | 3 [ ] |
| | medium yellow | | 4 [ ] |
| | light orange | Orlando (TNL) | 5 [ ] |
| | medium orange | Clemenules (CLE) | 6 [ ] |
| | dark orange | Murcott (HMA) | 7 [ ] |
| | red | | 8 [ ] |
| | purple | | 9 [ ] |
| **5.6 (70)** | **Time of maturity of fruit for consumption** | | |
| | early | Okitsu (SAT) | 3 [ ] |
| | medium | Clemenules (CLE) | 5 [ ] |
| | late | Murcott (HMA) | 7 [ ] |
| **5.7 (71)** | **Fruit: parthenocarpy** | | |
| | absent | Temple (HMA) | 1 [ ] |
| | present | Clemenules (CLE) | 9 [ ] |

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

6. Similar varieties and differences from these varieties

*Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.*

| Denomination(s) of variety(ies) similar to your candidate variety | Characteristic(s) in which your candidate variety differs from the similar variety(ies) | Describe the expression of the characteristic(s) for the **similar** variety(ies) | Describe the expression of the characteristic(s) for **your** candidate variety |
|---|---|---|---|
| *Example* | | | |
| | | | |
| | | | |
| | | | |

Comments:

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)"

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (http://www.upov.int/tgp/en/).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

Virus status

The plant material is virus-free [ ]
The plant material is virus tested [ ]
(indicate against which viruses: .....
..... )
The virus status is unknown [ ]

# Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

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”.

.....

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]