



**TWF/31/3**

**ORIGINAL:** English

**DATE:** April 25, 2000

**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS**

GENEVA

**TECHNICAL WORKING PARTY  
FOR  
FRUIT CROPS**

**Thirty-First Session  
Budapest, July 3 to 7, 2000**

WORKING PAPER ON REVISED TEST GUIDELINES FOR CITRUS

*Document prepared by experts from South Africa*

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
I. Subject of these Guidelines .....	3
II. Material Required .....	4
III. Conduct of Tests .....	4
IV. Methods and Observations.....	4
V. Grouping of Varieties .....	5
VI. Characteristics and Symbols .....	6
VII. Table of Characteristics .....	8
Group 1. Mandarins and their Hybrids.....	8
Group 2. Oranges and their Hybrids .....	33
Group 3. Lemons and Limes and their Hybrids .....	57
Group 4. Grapefruit and Pummelos and their Hybrids .....	81
VIII. Explanations on the Table of Characteristics .....	105
IX. Literature .....	112
X. Technical Questionnaire .....	113

## I. Subject of these Guidelines

1. These Test Guidelines apply to all vegetatively propagated varieties for fruit production and rootstock varieties of the following four groups of the subtribe Citrinae (citrus fruit trees) in the subfamily Aurantioideae (family Rutaceae):

### 1. MANDARINS AND THEIR HYBRIDS

SAT: *Citrus unshiu* Marc. (Satsumas)

CLE: *Citrus clementina* Hort. ex Tan. (Clementines)

MMN: *Citrus deliciosa* Ten. (Mediterranean Mandarins)

PMN: *Citrus reticulata* Blanco (Ponkan Mandarins)

TNL: Mandarin x Grapefruit or Pummelo (Tangelos)

TNR: Mandarin x Orange (Tangors)

### 2. ORANGES AND THEIR HYBRIDS

SWO: *Citrus sinensis* (L.) Osbeck (Sweet Oranges)

SOR: *Citrus aurantium* L. (Sour Oranges)

### 3. LEMONS AND LIMES AND THEIR HYBRIDS

LEM: *Citrus limon* (L.) Burm.f. (Lemons)

ACL: *Citrus latifolia* Tan. (Acid Limes, Lime Bearss)

SWL: *Citrus limettioides* Tan. (Sweet Limes)

MEX: *Citrus aurantifolia* (Christm. ex Panz.) Swingle (Mexican Limes)

RLM: *Citrus jambhiri* Lush. (Rough Lemons)

### 4. GRAPEFRUIT AND PUMMELOS AND THEIR HYBRIDS

GRA: *Citrus paradisi* Macfad. (Grapefruit)

PUM: *Citrus grandis* (L.) Osbeck (Pummelos)

**NZ comment: To check *Citrus maxima*.**

**TWF comment: To supply common names in all four languages.**

For each of the four groups a separate Table of Characteristics has been established. For all four tables, in the majority of cases, the same wording has been indicated for corresponding characteristics and their states of expression, although the example varieties indicated under the different groups may represent different actual expressions (eg. longer or shorter dimensions), irrespective of the fact that they may have exactly the same wording.

These Test Guidelines may be used for the testing of varieties of other citrus groups after having studied which of the characteristics indicated show reliable and useful results and whether further characteristics should be added:

### 5. CITRONS AND THEIR HYBRIDS

CTN: *Citrus medica* L. (Citrons)

### 6. BERGAMOTS AND THEIR HYBRIDS

BER: *Citrus bergamia* Risso et Poit. (Bergamots)

### 7. CALAMONDINS AND FORTUNELLA AND THEIR HYBRIDS

CAL: *Citrus madurensis* Lour. (Calamondins)

KUM: *Fortunella* Swingle (Kumquats)

## 8. TRIFOLIATE ORANGES AND THEIR HYBRIDS

PON: *Poncirus* Raf. (hybrids: Citranges, Citrumelos, etc.)

## 9. YUSU AND THEIR HYBRIDS

YUS: *Citrus junos* Sieb. (Yusu)

### II. Material Required

1. The competent authorities decide when, where and in what quantity and quality the plant material required for testing the variety is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must make sure that all customs formalities are complied with. As a minimum, the following quantity of plant material is recommended:

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

2. The plant material supplied should be visibly healthy, not lacking in vigor or affected by any important pests or diseases. It should preferably not be obtained from *in vitro* propagation.

3. 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.

### III. Conduct of Tests

1. To assess distinctness, it is essential for the trees under test to bear a satisfactory crop of fruit for at least two growing periods.

2. The tests should normally be conducted at one place. If any important characteristics of the variety cannot be seen at that place, the variety may be tested at an additional place.

3. The tests should be carried out under conditions ensuring normal growth. As a minimum, each test should include a total of 5 trees. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions. A standard specified rootstock should be used for each group.

4. Additional tests for special purposes may be established.

### IV. Methods and Observations

1. All observations should be made on 5 plants or 10 typical parts, 2 from each of 5 plants.

2. For the assessment of uniformity a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, the maximum number of off-types allowed would be 0.

3. 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.
4. The observation on the attitude of the main branches should be made immediately after harvest.
4. All observations on the young leaf should be made on the spring flush.
6. All observations on the fully developed leaf should be made on the middle third of the youngest spring flush branch sections not showing signs of active growth.
7. 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.
8. All observations on the flower bud should be made when the petal tips are just visible.
9. All observations on the open flower should be made on the first day of opening.
10. Unless otherwise indicated, for the observations on the fruit, 10 typical fruits should be selected out of a minimum of 20 fruits from 5 trees. 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 except for the following groups:

SOR, LEM, ACL, SWL, MEX, RLM: As soon as the juice content stabilizes.

The fruit should be tested weekly and harvested as soon as this stage has been reached.

11. 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.
12. All observations on the relief of the fruit and the texture and thickness of the rind should be made at the middle, between the base and apex of the fruit..
13. The observation on the oiliness of the fruit rind should be made within 3 to 7 days after harvesting.
14. All observations on the flesh of the fruit should be made on a cross section through the middle of the fruit.
15. Unless stated otherwise, all observations on the seed should be made on the fresh seed.

#### V. Grouping of Varieties

1. The collection to be grown should be divided into groups to facilitate the assessment of distinctness. In the first place the collection should be divided into 18 groups as mentioned in Chapter I(1). A list of these groups is reproduced at the end of Chapter VIII.
2. In addition, suitable characteristics 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 are fairly evenly distributed within the collection.

3. It is recommended that the competent authorities use the following characteristics for grouping fruit varieties:

- (i) Fruit: length (characteristic 33)
- (ii) Fruit: diameter (characteristic 34)
- (iii) Fruit: neck (characteristic 41)
- (iv) Fruit: nipple (characteristic 57)
- (v) Fruit surface: predominant color (characteristic 72)
- (vi) Fruit: presence of navel viewed internally (characteristic 108)
- (vii) Time of maturity of fruit for consumption (characteristic 125).

## VI. Characteristics and Symbols

1. To assess distinctness, uniformity and stability, the characteristics and their states as given in the Tables of Characteristics should be used.

2. Notes (in most cases 1 to 9), for the purposes of electronic data processing, are given opposite the states of expression for each characteristic.

3. Each characteristic which applies only to a specific group or specific groups is preceded by an abbreviation of the group or groups of three letters with or without an asterisk. One or more abbreviations with an asterisk before the number of the characteristic indicate that the characteristic is considered important for that or those groups. See the legend (paragraph 4) for the meaning of the addition of an asterisk to one or several abbreviations. Each example variety is also followed by the abbreviation of its group.

### 4. Legend:

(\*) Characteristics that should be used in every growing period over which examinations are made for the examinations of all varieties of the particular group or groups indicated after the (\*) and should always be included in the variety descriptions of that particular group or groups, except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible. The asterisk is applicable to fruit varieties only and not to rootstock varieties.

(+) See Explanations on the Table of Characteristics in chapter VIII.

5. Abbreviations

SWO:	<i>Citrus sinensis</i> (L.) Osbeck - sweet oranges
TNR:	<i>Citrus reticulata</i> x <i>Citrus sinensis</i> - tangors
MAN:	<i>Citrus reticulata</i> Blanco - mandarins, tangerines
SAT:	<i>Citrus unshiu</i> Marc. - satsumas
TNL:	<i>Citrus reticulata</i> x <i>Citrus paradisi</i> - tangelos
LEM:	<i>Citrus limon</i> (L.) Burm. f. - lemons
RLM:	<i>Citrus jambhiri</i> Lush. - rough lemons
SWL:	<i>Citrus limettioides</i> Tan. - sweet limes
LAL:	<i>Citrus latifolia</i> Tan. - large - fruited acid limes
SOR:	<i>Citrus aurantium</i> L. - sour oranges
CTN:	<i>Citrus medica</i> L. - citrons
BER:	<i>Citrus bergamia</i> Risso et Poit. - bergamots
GRA:	<i>Citrus paradisi</i> Macfad. - grapefruit and hybrids
PUM:	<i>Citrus grandis</i> (L.) Osbeck - pummelos and hybrids
KUM:	<i>Fortunella</i> Swingle - kumquats and hybrids
SAL:	<i>Citrus aurantiifolia</i> (Christm. et Panz.) - Swingle - small-fruited acid limes and hybrids
CAL:	<i>Citrus madurensis</i> Lour. - calamondins
PNC:	<i>Poncirus</i> Raf. and hybrids - trifoliolate oranges.

**ZA: To change according to new draft.**

**TWF 1999: We should consider whether (and where) we want to add the following paragraph:**

**As can be seen from the example varieties indicated to explain the different states of expression, the following characteristics, without specifically mentioning the fact, indicate not the actual expression but the expression in relation to the size of the organ concerned (eg. fruit: length of neck in relation to length of fruit):**

<b>40</b>	<b>55</b>	<b>69</b>	<b>99</b>
<b>42</b>	<b>56</b>	<b>71</b>	<b>109</b>
<b>43</b>	<b>58</b>	<b>78</b>	
<b>45</b>	<b>61</b>	<b>79</b>	
<b>47</b>	<b>63</b>	<b>81</b>	
<b>48</b>	<b>64</b>	<b>82</b>	
<b>50</b>	<b>68</b>	<b>84</b>	

**ZA: We take the actual expression when comparing varieties within a single group.**

VII. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres  
GROUP 1. MANDARINS AND THEIR HYBRIDS

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>1.</b> (*)	<b>Tree: habit</b>					
[2.]	upright				Marisol	1
	spreading				Clementino de Nules	2
	drooping				Satsuma Owari	3
<b>2.</b>	<b>Tree: density of spines</b>					
	<b>Not for Group 1</b>					
<b>3.</b>	<b>Tree: length of spines</b>					
	<b>Not for Group 1</b>					
<b>4.</b> (*)	<b>Young shoot: anthocyanin coloration of tip</b>					
	<b>Not for Group 1</b>					
<b>5.</b>	<b>Young shoot: intensity of anthocyanin coloration of tip</b>					
	<b>Not for Group 1</b>					
<b>6.</b>	<b>Fully developed leaf: length of blade (apical leaflet in case of compound leaf)</b>					
[5.]	short				Mandarino común	3
	medium				Nova	5
	long				Kara	7



Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>7.</b>	<b>Fully developed leaf: width of blade (as for 6)</b>					
[6.]	narrow				Mandarino común	3
	medium				Clementino de Nules	5
	broad				Page	7
<b>8.</b>	<b>Fully developed leaf: ratio length/width of blade (as for 6)</b>					
[7.]	small				Orlando	3
	medium				Clementino Fino	5
	large				Clementina de Nules	7
<b>9.</b>	<b>Fully developed leaf: shape of blade in cross section (as for 6)</b>					
[8.]	straight or very weakly concave				Satsuma Owari	1
	weakly concave				Minneola	2
	strongly concave					3
<b>10.</b>	<b>Fully developed leaf: twisting of blade (as for 6)</b>					
[9.]	absent or very weakly expressed					1
	weakly expressed					2
	strongly expressed					3
<b>11.</b>	<b>Fully developed leaf: blistering of blade (as for 6)</b>					
[10.]	absent or very weakly expressed					1
	weakly expressed					2
	strongly expressed					3

<b>12.</b>	<b>Fully developed leaf: intensity of green color of blade</b>		
[11.]	light	Nova	3
	medium	Satsuma Owari	5
	dark	Oroval	7
<b>13.</b>	<b>Fully developed leaf: pubescence on lower side of blade</b>		
	<b>Not for Group 1</b>		
<b>14.</b>	<b>Fully developed leaf: firmness of blade (as for 6)</b>		
[13.]	weak	Clementino Fino	3
	medium	Fortune	5
	strong	Satsuma Owari	7
<b>15.</b>	<b>Fully developed leaf: undulation of margin (as for 6)</b>		
[14.]	absent or very weakly expressed		1
	weakly expressed		2
	strongly expressed		3
<b>16.</b>	<b>Fully developed leaf: incisions of margin (as for 6)</b>		
[15.]	absent or very shallow	Satsuma Owari	1
	shallow		2
	deep		3

**TWF: To consider whether we should rather say: entire (1), sinuate (2), crenate (3), dentate (4).**

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>17.</b> (+)	<b>Fully developed leaf: shape of apex (as for 6)</b>					
[16.]	acuminate					1
	acute				Clementino de Nules	2
	obtuse				Minneola	3
	rounded					4
<b>18.</b> (+)	<b>Fully developed leaf: emargination at tip (as for 6)</b>					
[17.]	absent or very shallow				Refundido con el 17	1
	shallow					2
	deep					3
<b>19.</b>	<b>Fully developed leaf: length of petiole</b>					
[18.]	short				Clementino de Nules	3
	medium				fortune	5
	long				Minneola	7
<b>20.</b>	<b>Fully developed leaf: wings on petiole</b>					
[19.]	absent				Clementino de Nules	1
	present				Satsuma Owari	9
<b>21. Changed</b>	<b>Fully developed leaf: width of wings on petiole</b>					
[19a.]	narrow				Satsuma Owari	3
	medium					5
	broad					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>22.</b>	<b>Flower bud: anthocyanin coloration</b>					
	<b>Not for Group 1</b>					
<b>23.</b>	<b>Flower bud: intensity of anthocyanin coloration</b>					
	<b>Not for Group 1</b>					
<b>24.</b>	<b>Flower: diameter of calyx</b>					
[23.]	small					3
	medium					5
	large					7
<b>25.</b>	<b>Flower: length of petal</b>					
[24.]	short				Clementino Fino	3
	medium				Ellendale	5
	long				Satsuma Owari	7
<b>26.</b>	<b>Flower: width of petal</b>					
[25.]	narrow				Clementino de Nules	3
	medium				Ellendale	5
	broad				Satsuma Owari	7
<b>27.</b>	<b>Flower: ratio length/width of petal</b>					
<b>new</b>	small				Wilking	3
	medium				Clementino Fino	5
	large				Page	7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>28.</b>	<b>Flower: length of stamens</b>					
[27.]	short				Encore	3
	medium				Satsuma Owari	5
	long				Page	7
<b>29.</b>	<b>Anther: color</b>					
[28.]	white					1
	light yellow				Satsuma Owari	2
	medium yellow				Clementino Fino	3
<b>30. (* )</b>	<b>Anther: viable pollen</b>					
[29.]	absent			?	Satsuma Owari	1
				?	Mandarino Imperial	
	present			?	Clementino de Nules	9
<b>31.</b>	<b>Style: length</b>					
[31.]	short				Pixie	3
	medium				Clementino Fino	5
	long				Satsuma Owari	7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>32.</b>	<b>Infructescence: clustering of fruits</b>					
	<b>Not for Group 1</b>					
<b>33.</b>	<b>Fruit: length</b>					
(*)	short				Wilking	3
[34.]	medium				Clementino de Nules	5
	long				Minneola	7
<b>34.</b>	<b>Fruit: diameter</b>					
(*)						
[35.]	small				Clementino Fino	3
	medium				Clementino de Nules	5
	large				Ortanique	7
<b>35.</b>	<b>Fruit: ratio length/diameter</b>					
(*)						
[36.]	small				Encore	3
	medium				Clementino de Nules	5
	large				Minneola	7
<b>36.</b>	<b>Fruit: position of broadest part</b>					
(*)						
[37.]	towards stalk end					1
	at middle				Clementino de Nules	2
	towards distal part					3
<b>37.</b>	<b>Fruit: circumfer- ence</b>					
(+)						
	round				Ortanique	1
[38.]	somewhat angular					2
	scalloped					3

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>38.</b> (* (+)	<b>Fruit: general shape of stalk end</b>					
[39.]	flattened				Clementino de Nules	1
	slightly rounded				Ortanique	2
	strongly rounded					3
	tapered					4
<b>39.</b> (* (+)	<b>Fruit: depression at stalk end</b>					
[40.]	absent				Ortanique	1
	present				Marisol	9
<b>40.</b>	<b>Fruit: depth of depression at stalk end</b>					
[41.]	shallow					3
	medium					5
	deep					7
<b>41.</b> (* (+)	<b>Fruit: neck</b>					
[42.]	absent				Clementino de Nules	1
	present					9
<b>42.</b>	<b>Fruit: length of neck</b>					
[43.]	short					3
	medium					5
	long					7
<b>43. Changed</b>	<b>Fruit: thickness of neck</b>					
[44.]	thin					3
	medium					5
	thick					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>44.</b> (+)	<b>Fruit: constriction at stalk end</b>					
[45.]	absent				Clementino de Nules	1
	present					9
<b>45.</b>	<b>Fruit: expression of constriction at stalk end</b>					
[45a.]	weak					3
	medium					5
	strong					7
<b>46.</b>	<b>Fruit: radial grooves at stalk end</b>					
[45b.]	absent or very few				Nova	1
	few				Clementino de Nules	2
	many					3
<b>47.</b>	<b>Fruit: length of radial grooves at stalk end</b>					
[45c.]	short					3
	medium					5
	long					7



Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>48.</b> (+)	<b>Fruit: local depression at stalk attachment (necked varieties only)</b>					
[46.]	absent or very shallow					1
	shallow					2
	deep					3
<b>49.</b> (+)	<b>Fruit: collar</b>					
	absent				Clementino de Nules	1
[46a.]	present					9
<b>50.</b>	<b>Fruit: height of collar</b>					
[47.]	low					3
	medium					5
	high					7
<b>51.</b>	<b>Fruit: diameter of collar</b>					
<b>new</b>	small					3
	medium					5
	large					7
<b>52.</b>	<b>Fruit: abscission layer between floral disc and fruit</b>					
[49.]	absent or very weakly developed					1
	weakly developed					2
	strongly developed					3

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>53.</b> (* (+)	<b>Fruit: general shape of distal part</b>					
[50.]	flattened				Clementino de Nules	1
	slightly rounded					2
	strongly rounded					3
<b>54.</b> (* (+)	<b>Fruit: depression at distal end</b>					
[51.]	absent				Ortanique	1
	present				Arrufatina	9
<b>55.</b>	<b>Fruit: depth of depression at distal end</b>					
[52.]	shallow					3
	medium					5
	deep					7
<b>56.</b>	<b>Fruit: diameter of depression at distal end</b>					
[53.]	small					3
	medium					5
	large					7

<b>57.</b> (* )	<b>Fruit: nipple</b>  <b>Not for Group 1</b>					
<b>58.</b>	<b>Fruit: prominence of nipple</b>  <b>Not for Group 1</b>					
<b>59.</b> (* )	<b>Fruit: areola</b>  absent				Nova	1
[56.]	present				Ortanique	9

	Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>60.</b> (+)		<b>Fruit: type of areola</b>  smooth					1
[57.]		grooved					2
		ridged					3
<b>61.</b>		<b>Fruit: conspicuousness of areola</b>					
[58.]		weak					1
		medium					2
		strong					3
<b>62.</b>		<b>Fruit: development of areola</b>					
[59.]		not complete				Clementino Hernandino	1
		complete				Ortanique	2
<b>63.</b>		<b>Fruit: diameter of areola</b>					
[60.]		small				Clementino Arrufatino	3
		medium				Satsuma Owari	5
		large				Ortanique	7

<b>64.</b>	<b>Fruit: diameter of stylar scar</b>						
[61.]	small					Clementino de Nules	3
	medium					Satsuma Owari	5
	large						7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
------------------------------------	---------	----------	---------	---------	--	---------------

<b>65.</b>	<b>Fruit: protruding stylar point</b>						
	<b>Not for Group 1</b>						

<b>66.</b>	<b>Fruit: persistence of style</b>						
	<b>Not for Group 1</b>						

<b>67.</b>	<b>Fruit: navel opening</b>						
[64.]	absent					Clementino de Nules	1
	occasionally present					Fortune	2
	always present						3

<b>68.</b>	<b>Fruit: diameter of navel opening</b>						
[65.]	small					Ellendale	2
	medium					Fortune	5
	large						7

---

<b>69.</b>	<b>Fruit: bulging of navel</b>		
	<b>Not for Group 1</b>		

---

<b>70.</b>	<b>Fruit: radial grooves at distal end</b>		
[68.]	absent		1
	present		9

---

<b>71.</b>	<b>Fruit: expression of radial grooves at distal end</b>		
[68a.]	weak		3
	medium		5
	strong		7

---

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>72. (*)</b>	<b>Fruit surface: predominant color</b>					
[69.]	green					1
	yellow green					2
	light yellow					3
	medium yellow				Mapo	4
	green and yellow					5
	yellow orange					6
	medium orange				Clementino de Nules	7
	dark orange					8
	orange red				Nova	9
	green and orange					10
	yellow and orange					11
	yellow and red					12
	orange and red					13
<b>73.</b>	<b>Fruit surface: pubescence</b>					
	<b>Not for Group 1</b>					
<b>74.</b>	<b>Fruit surface: intensity of pubescence</b>					
	<b>Not for Group 1</b>					

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
<b>75.</b> (*)	<b>Fruit surface: glossiness</b>					
[70.]	absent or very weak				Clementino de Nules	1
	weak					3
	medium				Afourer	5
	strong					7
	very strong					9
<b>76.</b>	<b>Fruit surface: roughness</b>					
[71.]	smooth				Murcott	3
	medium				Clementino de Nules	5
	rough				Temple	7
<b>77.</b>	<b>Fruit surface: evenness of size of oil glands</b>					
[72.]	all more or less the same size					1
	larger ones inter- spersed by smaller ones					2
<b>78.</b>	<b>Fruit surface: size of larger oil glands</b>					
[73.]	small					3
	medium					7
	large					9

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>79.</b>	<b>Fruit surface: conspicuousness of larger oil glands</b>					
[74.]	weak				Clementino de Nules	3
	medium					5
	strong				Satsuma Owari	7
<b>80.</b>	<b>Fruit surface: presence of pitting on oil glands</b>					
[75.]	absent					1
	present					9
<b>81.</b>	<b>Fruit surface: density of pitting on oil glands</b>					
[76.]	sparse					3
	medium					5
	dense					7
<b>82.</b>	<b>Fruit surface: depth of pitting on oil glands</b>					
[77.]	shallow					3
	medium					5
	deep					7
<b>83.</b>	<b>Fruit surface: pebbling on oil glands</b>					
[77a.]	absent					
	present					



Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
<b>84.</b>	<b>Fruit surface: degree of pebbling on oil glands</b>					
[78.]	weak					3
	medium					5
	strong					7
<b>85. (* )</b>	<b>Fruit rind: thick- ness</b>					
[80.]	thin				Murcott	3
	medium				Clementino de Nules	5
	thick				Minneola	7
<b>86. (* )</b>	<b>Fruit rind: adher- ence to flesh</b>					
[82.]	weak				Clementino de Nules	3
	medium				Fortune	5
	strong				Ortanique	7
<b>87.</b>	<b>Fruit rind: strength</b>					
[83.]	weak					3
	medium					5
	strong					7
<b>88.</b>	<b>Fruit rind: oili- ness</b>					
[85.]	dry					3
	medium				Clementina de Nules	5
	oily				Ortanique	7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
<b>89. Changed</b>	<b>Fruit rind: conspicuousness of oil glands on inner surface</b>					
[85.]	absent or very weakly conspicuous					1
	weakly conspicuous				Clementino de Nules	2
	strongly conspicuous					3
<b>90.</b>	<b>Fruit: color of albedo</b>					
[86.]	greenish					1
	white				Clementino de Nules	2
	light yellow				Murcott	3
	light orange				Afourer	4
	pinkish					5
	reddish					6
<b>91.</b>	<b>Fruit: density of albedo</b>					
[87.]	loose				Clementino de Nules	3
	medium				Fortune	5
	dense				Ortanique	7
<b>92. [88.]</b>	<b>Fruit: amount of albedo adhering to flesh (strands excluded)</b>					
	absent or very small				Clementino de Nules	1
	small					3
	medium					5
	large					7
	very large					9

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>93.</b>	<b>Fruit: albedo strands</b>					
[89.]	absent					1
	present				Clementino de Nules	9
<b>94.</b>	<b>Fruit: amount of albedo strands</b>					
[89a.]	small					3
	medium					5
	large					7
<b>95.</b>	<b>Fruit: differently colored specks in flesh</b>					
	<b>Not for Group 1</b>					
<b>96.</b>	<b>Fruit: bicolored segments</b>					
	<b>Not for Group 1</b>					
<b>97. (* )</b>	<b>Fruit: main color of flesh</b>					
[92.]	light green					1
	light yellow					3
	medium yellow					4
	light orange					5
	medium orange				Clementino de Nules	6
	dark orange					7
	red					13
	yellow and red					14
	purple					15

**TWF 1999: To decide whether to include colorless.**

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
<b>98.</b>	<b>Fruit: filling of core</b>					
[93.]	absent or very sparse				Fortune	1
	sparse					3
	medium				Clementino de Nules	5
	dense				Murcott	7
	very dense					9
<b>99.</b>	<b>Fruit: diameter of core</b>					
[94.]	small				Murcott	3
	medium				Clementino de Nules	5
	large				Clementino Hernandino	7
<b>100.</b>	<b>Fruit: rudimentary segments</b>					
[95.]	absent or very weakly expressed				Clementino de Nules	1
	weakly expressed					2
	strongly expressed					3
<b>101.</b>	<b>Fruit: number of well developed segments</b>					
[96.]	few				Clementino Oroval	3
	medium				Ortanique	5
	many				Temple	7
<b>102.</b>	<b>Fruit: coherence of adjacent segment walls</b>					
[98.]	weak				Clementino de Nules	3
	medium				Fortune	5
	strong					7

<b>103.</b>	<b>Fruit: strength of segment walls</b>		
[99.]	weak	Mapo	3
	medium	Clementino Fino	5
	strong	Clementino Oronules	7
<b>104.</b>	<b>Fruit: length of juice vesicles</b>		
[100.]	short	Wilking	3
	medium		5
	long	Clementino de Nules	7
<b>105.</b>	<b>Fruit: thickness of juice vesicles</b>		
[100a]	thin	Clementino de Nules	3
	medium		5
	thick	Mapo	7
<b>106.</b>	<b>Fruit: conspicuousness of juice vesicle walls</b>		
[101.]	low		3
	medium		5
	high		7
<b>107.</b>	<b>Fruit: coherence of juice vesicles</b>		
[102.]	weak		3
	medium		5
	strong		7
<b>108.</b> (*)	<b>Fruit: presence of navel viewed <u>internally</u></b>		
[103.]	absent or very rare		1
	occasionally present		2
	always present		3

<b>109.</b>	<b>Fruit: size of navel (viewed internally)</b>		
[104.]	short		3
	medium		5
	long		7
<b>110.</b>	<b>Fruit: juice content</b>		
[106.]	low		3
	medium	Campeona	5
	high	Marisol	7
<b>111.</b>	<b>Fruit juice: total soluble solids</b>		
[107.]	low	Satsuma Okitsu	3
	medium	Temple	5
	high	Honey	7
<b>112.</b>	<b>Fruit juice: acidity</b>		
(+)			
[108.]	low	Clementino Hernandino	3
	medium	Clementino de Nules	5
	high	Fortune	7
<b>113.</b>	<b>Fruit: strength of fibre</b>		
[109.]	weak		3
	medium		5
	strong		7
<b>114.</b>	<b>Fruit: number of seeds</b>		
[110.]	absent or very few	Clementino de Nules	1
	few		3
	medium	Kara	5
	many		7
	very many	Mandarino Común	9

<b>115.</b> (*)	<b>Seed:</b> <b>polyembryony</b>		
[111.]	absent	Wilking	1
	present	Mandarino Común	9
<b>116.</b>	<b>Seed: length</b>		
[113.]	short	Temple	3
	medium		5
	long	Campeona	7
<b>117.</b>	<b>Seed: width</b>		
[114.]	narrow	Temple	3
	medium		5
	broad	Campeona	7
<b>118.</b>	<b>Seed: surface (when fresh)</b>		
[115.]	smooth	Kinnow	1
	veined	Wilking	2
	wrinkled		3
<b>119.</b>	<b>Seed: prominence of veins and/or wrinkles (as for 118)</b>		
[116.]	weak		3
	medium		5
	strong		7
<b>120.</b>	<b>Seed: external color when <u>fresh</u></b>		
[117.]	greenish		1
	whitish	Kara	2
	yellowish		3
	pinkish		4
	brownish		5

<b>121.</b>	<b>Seed: color of inner seed coat (as for 118)</b>		
[118.]	white		1
	light yellow		2
	light brown	Murcott	3
	brown		4
	dark brown		5
	red		6
	purple		7
<b>122.</b>	<b>Seed: color of cotyledons (as for 118, polyembryonic varieties only)</b>		
[119.]	white	Murcott	1
	cream	Kara	2
	light green	Mandarino Común	3
	dark green		4
<b>123.</b>	<b>Seed: external color when <u>dry</u></b>		
[120.]	greenish		1
	whitish		2
	yellowish		3
	brownish		4
<b>124.</b>	<b>Flowering habit</b>		
	<b>Not for Group 1</b>		
<b>125.</b>	<b>Time of maturity of fruit for consumption</b>		
[122.]	early	Satsuma Okitsu	3
	medium	Clementino de Nules	5
	late	Murcott	7



---

<b>126.</b> (*)	<b>Plant: partheno- carpy</b>		
[122a.	absent	Temple	1
	present	Clementino de Nules	9

---

<b>127.</b>	<b>Plant: self- incompatability</b>		
<b>new</b>	absent	Ellendale	1
	present	Clementino de Nules	9

---

VII. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres  
GROUP 2. ORANGES AND THEIR HYBRIDS

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>1.</b> (*)	<b>Tree: habit</b>					
[2.]	upright					1
	spreading					2
	drooping					3
<b>2.</b>	<b>Tree: density of spines</b>					
	<b>Not for Group 2</b>					
<b>3.</b>	<b>Tree: length of spines</b>					
	<b>Not for Group 2</b>					
<b>4.</b> (*)	<b>Young shoot: anthocyanin coloration of tip</b>					
	<b>Not for Group 2</b>					
<b>5.</b>	<b>Young shoot: intensity of anthocyanin coloration of tip</b>					
	<b>Not for Group 2</b>					
<b>6.</b>	<b>Fully developed leaf: length of blade (apical leaflet in case of compound leaf)</b>					
[5.]	short					3
	medium					5
	long					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>7.</b>	<b>Fully developed leaf: width of blade (as for 6)</b>					
[6.]	narrow					3
	medium					5
	broad					7
<b>8.</b>	<b>Fully developed leaf: ratio length/width of blade (as for 6)</b>					
[7.]	small					3
	medium					5
	large					7
<b>9.</b>	<b>Fully developed leaf: shape of blade in cross section (as for 6)</b>					
[8.]	straight or very weakly concave					1
	weakly concave					2
	strongly concave					3
<b>10.</b>	<b>Fully developed leaf: twisting of blade (as for 6)</b>					
[9.]	absent or very weakly expressed					1
	weakly expressed					2
	strongly expressed					3
<b>11.</b>	<b>Fully developed leaf: blistering of blade (as for 6)</b>					
[10.]	absent or very weakly expressed					1
	weakly expressed					2
	strongly expressed					3

<b>12.</b>	<b>Fully developed leaf: intensity of green color of blade</b>	
[11.]	light	3
	medium	5
	dark	7
<hr/>		
<b>13.</b>	<b>Fully developed leaf: pubescence on lower side of blade</b>	
	<b>Not for Group 2</b>	
<hr/>		
<b>14.</b>	<b>Fully developed leaf: firmness of blade (as for 6)</b>	
[13.]	weak	3
	medium	5
	strong	7
<hr/>		
<b>15.</b>	<b>Fully developed leaf: undulation of margin (as for 6)</b>	
[14.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3
<hr/>		
<b>16.</b>	<b>Fully developed leaf: incisions of margin (as for 6)</b>	
[15.]	absent or very shallow	1
	shallow	2
	deep	3

**TWF: To consider whether we should rather say: entire (1), sinuate (2), crenate (3), dentate (4).**

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>17.</b> (+)	<b>Fully developed leaf: shape of apex (as for 6)</b>					
[16.]	acuminate					1
	acute					2
	obtuse					3
	rounded					4
<b>18.</b> (+)	<b>Fully developed leaf: emargination at tip (as for 6)</b>					
[17.]	absent or very shallow					1
	shallow					2
	deep					3
<b>19.</b>	<b>Fully developed leaf: length of petiole</b>					
[18.]	short					3
	medium					5
	long					7
<b>20.</b>	<b>Fully developed leaf: wings on petiole</b>					
[19.]	absent					1
	present					9
<b>21.</b>	<b>Fully developed leaf: width of wings on petiole</b>					
[19a.]	narrow					3
	medium					5
	broad					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22.	<b>Flower bud: anthocyanin coloration</b>					
	<b>Not for Group 2</b>					
23.	<b>Flower bud: intensity of anthocyanin coloration</b>					
	<b>Not for Group 2</b>					
24.	<b>Flower: diameter of calyx</b>					
[23.]	small					3
	medium					5
	large					7
25.	<b>Flower: length of petal</b>					
[24.]	short					3
	medium					5
	long					7
26.	<b>Flower: width of petal</b>					
[25.]	narrow					3
	medium					5
	broad					7
27.	<b>Flower: ratio length/width of petal</b>					
<b>new</b>	small					3
	medium					5
	large					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>28.</b>	<b>Flower: length of stamens</b>					
[27.]	short					3
	medium					5
	long					7
<b>29.</b>	<b>Anther: color</b>					
[28.]	white					1
	light yellow					2
	medium yellow					3
<b>30. (* )</b>	<b>Anther: viable pollen</b>					
[29.]	absent					1
	present					9
<b>31.</b>	<b>Style: length</b>					
[31.]	short					3
	medium					5
	long					7
<b>32.</b>	<b>Infructescence: clustering of fruits</b>					
	<b>Not for Group 2</b>					
<b>33. (* )</b>	<b>Fruit: length</b>					
	short					3
[34.]	medium					5
	long					7

<b>34.</b> (*)	<b>Fruit: diameter</b>						
[35.]	small						3
	medium						5
	large						7
	Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>35.</b> (*)	<b>Fruit: ratio length/diameter</b>						
[36.]	small						3
	medium						5
	large						7
<b>36.</b> (*)	<b>Fruit: position of broadest part</b>						
[37.]	towards stalk end						1
	at middle						2
	towards distal part						3
<b>37.</b>	<b>Fruit: circumfer- ence</b>						
	<b>Not for Group 2</b>						
<b>38.</b> (*) (+)	<b>Fruit: general shape of stalk end</b>						
[39.]	flattened						1
	slightly rounded						2
	strongly rounded						3
	tapered						4
<b>39.</b> (*) (+)	<b>Fruit: depression at stalk end</b>						
[40.]	absent						1
	present						9



---

<b>40.</b>	<b>Fruit: depth of depression at stalk end</b>		
[41.]	shallow		3
	medium		5
	deep		7

---



---

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
------------------------------------	---------	----------	---------	---------	--	---------------

41.	<b>Fruit: neck</b>					
	<b>Not for Group 2</b>					
42.	<b>Fruit: length of neck</b>					
	<b>Not for Group 2</b>					
43.	<b>Fruit: thickness of neck</b>					
	<b>Not for Group 2</b>					
44. (+)	<b>Fruit: constriction at stalk end</b>					
	<b>Not for Group 2</b>					
45.	<b>Fruit: expression of constriction at stalk end</b>					
	<b>Not for Group 2</b>					
46.	<b>Fruit: radial grooves at stalk end</b>					
[45b.]	absent or very few					1
	few					2
	many					3
47.	<b>Fruit: length of radial grooves at stalk end</b>					
[45c.]	short					3
	medium					5
	long					7
48. (+)	<b>Fruit: local depression at stalk attachment (necked varieties only)</b>					
	<b>Not for Group 2</b>					
Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota

<b>49.</b>	<b>Fruit: collar</b>					
(+)	absent					1
[46a.]	present					9
<b>50.</b>	<b>Fruit: height of collar</b>					
[47.]	low					3
	medium					5
	high					7
<b>51.</b>	<b>Fruit: diameter of collar</b>					
<b>new</b>	small					3
	medium					5
	large					7
<b>52.</b>	<b>Fruit: abscission layer between floral disc and fruit</b>					
[49.]	absent or very weakly developed					1
	weakly developed					2
	strongly developed					3
<b>53.</b>	<b>Fruit: general shape of distal part</b>					
(*)						
(+)						
[50.]	flattened					1
	slightly rounded					2
	strongly rounded					3
<b>54.</b>	<b>Fruit: depression at distal end</b>					
(*)						
(+)						
[51.]	absent					1
	present					9
Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota

<b>55.</b>	<b>Fruit: depth of depression at distal end</b>	
[52.]	shallow	3
	medium	5
	deep	7
<b>56.</b>	<b>Fruit: diameter of depression at distal end</b>	
[53.]	small	3
	medium	5
	large	7
<b>57.</b> (* )	<b>Fruit: nipple</b> <b>Not for Group 2</b>	
<b>58.</b>	<b>Fruit: prominence of nipple</b> <b>Not for Group 2</b>	
<b>59.</b> (* )	<b>Fruit: areola</b>	
	absent	1
[56.]	present	9
<b>60.</b> (+)	<b>Fruit: type of areola</b>	
	smooth	1
[57.]	grooved	2
	ridged	3
<b>61.</b>	<b>Fruit: conspicuousness of areola</b>	
[58.]	weak	1
	medium	2
	strong	3

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>62.</b>	<b>Fruit: develop- ment of areola</b>					
[59.]	not complete					1
	complete					2
<b>63.</b>	<b>Fruit: diameter of areola</b>					
[60.]	small					3
	medium					5
	large					7
<b>64.</b>	<b>Fruit: diameter of stylar scar</b>					
[61.]	small					3
	medium					5
	large					7
<b>65.</b>	<b>Fruit: protruding stylar point</b>					
[62.]	absent					1
	present					9
<b>66.</b>	<b>Fruit: persistence of style</b>					
[63.]	none					1
	partial					2
	total					3
<b>67.</b>	<b>Fruit: navel open- ing</b>					
[64.]	absent					1
	occasionally pres- ent					2
	always present					3

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>68.</b>	<b>Fruit: diameter of navel opening</b>					
[65.]	small					2
	medium					5
	large					7
<b>69.</b>	<b>Fruit: bulging of navel</b>					
[66.]	absent or very weakly expressed					1
	weakly expressed					2
	strongly expressed					3
<b>70.</b>	<b>Fruit: radial grooves at distal end</b>					
[68.]	absent					1
	present					9
<b>71.</b>	<b>Fruit: expression of radial grooves at distal end</b>					
[68a.]	weak					3
	medium					5
	strong					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>72. (*)</b>	<b>Fruit surface: predominant color</b>					
[69.]	green					1
	yellow green					2
	light yellow					3
	medium yellow					4
	green and yellow					5
	yellow orange					6
	medium orange					7
	dark orange					8
	orange red					9
	green and orange					10
	yellow and orange					11
	yellow and red					12
	orange and red					13
<b>73.</b>	<b>Fruit surface: pubescence</b>					
	<b>Not for Group 2</b>					
<b>74.</b>	<b>Fruit surface: intensity of pubes- cence</b>					
	<b>Not for Group 2</b>					

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>75.</b> (*)	<b>Fruit surface: glossiness</b>					
[70.]	absent or very weak					1
	weak					3
	medium					5
	strong					7
	very strong					9
<b>76.</b>	<b>Fruit surface: roughness</b>					
[71.]	smooth					3
	medium					5
	rough					7
<b>77.</b>	<b>Fruit surface: evenness of size of oil glands</b>					
[72.]	all more or less the same size					1
	larger ones inter- spersed by smaller ones					2
<b>78.</b>	<b>Fruit surface: size of larger oil glands</b>					
[73.]	small					3
	medium					7
	large					9



<b>79.</b>	<b>Fruit surface: conspicuousness of larger oil glands</b>	
[74.]	weak	3
	medium	5
	strong	7
<hr/>		
<b>80.</b>	<b>Fruit surface: presence of pitting on oil glands</b>	
[75.]	absent	1
	present	9
<hr/>		
<b>81.</b>	<b>Fruit surface: density of pitting on oil glands</b>	
[76.]	sparse	3
	medium	5
	dense	7
<hr/>		
<b>82.</b>	<b>Fruit surface: depth of pitting on oil glands</b>	
[77.]	shallow	3
	medium	5
	deep	7
<hr/>		
<b>83.</b>	<b>Fruit surface: pebbling on oil glands</b>	
[77a.]	absent	
	present	
<hr/>		
<b>84.</b>	<b>Fruit surface: degree of pebbling on oil glands</b>	
[78.]	weak	3
	medium	5
	strong	7

---

<b>85.</b> (*)	<b>Fruit rind: thick- ness</b>	
[80.]	thin	3
	medium	5
	thick	7

---

<b>86.</b> (*)	<b>Fruit rind: adher- ence to flesh</b>	
	<b>Not for Group 2</b>	

---

<b>87.</b>	<b>Fruit rind: strength</b>	
[83.]	weak	3
	medium	5
	strong	7

---

<b>88.</b>	<b>Fruit rind: oili- ness</b>	
[84.]	dry	3
	medium	5
	oily	7

---

<b>89.</b>	<b>Fruit rind: con- spicuousness of oil glands on inner surface</b>	
	<b>Not for Group 2</b>	

---

<b>90.</b>	<b>Fruit: color of albedo</b>	
[86.]	greenish	1
	white	2
	light yellow	3
	light orange	4
	pinkish	5
	reddish	6

---

---

<b>91.</b>	<b>Fruit: density of albedo</b>	
	<b>Not for Group 2</b>	
[87.]	loose	3
	medium	5
	dense	7

---

<b>92.</b> [88.]	<b>Fruit: amount of albedo adhering to flesh (strands excluded)</b>	
	<b>Not for Group 2</b>	

---

<b>93.</b>	<b>Fruit: albedo strands</b>	
	<b>Not for Group 2</b>	

---

<b>94.</b>	<b>Fruit: amount of albedo strands</b>	
	<b>Not for Group 2</b>	

---

<b>95.</b>	<b>Fruit: differently colored specks in flesh</b>	
[90.]	absent	1
	present	9

---

<b>96.</b>	<b>Fruit: bicolored segments</b>	
[91.]	absent	1
	present	9

---

<b>97.</b> (*)	<b>Fruit: main color of flesh</b>	
[92.]	light green	1
	white	2
	light yellow	3
	medium yellow	4
	light orange	5
	medium orange	6
	dark orange	7
	red	13
	yellow and red	14
	purple	15

---

**TWF 1999: To decide whether to include colorless.**

	Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>98.</b>		<b>Fruit: filling of core</b>					
[93.]		absent or very sparse					1
		sparse					3
		medium					5
		dense					7
		very dense					9

<b>99.</b>	<b>Fruit: diameter of core</b>	
[94.]	small	3
	medium	5
	large	7
<b>100.</b>	<b>Fruit: rudimentary segments</b>	
[95.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3
<b>101.</b>	<b>Fruit: number of well developed segments</b>	
[96.]	few	3
	medium	5
	many	7
<b>102.</b>	<b>Fruit: coherence of adjacent segment walls</b>	
[98.]	weak	3
	medium	5
	strong	7
<b>103.</b>	<b>Fruit: strength of segment walls</b>	
[99.]	weak	3
	medium	5
	strong	7
<b>104.</b>	<b>Fruit: length of juice vesicles</b>	
[100.]	short	3
	medium	5
	long	7

<b>105.</b>	<b>Fruit: thickness of juice vesicles</b>	
[100a]	thin	3
	medium	5
	thick	7
<b>106.</b>	<b>Fruit: conspicu-ousness of juice vesicle walls</b>	
[101.]	low	3
	medium	5
	high	7
<b>107.</b>	<b>Fruit: coherence of juice vesicles</b>	
[102.]	weak	3
	medium	5
	strong	7
<b>108.</b> (*)	<b>Fruit: presence of navel viewed <u>in-ternally</u></b>	
[103.]	absent or very rare	1
	occasionally present	2
	always present	3
<b>109.</b>	<b>Fruit: size of navel (viewed internally)</b>	
[104.]	short	3
	medium	5
	long	7
<b>110.</b>	<b>Fruit: juice content</b>	
[106.]	low	3
	medium	5
	high	7

<b>111.</b>	<b>Fruit juice: total soluble solids</b>	
[107.]	low	3
	medium	5
	high	7
<b>112.</b>	<b>Fruit juice: acidity</b>	
(+)		
[108.]	low	3
	medium	5
	high	7
<b>113.</b>	<b>Fruit: strength of fibre</b>	
[109.]	weak	3
	medium	5
	strong	7
<b>114.</b>	<b>Fruit: number of seeds</b>	
[110.]	absent or very few	1
	few	3
	medium	5
	many	7
	very many	9
<b>115.</b>	<b>Seed: polyembryony</b>	
(*)		
[111.]	absent	1
	present	9
<b>116.</b>	<b>Seed: length</b>	
[113.]	short	3
	medium	5
	long	7

<b>117.</b>	<b>Seed: width</b>	
[114.]	narrow	3
	medium	5
	broad	7
<hr/>		
<b>118.</b>	<b>Seed: surface (when fresh)</b>	
[115.]	smooth	1
	veined	2
	wrinkled	3
<hr/>		
<b>119.</b>	<b>Seed: prominence of veins and/or wrinkles (as for 118)</b>	
[116.]	weak	3
	medium	5
	strong	7
<hr/>		
<b>120.</b>	<b>Seed: external color when <u>fresh</u></b>	
[117.]	greenish	1
	whitish	2
	yellowish	3
	pinkish	4
	brownish	5
<hr/>		
<b>121.</b>	<b>Seed: color of inner seed coat (as for 118)</b>	
[118.]	white	1
	light yellow	2
	light brown	3
	brown	4
	dark brown	5
	red	6
	purple	7
<hr/>		



<b>122.</b>	<b>Seed: color of cotyledons (as for 118, polyembryonic varieties only)</b>	
[119.]	white	1
	cream	2
	light green	3
	dark green	4
<b>123.</b>	<b>Seed: external color when <u>dry</u></b>	
[120.]	greenish	1
	whitish	2
	yellowish	3
	brownish	4
<b>124.</b>	<b>Flowering habit</b>	
	<b>Not for Group 2</b>	
<b>125.</b> (*)	<b>Time of maturity of fruit for consumption</b>	
[122.]	early	3
	medium	5
	late	7
<b>126.</b> (*)	<b>Plant: parthenocarp</b>	
[122a.]	absent	1
	present	9
<b>127.</b>	<b>Plant: self-incompatability</b>	
<b>new</b>	absent	1
	present	9

VII. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres  
GROUP 3. LEMONS AND LIMES AND THEIR HYBRIDS

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>1.</b> (*)	<b>Tree: habit</b>					
[2.]	upright					1
	spreading					2
	drooping					3
<b>2.</b>	<b>Tree: density of spines</b>					
[3.]	absent or very sparse					1
	sparse					2
	dense					3
<b>3.</b>	<b>Tree: length of spines</b>					
<b>new</b>	short					3
	medium					5
	long					7
<b>4.</b> (*)	<b>Young shoot: anthocyanin coloration of tip</b>					
[4.]	absent					1
	present					9
<b>5.</b>	<b>Young shoot: intensity of anthocyanin coloration of tip</b>					
[4a.]	weak					3
	medium					5
	strong					7

<b>6.</b>	<b>Fully developed leaf: length of blade (apical leaf-let in case of compound leaf)</b>	
[5.]	short	3
	medium	5
	long	7
<b>7.</b>	<b>Fully developed leaf: width of blade (as for 6)</b>	
[6.]	narrow	3
	medium	5
	broad	7
<b>8.</b>	<b>Fully developed leaf: ratio length/width of blade (as for 6)</b>	
[7.]	small	3
	medium	5
	large	7
<b>9.</b>	<b>Fully developed leaf: shape of blade in cross section (as for 6)</b>	
[8.]	straight or very weakly concave	1
	weakly concave	2
	strongly concave	3
<b>10.</b>	<b>Fully developed leaf: twisting of blade (as for 6)</b>	
[9.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3

---

<b>11.</b>	<b>Fully developed leaf: blistering of blade (as for 6)</b>	
[10.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3
<hr/>		
<b>12.</b>	<b>Fully developed leaf: intensity of green color of blade</b>	
[11.]	light	3
	medium	5
	dark	7
<hr/>		
<b>13.</b>	<b>Fully developed leaf: pubescence on lower side of blade</b>	
[12.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3
<hr/>		
<b>14.</b>	<b>Fully developed leaf: firmness of blade (as for 6)</b>	
[13.]	weak	3
	medium	5
	strong	7
<hr/>		
<b>15.</b>	<b>Fully developed leaf: undulation of margin (as for 6)</b>	
[14.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3

---

<b>16.</b>	<b>Fully developed leaf: incisions of margin (as for 6)</b>	
[15.]	absent or very shallow	1
	shallow	2
	deep	3
<hr/>		
<b>TWF: To consider whether we should rather say: entire (1), sinuate (2), crenate (3), dentate (4).</b>		
<hr/>		
<b>17.</b>	<b>Fully developed leaf: shape of apex (as for 6)</b>	
(+)		
[16.]	acuminate	1
	acute	2
	obtuse	3
	rounded	4
<hr/>		
<b>18.</b>	<b>Fully developed leaf: emargination at tip (as for 6)</b>	
(+)		
[17.]	absent or very shallow	1
	shallow	2
	deep	3
<hr/>		
<b>19.</b>	<b>Fully developed leaf: length of petiole</b>	
[18.]	short	3
	medium	5
	long	7
<hr/>		
<b>20.</b>	<b>Fully developed leaf: wings on petiole</b>	
[19.]	absent	1
	present	9
<hr/>		

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
<b>21. Changed</b>	<b>Fully developed leaf: width of wings on petiole</b>					
[19a.]	narrow					3
	medium					5
	broad					7
<b>22.</b>	<b>Flower bud: anthocyanin coloration</b>					
[21.]	absent					1
	present					9
<b>23.</b>	<b>Flower bud: intensity of anthocyanin coloration</b>					
[21a.]	weak					3
	medium					5
	strong					7
<b>24.</b>	<b>Flower: diameter of calyx</b>					
[23.]	small					3
	medium					5
	large					7
<b>25.</b>	<b>Flower: length of petal</b>					
[24.]	short					3
	medium					5
	long					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>26.</b>	<b>Flower: width of petal</b>					
[25.]	narrow					3
	medium					5
	broad					7
<b>27.</b>	<b>Flower: ratio length/width of petal</b>					
<b>new</b>	small					3
	medium					5
	large					7
<b>28.</b>	<b>Flower: length of stamens</b>					
[27.]	short					3
	medium					5
	long					7
<b>29.</b>	<b>Anther: color</b>					
[28.]	white					1
	light yellow					2
	medium yellow					3
<b>30. (* )</b>	<b>Anther: viable pollen</b>					
[29.]	absent					1
	present					9
<b>31.</b>	<b>Style: length</b>					
[31.]	short					3
	medium					5
	long					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>32.</b>	<b>Infructescence: clustering of fruits</b>					
<b>new</b>	absent					1
	present					9
<b>33.</b>	<b>Fruit: length</b>					
(*)	short					3
[34.]	medium					5
	long					7
<b>34.</b>	<b>Fruit: diameter</b>					
(*)						
[35.]	small					3
	medium					5
	large					7
<b>35.</b>	<b>Fruit: ratio length/diameter</b>					
(*)						
[36.]	small					3
	medium					5
	large					7
<b>36.</b>	<b>Fruit: position of broadest part</b>					
(*)						
[37.]	towards stalk end					1
	at middle					2
	towards distal part					3



Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>37.</b>	<b>Fruit: circumfer- ence</b>					
	<b>Not for Group 3</b>					
<b>38.</b> (* (+)	<b>Fruit: general shape of stalk end</b>					
[39.]	flattened					1
	slightly rounded					2
	strongly rounded					3
	tapered					4
<b>39.</b> (* (+)	<b>Fruit: depression at stalk end</b>					
[40.]	absent					1
	present					9
<b>40.</b>	<b>Fruit: depth of depression at stalk end</b>					
[41.]	shallow					3
	medium					5
	deep					7
<b>41.</b> (* (+)	<b>Fruit: neck</b>					
	absent					1
[42.]	present					9
<b>42.</b>	<b>Fruit: length of neck</b>					
[43.]	short					3
	medium					5
	long					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>43. Changed</b>	<b>Fruit: thickness of neck</b>					
[44.]	thin					3
	medium					5
	thick					7

<b>44.</b> (+)	<b>Fruit: constriction at stalk end</b>					
	<b>Not for Group 3</b>					
<b>45.</b>	<b>Fruit: expression of constriction at stalk end</b>					
	<b>Not for Group 3</b>					
<b>46.</b>	<b>Fruit: radial grooves at stalk end</b>					
	<b>Not for Group 3</b>					
<b>47.</b>	<b>Fruit: length of radial grooves at stalk end</b>					
	<b>Not for Group 3</b>					
<b>48.</b> (+)	<b>Fruit: local de- pression at stalk attachment (necked varieties only)</b>					
[46.]	absent or very shallow					1
	shallow					2
	deep					3
<b>49.</b> (+)	<b>Fruit: collar</b>					
	absent					1
[46a.]	present					9
<b>Group</b> <b>Groupe</b> <b>Gruppe</b> <b>Grupo</b>	<b>English</b>	<b>français</b>	<b>deutsch</b>	<b>español</b>	<b>Example Varieties</b> <b>Exemples</b> <b>Beispielssorten</b> <b>Varietades ejemplo</b>	<b>Note/ Nota</b>

<b>50.</b>	<b>Fruit: height of collar</b>	
[47.]	low	3
	medium	5
	high	7
<hr/>		
<b>51.</b>	<b>Fruit: diameter of collar</b>	
<b>new</b>	small	3
	medium	5
	large	7
<hr/>		
<b>52.</b>	<b>Fruit: abscission layer between floral disc and fruit</b>	
[49.]	absent or very weakly developed	1
	weakly developed	2
	strongly developed	3
<hr/>		
<b>53.</b> (* (+)	<b>Fruit: general shape of distal part</b>	
[50.]	flattened	1
	slightly rounded	2
	strongly rounded	3
<hr/>		

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>54.</b> (* (+)	<b>Fruit: depression at distal end</b>					
	<b>Not for Group 3</b>					
<b>55.</b>	<b>Fruit: depth of depression at dis- tal end</b>					
	<b>Not for Group 3</b>					
<b>56.</b>	<b>Fruit: diameter of depression at dis- tal end</b>					
[53.]	small					3
	medium					5
	large					7
<b>57.</b> (* (+)	<b>Fruit: nipple</b>					
	absent					3
[54.]	present					9
<b>58.</b>	<b>Fruit: prominence of nipple</b>					
[55.]	weak					3
	medium					5
	strong					7
<b>59.</b> (*	<b>Fruit: areola</b>					
	absent					1
[56.]	present					9
<b>60.</b> (+)	<b>Fruit: type of areola</b>					
	smooth					1
[57.]	grooved					2
	ridged					3

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>61.</b>	<b>Fruit: conspicu- ousness of areola</b>					
[58.]	weak					1
	medium					2
	strong					3
<b>62.</b>	<b>Fruit: develop- ment of areola</b>					
[59.]	not complete					1
	complete					2
<b>63.</b>	<b>Fruit: diameter of areola</b>					
[60.]	small					3
	medium					5
	large					7
<b>64.</b>	<b>Fruit: diameter of stylar scar</b>					
[61.]	small					3
	medium					5
	large					7
<b>65.</b>	<b>Fruit: protruding stylar point</b>					
	<b>Not for Group 3</b>					
<b>66.</b>	<b>Fruit: persistence of style</b>					
	<b>Not for Group 3</b>					

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>67.</b>	<b>Fruit: navel opening</b>					
	<b>Not for Group 3</b>					
<b>68.</b>	<b>Fruit: diameter of navel opening</b>					
	<b>Not for Group 3</b>					
<b>69.</b>	<b>Fruit: bulging of navel</b>					
	<b>Not for Group 3</b>					
<b>70.</b>	<b>Fruit: radial grooves at distal end</b>					
[68.]	absent					1
	present					9
<b>71.</b>	<b>Fruit: expression of radial grooves at distal end</b>					
[68a.]	weak					3
	medium					5
	strong					7

---

Group	English	français	deutsch	español	Example Varieties	
Groupe					Exemples	Note/
Gruppe					Beispielssorten	Nota
Grupo					Variedades ejemplo	

---



<b>72.</b> <b>(*)</b>	<b>Fruit surface:</b> <b>predominant</b> <b>color</b>					
[69.]	green					1
	yellow green					2
	light yellow					3
	medium yellow					4
	green and yellow					5
	yellow orange					6
	medium orange					7
	dark orange					8
	orange red					9
	green and orange					10
	yellow and orange					11
	yellow and red					12
	orange and red					13

---

**73.** **Fruit surface:**  
**pubescence**

**Not for Group 3**

---

**74.** **Fruit surface:**  
**intensity of pubes-**  
**cence**

**Not for Group 3**

---

<b>75.</b> <b>(*)</b>	<b>Fruit surface:</b> <b>glossiness</b>					
[70.]	absent or very weak					1
	weak					3
	medium					5
	strong					7
	very strong					9

---

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
------------------------------------	---------	----------	---------	---------	--	---------------

---

<b>76.</b>	<b>Fruit surface: roughness</b>	
[71.]	smooth	3
	medium	5
	rough	7
<hr/>		
<b>77.</b>	<b>Fruit surface: evenness of size of oil glands</b>	
[72.]	all more or less the same size	1
	larger ones inter- spersed by smaller ones	2
<hr/>		
<b>78.</b>	<b>Fruit surface: size of larger oil glands</b>	
[73.]	small	3
	medium	7
	large	9
<hr/>		
<b>79.</b>	<b>Fruit surface: conspicuousness of larger oil glands</b>	
[74.]	weak	3
	medium	5
	strong	7
<hr/>		
<b>80.</b>	<b>Fruit surface: presence of pitting on oil glands</b>	
[75.]	absent	1
	present	9
<hr/>		

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>81.</b>	<b>Fruit surface: density of pitting on oil glands</b>					
[76.]	sparse					3
	medium					5
	dense					7
<b>82.</b>	<b>Fruit surface: depth of pitting on oil glands</b>					
[77.]	shallow					3
	medium					5
	deep					7
<b>83.</b>	<b>Fruit surface: pebbling on oil glands</b>					
[77a.]	absent					
	present					
<b>84.</b>	<b>Fruit surface: degree of pebbling on oil glands</b>					
[78.]	weak					3
	medium					5
	strong					7
<b>85. (* )</b>	<b>Fruit rind: thick- ness</b>					
[80.]	thin					3
	medium					5
	thick					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>86.</b> (*)	<b>Fruit rind: adherence to flesh</b>					
	<b>Not for Group 3</b>					
<b>87.</b>	<b>Fruit rind: strength</b>					
	<b>Not for Group 3</b>					
<b>88.</b>	<b>Fruit rind: oiliness</b>					
[85.]	dry					3
	medium					5
	oily					7
<b>89.</b>	<b>Fruit rind: conspicuousness of oil glands on inner surface</b>					
	<b>Not for Group 3</b>					
<b>90.</b>	<b>Fruit: color of albedo</b>					
[86.]	greenish					1
	white					2
	light yellow					3
	light orange					4
	pinkish					5
	reddish					6

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>91.</b>	<b>Fruit: density of albedo</b>					
	<b>Not for Group 3</b>					
<b>92.</b> [88.]	<b>Fruit: amount of albedo adhering to flesh (strands excluded)</b>					
	<b>Not for Group 3</b>					
<b>93.</b>	<b>Fruit: albedo strands</b>					
	<b>Not for Group 3</b>					
<b>94.</b>	<b>Fruit: amount of albedo strands</b>					
	<b>Not for Group 3</b>					
<b>95.</b>	<b>Fruit: differently colored specks in flesh</b>					
	<b>Not for Group 3</b>					
<b>96.</b>	<b>Fruit: bicolored segments</b>					
	<b>Not for Group 3</b>					
<b>97.</b> (*)	<b>Fruit: main color of flesh</b>					
[92.]	light green					1
	white					2
	light yellow					3
	medium yellow					4
	light orange					5
	medium orange					6
	dark orange					7

**TWF 1999: To decide whether to include colorless.**

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>98.</b>	<b>Fruit: filling of core</b>					
[93.]	absent or very sparse					1
	sparse					3
	medium					5
	dense					7
	very dense					9
<b>99.</b>	<b>Fruit: diameter of core</b>					
[94.]	small					3
	medium					5
	large					7
<b>100.</b>	<b>Fruit: rudimentary segments</b>					
[95.]	absent or very weakly expressed					1
	weakly expressed					2
	strongly expressed					3
<b>101.</b>	<b>Fruit: number of well developed segments</b>					
[96.]	few					3
	medium					5
	many					7

<b>102.</b>	<b>Fruit: coherence of adjacent segment walls</b>		
	<b>Not for Group 3</b>		
<hr/>			
<b>103.</b>	<b>Fruit: strength of segment walls</b>		
[99.]	weak		3
	medium		5
	strong		7
<hr/>			
<b>104.</b>	<b>Fruit: length of juice vesicles</b>		
[100.]	short		3
	medium		5
	long		7
<hr/>			
<b>105.</b>	<b>Fruit: thickness of juice vesicles</b>		
[100a]	thin		3
	medium		5
	thick		7
<hr/>			
<b>106.</b>	<b>Fruit: conspicuousness of juice vesicle walls</b>		
[101.]	low		3
	medium		5
	high		7
<hr/>			
<b>107.</b>	<b>Fruit: coherence of juice vesicles</b>		
[102.]	weak		3
	medium		5
	strong		7
<hr/>			

<b>108.</b> (*)	<b>Fruit: presence of navel viewed <u>internally</u></b>		
	<b>Not for Group 3</b>		
<b>109.</b>	<b>Fruit: size of navel (viewed internally)</b>		
	<b>Not for group 3</b>		
<b>110.</b>	<b>Fruit: juice content</b>		
[106.]	low		3
	medium		5
	high		7
<b>111.</b>	<b>Fruit juice: total soluble solids</b>		
[107.]	low		3
	medium		5
	high		7
<b>112.</b> (+)	<b>Fruit juice: acidity</b>		
[108.]	low		3
	medium		5
	high		7
<b>113.</b>	<b>Fruit: strength of fibre</b>		
[109.]	weak		3
	medium		5
	strong		7



<b>114.</b>	<b>Fruit: number of seeds</b>	
[110.]	absent or very few	1
	few	3
	medium	5
	many	7
	very many	9
<hr/>		
<b>115. (*).</b>	<b>Seed: polyembryony</b>	
[111.]	absent	1
	present	9
<hr/>		
<b>116.</b>	<b>Seed: length</b>	
[113.]	short	3
	medium	5
	long	7
<hr/>		
<b>117.</b>	<b>Seed: width</b>	
[114.]	narrow	3
	medium	5
	broad	7
<hr/>		
<b>118.</b>	<b>Seed: surface (when fresh)</b>	
[115.]	smooth	1
	veined	2
	wrinkled	3
<hr/>		
<b>119.</b>	<b>Seed: prominence of veins and/or wrinkles (as for 118)</b>	
[116.]	weak	3
	medium	5
	strong	7
<hr/>		

<b>120.</b>	<b>Seed: external color when <u>fresh</u></b>	
[117.]	greenish	1
	whitish	2
	yellowish	3
	pinkish	4
	brownish	5
<hr/>		
<b>121.</b>	<b>Seed: color of inner seed coat (as for 118)</b>	
[118.]	white	1
	light yellow	2
	light brown	3
	brown	4
	dark brown	5
	red	6
	purple	7
<hr/>		
<b>122.</b>	<b>Seed: color of cotyledons (as for 118, polyembry- onic varieties only)</b>	
[119.]	white	1
	cream	2
	light green	3
	dark green	4
<hr/>		
<b>123.</b>	<b>Seed: external color when <u>dry</u></b>	
[120.]	greenish	1
	whitish	2
	yellowish	3
	brownish	4

---

<b>124.</b>	<b>Flowering habit</b>	
(*)	flowering once	1
[121.]	flowering more than once	2

---

<b>125.</b>	<b>Time of maturity of fruit for consumption</b>	
(*)		
[122.]	early	3
	medium	5
	late	7

---

<b>126.</b>	<b>Plant: parthenocarp</b>	
(*)		
[122a.]	absent	1
	present	9

---

<b>127.</b>	<b>Plant: self-incompatability</b>	
<b>new</b>	absent	1
	present	9

---

VII. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres  
GROUP 4. GRAPEFRUIT AND PUMMELOS AND THEIR HYBRIDS

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>1.</b> (*)	<b>Tree: habit</b>					
[2.]	upright					1
	spreading					2
	drooping					3
<b>2.</b>	<b>Tree: density of spines</b>					
[3.]	absent or very sparse					1
	sparse					2
	dense					3
<b>3.</b>	<b>Tree: length of spines</b>					
<b>new</b>	short					3
	medium					5
	long					7
<b>4.</b> (*)	<b>Young shoot: anthocyanin coloration of tip</b>					
[4.]	absent					1
	present					9
<b>5.</b>	<b>Young shoot: intensity of anthocyanin coloration of tip</b>					
[4a.]	weak					3
	medium					5
	strong					7

<b>6.</b>	<b>Fully developed leaf: length of blade (apical leaf-let in case of compound leaf)</b>	
[5.]	short	3
	medium	5
	long	7
<b>7.</b>	<b>Fully developed leaf: width of blade (as for 6)</b>	
[6.]	narrow	3
	medium	5
	broad	7
<b>8.</b>	<b>Fully developed leaf: ratio length/width of blade (as for 6)</b>	
[7.]	small	3
	medium	5
	large	7
<b>9.</b>	<b>Fully developed leaf: shape of blade in cross section (as for 6)</b>	
[8.]	straight or very weakly concave	1
	weakly concave	2
	strongly concave	3
<b>10.</b>	<b>Fully developed leaf: twisting of blade (as for 6)</b>	
[9.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3

<b>11.</b>	<b>Fully developed leaf: blistering of blade (as for 6)</b>	
[10.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3
<b>12.</b>	<b>Fully developed leaf: intensity of green color of blade</b>	
[11.]	light	3
	medium	5
	dark	7
<b>13.</b>	<b>Fully developed leaf: pubescence on lower side of blade</b>	
[12.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3
<b>14.</b>	<b>Fully developed leaf: firmness of blade (as for 6)</b>	
[13.]	weak	3
	medium	5
	strong	7
<b>15.</b>	<b>Fully developed leaf: undulation of margin (as for 6)</b>	
[14.]	absent or very weakly expressed	1
	weakly expressed	2
	strongly expressed	3

<b>16.</b>	<b>Fully developed leaf: incisions of margin (as for 6)</b>	
[15.]	absent or very shallow	1
	shallow	2
	deep	3
<hr/>		
<b>TWF: To consider whether we should rather say: entire (1), sinuate (2), crenate (3), dentate (4).</b>		
<hr/>		
<b>17.</b>	<b>Fully developed leaf: shape of apex (as for 6)</b>	
(+)		
[16.]	acuminate	1
	acute	2
	obtuse	3
	rounded	4
<hr/>		
<b>18.</b>	<b>Fully developed leaf: emargination at tip (as for 6)</b>	
(+)		
[17.]	absent or very shallow	1
	shallow	2
	deep	3
<hr/>		
<b>19.</b>	<b>Fully developed leaf: length of petiole</b>	
[18.]	short	3
	medium	5
	long	7
<hr/>		
<b>20.</b>	<b>Fully developed leaf: wings on petiole</b>	
[19.]	absent	1
	present	9
<hr/>		

	Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
<b>21.</b>		<b>Fully developed leaf: width of wings on petiole</b>					
[19a.]		narrow					3
		medium					5
		broad					7
<b>22.</b>		<b>Flower bud: anthocyanin coloration</b>					
[21.]		absent					1
		present					9
<b>23.</b>		<b>Flower bud: intensity of anthocyanin coloration</b>					
[21a.]		weak					3
		medium					5
		strong					7
<b>24.</b>		<b>Flower: diameter of calyx</b>					
[23.]		small					3
		medium					5
		large					7
<b>25.</b>		<b>Flower: length of petal</b>					
[24.]		short					3
		medium					5
		long					7



	Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>26.</b>		<b>Flower: width of petal</b>					
[25.]		narrow					3
		medium					5
		broad					7
<b>27.</b>		<b>Flower: ratio length/width of petal</b>					
<b>new</b>		small					3
		medium					5
		large					7
<b>28.</b>		<b>Flower: length of stamens</b>					
[27.]		short					3
		medium					5
		long					7
<b>29.</b>		<b>Anther: color</b>					
[28.]		white					1
		light yellow					2
		medium yellow					3
<b>30. (* )</b>		<b>Anther: viable pollen</b>					
[29.]		absent					1
		present					9
<b>31.</b>		<b>Style: length</b>					
[31.]		short					3
		medium					5
		long					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>32.</b>	<b>Infructescence: clustering of fruits</b>					
<b>new</b>	absent					1
	present					9
<b>33.</b>	<b>Fruit: length</b>					
(*)	short					3
[34.]	medium					5
	long					7
<b>34.</b>	<b>Fruit: diameter</b>					
(*)						
[35.]	small					3
	medium					5
	large					7
<b>35.</b>	<b>Fruit: ratio length/diameter</b>					
(*)						
[36.]	small					3
	medium					5
	large					7
<b>36.</b>	<b>Fruit: position of broadest part</b>					
(*)						
[37.]	towards stalk end					1
	at middle					2
	towards distal part					3

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>37.</b>	<b>Fruit: circumfer- ence</b>					
	<b>Not for Group 4</b>					
<b>38.</b> (* (+)	<b>Fruit: general shape of stalk end</b>					
[39.]	flattened					1
	slightly rounded					2
	strongly rounded					3
	tapered					4
<b>39.</b> (* (+)	<b>Fruit: depression at stalk end</b>					
[40.]	absent					1
	present					9
<b>40.</b>	<b>Fruit: depth of depression at stalk end</b>					
[41.]	shallow					3
	medium					5
	deep					7
<b>41.</b>	<b>Fruit: neck</b>					
	<b>Not for group 4</b>					
<b>42.</b>	<b>Fruit: length of neck</b>					
	<b>Not for Group 4</b>					
<b>43.</b>	<b>Fruit: thickness of neck</b>					
	<b>Not for Group 4</b>					

---

**44.** **Fruit:**  
**constriction at**  
**stalk end**

(+)

**Not for Group 4**

---

Group  
Groupe  
Gruppe  
Grupo

English

français

deutsch

español

Example  
Exemples

Beispielssorten

Variedades ejemplo

Varieties

Note/

Nota

---

**45.** **Fruit: expression**  
**of constriction at**  
**stalk end**

**Not for Group 4**

---

**46.**

**Fruit: radial**  
**grooves at stalk**  
**end**

**Not for Group 4**

---

47. **Fruit: length of radial grooves at stalk end**

**Not for Group 4**

---

48. **Fruit: local depression at stalk attachment (necked varieties only)**

**Not for Group 4**

---

49. **Fruit: collar**

**Not for Group 4**

---

50. **Fruit: height of collar**

**Not for Group 4**

---

51. **Fruit: diameter of collar**

**Not for Group 4**

---

52. **Fruit: abscission layer between floral disc and fruit**

[49.]	absent or very weakly developed	1
	weakly developed	2
	strongly developed	3

---

Group  
Groupe  
Gruppe  
Grupo

English

français

deutsch

español

Example Varieties  
Exemples  
Beispielssorten  
Variedades ejemplo

Note/  
Nota

---

<b>53.</b> (* (+)	<b>Fruit: general shape of distal part</b>						
[50.]	flattened						1
	slightly rounded						2
	strongly rounded						3
<b>54.</b> (* (+)	<b>Fruit: depression at distal end</b>						
[51.]	absent						1
	present						9
<b>55.</b>	<b>Fruit: depth of depression at distal end</b>						
[52.]	shallow						3
	medium						5
	deep						7
<b>56.</b>	<b>Fruit: diameter of depression at distal end</b>						
[53.]	small						3
	medium						5
	large						7
<b>57.</b> (*	<b>Fruit: nipple</b>						
	<b>Not for Group 4</b>						
<b>58.</b>	<b>Fruit: prominence of nipple</b>						
	<b>Not for Group 4</b>						
<b>59.</b> (*	<b>Fruit: areola</b>						
	absent						1
[56.]	present						9
Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielsorten Variedades ejemplo	Varieties Note/ Nota	

<b>60.</b>	<b>Fruit: type of areola</b>	
(+)	smooth	1
[57.]	grooved	2
	ridged	3
<hr/>		
<b>61.</b>	<b>Fruit: conspicu- ousness of areola</b>	
[58.]	weak	1
	medium	2
	strong	3
<hr/>		
<b>62.</b>	<b>Fruit: develop- ment of areola</b>	
[59.]	not complete	1
	complete	2
<hr/>		
<b>63.</b>	<b>Fruit: diameter of areola</b>	
[60.]	small	3
	medium	5
	large	7
<hr/>		
<b>64.</b>	<b>Fruit: diameter of stylar scar</b>	
[61.]	small	3
	medium	5
	large	7
<hr/>		

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
65.	<b>Fruit: protruding stylar point</b>					
	<b>Not for Group 4</b>					
66.	<b>Fruit: persistence of style</b>					
	<b>Not for Group 4</b>					
67.	<b>Fruit: navel open- ing</b>					
	<b>Not for Group 4</b>					
68.	<b>Fruit: diameter of navel opening</b>					
	<b>Not for Group 4</b>					
69.	<b>Fruit: bulging of navel</b>					
	<b>Not for Group 4</b>					
70.	<b>Fruit: radial grooves at distal end</b>					
	<b>Not for Group 4</b>					
71.	<b>Fruit: expression of radial grooves at distal end</b>					
	<b>Not for Group 4</b>					



Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>72.</b> (*)	<b>Fruit surface: predominant color</b>					
[69.]	green					1
	yellow green					2
	light yellow					3
	medium yellow					4
	green and yellow					5
	pink					14
	green and pink					15
	yellow and pink					16
	purple					17
	red and purple					18
<b>73.</b>	<b>Fruit surface: pubescence</b>					
[69a.]	absent					1
	present					9
<b>74.</b>	<b>Fruit surface: intensity of pubes- cence</b>					
[69b.]	weak					3
	medium					5
	strong					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>75. (*)</b>	<b>Fruit surface: glossiness</b>					
[70.]	absent or very weak					1
	weak					3
	medium					5
	strong					7
	very strong					9
<b>76.</b>	<b>Fruit surface: roughness</b>					
[71.]	smooth					3
	medium					5
	rough					7
<b>77.</b>	<b>Fruit surface: evenness of size of oil glands</b>					
[72.]	all more or less the same size					1
	larger ones inter- spersed by smaller ones					2
<b>78.</b>	<b>Fruit surface: size of larger oil glands</b>					
[73.]	small					3
	medium					7
	large					9

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
<b>79.</b>	<b>Fruit surface: conspicuousness of larger oil glands</b>					
[74.]	weak					3
	medium					5
	strong					7
<b>80.</b>	<b>Fruit surface: presence of pitting on oil glands</b>					
[75.]	absent					1
	present					9
<b>81.</b>	<b>Fruit surface: density of pitting on oil glands</b>					
[76.]	sparse					3
	medium					5
	dense					7
<b>82.</b>	<b>Fruit surface: depth of pitting on oil glands</b>					
[77.]	shallow					3
	medium					5
	deep					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note / Nota
<b>83.</b>	<b>Fruit surface: pebbling on oil glands</b>					
[77a.]	absent					
	present					
<b>84.</b>	<b>Fruit surface: degree of pebbling on oil glands</b>					
[78.]	weak					3
	medium					5
	strong					7
<b>85. (* )</b>	<b>Fruit rind: thickness</b>					
[80.]	thin					3
	medium					5
	thick					7
<b>86. (* )</b>	<b>Fruit rind: adher- ence to flesh</b>					
[82.]	weak					3
	medium					5
	strong					7
<b>87.</b>	<b>Fruit rind: strength</b>					
[83.]	weak					3
	medium					5
	strong					7

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Not e/ Not a
<b>88.</b>	<b>Fruit rind: oiliness</b>					
[84.]	dry					3
	medium					5
	oily					7
<b>89.</b>	<b>Fruit rind: conspicuousness of oil glands on inner surface</b>					
	<b>Not for Group 4</b>					
<b>90.</b>	<b>Fruit: color of albedo</b>					
[86.]	greenish					1
	white					2
	light yellow					3
	light orange					4
	pinkish					5
	reddish					6
<b>91.</b>	<b>Fruit: density of albedo</b>					
	<b>Not for Group 4</b>					
<b>92.</b> [88.]	<b>Fruit: amount of albedo adhering to flesh (strands excluded)</b>					
	<b>Not for Group 4</b>					
<b>93.</b>	<b>Fruit: albedo strands</b>					
	<b>Not for Group 4</b>					
<b>94.</b>	<b>Fruit: amount of albedo strands</b>					
	<b>Not for Group 4</b>					

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Not e/ Not a
<b>95.</b>	<b>Fruit: differently colored specks in flesh</b>					
[90.]	absent					1
	present					9
<b>96.</b>	<b>Fruit: bicolored segments</b>					
[91.]	absent					1
	present					9
<b>97. (* )</b>	<b>Fruit: main color of flesh</b>					
[92.]	light green					1
	white					2
	light yellow					3
	medium yellow					4
	light orange					5
	medium orange					6
	dark orange					7
	light pink					8
	medium pink					9
	dark pink					10
	green and pink					11
	yellow and pink					12
	red					13
	yellow and red					14
	purple					15

**TWF 1999: To decide whether to include colorless.**

Group Groupe Gruppe Grupo	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
<b>98.</b>	<b>Fruit: filling of core</b>					
[93.]	absent or very sparse					1
	sparse					3
	medium					5
	dense					7
	very dense					9
<b>99.</b>	<b>Fruit: diameter of core</b>					
[94.]	small					3
	medium					5
	large					7
<b>100.</b>	<b>Fruit: rudimentary segments</b>					
[95.]	absent or very weakly expressed					1
	weakly expressed					2
	strongly expressed					3
<b>101.</b>	<b>Fruit: number of well developed segments</b>					
[96.]	few					3
	medium					5
	many					7
<b>102.</b>	<b>Fruit: coherence of adjacent segment walls</b>					
[98.]	weak					3
	medium					5
	strong					7

<b>103.</b>	<b>Fruit: strength of segment walls</b>	
[99.]	weak	3
	medium	5
	strong	7
<hr/>		
<b>104.</b>	<b>Fruit: length of juice vesicles</b>	
[100.]	short	3
	medium	5
	long	7
<hr/>		
<b>105.</b>	<b>Fruit: thickness of juice vesicles</b>	
[100a]	thin	3
	medium	5
	thick	7
<hr/>		
<b>106.</b>	<b>Fruit: conspicu- ousness of juice vesicle walls</b>	
[101.]	low	3
	medium	5
	high	7
<hr/>		
<b>107.</b>	<b>Fruit: coherence of juice vesicles</b>	
[102.]	weak	3
	medium	5
	strong	7
<hr/>		



<b>108.</b> (*)	<b>Fruit: presence of navel viewed <u>in-</u> <u>ternally</u></b>		
	<b>Not for Group 4</b>		
<b>109.</b>	<b>Fruit: size of navel (viewed internally)</b>		
	<b>Not for Group 4</b>		
<b>110.</b>	<b>Fruit: juice con- tent</b>		
[106.]	low		3
	medium		5
	high		7
<b>111.</b>	<b>Fruit juice: total soluble solids</b>		
[107.]	low		3
	medium		5
	high		7
<b>112.</b> (+)	<b>Fruit juice: acidity</b>		
[108.]	low		3
	medium		5
	high		7
<b>113.</b>	<b>Fruit: strength of fibre</b>		
[109.]	weak		3
	medium		5
	strong		7

<b>114.</b>	<b>Fruit: number of seeds</b>	
[110.]	absent or very few	1
	few	3
	medium	5
	many	7
	very many	9
<b>115. (* )</b>	<b>Seed: polyembryony</b>	
[111.]	absent	1
	present	9
<b>116.</b>	<b>Seed: length</b>	
[113.]	short	3
	medium	5
	long	7
<b>117.</b>	<b>Seed: width</b>	
[114.]	narrow	3
	medium	5
	broad	7
<b>118.</b>	<b>Seed: surface (when fresh)</b>	
[115.]	smooth	1
	veined	2
	wrinkled	3
<b>119.</b>	<b>Seed: prominence of veins and/or wrinkles (as for 118)</b>	
[116.]	weak	3
	medium	5
	strong	7

<b>120.</b>	<b>Seed: external color when <u>fresh</u></b>	
[117.]	greenish	1
	whitish	2
	yellowish	3
	pinkish	4
	brownish	5
<hr/>		
<b>121.</b>	<b>Seed: color of inner seed coat (as for 118)</b>	
[118.]	white	1
	light yellow	2
	light brown	3
	brown	4
	dark brown	5
	red	6
	purple	7
<hr/>		
<b>122.</b>	<b>Seed: color of cotyledons (as for 118, polyembry- onic varieties only)</b>	
[119.]	white	1
	cream	2
	light green	3
	dark green	4
<hr/>		
<b>123.</b>	<b>Seed: external color when <u>dry</u></b>	
[120.]	greenish	1
	whitish	2
	yellowish	3
	brownish	4

<b>124.</b>	<b>Flowering habit</b>			
(*)	flowering once			1
[121.]	flowering more than once			2
<b>125.</b>	<b>Time of maturity of fruit for consumption</b>			
(*)				
[122.]	early			3
	medium			5
	late			7
<b>126.</b>	<b>Plant: parthenocarp</b>			
(*)				
[122a.]	absent			1
	present			9
<b>127.</b>	<b>Plant: self-incompatability</b>			
<b>new</b>	absent			1
	present	présente	vorhanden	9

VIII. Explanations on the Table of Characteristics

Ad. 17: Fully developed leaf: shape of apex (as for 6)

1 acuminate	2 acute
3 obtuse	4 rounded

Ad. 18: Fully developed leaf: emargination at tip (as for 6)

**Must this drawing be changed to fit the new states?**

1 absent	9 present
-------------	--------------

Ad. 37: Fruit: circumference

1 round	2 somewhat angular	3 scalloped
------------	-----------------------	----------------

Ad. 38: Fruit: general shape of stalk end

1 flattened	2 slightly rounded	3 strongly rounded	4 tapered
----------------	-----------------------	-----------------------	--------------

Ad. 39: Fruit: depression at stalk end

1  
absent

9  
present

Ad. 41: Fruit: neck

1  
absent

9  
present

Ad. 44: Fruit: constriction at stalk end

1  
absent

9  
present

Ad. 48: Fruit local depression at stalk attachment (necked varieties only)

**[drawings still missing]**

1  
absent or very shallow

2  
shallow

3  
deep

Ad. 49: Fruit: collar

1  
absent

9  
present

Ad. 53: Fruit: general shape of distal part

1  
flattened

2  
slightly rounded

3  
strongly rounded

Ad. 54: Fruit: depression at distal end

1  
absent

9  
present

Ad. 57: Fruit: nipple

1  
absent

9  
present

Ad. 60: Fruit: type of areola

1  
smooth

2  
grooved

3  
ridged



## List of Groups of Citrus Varieties

### GROUP

#### 1 MANDARINS AND THEIR HYBRIDS

SAT: *Citrus unshiu* Marc. (Satsumas)

CLE: *Citrus clementina* Hort. ex Tan. (Clementines)

MMN: *Citrus deliciosa* Ten. (Mediterranean Mandarins)

PMN: *Citrus reticulata* Blanco (Ponkan Mandarins)

TNL: Mandarin x Grapefruit or Pummelo (Tangelos)

TNR: Mandarin x Orange (Tangors)

#### 2 ORANGES AND THEIR HYBRIDS

SWO: *Citrus sinensis* (L.) Osbeck (Sweet Oranges)

SOR: *Citrus aurantium* L. (Sour Oranges)

#### 3 LEMONS AND LIMES AND THEIR HYBRIDS

LEM: *Citrus limon* (L.) Burm.f. (Lemons)

ACL: *Citrus latifolia* Tan. (Acid Limes, Lime Bearss)

SWL: *Citrus limettioides* Tan. (Sweet Limes)

MEX: *Citrus aurantifolia* (Christm. ex Panz.) Swingle (Mexican Limes)

RLM: *Citrus jambhiri* Lush. (Rough Lemons)

#### 4 GRAPEFRUIT AND PUMMELOS AND THEIR HYBRIDS

GRA: *Citrus paradisi* Macfad. (Grapefruit)

PUM: *Citrus grandis* (L.) Osbeck (Pummelos)

**NZ comment: To check *Citrus maxima*.**

**TWF comment: To supply common names in all four languages.**

#### 5. CITRONS AND THEIR HYBRIDS

CTN: *Citrus medica* L. (Citrons)

#### 6. BERGAMOTS AND THEIR HYBRIDS

BER: *Citrus bergamia* Risso et Poit. (Bergamots)

#### 7. CALAMONDINS AND FORTUNELLA AND THEIR HYBRIDS

CAL: *Citrus madurensis* Lour. (Calamondins)

KUM: *Fortunella* Swingle (Kumquats)

#### 8. TRIFOLIATE ORANGES AND THEIR HYBRIDS

PON: *Poncirus* Raf. (hybrids: Citranges, Citrumelos, etc.)

#### 9. YUSU AND THEIR HYBRIDS

YUS: *Citrus junos* Sieb. (Yusu)

IX. 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.
- DAMIGELLA, P., TRIBULATO, E., CALABRESE, F., CRESCIMANNO, F.G., CONTINELLA, G., 1980: “Gli Agrumi,” Cultivar. R.E.D.A., Roma, Italy, pp. 9 - 70.
- RAY R., WALHEIM L., 1980: “Citrus: How to select, grow and enjoy,” HP Books, Tucson, USA, pp. 41 - 115.
- REUTHER W. (Editors), 1973. “The Citrus Industry,” Volume III, University of California, Division of Agricultural Sciences, 528 pp.
- REUTHER W., BATCHELOR L.D., WEBBER H.J. (Editors), 1968: “The Citrus Industry,” Volume 11, University of California, Division of Agricultural Sciences, 398 pp.
- REUTHER W., WEBBER H.J., BATCHELOR L.D. (Editors), 1967: “The Citrus - Industry,” Volume 1, University of California, Division of Agricultural Sciences, 611 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,” Ministro 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.
- THORNTON, I.R., EL-ZEFTAWI, B.M., 1983: “Culture of irrigated citrus fruits,” Government Printer, State of Victoria, Australia, pp. 12 -25.

X. Technical Questionnaire

	Reference Number (not to be filled in by the applicant)

**TECHNICAL QUESTIONNAIRE**  
to be completed in connection with an application for plant breeders' rights

**GROUP****List of Groups of Citrus Varieties****1. MANDARINS AND THEIR HYBRIDS**SAT: *Citrus unshiu* Marc. (Satsumas)CLE: *Citrus clementina* Hort. ex Tan. (Clementines)MMN: *Citrus deliciosa* Ten. (Mediterranean Mandarins)PMN: *Citrus reticulata* Blanco (Ponkan Mandarins)

TNL: Mandarin x Grapefruit or Pummelo (Tangelos)

TNR: Mandarin x Orange (Tangors)

**2. ORANGES AND THEIR HYBRIDS**SWO: *Citrus sinensis* (L.) Osbeck (Sweet Oranges)SOR: *Citrus aurantium* L. (Sour Oranges)**3. LEMONS AND LIMES AND THEIR HYBRIDS**LEM: *Citrus limon* (L.) Burm.f. (Lemons)ACL: *Citrus latifolia* Tan. (Acid Limes, Lime Bearss)SWL: *Citrus limettioides* Tan. (Sweet Limes)MEX: *Citrus aurantifolia* (Christm. ex Panz.) Swingle (Mexican Limes)RLM: *Citrus jambhiri* Lush. (Rough Lemons)**4. GRAPEFRUIT AND PUMMELOS AND THEIR HYBRIDS**GRA: *Citrus paradisi* Macfad. (Grapefruit)PUM: *Citrus grandis* (L.) Osbeck (Pummelos)**5. CITRONS AND THEIR HYBRIDS**CTN: *Citrus medica* L. (Citrons)**6. BERGAMOTS AND THEIR HYBRIDS**BER: *Citrus bergamia* Risso et Poit. (Bergamots)**7. CALAMONDINS AND FORTUNELLA AND THEIR HYBRIDS**CAL: *Citrus madurensis* Lour. (Calamondins)KUM: *Fortunella* Swingle (Kumquats)**8. TRIFOLIATE ORANGES AND THEIR HYBRIDS**PON: *Poncirus* Raf. (hybrids: Citranges, Citrumelos, etc.)**9. YUSU AND THEIR HYBRIDS**YUS: *Citrus junos* Sieb. (Yusu)

2. Applicant (Name and address)

3. Proposed denomination or breeder's reference

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

4.1 Origin

(a) Seedling of unknown parentage [ ]

(b) Produced by controlled pollination [ ]  
(indicate parent varieties)

– Seed bearing parent (indicate parent)

.....

– Pollen parent (indicate parent)

.....

(c) Produced by open pollination of [ ]  
(indicate seed bearing parent plant)

.....

(d) Mutation or sport from (indicate original parent variety) [ ]  
.....

(e) Discovery (indicate where and when) [ ]  
.....

4.2 *In vitro* propagation

The plant material of the candidate variety has been obtained  
by *in vitro* propagation yes [ ]  
no [ ]

4.3 Pollenizer

Good pollenizers of the candidate variety are the following varieties:

.....

4.4 Virus status

(a) The variety is free from all known viruses as follows: [ ]  
(indicate from which viruses)

.....

(b) The plant material is virus tested [ ]  
(indicate against which viruses)

.....

(c) The virus status is unknown [ ]

4.5 Other information

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

Group	Characteristics	Example Varieties	Note
<b>5.1 (4.)</b>	<b>Young shoot: anthocyanin coloration of tip</b>		
	absent		3[ ]
	present		9[ ]
<b>5.2 (5.)</b>	<b>Young shoot: intensity of anthocyanin coloration of tip</b>		
	weak		3[ ]
	medium		5[ ]
	strong		7[ ]
<b>5.3 (33.)</b>	<b>Fruit: length</b>		
	short		3[ ]
	medium		5[ ]
	long		7[ ]
<b>5.4 (34.)</b>	<b>Fruit: diameter</b>		
	small		3[ ]
	medium		5[ ]
	large		7[ ]
<b>5.5 (41.)</b>	<b>Fruit: neck</b>		
	absent		1[ ]
	present		9[ ]



Group	Characteristics	Example Varieties	Note
<b>5.6</b> <b>(57.)</b>	<b>Fruit: nipple</b>		
	absent		3[ ]
	present		9[ ]
<b>5.7</b> <b>(72.)</b>	<b>Fruit surface: predominant color</b>		
	green		1[ ]
	yellow green		2[ ]
	light yellow		3[ ]
	medium yellow		4[ ]
	green and yellow		5[ ]
	yellow orange		6[ ]
	medium orange		7[ ]
	dark orange		8[ ]
	orange red		9[ ]
	green and orange		10[ ]
	yellow and orange		11[ ]
	yellow and red		12[ ]
	orange and red		13[ ]
	pink		14[ ]
	green and pink		15[ ]
	yellow and pink		16[ ]
	purple		17[ ]
red and purple		18[ ]	

Group	Characteristics	Example Varieties	Note
<b>5.8</b> (73.)	<b>Fruit surface: pubescence</b>		
	absent		1[ ]
	present		9[ ]
<b>5.9</b> (97.)	<b>Fruit: main color of flesh</b>		
	light green		1[ ]
	white		2[ ]
	light yellow		3[ ]
	medium yellow		4[ ]
	light orange		5[ ]
	medium orange		6[ ]
	dark orange		7[ ]
	light pink		8[ ]
	medium pink		9[ ]
	dark pink		10[ ]
	green and pink		11[ ]
	yellow and pink		12[ ]
	red		13[ ]
	yellow and red		14[ ]
purple		15[ ]	
<b>5.10</b> (108.)	<b>Fruit: presence of navel viewed <u>internally</u></b>		
	absent or very rare		1[ ]
	occasionally present		2[ ]
	always present		3[ ]

Group	Characteristics	Example Varieties	Note
<b>5.11</b> <b>(125.)</b>	<b>Time of maturity of fruit for consumption</b>	early	3[ ]
		medium	5[ ]
		late	7[ ]
<b>5.12</b> <b>(126.)</b>	<b>Plant: parthenocarpy</b>	absent	1[ ]
		present	9[ ]

6. Similar varieties and differences from these varieties

Denomination of similar variety	Characteristic in which the similar variety is different <sup>o)</sup>	State of expression of similar variety	State of expression of candidate variety
---------------------------------	--	--	--

<sup>o)</sup> In the case of identical states of expressions of both varieties, please indicate the size of the difference.

7. Additional information which may help to distinguish the variety

7.1 Resistance to pests and diseases

7.2 Special conditions for the examination of the variety

7.3 Other information

A representative color photo of the variety should be included in the Technical Questionnaire.

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 that question is yes, please attach a copy of such an authorization.

[End of document]