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GENEVA

**TECHNICAL WORKING PARTY
FOR
FRUIT CROPS****Thirty-Third Session
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DRAFT TEST GUIDELINES FOR MANDARIN

*(Citrus L. – Group 1)**prepared by the Office of the Union*

The attached document TG/MANDA(proj.1) already incorporates the standard wording of document TGP/7.2, which was adopted by the Technical Committee at its thirty-eighth session in April 2002, and includes some additional standard wording from document TGP/7.1 Draft 1, also agreed at that session.

[Document TG/MANDA(proj.1) follows]

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

CITRUS L. – Group 1

MANDARIN

- *Citrus clementina* Hort. ex Tan. (Clementine)
- *Citrus deliciosa* Ten. (Mediterranean Mandarin)
- *Citrus reticulata* Blanco (Ponkan Mandarin)
- *Citrus unshiu* Marc. (Satsuma)
- Mandarin x (Grapefruit or Pummelo) (Tangelo)
- Mandarin x Orange (Tangor)

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names: *

<i>Latin</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Citrus clementina</i> Hort. ex Tan.	Clementine	Clémentinier	Clementine	Mandarina Clementina
<i>Citrus deliciosa</i> Ten.	Mandarin	Mandarinier	Mandarine	Mandarino
<i>Citrus reticulata</i> Blanco	Tangerine	Tangerinier	Tangerinenbaum	Tangerino
<i>Citrus unshiu</i> Marc.	Satsuma	Satsuma	Satsuma	Mandarina Satsuma

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.

Other associated documents:

CITRUS L. – GROUP 2: TG/ORANG(proj.1) - (TWF/33/5)
CITRUS L. – GROUP 3: TG/LEM-LIM(proj.1) - (TWF/33/3)
CITRUS L. – GROUP 4: TG/GRA-PUM(proj.1) - (TWF/33/2)
CITRUS L. – GROUP 5: TG/PONCI(proj.1) - (TWF/33/6)

* 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 Web Site (<http://www.upov.int>), for the latest information.]

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1. Subject of these Guidelines

1.1 The following Test Guidelines have been developed from the standard Citrus Test Guidelines template. In particular, the Table of Characteristics has been selected from the overall set of citrus characteristics presented in the Annex.

1.2 These Test Guidelines apply to all vegetatively propagated varieties for fruit production and rootstock varieties of the following species of the group mandarin of the genus *Citrus* L. (Rutaceae), and its hybrids:

Group 1: MANDARIN AND ITS HYBRIDS

Citrus clementina Hort. ex Tan. (Clementine) – CLE

Citrus deliciosa Ten. (Mediterranean Mandarin) – MMN

Citrus reticulata Blanco (Ponkan Mandarin) – PMN

Citrus unshiu Marc. (Satsuma) – SAT

Mandarin x (Grapefruit or Pummelo) (Tangelo) – TNL

Mandarin x Orange (Tangor)– TNR

Other Mandarin Hybrids – HMA

1.3 In the case of hybrids between species within the genus *Citrus* L., the Test Guidelines to be used should be those for which the overall appearance of FRUIT is most suited. However, if the variety cannot be clearly distinguished from ALL varieties covered by another set of Test Guidelines this other set of Test Guidelines should also be used to examine the variety.

1.4 In the case of hybrids between species within the genus *Citrus* L., where the variety is clearly distinguishable from all other varieties covered by other Test Guidelines, it may still be necessary to use additional citrus characteristics to examine the variety. In these circumstances it is appropriate to use characteristics from the Test Guidelines covering the parent species, or to select characteristics from the overall set of citrus characteristics presented in the Annex.

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 bud sticks of 6 to 10 mm in diameter (one year old), each cut just behind a typical fruit or, if required by the competent authorities, one-year-old grafted trees. In the case of rootstock varieties, rooted cuttings or polyembryonic seeds may be required in addition.

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

10 bud sticks sufficient to establish 10 plants or,
if required by the competent authorities,
10 one-year-old grafted trees.

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 must be stated by the applicant.

2.5 The plant material must not have undergone any treatment 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 at least two independent growing cycles and must be sufficient for the trees under test to bear a satisfactory crop of fruit in at least two growing periods.

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. Where necessary for the examination of fruit varieties, a standard specified rootstock should be used for each group.

3.3.2 All observations should be made on plants of the same age not less than 3 years old. The age of the plants should be specified.

3.3.3 Information on examining particular characteristics:

3.3.3.1 The table of characteristics provides notes which indicate the recommendations for observing characteristics as follows:

- a Growth habit: The observation on the growth habit of the tree should be made immediately after harvest.
- b Young leaf: All observations on the young leaf should be made on actively growing spring flush.
- c Leaf: All observations on the leaf should be made on fully developed leaves on the middle third of the youngest spring flush branch sections not showing signs of active growth.

- d** Flower: Unless otherwise indicated, all observations on the flower bud and the flower should be made on the terminal flower bud and flower, at the time of full flowering of the variety.

All observations on the open flower should be made on the first day of opening.

- e** Flower bud: All observations on the flower bud should be made when the petal tips are just visible.

- f** Fruit: Unless otherwise indicated, all observations on the fruit should be made on the main fruiting of the year. All observations on the fruit should be made at the stage of optimum ripeness. This stage should be determined by the ratio: total soluble solids/acid content of juice. The fruit should be tested weekly and harvested as soon as this stage has been reached.

All fruits for observation should be taken from the periphery of the tree and fruit misformed as a result of clustering should not be sampled.

- g** Fruit surface and fruit rind: All observations on the fruit surface and on the fruit rind should be made at the middle, between the base and apex of the fruit.

The observation on the oiliness of the fruit rind should be made, by peeling the fruit, within 3 to 7 days after harvesting.

- h** Fruit flesh: All observations on the flesh of the fruit should be made on a cross section through the middle of the fruit.

- i** Seed: All observations on the seed should be made on the fresh seed.

3.4 *Test Design*

3.4.1 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. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions.

3.4.2 Each test should be designed to result in a total of, at least, 5 plants.

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 5 plants or 2 parts taken from each of 5 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*

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:

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) Fruit: length (characteristic 28)
- (b) Fruit: diameter (characteristic 29)
- (c) Fruit: presence of neck (characteristic 36)
- (d) Fruit surface: predominant color (characteristic 61)
- (e) Time of maturity of fruit for consumption (characteristic 108)

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. Each example variety is followed by the abbreviation of its group in brackets.

6.5 Legend

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

(*) Asterisked characteristic – see section 6.1.2

(*F) Asterisked characteristic for fruit varieties

(*R) Asterisked characteristic for rootstock varieties

c#. Corresponding number of characteristic in the citrus overall table of characteristics

[#.] Number of characteristic in document TWF/32/3

(QL) Qualitative characteristic – see section 6.3

(QN) Quantitative characteristic – see section 6.3

(PQ) Pseudo-Qualitative characteristic – see section 6.3

Notes for observing characteristics – see section 3.3.3.1:

a	Growth habit
b	Young leaf
c	Leaf
d	Flower
e	Flower bud
f	Fruit
g	Fruit surface and fruit rind
h	Fruit flesh
i	Seed

6.6 Abbreviations

- CLE: *Citrus clementina* Hort. ex Tan. (Clementine)
- MMN: *Citrus deliciosa* Ten. (Mediterranean Mandarin)
- PMN: *Citrus reticulata* Blanco (Ponkan Mandarin)
- SAT: *Citrus unshiu* Marc. (Satsuma)
- TNL: Mandarin x (Grapefruit or Pummelo) (Tangelo)
- TNR: Mandarin x Orange (Tangor)
- HMA: Other Mandarin Hybrids

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

MoE ^o	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	Ploidy					
	diploid					2
<i>[new]</i>	triploid					3
c1.	tetraploid					4
2. (*)	Tree: growth habit					
a	upright				Marisol	1
<i>[1.]</i>	spreading				Clemenules	2
c2.	drooping				Owari	3
3.	Tree: density of spines					
a	absent or sparse				Owari	1
<i>[2.]</i>	intermediate				Marisol	2
c3.	dense					3
4.	Tree: length of spines					
a	short				Marisol	3
<i>[3.]</i>	medium					5
c4.	long					7
5.	Leaf blade: length (apical leaflet in case of compound leaf)					
c	short				Común	3
<i>[6.]</i>	medium				Nova	5
c10.	long				Kara	7

o

MoE = Method of Examination

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
6.		Leaf blade: width (as for 7)					
	c	narrow				Común	3
[7.]		medium				Clemenules	5
c11.		broad				Page	7
7.		Leaf blade: ratio length/width (as for 7)					
	c	small				Orlando	3
[8.]		medium				Fino	5
c12.		large				Clemenules	7
8.		Leaf blade: shape in cross section (as for 7)					
	c	straight or weakly concave				Owari	1
[9.]		intermediate				Minneola	2
c17.		strongly concave					3
9.		Leaf blade: twisting					
	c	absent or weak					1
[10.]		intermediate					2
c19.		strong					3
10.		Leaf blade: blistering					
	c	absent or weak					1
[11.]		intermediate					2
c20.		strong					3

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
11.		Leaf blade: intensity of green color					
	<input checked="" type="checkbox"/>	light				Nova	3
[12.]		medium				Owari	5
c21.		dark				Oroval	7
12.		Leaf blade: undulation of margin					
	<input checked="" type="checkbox"/>	absent or weak					1
[15.]		intermediate					2
c23.		strong					3
13.		Leaf blade: incisions of margin					
	<input checked="" type="checkbox"/>	entire					1
[16.]		crenate					2
c24.		dentate					3
14.		Leaf blade: shape of apex					
(+)	<input checked="" type="checkbox"/>	acuminate					1
		acute				Clemenules	2
[17.]		obtuse				Minneola	3
c25.		rounded					4
15.		Leaf blade: emargination at tip					
(+)	<input checked="" type="checkbox"/>	absent					1
[18.]		present					9

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
16.		Petiole: length					
	d	short				Clemenules	3
[19.]		medium				Fortune	5
c27.		long				Minneola	7
17.		Petiole: presence of wings					
[20.]	d	absent				Clemenules	1
c28.		present				Owari	9
18.		Petiole: width of wings					
	d	narrow				Owari	3
[21.]		medium					5
c29.		broad					7
19.		Flower: diameter of calyx					
	d	small					3
[24.]		medium					5
c32.		large					7
20.		Flower: length of petal					
	d	short				Fino	3
[25.]		medium				Ellendale	5
c33.		long				Owari	7
21.		Flower: width of petal					
	d	narrow				Clemenules	3
[26.]		medium				Ellendale	5
c34.		broad				Owari	7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
22.		Flower: ratio length/width of petal					
	<input type="checkbox"/>	small				Wiling	3
[27.]		medium				Fino	5
c35.		large				Page	7
23.		Flower: length of stamens					
	<input type="checkbox"/>	short				Encore	3
[28.]		medium				Owari	5
c36.		long				Page	7
24.		Anther: color					
	<input type="checkbox"/>	white					1
[29.]		light yellow				Owari	2
c39.		medium yellow				Fino	3
25.		Anther: viable pollen					
[30.]	<input type="checkbox"/>	absent				Owari	1
c40.		present					9
26.		Style: length					
	<input type="checkbox"/>	short				Pixie	3
[31.]		medium				Fino	5
c41.		long				Owari	7
27.		Infructescence: clustering of fruits					
[32.]		absent					1
c44.		present					9

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
28. (*)	Fruit: length					
	f short				Wilking	3
[33.]	medium				Clemenules	5
c45.	long				Minneola	7
29. (*)	Fruit: diameter					
	f small				Fino	3
[34.]	medium				Clemenules	5
c46.	large				Ortanique	7
30. (*)	Fruit: ratio length/diameter					
	f small				Encore	3
[35.]	medium				Clemenules	5
c47.	large				Minneola	7
31. (*)	Fruit: position of broadest part					
	f towards stalk end					1
[36.]	at middle				Clemenules	2
c48.	towards distal end					3
32. (+)	Fruit: circumference in transversal section					
	f round				Ortanique	1
[37.]	somewhat angular					2
c49.	scalloped					3

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33. (*) (+)	Fruit: general shape of proximal part (excluding neck, collar and depression at stalk end)					
f	flattened				Clemenules	1
	slightly rounded				Ortanique	2
[38.]	strongly rounded					3
c50.	tapered					4
34. (*) (+)	Fruit: presence of depression at stalk end (excluding necked varieties)					
[39.]	f absent				Ortanique	1
c51.	present				Marisol	9
35.	Fruit: depth of depression at stalk end (excluding necked varieties)					
	f shallow					3
[40.]	medium					5
c52.	deep					7
36. (*) (+)	Fruit: presence of neck					
[41.]	f absent				Clemenules	1
c53.	present					9
37.	Fruit: length of neck					
	f short					3
[42.]	medium					5
c54.	long					7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
38.		Fruit: thickness of neck					
	<input type="checkbox"/>	thin					3
[43.]		medium					5
c55.		thick					7
39.		Fruit: presence of constriction at stalk end					
(+)							
[44.]	<input type="checkbox"/>	absent				Clemenules	1
c56.		present					9
40.		Fruit: expression of constriction at stalk end					
	<input type="checkbox"/>	weak					3
[45.]		medium					5
c57.		strong					7
41.		Fruit: number of radial grooves at stalk end					
	<input type="checkbox"/>	absent or few				Nova	1
[46.]		intermediate				Clemenules	2
c58.		many					3
42.		Fruit: length of radial grooves at stalk end					
	<input type="checkbox"/>	short					3
[47.]		medium					5
c59.		long					7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
43.		Fruit: local depression at stalk attachment (necked varieties only)					
	<input type="checkbox"/>	absent or shallow					1
[48.]		intermediate					2
c60.		deep					3
44.		Fruit: presence of collar					
(+)							
[49.]	<input type="checkbox"/>	absent				Clemenules	1
c61.		present					9
45.		Fruit: height of collar					
(+)							
	<input type="checkbox"/>	low					1
[50.]		medium					
c62.		high					9
46.		Fruit: diameter of collar					
	<input type="checkbox"/>	small					1
[51.]		medium					2
c63.		large					3
47.		Fruit: abscission layer between floral disc and fruit					
	<input type="checkbox"/>	absent or weakly developed					1
[52.]		intermediate					2
c64.		strongly developed					3

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
48. (* (+)	Fruit: general shape of distal part (excluding nipple, bulging of navel and depression at distal end)					
	f flattened				Clemenules	1
[53.]	slightly rounded					2
c65.	strongly rounded					3
49. (* (+)	Fruit: presence of depression at distal end					
[54.]	f absent				Ortanique	1
c66.	present				Arrufatina	9
50.	Fruit: depth of depression at distal end					
	f shallow					3
[55.]	medium					5
c67.	deep					7
51.	Fruit: diameter of depression at distal end					
	f small					3
[56.]	medium					5
c68.	large					7
52. (*	Fruit: presence of areola					
	f absent				Nova	1
[59.]	incomplete					2
c71.	complete				Ortanique	3

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
53.		Fruit: type of areola					
(+)							
	f	smooth					1
[60.]		grooved					2
c72.		ridged					3
54.		Fruit: diameter of areola					
	f	small				Arrufatina	3
[63.]		medium				Owari	5
c73.		large				Ortanique	7
55.		Fruit: diameter of stylar scar					
	f	small				Clemenules	3
[64.]		medium				Owari	5
c74.		large					7
56.		Fruit: persistence of style					
	f	none					1
[66.]		partial					2
c76.		total					3
57.		Fruit: presence of navel opening					
	f	absent				Clemenules	1
[67.]		occasionally present				Fortune	2
c77.		always present					3

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
58.	Fruit: diameter of navel opening					
f	small				Ellendale	1
[68.]	medium				Fortune	2
c78.	large					3
59.	Fruit: presence of radial grooves at distal end					
[70.]	f absent					1
c80.	present					9
60.	Fruit: expression of radial grooves at distal end					
f	weak					3
[71.]	medium					5
c81.	strong					7
61. (*)	Fruit surface: predominant color					
f	green					1
g	yellow green					2
	light yellow					3
	medium yellow				Mapo	4
	yellow orange					5
	medium orange				Clemenules	6
	dark orange					7
[72.]	orange red				Nova	8
c83.	red					9

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
62. (*)	Fruit surface: glossiness					
	f	absent or very weak			Clemenules	1
	g	weak				3
		medium			Afourer	5
[75.]		strong				7
c86.		very strong				9
63.	Fruit surface: roughness					
	f	smooth			Murcott	3
[76.]	g	medium			Clemenules	5
c87.		rough			Temple	7
64.	Fruit surface: size of oil glands					
[77.]	f	all more or less the same size				1
c88.	g	larger ones interspersed by smaller ones				2
65.	Fruit surface: size of larger oil glands					
	f	small				3
[78.]	g	medium				5
c89.		large				7
66.	Fruit surface: conspicuousness of larger oil glands					
	f	weak			Clemenules	3
[79.]	g	medium				5
c90.		strong			Owari	7

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
67.	Fruit surface: presence of pitting and pebbling on oil glands					
	f pitting and pebbling absent					1
	g pitting absent, pebbling present					2
[80.]	pitting present, pebbling absent					3
c91.	pitting and pebbling present					4
68.	Fruit surface: density of pitting on oil glands					
	f sparse					3
[81.]	g medium					5
c92.	dense					7
69.	Fruit surface: density of pebbling on oil glands					
	f sparse					3
[83.]	g medium					5
c94.	dense					7
70.	Fruit surface: degree of pebbling on oil glands					
	f weak					3
[84.]	g medium					5
c95.	strong					7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
71.		Fruit rind: thickness					
(*)							
	f	thin				Murcott	3
[85.]	g	medium				Clemenules	5
c96.		thick				Minneola	7
72.		Fruit rind: adherence to flesh					
(*)							
	f	weak				Clemenules	3
[86.]	g	medium				Fortune	5
c97.		strong				Ortanique	7
73.		Fruit rind: strength					
	f	weak					3
[87.]	g	medium					5
c98.		strong					7
74.		Fruit rind: oiliness					
	f	dry					3
[88.]	g	medium				Clemenules	5
c99.		oily				Ortanique	7
75.		Fruit rind: conspicuousness of oil glands on inner surface					
	f	absent or weakly conspicuous					1
[89.]	g	intermediate				Clemenules	2
c100.		strongly conspicuous					3

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
76.		Fruit: color of albedo					
	f	greenish					1
		white				Clemenules	2
		light yellow				Murcott	3
		light orange				Afourer	4
[90.]		pink					5
c101.		reddish					6
77.		Fruit: density of albedo					
	f	loose				Clemenules	1
[91.]	h	medium				Fortune	2
c102.		dense				Ortanique	3
78. (*)		Fruit: amount of albedo adhering to flesh (strands excluded)					
	f	absent or very small				Clemenules	1
	h	small					3
		medium					5
[92.]		large					7
c103.		very large					9
79.		Fruit: presence of albedo strands					
[93.]	f	absent					1
c104.	h	present				Clemenules	9

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
80.		Fruit: amount of albedo strands					
	f	small					1
[94.]	h	medium					2
c105.		large					3
81. (*)		Fruit: main color of flesh					
	f	whitish					1
	h	light green					2
		light yellow					3
		medium yellow					4
		light orange					5
		medium orange				Clemenules	6
		dark orange					7
[97.]		red					8
c108.		purple					9
82.		Fruit: filling of core					
	f	absent or very sparse				Fortune	1
		sparse					3
		medium				Clemenules	5
[98.]		dense				Murcott	7
c110.		very dense					9
83.		Fruit: diameter of core					
	f	small				Murcott	3
[99.]		medium				Clemenules	5
c111.		large				Hernandina	7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
84.		Fruit: rudimentary segments					
	f	absent or weak				Clemenules	1
<i>[100.]</i>		intermediate					2
c112.		strong					3
85.		Fruit: number of well developed segments					
	f	few				Oroval	3
<i>[101.]</i>		medium				Ortanique	5
c113.		many				Temple	7
86.		Fruit: coherence of adjacent segment walls					
	f	weak				Clemenules	3
<i>[102.]</i>		medium				Fortune	5
c114.		strong					7
87.		Fruit: strength of segment walls					
	f	weak				Mapo	3
<i>[103.]</i>		medium				Fino	5
c115.		strong				Oronules	7
88.		Fruit: length of juice vesicles					
	f	short				Wilking	3
<i>[104.]</i>		medium					5
c116.		long				Clemenules	7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
89.		Fruit: thickness of juice vesicles					
	f	thin				Clemenules	3
<i>[105.]</i>		medium					5
c117.		thick				Mapo	7
90.		Fruit: conspicuousness of juice vesicle walls					
	f	low					3
<i>[106.]</i>		medium					5
c118.		high					7
91.		Fruit: coherence of juice vesicles					
	f	weak					3
<i>[107.]</i>		medium					5
c119.		strong					7
92. (*).		Fruit: presence of navel viewed <u>internally</u>					
	f	absent or very rare					1
<i>[108.]</i>		occasionally present					2
c120.		always present					3
93.		Fruit: size of navel (viewed internally)					
	f	small					3
<i>[109.]</i>		medium					5
c121.		large					7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
94.		Fruit: juice content					
	f	low					3
<i>[110.]</i>		medium				Campeona	5
c122.		high				Marisol	7
95.		Fruit juice: total soluble solids					
(*)	f	low				Okitsu	3
<i>[111.]</i>		medium				Temple	5
c123.		high				Honey	7
96.		Fruit juice: acidity					
	f	low				Hernandina	3
<i>[112.]</i>		medium				Clemenules	5
c124.		high				Fortune	7
97.		Fruit: strength of fibre					
	f	weak					3
<i>[113.]</i>		medium					5
c125.		strong					7
98.		Fruit: number of seeds (controlled self pollination)					
	f	absent or very few				Clemenules	1
		few					3
		medium				Kara	5
<i>[114.]</i>		many					7
c126.		very many				Común	9

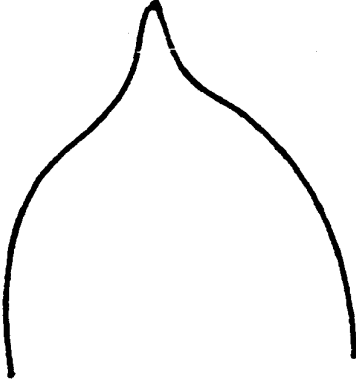
	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
99.		Fruit: number of seeds (open pollination)					
(+)	f	absent or very few					1
		few					2
<i>[new]</i>		moderate					3
c127.		many					4
100.		Seed: polyembryony					
(*)							
<i>[115.]</i>	i	absent				Wilking	1
c128.		present				Común	9
101.		Seed: length					
	i	short				Temple	3
<i>[116.]</i>		medium					5
c129.		long				Campeona	7
102.		Seed: width					
	i	narrow				Temple	3
<i>[117.]</i>		medium					5
c130.		broad				Campeona	7
103.		Seed: surface					
<i>[118.]</i>	i	smooth				Kinnow	1
c131.		wrinkled				Wilking	2
104.		Seed: prominence of wrinkles					
	i	weak					3
<i>[119.]</i>		medium					5
c132.		strong					7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
105.		Seed: external color					
	i	greenish				Kara	1
		whitish					2
		yellowish					3
<i>[120.]</i>		pinkish					4
c133.		brownish					5
106.		Seed: color of inner seed coat					
	i	white					1
		light yellow					2
		light brown				Murcott	3
		medium brown					4
		dark brown					5
<i>[121.]</i>		red					6
c134.		purple					7
107.		Seed: color of cotyledons					
	i	white				Murcott	1
		cream				Kara	2
<i>[122.]</i>		light green				Común	3
c135.		dark green					4
108.		Time of maturity of fruit for consumption					
(*)		early				Okitsu	3
<i>[125.]</i>		medium				Clemenules	5
c137.		late				Murcott	7

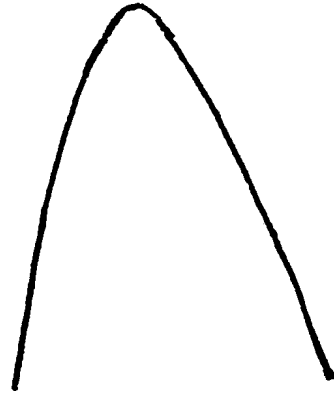
	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
109.		Fruit:					
(*)		parthenocarpy					
<i>[126.]</i>		absent				Temple	1
c138.		present				Clemenules	9
110.		Plant: self-					
(+)		incompatibility					
<i>[127.]</i>		absent				Ellendale	1
c139.		present				Clemenules	9

8. Explanations on the Table of Characteristics

Ad. 14 (c25.): Leaf blade: shape of apex



1
acuminate



2
acute

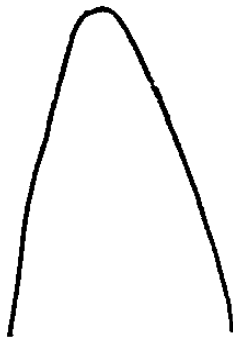


3
obtuse

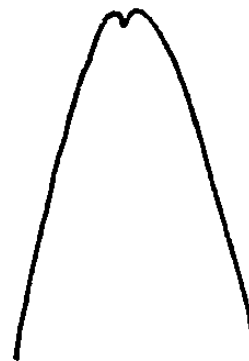


4
rounded

Ad. 15 (c26.): Leaf blade: emargination at tip

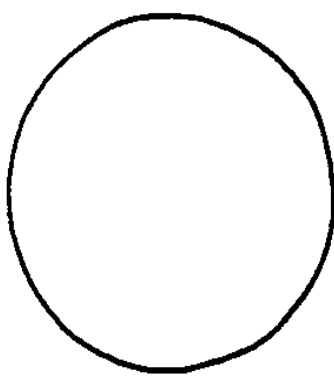


1
absent

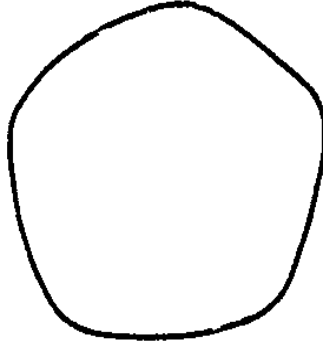


9
present

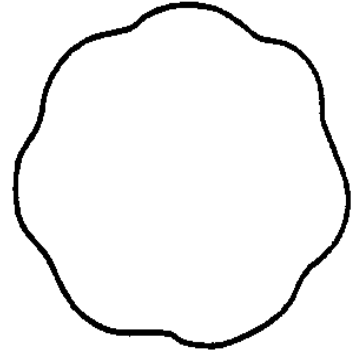
Ad. 32 (c49.): Fruit: circumference in transversal section



1
round

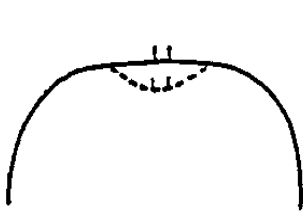


2
somewhat angular



3
scalloped

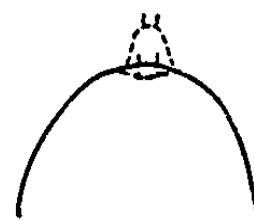
Ad. 33 (c50.): Fruit: general shape of proximal part (excluding neck, collar and depression at stalk end)



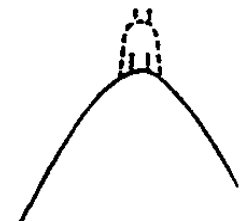
1
flattened



2
slightly rounded

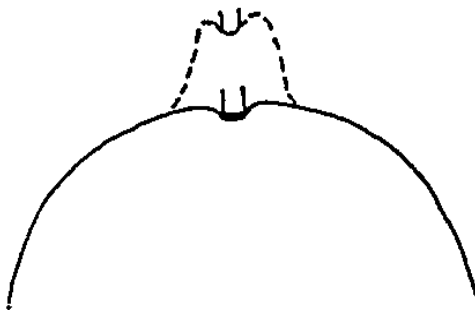


3
strongly rounded

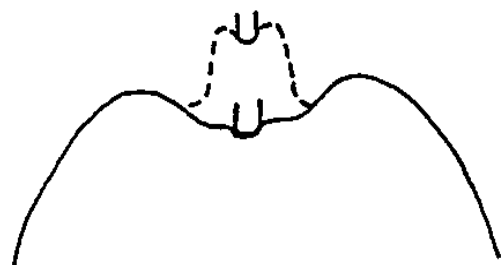


4
tapered

Ad. 34 (c51.): Fruit: presence of depression at stalk end (excluding necked varieties)

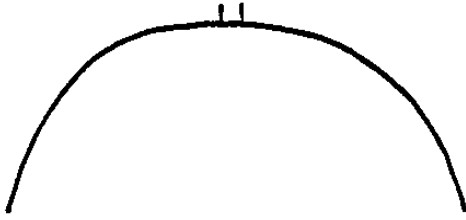


1
absent

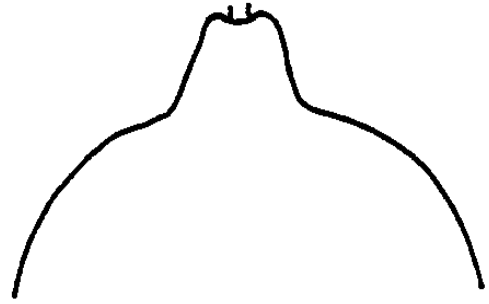


9
present

Ad. 36 (c53.): Fruit: presence of neck

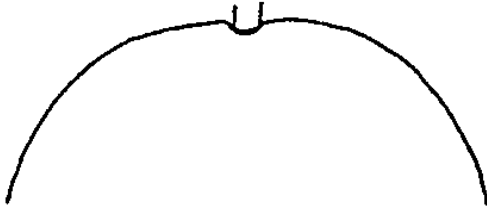


1
absent



9
present

Ad. 39 (c56.): Fruit: presence of constriction at stalk end



1
absent



9
present

Ad. 44 (c61.): Fruit: presence of collar

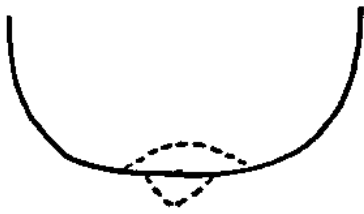


1
absent



9
present

Ad. 48 (c65.): Fruit: general shape of distal part (excluding nipple, bulging of navel and depression at distal end)



1
flattened



2
slightly rounded



3
strongly rounded

Ad. 49 (c66.): Fruit: presence of depression at distal end



1
absent



9
present

Ad. 53 (c72.): Fruit: type of areola



1
smooth



2
grooved



3
ridged

Ad. 99 (c127.): Fruit: number of seeds (open pollination)

Ad. 110 (c139.): Plant: self-incompatibility

LIST OF EXAMPLE VARIETIES FOR MANDARIN

Variety denomination	Group or species	Observations	Synonyms
AFOURER	TNR		MURCOTT AFOURER
ARRUFATINA	CLE		
CAMPEONA	HMA	Citrus nobilis	
CLEMENULES	CLE		CLEMENTINA DE NULES
COMUN	MMN		WILOWLEAF, AVANA, MEDITERRANEA
ELLENDALE	TNR		
ENCORE	HMA	Citrus nobilis x Citrus deliciosa	
FINO	CLE		CLEMENTINA FINA
FORTUNE	HMA	Citrus clementina x Citrus tangerina	
HERNANDINA	CLE		
HONEY	HMA	Citrus nobilis x Citrus deliciosa	
KARA	HMA	Citrus unshiu x Citrus nobilis	
KINOW	HMA	Citrus nobilis x Citrus deliciosa	
MAPO	TNL		
MARISOL	CLE		
MINNEOLA	TNL	Citrus paradisi x Citrus tangerina. Grapefruit DUNCAN x Mandarin DANCY	HONEYBELL
MURCOTT	TNR		
NOVA	HMA	Citrus clementina x Tangelo ORLANDO	CLEMENVILLA
OKITSU	SAT		
ORLANDO	TNL	Citrus paradisi x Citrus tangerina. Grapefruit DUNCAN x Mandarin DANCY	LAKE TANGELO
OROVAL	CLE		
ORTANIQUE	TNR		
OWARY	SAT		
PAGE	HMA	Tangelo MINNEOLA x Citrus clementina	
PIXIE	HMA	Citrus nobilis x Citrus tangerina	
TEMPLE	HMA	Citrus temple Ort ex Y Tan.	
WILKING	HMA	Citrus nobilis x Citrus deliciosa	

9. Literature

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10. 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 Latin Name	<table border="1"> <tr><td><i>Citrus clementina</i> Hort. ex Tan. – CLE</td><td>[]</td></tr> <tr><td><i>Citrus deliciosa</i> Ten. – MMN</td><td>[]</td></tr> <tr><td><i>Citrus reticulata</i> Blanco – PMN</td><td>[]</td></tr> <tr><td><i>Citrus unshiu</i> Marc. – SAT</td><td>[]</td></tr> <tr><td>Mandarin x (Grapefruit or Pummelo) – TNL</td><td>[]</td></tr> <tr><td>Mandarin x Orange – TNR</td><td>[]</td></tr> <tr><td>Other Hybrid – HMA:</td><td>[]</td></tr> </table>		<i>Citrus clementina</i> Hort. ex Tan. – CLE	[]	<i>Citrus deliciosa</i> Ten. – MMN	[]	<i>Citrus reticulata</i> Blanco – PMN	[]	<i>Citrus unshiu</i> Marc. – SAT	[]	Mandarin x (Grapefruit or Pummelo) – TNL	[]	Mandarin x Orange – TNR	[]	Other Hybrid – HMA:	[]
<i>Citrus clementina</i> Hort. ex Tan. – CLE	[]															
<i>Citrus deliciosa</i> Ten. – MMN	[]															
<i>Citrus reticulata</i> Blanco – PMN	[]															
<i>Citrus unshiu</i> Marc. – SAT	[]															
Mandarin x (Grapefruit or Pummelo) – TNL	[]															
Mandarin x Orange – TNR	[]															
Other Hybrid – HMA:	[]															
1.2 Common Name	<table border="1"> <tr><td>Clementine – CLE</td><td>[]</td></tr> <tr><td>Mediterranean Mandarin – MMN</td><td>[]</td></tr> <tr><td>Ponkan Mandarin – PMN</td><td>[]</td></tr> <tr><td>Satsuma – SAT</td><td>[]</td></tr> <tr><td>Tangelo – TNL</td><td>[]</td></tr> <tr><td>Tangor – TNR</td><td>[]</td></tr> <tr><td>Other Hybrid – HMA:</td><td>[]</td></tr> </table>		Clementine – CLE	[]	Mediterranean Mandarin – MMN	[]	Ponkan Mandarin – PMN	[]	Satsuma – SAT	[]	Tangelo – TNL	[]	Tangor – TNR	[]	Other Hybrid – HMA:	[]
Clementine – CLE	[]															
Mediterranean Mandarin – MMN	[]															
Ponkan Mandarin – PMN	[]															
Satsuma – SAT	[]															
Tangelo – TNL	[]															
Tangor – TNR	[]															
Other Hybrid – HMA:	[]															
2. Applicant																
Name	<input type="text"/>															
Address	<input type="text"/>															
Telephone No.	<input type="text"/>															
Fax No.	<input type="text"/>															
E-mail address	<input type="text"/>															
Breeder (if different from applicant)	<input type="text"/>															

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

3. Proposed denomination and breeder's reference

Proposed denomination
(if available)

Breeder's reference

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

4.1 Breeding Scheme

4.1.1 Variety resulting from:

- (a) controlled cross []
(please state parent varieties)
- (b) partially unknown 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)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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 Fruit: length (28)		
short	Wilking	3[]
medium	Clemenules	5[]
long	Minneola	7[]
5.2 Fruit: diameter (29)		
small	Fino	3[]
medium	Clemenules	5[]
large	Ortanique	7[]
5.3 Fruit: presence of neck (36)		
absent	Clemenules	1[]
present		9[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
5.4 Fruit surface: predominant color (61)		
green		1[]
yellow green		2[]
light yellow		3[]
medium yellow	Mapo	4[]
yellow orange		5[]
medium orange	Clemenules	6[]
dark orange		7[]
orange red		8[]
red		9[]
5.5 Fruit: main color of flesh (81)		
whitish		1[]
light green		2[]
light yellow		3[]
medium yellow		4[]
light orange		5[]
medium orange	Clemenules	6[]
dark orange		7[]
red		8[]
purple		9[]
5.6 Time of maturity of fruit for consumption (108)		
early	Okitsu	3[]
medium	Clemenules	5[]
late	Murcott	7[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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**5.7 Fruit: parthenocarpy
(109)**

absent	Temple	1[]
present	Clemenules	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
<i>(Example)</i>	<i>Plant: height</i>	<i>e.g. note 3</i>	<i>note 7</i>
		<i>e.g. short</i>	<i>tall</i>
		<i>e.g. 90 cm</i>	<i>130 cm</i>

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

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

Applicant's name

Signature

[Annex follows; see document TWF/33/4 Add.]