



EUROPEAN UNION

COMMUNITY PLANT VARIETY OFFICE

PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

***Citrus L.* – Group 1**

MANDARINS

UPOV Species Code: CITRU, CITRU_RET, CITRU_UN

Adopted on 18/11/2004

I SUBJECT OF THE PROTOCOL

The protocol describes the technical procedures to be followed in order to meet the Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on general UPOV Document TG/1/3 and UPOV guideline TG/201/1 dated 09/04/2003 for the conduct of tests for Distinctness, Uniformity and Stability. This protocol applies for all varieties of the following group of the genus *Citrus* L. (*Rutaceae*), and their hybrids: MANDARINS. See below for the list of species and their subgroups:

GROUP 1 – ALTERNATIVE NAMES AND CORRESPONDING SUBGROUPS*

<i>Botanical taxon</i>	<i>Subgroup</i>	<i>Common name</i>
<i>Citrus amblycarpa</i> (Hassk.) Ochse	HMA	
<i>Citrus benikoji</i> hort. ex Tanaka	PMN	
<i>Citrus chuana</i> hort. ex Tseng	PMN	
<i>Citrus clementina</i> hort. ex Tan.	CLE	Clementine
<i>Citrus crenatifolia</i> Lush.	PMN	
<i>Citrus deliciosa</i> Ten.	MMM	Mediterranean Mandarin
<i>Citrus depressa</i> Hayata	HMA	
<i>Citrus genshokan</i> (Hayata) hort. ex Tanaka	PMN	
<i>Citrus hainanensis</i> Tanaka	HMA	
<i>Citrus haniana</i> hort. ex Tseng	PMN	
<i>Citrus ichangensis</i> Swing. x <i>C. reticulata</i> Blanco	HMR	Ichandarin
<i>Citrus ichangensis</i> Swing. x <i>C. unshiu</i> (Mak.) Marc.	HMR	Ichandarin
<i>Citrus inflata</i> hort. ex Tanaka	HMA	
<i>Citrus inflatorugosa</i> hort. ex Tanaka	HMA	
<i>Citrus keraji</i> hort. ex Tanaka	HMA	
<i>Citrus leiocarpa</i> hort. ex Tanaka	HMA	
<i>Citrus lycopersicaeformis</i> (Lush.) hort. ex Tanaka	HMA	
<i>Citrus madurensis</i> Lour.	HMA	Calamondin
<i>Citrus maxima</i> (Burm.) Merr. x <i>C. ichangensis</i> Swing.	HMR	Ichangelo
<i>Citrus nippokoreana</i> Tanaka	HMA	
<i>Citrus nobilis</i> Lour.	HMA	
<i>Citrus oto</i> hort. ex Yu. Tanaka	HMA	

* 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 (www.upov.int), for the latest information.]

<i>Botanical taxon</i>	<i>Subgroup</i>	<i>Common name</i>
<i>Citrus paratangerina</i> hort. ex Tanaka	PMN	
<i>Citrus platymamma</i> hort. ex Tanaka	PMN	
<i>Citrus pseudo-aurantium</i> hort. ex Yu. Tanaka	HMA	
<i>Citrus pseudosunki</i> hort. ex Tanaka	HMA	
<i>Citrus reshni</i> hort. ex Tanaka	HMA	
<i>Citrus reticulata</i> Blanco	PMN	Tangerine
<i>Citrus reticulata</i> Blanco x <i>C. paradisi</i> Macfad	TNL	Tangelo
<i>Citrus reticulata</i> Blanco x <i>C. sinensis</i> (L.) Osb.	TNR	Tangor
<i>Citrus reticulata</i> Blanco x <i>Fortunella</i> sp.	HMR	Kumandarin
<i>Citrus suavissima</i> hort. ex Tanaka	PMN	
<i>Citrus succosa</i> hort. ex Tanaka	PMN	
<i>Citrus suhuiensis</i> hort. ex Tanaka	PMN	
<i>Citrus sunki</i> (Hayata) hort. ex Tanaka	HMA	
<i>Citrus tangerina</i> hort. ex Tanaka	PMN	
<i>Citrus tardiferax</i> hort. ex Tanaka	PMN	
<i>Citrus tardiva</i> hort. ex Shirai	HMA	
<i>Citrus tarogayo</i> hort. ex Yu. Tanaka	HMA	
<i>Citrus temple</i> hort. ex Y. Tan. x <i>C. paradisi</i> Macfad	HMA	Siamelo
<i>Citrus temple</i> hort. ex Yu. Tanaka	TNR	
<i>Citrus tumida</i> hort. ex Tanaka	HMA	
<i>Citrus unshiu</i> Marcow.	SAT	Satsuma
<i>Citrus yatsushiro</i> hort. ex Tanaka	HMA	
<i>Citrus yuko</i> hort. ex Tanaka	HMA	
Tangelo x <i>C. paradisi</i> Macfad	HMA	Tangelolo
Tangor x <i>C. temple</i> hort. ex Y. Tan.	HMA	Tangorgelo

II SUBMISSION OF SEED AND OTHER PLANT MATERIAL

1. The Community Plant Variety Office (CPVO) is responsible for informing the applicant of
 - the closing date for the receipt of plant material;
 - the minimum amount and quality of plant material required;
 - the examination office to which material is to be sent.

A sub-sample of the material submitted for test will be held in the variety collection as the definitive sample of the candidate variety.

The applicant is responsible for ensuring compliance with any customs and plant health requirements.

2. Final dates for receipt of documentation and material by the Examination Office

The final dates for receipt of requests, technical questionnaires and the final date or submission period for plant material will be decided by the CPVO and each Examination Office chosen.

The Examination Office is responsible for immediately acknowledging the receipt of requests for testing, and technical questionnaires. Immediately after the closing date for the receipt of plant material the Examination Office should inform the CPVO whether acceptable plant material has been received or not. However if unsatisfactory plant material is submitted the CPVO should be informed as soon as possible.

3. Plant material requirements

The final dates for request for technical examination and sending of Technical Questionnaire by the CPVO as well as submission date of plant material, quantity and quality by the applicant can be found in the S2 supplement of the CPVO Official Gazette and the CPVO website (www.cpvo.europa.eu).

Quality of plants: As regards health status, should not be less than the standards laid down in Council Directive 77/93/EEC, 92/34/EEC and 2000/29/EC. The plant material must be free from:

Insects, mites and nematodes at all stages of their development

- *Aleurothixus gloccosus* (Mashell)
- *Meloidogyne* spp.
- *Parabemisia myricae* (Kuwana)
- *Tylenchulus semipenetrans*

Fungi

- *Phytophthora* spp.

Viruses and virus-like organisms, and in particular

- Citrus leaf rugose
- Diseases that induce psorosis-like young leaves symptoms such as: psorosis, ring spot, cristacortis, impietratura, concave gum
- Infections variegation
- Viroids such as exocortis, cachexiaxyloporosis

Chemical treatment: The plant material must not have undergone any treatment unless the CPVO and the examination office allow or request such treatment. If it has been treated, full details of the treatment must be given.

- Labelling of individual plants in sample:
- Species
 - File number of the application allocated by the CPVO
 - Breeder's reference
 - Examination office's reference (if known)
 - Name of applicant
 - The phrase "On request of the CPVO"

III CONDUCT OF TESTS

1. Variety collection

A variety collection will be maintained for the purpose of establishing distinctness of the candidate varieties in test. A variety collection may contain both living material and descriptive information. A variety will be included in a variety collection only if plant material is available to make a technical examination.

Pursuant to Article 7 of Council Regulation No. 2100/94, the basis for a collection should be the following:

- varieties listed or protected at the EU level or at least in one of the EEA Member States;
- varieties protected in other UPOV Member States;
- any other variety in common knowledge.

The composition of the variety collection in each Examination Office depends on the environmental conditions in which the Examination Office is located.

Variety collections will be held under conditions which ensure the long term maintenance of each accession. It is the responsibility of Examination Offices to replace reference material which has deteriorated or become depleted. Replacement material can only be introduced if appropriate tests confirm conformity with the existing reference material. If any difficulties arise for the replacement of reference material, Examination Offices must inform the CPVO. If authentic plant material of a variety cannot be supplied to an Examination Office the variety will be removed from the variety collection.

2. Material to be examined

Candidate varieties will be directly compared with other candidates for Community plant variety rights tested at the same Examination Office, and with appropriate varieties in the variety collection. When necessary an Examination Office may also include other candidates and varieties. Examination Offices should therefore make efforts to co-ordinate the work with other Offices involved in DUS testing of mandarins. There should be at least an exchange of technical questionnaires for each candidate variety, and during the test period, Examination Offices should notify each other and the CPVO of candidate varieties which are likely to present problems in establishing distinctness. In order to solve particular problems Examination Offices may exchange plant material.

3. Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in the Annex 1. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted. In the latter case, the CPVO should be informed. In addition the existence of some other regulation e.g. plant health, may make the observation of the characteristic impossible.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N° 1239/95, to insert additional characteristics and their expression in respect of a variety.

4. Grouping of varieties

The varieties and candidates to be compared will be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety and which in their various states of expression are fairly evenly distributed throughout the collection. In the case of continuous grouping characteristics overlapping states of expression between adjacent groups is required to reduce the risks of incorrect allocation of candidates to groups. The characters used for grouping could be the following:

- a) Fruit : length (characteristic 20)
- b) Fruit : diameter (characteristic 21)
- c) Fruit: presence of neck (characteristic 26)
- d) Fruit surface: predominant colour(s) (characteristic 39)
- e) Time of maturity of fruit for consumption (characteristic 75)
- f) Parthenocarpy (characteristic 76)
- g) Self incompatibility (characteristic 77)

5. Trial designs and growing conditions

The minimum duration of tests (independent growing cycles) will normally include at least two satisfactory crops of fruit. Tests will be carried out under conditions ensuring normal growth. The size of the plots will be such that plants or parts of plants may be removed for measuring and counting without prejudice to the observations which must be made up to the end of the growing period.

The test design is as follows

Each test should include 5 plants.

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.

Leaf: 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.

Flower: Unless otherwise indicated, 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.

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

Fruit: Observations on the fruit should be made at the stage of optimum ripeness. The fruit should be tested weekly and harvested as soon as this stage has been reached.

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

Fruit surface and fruit rind: 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 three to seven days after harvesting.

Fruit flesh: Observations on the flesh of the fruit should be made on a cross section through the middle of the fruit.

Seed: Observations on the seed should be made on the fresh seed.

6. Special tests

In accordance with Article 83(3) of Council Regulation No. 2100/94 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

Special tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characters listed in the protocol.

7. Standards for decisions

a) **Distinctness**

A candidate variety will be considered to be distinct if it meets the requirements of Article 7 of Council Regulation No. 2100/94.

b) **Uniformity**

A candidate will be considered to be sufficiently uniform if the number of off-types does not exceed the number of plants as indicated in the table below. A population standard of 1% and an acceptance probability of 95% should be applied.

Table of maximum numbers of off-types allowed for uniformity standards.

Number of plants	off-types allowed
≤ 5	0

c) **Stability**

A candidate will be considered to be sufficiently stable when there is no evidence to indicate that it lacks uniformity.

IV REPORTING OF RESULTS

After each recording season the results will be summarised and reported to the CPVO in the form of a UPOV model interim report in which any problems will be indicated under the headings distinctness, uniformity and stability. Candidates may meet the DUS standards after two fruiting periods but in some cases three fruiting periods may be required. When tests are completed the results will be sent by the Examination Office to the CPVO in the form of a UPOV model final report.

If it is considered that the candidate complies with the DUS standards, the final report will be accompanied by a variety description in the format recommended by UPOV. If not the reasons for failure and a summary of the test results will be included with the final report.

The CPVO must receive interim reports and final reports by the date agreed between the CPVO and the examination office.

Interim reports and final examination reports shall be signed by the responsible member of the staff of the Examination Office and shall expressly acknowledge the exclusive rights of disposal of CPVO.

V LIAISON WITH THE APPLICANT

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

The interim report as well as the final report shall be sent by the Examination Office to the CPVO.

ANNEXES TO FOLLOW

ANNEX I	<u>PAGE</u>
Table of characteristics	11
Explanations and methods	22
<u>Legend:</u>	
(+) See explanations on the Table of characteristics	
QL Qualitative characteristic	
QN Quantitative characteristic	
PQ Pseudo-qualitative characteristic	
Literature	27

ANNEX II

Technical Questionnaire

ANNEX I

TABLE OF CHARACTERISTICS TO BE USED IN DUS-TEST AND PREPARATION OF DESCRIPTIONS

CPVO N°	UPOV N°	Characteristics	Examples	Note	
1. QL	1.	Ploidy	diploid	Clemenules (CLE)	2
			triploid	Winola (HMA)	3
			tetraploid		4
2. (+) PQ	2.	Tree: growth habit	upright	Marisol (CLE)	1
			spreading	Clemenules (CLE)	2
			drooping	Owari (SAT)	3
3. QN	3.	Tree: density of spines	absent	Owari (SAT)	1
			sparse	Okitsu (SAT)	2
			intermediate	Marisol (CLE)	3
			dense		4
4. QN	4.	Tree: length of spines	short	Marisol (CLE)	3
			medium		5
			long		7
5. QN	5.	Leaf blade: length (apical leaflet in case of compound leaf)	short	Común (MMN)	3
			medium	Nova (HMA)	5
			long	Kara (HMA)	7
6. QN	6.	Leaf blade: width (apical leaflet in case of compound leaf)	narrow	Común (MMN)	3
			medium	Clemenules (CLE)	5
			broad	Page (HMA)	7
7. QN	7.	Leaf blade: ratio length/width (apical leaflet in case of compound leaf)	small	Orlando (TNL)	3
			medium	Fino (CLE)	5
			large	Clemenules (CLE)	7

CPVO N°	UPOV N°	Characteristics		Examples	Note
8. QN	8.	Leaf blade: shape in cross section	straight or weakly concave	Owari (SAT)	1
			intermediate	Mineola (TNL)	2
			strongly concave	Primosole (HMA)	3
9. PQ	13.	Leaf blade: incisions of margin	absent	Owari (SAT)	1
			crenate	Mandarino Cleopatra (MCL)	2
			dentate		3
10. (+) PQ	14.	Leaf blade: shape of apex	acuminate		1
			acute	Clemenules (CLE)	2
			obtuse	Mineola (TNL)	3
			rounded		4
11. QN	16.	Petiole: length	short	Clemenules (CLE)	3
			medium	Fortune (HMA)	5
			long	Minneola (TNL)	7
12. QL	17.	Petiole: presence of wings	absent	Clemenules	1
			present	Minneola (TNL)	9
13. QN	20.	Flower: length of petal	short	Clementina Fina (CLE)	3
			medium	Ellendale(TNR)	5
			long	Owari (SAT)	7
14. QN	21.	Flower: width of petal	narrow	Clemenules (CLE)	3
			medium	Ellendale (TNR)	5
			broad	Owari (SAT)	7
15. QN	22.	Flower: ratio length/width of petal	small	Wilking (HMA)	3
			medium	Clementina Fina (CLE)	5
			large	Page (HMA)	7

CPVO N°	UPOV N°	Characteristics		Examples	Note
16. QN	23.	Flower: length of stamens	short	Encore (HMA)	3
			medium	Clemenules (CLE)	5
			long	Owari (SAT)	7
17. PQ	24.	Anther: colour	white		1
			light yellow	Owari (SAT)	2
			medium yellow	Clementina Fina (CLE)	3
18. QL	25.	Anther: viable pollen	absent		1
			present	Clemenules (CLE)	9
19. QN	26.	Style: length	short	Pixie (HMA)	3
			medium	Clementina Fina (CLE)	5
			long	Owari (SAT)	7
20. QN	28.	Fruit: length	short	Wiling (HMA)	3
			medium	Clemenules (CLE)	5
			long	Minneola (TNL)	7
21. QN	29.	Fruit: diameter	small	Clementina Fina (CLE)	3
			medium	Clemenules (CLE)	5
			large	Ortanique (TNR)	7
22. QN	30.	Fruit: ratio length/diameter	small	Encore ((HMA)	3
			medium	Clemenules (CLE)	5
			large	Minneola (TNL)	7
23. QN	31.	Fruit: position of broadest part	towards stalk end		1
			at middle	Clemenules (CLE)	2
			towards distal end		3
24. (+) PQ	32.	Fruit: shape in transverse section	circular	Ortanique (TNR)	1
			somewhat angular	Clemenules (CLE)	2
			scalloped		3

CPVO N°	UPOV N°	Characteristics	Examples	Note	
25. (+) PQ	33.	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
26. (+) QL	34.	Fruit: presence of neck	absent	Clemenules (CLE)	1
			present		9
27. (+) QL	37.	Only varieties without fruit neck: Fruit: presence of depression at stalk end	absent	Ortanique (TNR)	1
			present	Marisol (CLE)	9
28. QN	41.	Fruit: number of radial grooves at stalk end	absent or few	Nova (HMA)	1
			intermediate	Clemenules (CLE)	2
			many		3
29. (+) QL	44.	Fruit: presence of collar	absent	Clemenules (CLE)	1
			present		9
30. (+) QN	48.	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		3
31. (+) QL	49.	Fruit: presence of depression at distal end	absent	Ortanique (TNR)	1
			present	Arrufatina (CLE)	9
32. QL	52.	Fruit: presence of areola	absent	Nova (HMA)	1
			incomplete	Hernandina (CLE)	2
			complete	Ortanique (TNR)	3

CPVO N°	UPOV N°	Characteristics		Examples	Note
33. (+) QL	53.	Fruit: type of areola	smooth	Owari (SAT)	1
			grooved		2
			ridged		3
34. QN	54.	Fruit: diameter of areola	small	Arrufatina (CLE)	3
			medium	Owari (SAT)	5
			large	Ortanique (TNR)	7
35. QN	55.	Fruit: diameter of stylar scar	small	Clemenules (CLE)	3
			medium	Owari (SAT)	5
			large		7
36. PQ	56.	Fruit: persistence of style	none	Clemenules (CLE)	1
			partial		2
			total		3
37. PQ	57.	Fruit: presence of navel opening	absent	Clemenules (CLE)	1
			occasionally present	Fortune (HMA)	2
			always present		3
38. QL	59.	Fruit: presence of radial grooves at distal end	absent	Clemenules (CLE)	1
			present		9
39. PQ	61.	Fruit surface: predominant colour(s)	green		1
			yellow green		2
			light yellow		3
			medium yellow	Mapo (TNL)	4
			yellow orange		5
			medium orange	Clemenules (CLE)	6
			dark orange		7
			orange red	Nova (HMA)	8
			red		9

CPVO N°	UPOV N°	Characteristics		Examples	Note
40. QN	62.	Fruit surface: glossiness	absent or very weak	Owari (SAT)	1
			weak	Clemenules (CLE)	3
			medium	Okitsu (SAT)	5
			strong	Nadorcott (TNR)	7
			very strong		9
41. QN	63.	Fruit surface: roughness	smooth	Murcott (TNR)	3
			medium	Clemenules (CLE)	5
			rough	Temple (HMA)	7
42. PQ	64.	Fruit surface: size of oil glands	all more or less the same size		1
			larger ones interspersed by smaller ones		2
43. PQ	67.	Fruit surface: presence of pitting and pebbling on oil glands	pitting and pebbling absent	Nova (HMA)	1
			pitting absent, pebbling present	Loretina (CLE)	2
			pitting present, pebbling absent	Owari (SAT)	3
			pitting and pebbling present		4
44. QN	71.	Fruit rind: thickness	thin	Murcott (TNR)	3
			medium	Clemenules (CLE)	5
			thick	Minneola (TNL)	7
45. QN	72.	Fruit rind: adherence to flesh	weak	Clemenules (CLE)	3
			medium	Fortune (HMA)	5
			strong	Ortanique (TNR)	7
46. QN	73.	Fruit rind: strength	weak		3
			medium	Clemenules (CLE)	5
			strong		7

CPVO N°	UPOV N°	Characteristics	Examples	Note	
47. QN	74.	Fruit rind: oiliness	dry	3	
			medium	Clemenules (CLE)	5
			oily	Ortanique (TNR)	7
48. PQ	76.	Fruit: colour of albedo	greenish		1
			white	Clemenules (CLE)	2
			light yellow	Murcott (TNR)	3
			light orange	Nadorcott (TNR)	4
			pink		5
			reddish		6
49. QN	77.	Fruit: density of albedo	loose	Clemenules (CLE)	3
			medium	Fortune (HMA)	5
			dense	Ortanique (TNR)	7
50. QN	78.	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
51. QL	79.	Fruit: presence of albedo strands	absent		1
			present	Clemenules (CLE)	9
52. QN	80.	Fruit: amount of albedo strands	small		3
			medium		5
			large		7

CPVO N°	UPOV N°	Characteristics	Examples	Note	
53. PQ	81.	Fruit: main colour of flesh	whitish		1
			light green		2
			light yellow		3
			medium yellow	Mapo (HMA)	4
			light orange		5
			medium orange	Clemenules (CLE)	6
			dark orange		7
			red		8
			purple		9
54. QN	82.	Fruit: filling of core	absent or very sparse	Fortune (HMA)	1
			sparse		3
			medium	Clemenules (CLE)	5
			dense	Murcott (TNR)	7
			very dense		9
55. QN	83.	Fruit: diameter of core	small	Murcott (TNR)	3
			medium	Clemenules (CLE)	5
			large	Hermandina (CLE)	7
56. QN	84.	Fruit: presence of rudimentary segments	absent or weak	Clemenules (CLE)	1
			intermediate		2
			strong		3
57. QN	85.	Fruit: number of well developed segments	few	Oroval (CLE)	3
			medium	Ortanique (TNR)	5
			many	Temple (HMA)	7
58. QN	86.	Fruit: coherence of adjacent segment walls	weak	Clemenules (CLE)	3
			medium	Fortune (HMA)	5
			strong		7

CPVO N°	UPOV N°	Characteristics		Examples	Note
59. QN	87.	Fruit: strength of segment walls	weak	Mapo (TNL)	3
			medium	Clementina Fina (CLE)	5
			strong	Oronules (CLE)	7
60. QN	88.	Fruit: length of juice vesicles	short	Wilking (HMA)	3
			medium		5
			long	Clemenules (CLE)	7
61. QN	89.	Fruit: thickness of juice vesicles	thin	Clemenules (CLE)	3
			medium		5
			thick	Mapo (TNL)	7
62. PQ	92.	Fruit: presence of navel (viewed internally)	absent or very rare	Clemenules (CLE)	1
			occasionally present	Nova (HMA)	2
			always present		3
63. QN	94.	Fruit: juiciness	low		3
			medium	Campeona (HMA)	5
			high	Marisol (CLE)	7
64. QN	95.	Fruit juice: total soluble solids	low	Okitsu (SAT)	3
			medium	Temple (HMA)	5
			high	Honey (HMA)	7
65. QN	96.	Fruit juice: acidity	low	Hermandina (CLE)	3
			medium	Clemenules (CLE)	5
			high	Fortune (HMA)	7
66. QN	97.	Fruit: strength of fibre	weak	Mapo (HMA)	3
			medium	Clemenules (CLE)	5
			strong		7

CPVO N°	UPOV N°	Characteristics	Examples	Note
67. (+)	98.	Fruit: number of seeds (controlled manual self- pollination)	absent or very few Clemenules (CLE)	1
QN			few	3
			medium Kara (HMA)	5
			many	7
			very many Común (MMN)	9
68.	100.	Seed: polyembryony	absent Wilking (HMA)	1
QL			present Común (MMN)	9
69.	101.	Seed: length	short Temple (HMA)	3
QN			medium	5
			long Campeona (HMA)	7
70.	102.	Seed: width	narrow Temple (HMA)	3
QN			medium	5
			broad Campeona (HMA)	7
71.	103.	Seed: surface	smooth Común (MMN)	1
QL			wrinkled	2
72.	105.	Seed: external colour	greenish Kara (HMA)	1
PQ			whitish	2
			yellowish	3
			pinkish	4
			brownish	5
73.	106.	Seed: colour of inner seed coat	white	1
PQ			light yellow	2
			light brown Murcott (TNR)	3
			medium brown	4
			dark brown	5
			red	6
			purple	7

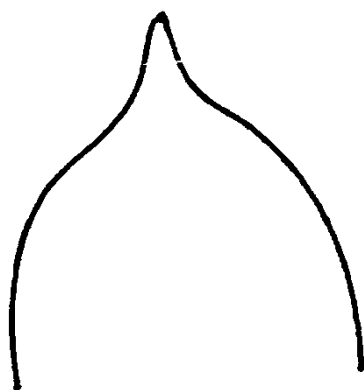
CPVO N°	UPOV N°	Characteristics		Examples	Note
74.	107.	<u>Only varieties with seed: polyembryony present:</u> Seed: Colour of cotyledons	white	Murcott (TNR)	1
PQ			cream	Kara (HMA)	2
			light	Común (MMN)	3
			dark green		4
75.	108.	Time of maturity of fruit for consumption	early	Okitsu (SAT)	3
QN			medium	Clemenules (CLE)	5
			late	Murcott (TNR)	7
76.	109.	Parthenocarpy	absent	Wiling (HMA)	1
QL			present	Clemenules (CLE)	9
77. (+)	110.	Self-incompatibility	absent	Común (MMN)	1
QL			present	Clemenules (CLE)	9

EXPLANATIONS AND METHODS

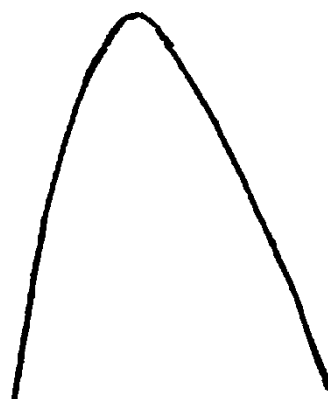
Ad. 2 : Tree: Growth habit

The observation on the growth habit of the tree 7 should be made immediately after harvest.

Ad. 10 : Leaf blade: shape of apex



1
acuminate



2
acute

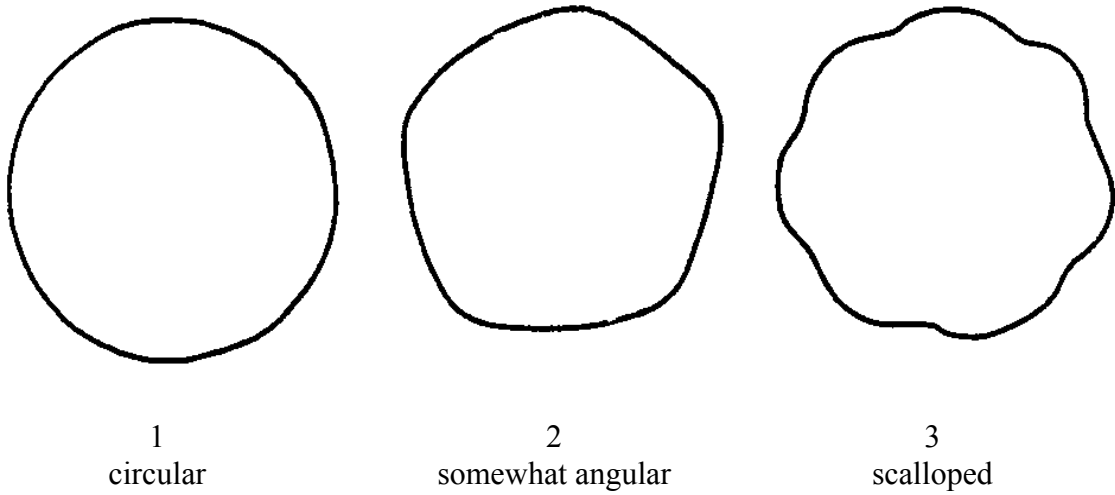


3
obtuse

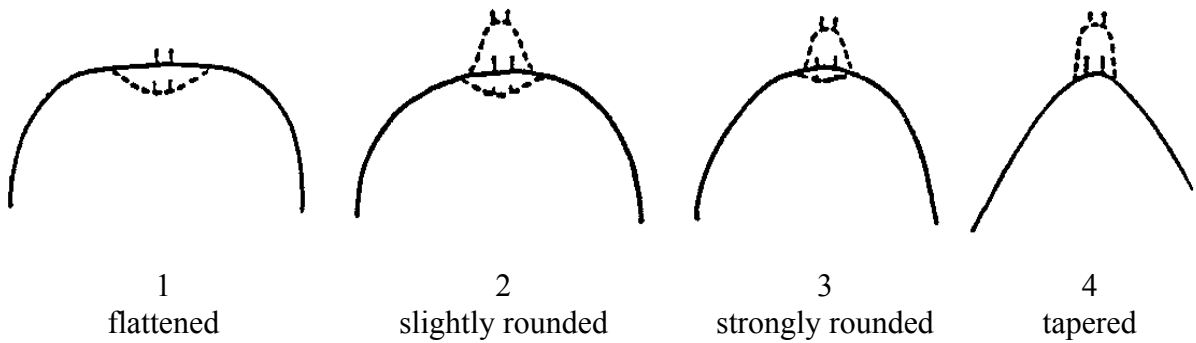


4
rounded

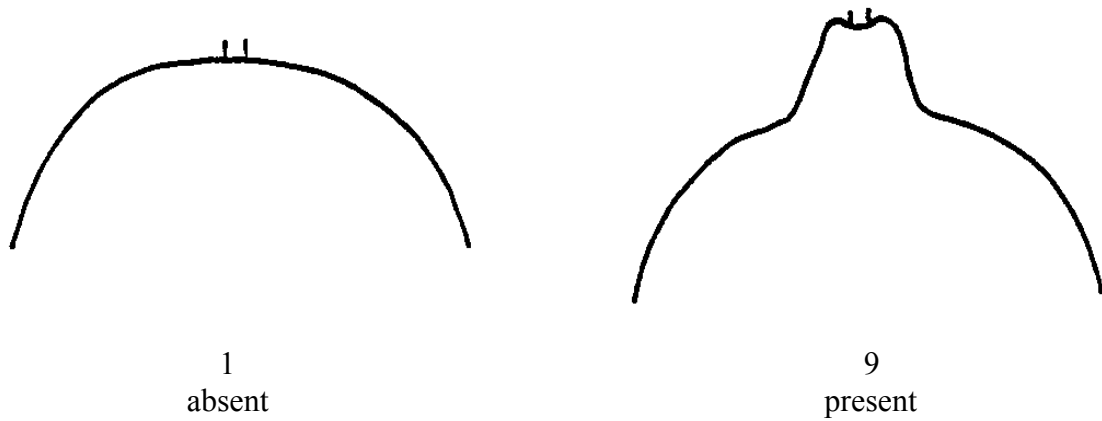
Ad. 24 : Fruit: shape in transverse section



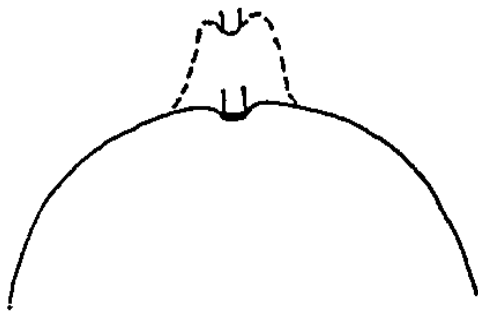
Ad. 25 : Fruit: general shape of proximal part (excluding neck, collar and depression at stalk end)



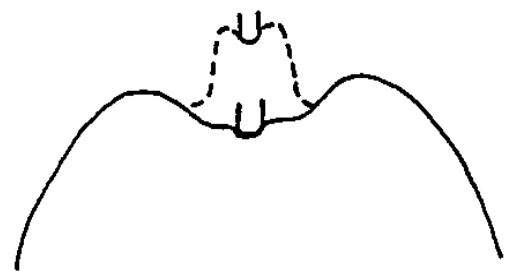
Ad. 26 : Fruit: presence of neck



Ad. 27 : Only varieties without fruit neck: Fruit: presence of depression at stalk end



1
absent

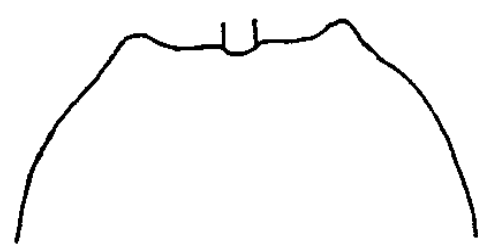


9
present

Ad. 29 : Fruit: presence of collar



1
absent



9
present

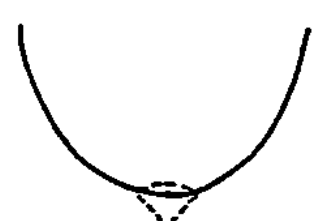
Ad. 30 : Fruit: general shape of distal part (excluding nipple, bulging of navel and depression at distal end)



1
flattened

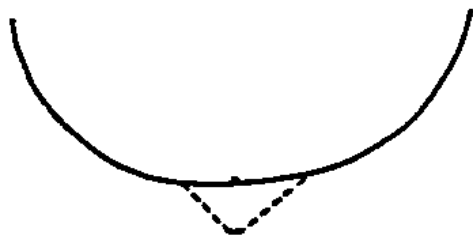


2
slightly rounded



3
strongly rounded

Ad. 31 : Fruit: presence of depression at distal end



1
absent



9
present

Ad. 33 : Fruit: type of areola



1
smooth



2
grooved



3
ridged

Ad. 67 : Fruit: number of seeds (controlled manual self-pollination)

Manual self-pollination is necessary to ensure a consistent production of seed.

Ad. 77 : Self-incompatibility

A variety is self-incompatible when the fertile pollen of its own flower or of other flowers of the same variety is not able to fertilize the ovary.

The test on self-incompatibility has to be carried out on at least 10 flowers.

Choose flowers with petals which are just before opening and open the flower manually. Then separate and cut the anthers. Take viable pollen from other flowers of the same variety and put it on the stigma. Cover the flowers with muslin in order to avoid accidental pollination by other pollen. If the mature fruit bears no seeds, the variety is self-incompatible. If the mature fruit bears seeds, the variety is self-compatible.

Synonym(s) of Example Varieties

Example varieties	Subgroup	Observations	Synonym(s)
Clemenules	CLE		Clementina de Nules
Comun	MMN		Avana, Mediterranea, Wilowleaf
Clementina Fina	CLE		Fino
Minneola	TNL	<i>Citrus paradisi</i> Macfad. x <i>C. tangerina</i> hort. ex Tan. Grapefruit Duncan x Mandarin Dancy	Honeybell
Nadorcott	TNR		Afourer, Murcott Afourer
Nova	HMA	<i>Citrus clementina</i> hort. ex Tan. x Tangelo Orlando	Clemenvilla
Orlando	TNL	<i>Citrus paradisi</i> Macfad. x <i>C. tangerina</i> hort. ex Tan. Grapefruit Duncan x Mandarin Dancy	Lake Tangelo

LITERATURE

Alexander, D. McE., 1983: "Some citrus species and varieties in Australia," Commonwealth Scientific and Industrial Research Organization, Australia, 64 pp.

Blondel, L., 1978: Botanical classification of species of the genus Citrus, *Fruits* 33 (11): pp. 695 - 720.

Bono, R., Soler, J., Fernandez de Cordova, L., 1986: "Variedades de agrios cultivadas en España". Generalitat Valenciana, 70 pp.

Damigella, P., Tribulato, E., Calabrese, F., Crescimanno, F.G., Continella, G., 1980: "Gli Agrumi," Cultivar. R.E.D.A., Roma, Italy, pp. 9 - 70.

Ortiz Marcide, J.M., 1985: "Nomenclatura botánica de los cítricos". *Levante Agrícola* nº 259-260, pp. 71-79.

Reuther, W., Webber, H.J., Batchelor, L.D. (Editors), 1967: "The Citrus Industry," Volume I, University of California, Division of Agricultural Sciences, 611 pp.

Soler, J., 1999: Reconocimiento de variedades de cítricos en campo. Generalitat Valenciana. 187 pp.

Saunt, J., 1990: "Citrus varieties of the world: an illustrated guide," Sinclair International Ltd., Norwich, England, 126 pp.

Spina, P., Russo, F., Geraci, G., Martelli, S., 1980: "Schede per il registro varietale dei fruttiferi I - ARANCIO e MANDARINO," Ministero Agricoltura e Foreste - S.O.I., Roma, Italy, 92 pp.

Tanaka, T., 1932: "A Monograph of the Satsuma orange with special reference to the occurrence of new varieties through bud variation," reprinted from the "Memoirs of the Faculty of Science and Agriculture, Taihoku Imperial University," Volume IV, Taihoku, Formosa, Japan, 626 pp.

Zaragoza, S., Navarro, L., Cebolla, V., 1997: "Evaluation of the field collection through the germo data-base". Proceedings of the sectorial meeting of the mediterranean citrus net work (Mecinet) on global cooperation for citrus germplasm conservation and use, pp. 142-148.

Zaragoza, S., Trenor, I., Alonso, E., Medina, A., Pina, J.A., Navarro, L., 1995: "Evaluación de la colección de variedades del Banco de Germoplasma de Cítricos del IVIA: Planteamiento y primeros resultados generales". *Levante Agrícola* nº 331, pp. 145-149.

ANNEX II



European Union
Community Plant Variety Office

TECHNICAL QUESTIONNAIRE

to be completed in connection with an application for Community Plant Variety Rights
Please answer all questions. A question without any answer will lead to a non-attribution
of an application date. In cases where a field / question is not applicable, please state so.

1. **Botanical taxon:** Name of the genus, species or sub-species to which the variety belongs and
common name

Citrus L. – Group 1

MANDARINS

2. **Applicant(s):** Name(s) and address(es), phone and fax number(s), Email address, and where
appropriate name and address of the procedural representative

3. **Variety denomination**

a) Where appropriate proposal for a variety denomination:

b) Provisional designation (breeder's reference):

4. Information on origin, maintenance and reproduction of the variety

4.1 Breeding scheme

- (a) Variety resulting from
 - (i) Controlled cross []
(indicate parent varieties)

 - (ii) Partially unknown cross []
(indicate known parent variety(ies))

 - (iii) Totally unknown []
- (b) Mutation []
(indicate parent variety)
- (c) Discovery []
(indicate where, when and how developed)
- (d) Other (please provide details) []

4.2 Method of propagation

- (a) Cuttings []
- (b) *In vitro* propagation []
- (c) Seed []
- (d) Other (please specify): []

4.3 Virus status

The variety is:

- (i) Virus free (indicate viruses) []
- (ii) Virus tested (indicate against which virus)..... []
- (iii) The virus status is unknown []

4.4 Geographical origin of the variety: the region and the country in which the variety was bred or discovered and developed

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in the CPVO Protocol; please mark the state of expression which best corresponds).

Characteristics	Example varieties	Note
5.1 Fruit: length (20)		
short	Wiling (HMA)	3 []
medium	Clemenules (CLE)	5 []
long	Minneola (TNL)	7 []
5.2 Fruit: diameter (21)		
small	Clementina Fina (CLE)	3 []
medium	Clemenules (CLE)	5 []
large	Ortanique (TNR)	7 []
5.3 Fruit: presence of neck (26)		
absent	Clemenules (CLE)	1 []
present		9 []

	Characteristics	Example varieties	Note
5.4 (39)	Fruit surface: predominant colour(s)		
	green		1 []
	yellow green		2 []
	light yellow		3 []
	medium yellow	Mapo (TNL)	4 []
	yellow orange		5 []
	medium orange	Clemenules (CLE)	6 []
	dark orange		7 []
	orange red	Nova (HMA)	8 []
	red		9 []
5.5 (53)	Fruit: main colour of flesh		
	whitish		1 []
	light green		2 []
	light yellow		3 []
	medium yellow	Mapo (HMA)	4 []
	light orange		5 []
	medium orange	Clemenules (CLE)	6 []
	dark orange		7 []
	red		8 []
	purple		9 []
5.6 (75)	Time of maturity of fruit for consumption		
	early	Okitsu (SAT)	3 []
	medium	Clemenules (CLE)	5 []
	late	Murcott (TNR)	7 []

Characteristics		Example varieties	Note
5.7 (76)	Parthenocarpy		
	absent	Wilking (HMA)	1 []
	present	Clemenules (CLE)	9 []
5.8 (77)	Self-incompatability		
	absent	Común (MMN)	1 []
	present	Clemenules (CLE)	9 []
6. Similar varieties and differences from these varieties:			
Denomination of similar variety	Characteristic in which the similar variety is different ¹⁾	State of expression of similar variety	State of expression of candidate variety
<p>¹⁾ In the case of identical states of expressions of both varieties, please indicate the size of the difference</p>			
7. Additional information which may help to distinguish the variety			
A representative printed-out colour photo of the variety must be added to the Technical Questionnaire.			
7.1 Resistance to pests and diseases			
7.2 Special conditions for the examination of the variety			
[] YES, please specify			
[] NO			

7.3 Other information

YES, please specify

NO

8. GMO-information required

The variety represents a Genetically Modified Organism within the meaning of Article 2(2) of Council Directive EC/2001/18 of 12/03/2001.

YES NO

If yes, please add a copy of the written attestation of the responsible authorities stating that a technical examination of the variety under Articles 55 and 56 of the Basic Regulation does not pose risks to the environment according to the norms of the above-mentioned Directive.

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) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| (b) Chemical treatment (e.g. growth retardant or pesticide) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| (c) Tissue culture | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| (d) Other factors | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Please provide details of where you have indicated "Yes":

I/we hereby declare that to the best of my/our knowledge the information given in this form is complete and correct.

Date

Signature

Name

[End of document]