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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS  
GENEVA

**DRAFT**

**MELON**

UPOV Code: CUCUM\_MEL

(*Cucumis melo* L.)

**GUIDELINES**

**FOR THE CONDUCT OF TESTS**

**FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

*prepared by an expert from Spain in conjunction with the Chairman of the  
Technical Working Party for Vegetables (TWV)*

*to be presented at the thirty-ninth session of the TWV, to be held in  
Nitra, Slovakia, from June 6 to 10, 2005*

Alternative Names:\*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Cucumis melo</i> L.	Melon	Melon	Melone	Melón

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

**ASSOCIATED DOCUMENTS**

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

Other associated UPOV documents:

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

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Cucumis melo* L.

2. Material Required

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

2.2 The material is to be supplied in the form of seed

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

100 g or 2000 seeds

The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

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

3. Method of Examination

3.1 *Number of Growing Cycles*

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

3.2 *Testing Place*

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 "Examining Distinctness".

3.3 *Conditions for Conducting the Examination*

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

The recommended method of observing the characteristic is indicated by the following key in the second column of the Table of Characteristics:

MG: single measurement of a group of plants or parts of plants  
MS: measurement of a number of individual plants or parts of plants  
VG: visual assessment by a single observation of a group of plants or parts of plants  
VS: visual assessment by observation of individual plants or parts of plants

### 3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 20 plants, which should be divided between two or more replicates.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

### 3.5 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations should be made on 20 plants or parts taken from each of 20 plants.

### 3.6 *Additional Tests*

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

## 4. Assessment of Distinctness, Uniformity and Stability

### 4.1 *Distinctness*

#### 4.1.1 *General Recommendations*

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

#### 4.1.2 *Consistent Differences*

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

#### 4.1.3 *Clear Differences*

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

recommendations contained in the General Introduction prior to making decisions regarding distinctness.

#### 4.2 *Uniformity*

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

4.2.2 The assessment of uniformity for cross-pollinated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction.

4.2.3 For the assessment of uniformity of self-pollinated varieties (in-bred lines), vegetatively propagated varieties and hybrid varieties, a population standard of 1 % and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 20 plants, 1 off-type is allowed.

#### 4.3 *Stability*

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

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

4.3.3 Where appropriate, or in cases of doubt, the stability of a hybrid variety may, in addition to an examination of the hybrid variety itself, also be assessed by examination of the uniformity and stability of its parent lines.

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

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

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

5.3 The following have been agreed as useful grouping characteristics:

- (a) Inflorescence: sex expression (at full flowering) (characteristic 12)
- (b) Fruit: shape in longitudinal section (characteristic 28)
- (c) Fruit: ground color of skin (characteristic 29)
- (d) Fruit: warts (characteristic 38)
- (e) Fruit: grooves (characteristic 43)
- (f) Fruit: cork formation (characteristic 49)
- (g) Fruit: main color and hue of flesh (characteristic 55)
- (h) Seed: length (characteristic 61)
- (i) Seed: color (characteristic 64)

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

## 6. Introduction to the Table of Characteristics

### 6.1 *Categories of Characteristics*

#### 6.1.1 Standard Test Guidelines Characteristics

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

#### 6.1.2 Asterisked Characteristics

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

### 6.2 *States of Expression and Corresponding Notes*

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

### 6.3 *Types of Expression*

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

### 6.4 *Example Varieties*

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

6.5 *Legend*

(\*) Asterisk characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3

QN: Quantitative characteristic – see Chapter 6.3

PQ: Pseudo-qualitative characteristic – see Chapter 6.3

(a)-(e) See Explanations on the Table of Characteristics in Chapter 8.1

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

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

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
<b>1.</b>	<b>VG</b>	<b>Seedling: length of hypocotyl</b>					
<b>QN</b>	<b>(a)</b>	very short			Golden Crispy	1	
		short			Arava, Clipper	3	
		medium			Doral, Futuro	5	
		long			Bimbo, Ronda	7	
		very long			Noy	9	
<b>2.</b>	<b>VG</b>	<b>Seedling: size of cotyledon</b>					
<b>QN</b>	<b>(a)</b>	very small			Golden Crispy	1	
		small			Candy, Lunasol	3	
		medium			Futuro, Sancho	5	
		large			Bimbo, Nicolás	7	
		very large			Noy	9	
<b>3.</b>	<b>VG</b>	<b>Seedling: intensity of green color of cotyledon</b>					
<b>QN</b>	<b>(a)</b>	light			Bimbo, Lucas	3	
		medium			Candy, Piel de Sapo	5	
		dark			Clipper, Lunasol	7	
<b>4.</b>	<b>VG</b>	<b>Leaf blade: size</b>					
<b>QN</b>	<b>(b)</b>	small			Geaprince, Lunasol,	3	
		medium			Candy, Total	5	
		large			Don, Subrero	7	



	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>5.</b>	<b>VG</b>	<b>Leaf blade: intensity of green color</b>				
<b>QN</b>	<b>(b)</b>	light			Fimel, Yuma	3
		medium			Doral, Galia	5
		dark			Gama, Gustal	7
<b>6.</b>	<b>VG</b>	<b>Leaf blade: development of lobes</b>				
<b>(+)</b>						
<b>QN</b>	<b>(b)</b>	weak			Boule d'or	3
		medium			Piel de Sapo	5
		strong			Galia	7
<b>7.</b>	<b>VG</b>	<b>Leaf blade: length of terminal lobe</b>				
<b>(+)</b>						
<b>QN</b>	<b>(b)</b>	short			Perlita	3
		medium			Clipper, Gama	5
		long			Gustal, Primal	7
<b>8.</b>	<b>VG</b>	<b>Leaf blade: dentation of margin</b>				
<b>QN</b>	<b>(b)</b>	weak			Clipper, Vedrantaís	3
		medium			De Cavaillon espagnol, Piel de Sapo	5
		strong			Boule d'or, Portoluz	7
<b>9.</b>	<b>VG</b>	<b>Leaf blade: blistering</b>				
<b>QN</b>	<b>(b)</b>	weak			Galia	3
		medium			Costa	5
		strong			Haros	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>10. VG</b>	<b>Petiole: attitude</b>					
<b>QN (b)</b>	erect				Alfredo	1
	semi-erect				Peko	3
	horizontal				Creso	5
<b>11. MS</b>	<b>Petiole: length</b>					
<b>QN (b)</b>	short				Costa	3
	medium				Arava, Sancho	5
	long				Goldgen	7
<b>12. VS (*)</b>	<b>Inflorescence: sex expression (at full flowering)</b>					
<b>QL</b>	monoecious				Alpha, Categoría	1
	andromonoecious				Piel de Sapo	2
<b>13. VG (+)</b>	<b>Young fruit: hue of green color of skin</b>					
<b>PQ (c)</b>	whitish green				Geasol	1
	yellowish green				Fimel	2
	green				Lucas	3
	greyish green				Spanglia	4
<b>14. VG (*)</b>	<b>Young fruit: intensity of green color of skin</b>					
<b>QN (c)</b>	very light				Solarking	1
	light				Fimel	3
	medium				Eros	5
	dark				Galia	7
	very dark				Edén	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>15.</b>	<b>VG</b>	<b>Young fruit : density of dots</b>				
<b>QN</b>	<b>(c)</b>	absent or very sparse			Solarking	1
		sparse			Fimel	3
		medium			Lucas	5
		dense			Arava	7
		very dense			Edén	9
<b>16.</b>	<b>VG</b>	<b>Young fruit: size of dots</b>				
<b>QN</b>	<b>(c)</b>	small			Lucas	3
		medium			Arava	5
		large			Spanglia	7
<b>17.</b>	<b>VG</b>	<b>Young fruit: contrast of <b>dot</b> color/ground color</b>				
<b>QN</b>	<b>(c)</b>	weak			Lucas	3
		medium			Arava	5
		strong			Total	7
<b>18.</b>	<b>VS</b>	<b>Young fruit: <b>conspicuousness of groove coloring</b></b>				
<b>QN</b>	<b>(c)</b>	absent or very <b>weak</b>			Solarking	1
		<b>weak</b>			Geaprince, Total	3
		medium			Gama	5
		<b>strong</b>			Clipper, Galia	7
		very <b>strong</b>			Nembo	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>19.</b>	<b>VS</b>	<b>Young fruit: intensity of groove coloring</b>				
<b>QN</b>	<b>(c)</b>	light				3
		medium			Gama, Topper	5
		dark			Century, Drake	7
<b>20.</b>	<b>MS</b>	<b>Young fruit: length of peduncle</b>				
<b>QN</b>	<b>(c)</b>	short			Lince Haros	3
		medium			Arava, Romeo	5
		long			Corín	7
<b>21.</b>	<b>MS</b>	<b>Young fruit: thickness of peduncle 1 cm from fruit</b>				
<b>QN</b>	<b>(c)</b>	thin			Solarking	3
		medium			Geaprince, Vedrantaís	5
		thick			Charentais, Doral	7
<b>22.</b>	<b>VG</b>	<b>Young fruit: extension of darker area around peduncle</b>				
<b>QN</b>	<b>(c)</b>	absent or very small			Doral	1
		small			Boule d'or	3
		medium			Mirasol Geaprince	5
		large				7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>23.</b>	<b>VG</b>					
<b>(+)</b>	<b>Fruit: change of skin color from young fruit to maturity</b>					
<b>QN</b>	early in the development of fruit				Alpha, Charantais, Clipper	1
	late in the development of fruit				Galia, Amarillo Oro	2
	very late in the development of fruit or no change				Futuro, Piel de Sapo	3
<b>24.</b>	<b>MS</b>					
<b>(*)</b>	<b>Fruit: length</b>					
<b>QN</b>	<b>(d)</b> very short				Doublon, Golden Crispy	1
	short				Topper, Vedrantaís	3
	medium				Marina, Spanglia	5
	long				Categoría, Toledo	7
	very long				Katsura Giant, Valdivia	9
<b>25.</b>	<b>MS</b>					
<b>(*)</b>	<b>Fruit: diameter</b>					
<b>QN</b>	<b>(d)</b> very narrow				Banana, Golden Crispy	1
	narrow				Alpha, Maestro	3
	medium				Categoría, Galia	5
	broad				Albino, Kinka	7
	very broad				Noir des Carmes	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>26. MS</b>	<b>Fruit: ratio length/diameter</b>					
<b>(*)</b>						
<b>QN</b>	<b>(d)</b>					
	very small				Noir des Carmes	1
	very small to small				Alpha, Arava	2
	small				Buster, Supermarket	3
	small to medium				Aril, Edén	4
	medium				Doral, Tendral Negro	5
	medium to large				Sirocco, Verdol	6
	large				Categoría, Futuro	7
	large to very large				Iguana, Canador	8
	very large				Banana	9
<b>27. VG</b>	<b>Fruit: position of maximum diameter</b>					
<b>(*)</b>						
<b>(+)</b>						
<b>QN</b>	<b>(d)</b>					
	toward stem end				Piolín , Sapo de Oro	1
	at middle				Piel de Sapo, Vedrantaís	2
	toward blossom end				Edén, Katsura Giant, Cganchi	3
<b>28. VG</b>	<b>Fruit: shape in longitudinal section</b>					
<b>(*)</b>						
<b>(+)</b>						
<b>PQ</b>	<b>(d)</b>					
	ovate				De Cavaillon, Piolín	1
	medium elliptic				Piel de Sapo	2
	broad elliptic				Corin, Sardo	3
	circular				Alpha, Galia	4
	quadrangular				Zatta	5
	oblate				Jívaro, Noir de Carmes	6
	obovate				Cganchi	7
	elongated				Alficoz, Banana	8

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>29.</b>	<b>VG</b>	<b>Fruit: ground color of skin</b>				
(*)						
(+)						
<b>PQ</b>	(d)	white			Albino, Honey Dew	1
		yellow			Amarillo-Canario, Edén, Galia, Passport, Solarking	2
		green			Gohyang, Piel de Sapo	3
		grey			Sirio, Romeo, Supporter, Geaprince, Geamar, Vedrantaís	4
<b>30.</b>	<b>VG</b>	<b>Fruit: intensity of ground color of skin</b>				
<b>QN</b>	(d)	light				3
		medium				5
		dark				7
<b>31.</b>	<b>VG</b>	<b>Fruit: hue of color of skin</b>				
(+)						
<b>PQ</b>	(d)	absent or very weak			Amarillo-Canario (yellow), Piel de Sapo (green), Sirio (grey), Albino (white)	1
		whitish			Romeo (grey)	2
		yellowish			Supporter, Geaprince (grey)	3
		orange			Edén (yellow)	4
		ochre			Passport (yellow)	5
		greenish			Geamar (grey), Solarking (yellow), Honey Dew (white)	6
		greyish			Gohyang (green)	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
<b>32.</b>	<b>VS</b>	<b>Fruit: density of dots</b>					
<b>QN</b>	<b>(d)</b>	absent or very sparse			Charentais	1	
		sparse				3	
		medium			Petit Gris de Rennes	5	
		dense			Piel de Sapo	7	
		very dense			Albino	9	
<b>33.</b>	<b>VS</b>	<b>Fruit: size of dots</b>					
<b>QN</b>	<b>(d)</b>	small			Doral	3	
		medium			Toledo	5	
		large			Futuro	7	
<b>34.</b>	<b>VG</b>	<b>Fruit: color of dots</b>					
<b>QL</b>	<b>(d)</b>	white			Edén	1	
		yellow			Piel de Sapo	2	
		green			Tendral Negro	3	
<b>35.</b>	<b>VS</b>	<b>Fruit: intensity of color of dots</b>					
<b>QN</b>	<b>(d)</b>	light			Kinka, Mesol	3	
		medium			Sapiel, Toledo	5	
		dark			Soprano, Víctor	7	



	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>36. (*)</b>	<b>VG Fruit: density of patches</b>					
<b>QN (d)</b>	absent or very sparse				Rochet	1
	sparse					3
	medium				Braco	5
	dense				Piel de Sapo	7
	very dense				Oranje Ananas	9
<b>37. (*)</b>	<b>VG Fruit: size of patches</b>					
<b>QN (d)</b>	small				Baltasar	3
	medium				Sancho	5
	large				Taurus	7
<b>38. (*)</b>	<b>VG Fruit: warts</b>					
<b>QL (d)</b>	absent				Piel de Sapo	1
	present				Zatta	9
<b>39. (*)</b>	<b>VS Fruit: attachment of peduncle at maturity</b>					
<b>QN (d)</b>	very weak				Edén	1
	weak				Arava, Maestro	3
	medium				Doral, Vedrantaís	5
	strong				Clipper, Costa	7
	very strong				Daimiel, Eloro	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>40.</b>	<b>VS</b>	<b>Fruit: shape of base</b>				
(*)						
(+)						
<b>PQ</b>	<b>(d)</b>	pointed			Edén	1
		rounded			Arava	2
		<b>truncate</b>			Zatta	3
<b>41.</b>	<b>VS</b>	<b>Fruit: shape of apex</b>				
(*)						
(+)						
<b>PQ</b>	<b>(d)</b>	pointed			Canador, Futuro	1
		rounded			Alpha, Honey Dew	2
		<b>truncate</b>			Noir des Carmes	3
<b>42.</b>	<b>VS</b>	<b>Fruit: size of pistil scar</b>				
(*)						
<b>QN</b>	<b>(d)</b>	small			Alpha, Categoría	3
		medium			Charentais, Eros, Verdol	5
		large			Drake, Supermarket	7
<b>43.</b>	<b>VG</b>	<b>Fruit: grooves</b>				
(*)						
<b>QL</b>	<b>(d)</b>	<b>absent or sometimes present</b>			Piel de Sapo	1
		<b>always present</b>			Ogen, Vedrantaís	2
<b>44.</b>	<b>VS</b>	<b>Fruit: width of grooves</b>				
<b>QN</b>	<b>(d)</b>	narrow			Auraprince	3
		medium			Biga	5
		broad			Nembo, Sirio	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>45.</b>	<b>VS Fruit: depth of grooves</b>					
<b>QN (d)</b>	very shallow				Amber	1
	shallow				Galia	3
	medium				Alpha	5
	deep				Panamá, Supermarket	7
	very deep				Noir des Carmes, Sucrin de Tours	9
<b>46.</b>	<b>VG Fruit: color of grooves</b>					
<b>QL (d)</b>	white				Geumssaraki	1
	yellow				Futuro, Galia	2
	green				Charentais	3
<b>47.</b>	<b>VG Fruit: intensity of groove color</b>				[KR to provide]	
<b>QN (d)</b>	light					
	medium					
	intense					
<b>48.</b>	<b>VS Fruit: creasing of surface</b>					
(*) (+)						
<b>QN (d)</b>	absent or very weak				Vedrantais	1
	weak				Melchor, Sirocco	3
	medium				Costa, Piolin	5
	strong				Tendral Negro	7
<b>49.</b>	<b>VS Fruit: cork formation</b>					
(*)						
<b>QL (d)</b>	absent				Alpha	1
	present				Dalton	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>50.</b> (*)	<b>VS Fruit: thickness of cork layer</b>					
<b>QN</b>	(d) very thin				Amarillo Oro	1
	thin				Riosol, Vedrantaís	3
	medium				Marina	5
	thick				Geamar, PMR 45	7
	very thick				Honey Rock, Perlita	9
<b>51.</b> (*)	<b>VS Fruit: pattern of cork formation</b>					
<b>PQ</b>	(d) <b>dots only</b>				Hermes, Vedrantaís	1
	dots and linear				Jíváro, Topper	2
	<b>linear only</b>				Futuro, Riosol	3
	linear and netted				Anatol, Chantal	4
	<b>netted only</b>				Galia, Perlita	5
<b>52.</b> (*)	<b>VS Fruit: density of pattern of cork formation</b>					
<b>QN</b>	(d) very sparse				Alpha, Amarillo Oro	1
	sparse				Vedrantaís	3
	medium				Regal, Vital	5
	dense				Galia, Geamar	7
	very dense				Honey Rock, Perlita	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>53.</b>	<b>VG</b>	<b>Fruit: change of skin color from maturity to over maturity</b>				
(+)						
<b>QN</b>	<b>absent</b> or very slow				Clipper, Doral, Galia, Honey dew, Piel de Sapo	1
	<b>slow</b>				<b>Goloso</b>	3
	medium				Futuro, Vendôme <b>Dulcinea</b>	5
	<b>fast</b>				Corin, Marina, Nembo	7
<b>54.</b>	<b>VS</b>	<b>Fruit: maximum width of flesh in longitudinal section</b>				
(+)						
<b>QN</b>	<b>(d)</b> thin				Gama	3
	medium				Toledo	5
	thick				Tito	7
<b>55.</b>	<b>VS</b>	<b>Fruit: main color and hue of flesh</b>				
(*)						
<b>PQ</b>	<b>(d)</b> white				Piel de Sapo	1
	white greenish				Galía	2
	green				Radical	3
	white yellowish				Guaraní	4
	orange				Vedrantaís	5
	reddish orange				Magenta	6
<b>56.</b>	<b>VS</b>	<b>Only varieties with main color and hue of flesh: orange: Fruit: intensity of orange color of flesh</b>				
<b>QN</b>	<b>(d)</b> light				Fantasy, Oloroso	3
	medium				Lunasol	5
	dark				Geamar	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
<b>57.</b>	<b>Only varieties with main color and hue of flesh: white; whitish green; green; whitish yellow; Fruit: secondary salmon coloring of flesh</b>						
VS							
QN	(d)	absent or very weak			Gustal	1	
		weak			Floraprince, Toledo	3	
		medium			Arizo, Eloro	5	
		strong				7	
<b>58.</b>	VS	<b>Fruit: firmness of flesh</b>					
(+)							
QN	(d)	soft			Galia, Marina	3	
		medium			Sancho, Supporter	5	
		firm			Braco, Geamar	7	
<b>59.</b>	VG	<b>Only varieties with change of skin color from maturity to over maturity: Fruit at over maturity: hue of color of skin</b>					
PQ		yellow			Futuro, Marina	1	
		orangish yellow			Drake, Gama	2	
		creamish			Figaro, Vendôme	3	

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>60.</b>	<b>VS</b>	<b>Only varieties with change of skin color from maturity to over maturity and with yellow or orangish yellow color of skin: Fruit at over maturity: intensity of yellow color of skin</b>				
<b>QN</b>		light			Dulcinea	3
		medium			Futuro	5
		dark			Trapío	7
<b>61.</b> <b>(*)</b>	<b>MS</b>	<b>Seed: length</b>				
<b>QN</b>	<b>(e)</b>	very short			Golden Crispi, Geumssaraki	1
		short			Elario, Katsura Giant	3
		medium			Arava, Sancho	5
		long			Amarillo Oro, Toledo	7
		very long			Albino	9
<b>62.</b>	<b>MS</b>	<b>Seed: width</b>				
<b>QN</b>	<b>(e)</b>	very narrow			Golden Crispi	1
		narrow			Aurabel	3
		medium			Arava, Sancho	5
		large			Amarillo Oro	7
		very large			Ronda	9
<b>63.</b>	<b>VS</b>	<b>Seed: shape</b>				
	<b>(+)</b>					
<b>QL</b>	<b>(e)</b>	not pine-nut shape			Toledo	1
		pine-nut shape			Piel de Sapo	2

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>64.</b>	<b>VG</b>					
	(*)					
<b>QL</b>	(e)	whitish			Amarillo Oro s.b.	1
		cream yellow			Galia, Piel de Sapo	2
<b>65.</b>	<b>VG</b>	<b>Only varieties with cream yellow seed color: Seed: intensity of color</b>				
<b>QN</b>	(e)	light			Goldgen	3
		medium			Galia	5
		dark			Doral	7
<b>66.</b>	<b>VS</b>	<b>Time of male flowering</b>				
<b>QN</b>		early			Clipper, Vital	3
		medium			Categoría	5
		late			Nicolás, Rocín	7
<b>67.</b>	<b>VS</b>	<b>Time of female flowering</b>				
<b>QN</b>		early			Clipper	3
		medium			Braco, Categoría, Vital	5
		late			Nicolás	7
<b>68.</b>	<b>MS/ VS</b>	<b>Time of ripening</b>				
<b>QN</b>		very early			Goldstar, Sun	1
		early			Galia	3
		medium			Védrantais	5
		late			Pinonet Piel de Sapo, Rochet	7
		very late			Clipper, Supporter, Tendral	9





	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>70.4</b>	<b>Race 1-2</b>	<b>Race 1-2</b>	<b>Pathotyp 1-2</b>	<b>Raza 1-2</b>		
(+)						
	absent				Jaune Canari2 Joker, Vedrantais	1
	present				Jador	9
<b>71.</b>	<b>Resistance to</b> <b><i>Sphaeroteca</i></b> <b><i>fuliginea</i> (Powdery</b> <b>mildew)</b>	<b>Résistance au</b> <b><i>Sphaeroteca</i></b> <b><i>fuliginea</i> (l'oïdium)</b>	<b>Resistenz gegen</b> <b><i>Sphaeroteca</i></b> <b><i>fuliginea</i> (Echten</b> <b>Mehltau)</b>	<b>Resistencia a</b> <b><i>Sphaeroteca</i></b> <b><i>fuliginea</i> (oidio)</b>		
(+)						
QL	-----	-----	-----	-----	-----	-----
<b>71.1</b>	<b>Race 1</b>	<b>Race 1</b>	<b>Pathotyp 1</b>	<b>Raza 1</b>		
	absent	absente	fehlend	ausente	Alpha, Boneto, Delta, Jerac	1
	present	présen	vorhanden	presente	Cézanne, Raphaël, Théo	9
<b>71.2</b>	<b>Race 2</b>	<b>Race 2</b>	<b>Pathotyp 2</b>	<b>Raza 2</b>		
	absent	absente	fehlend	ausente	Boneto, Europa, Vercor	1
	present	présen	vorhanden	presente	Cézanne, Raphaël, Théo	9
<b>71.3</b>	<b>Race 5</b>	<b>Race 5</b>	<b>Pathotyp 5</b>	<b>Raza 5</b>		
	absent	absente	fehlend	ausente	Vedrantais	1
	present	présen	vorhanden	presente	Raphaël, Théo	9
<b>72.</b>	<b>Resistance to</b> <b><i>Erysiphe fuliginea</i></b> <b>Race 1</b>	<b>Résistance au</b> <b><i>Erysiphe fuliginea</i></b> <b>Race 1</b>	<b>Resistenz gegen</b> <b><i>Erysiphe fuliginea</i></b> <b>Pathotyp 1</b>	<b>Resistencia a</b> <b><i>Erysiphe fuliginea</i></b> <b>Raza 1</b>		
(+)						
QL						
	absent	absente	fehlend	ausente	Bastion, Boneto, Europa	1
	present	présen	vorhanden	presente	Cézanne, Raphaël, Théo	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>73.</b>	<b>Resistance to colonization by <i>Aphis gossypii</i></b>					
(+)						
<b>QL</b>	absent				Charentais	1
	present				AR, Margot, Top Mark	9
<b>74.</b>	<b>Resistance to Zucchini Yellow Mosaic Virus (ZYMV) Race F</b>					
(+)						
<b>QL</b>	absent	absente	fehlend	ausente	Alpha, Boule d'Or, Cantor, Doublon	1
	present	présen	vorhanden	presente	Eloro, Hermes, Vedrantaï	9
<b>75.</b>	<b>Resistance to Papaya Ringspot Virus (PRV)</b>					
(+)						
<b>QL</b>	-----	-----	-----	-----	-----	-----
<b>75.1</b>	<b>Race GVA</b>	<b>Race GVA</b>	<b>Pathotyp GVA</b>	<b>Raza GVA</b>		
	absent				Vedrantaï	1
	present				WMRV 29, 72025	9
	-----	-----	-----	-----	-----	-----
<b>75.2</b>	<b>Race E<sub>2</sub></b>	<b>Race E<sub>2</sub></b>	<b>Pathotyp E<sub>2</sub></b>	<b>Raza E<sub>2</sub></b>		
	absent				Vedrantaï, 72025	1
	present				WMRV 29	9
<b>76.</b>	<b>Resistance to Muskmelon Necrotic Spot Virus (MNSV) Race E<sub>8</sub></b>					
(+)						
<b>QL</b>	absent				Vedrantaï	1
	present				Primal, VA 435	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>77.</b> <b>(+)</b>	<b>Resistance to Cucumber Mosaic Virus (CMV)</b>					
<b>QL</b>	absent				<b>Dalton, Cézanne</b>	1
	present				<b>Lunaduke</b>	9

8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

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

(a) Seedling: All observations on the seedling should be made just before the development of the first true leaf.

(b) Leaf blade: Unless otherwise indicated, all observations on the leaf blade, should be made on fully developed but not old leaves, preferably between the 5<sup>th</sup> and 8<sup>th</sup> node when the plant has at least 11 nodes.

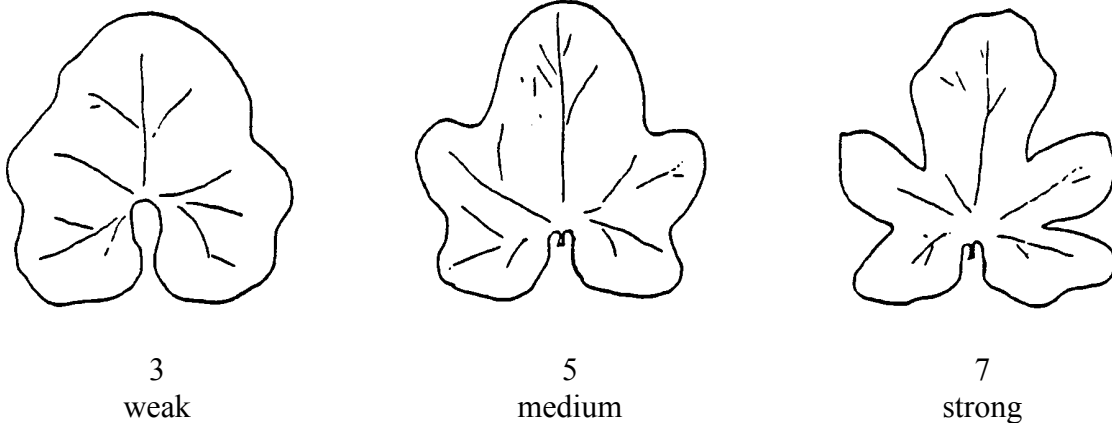
(c) Young fruit: All observations on the young fruit should be made on green, unripe fruits, before the color change. For most varieties this means when the fruit is half the final size. To facilitate the observation, it is recommended to harvest one young fruit per plant, if the number of fruits per plant makes that possible.

(d) Fruit: Observations which should be made on ripened fruit. The color must not start to change to the over maturity color. It is convenient to harvest fruits to observe varieties side-by-side. When appropriate, for the flesh characteristics it is recommended to wait at least one week after the harvest before opening the fruits.

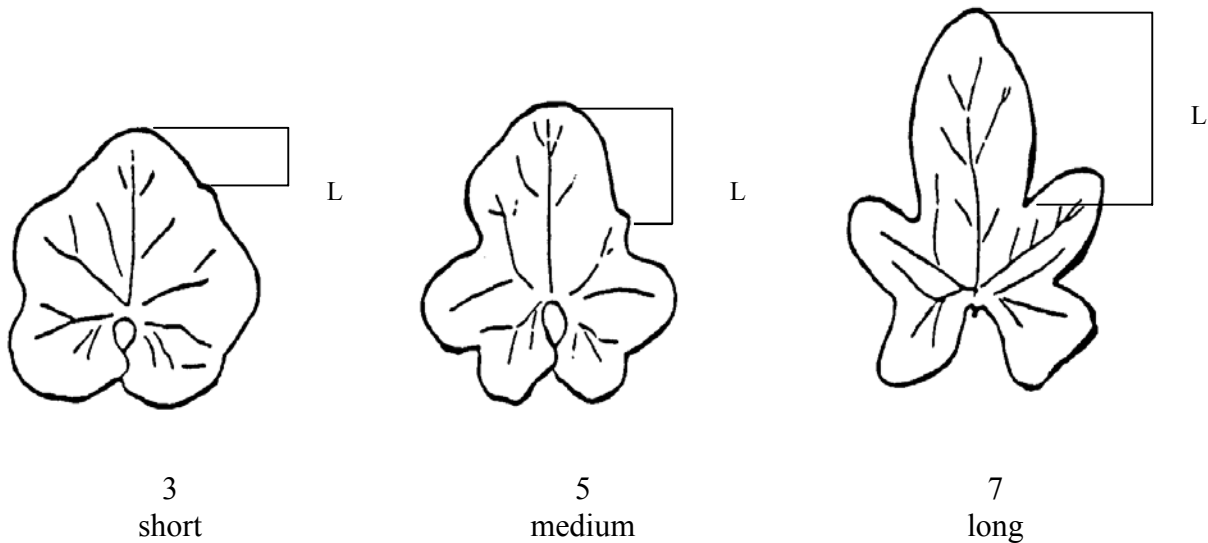
(e) Seed: All observations on the seed should be made on fully **developed** and dry seeds, after washing and drying in the shade.

## 8.2 Explanations for individual characteristics

### Ad. 6: Leaf blade: development of lobes



### Ad. 7: Leaf blade: length of terminal lobe



### Ad. 13: Young fruit: hue of green color of skin

The basic color of the young fruit is green. There are two true hue levels “yellowish” and “green” depending on the proportion between red and blue components in the color, and two other hue levels “greyish” that is rather a low saturation of the green color and “whitish” that results from a very light intensity of the green color.

### Ad. 23: Change of skin color from young fruit to maturity; Ad. 53: Change of skin color from maturity to over maturity

The melon fruit may have up to three different skin colors in the course of its development. The speed of evolution of the color depends on the type of variety, but within a type different speeds can also be observed. Please note that in cases where the color change is closely linked to maturity, the observation should be clear: either on the color change related to maturity (characteristic 23) or within mature fruits from mature to over mature

(characteristic 53). The changing of fruit skin color can be described by using the following characteristics:

1. Stage 1: color of the young fruit (green color)
2. Change from Stage 1 to Stage 2 (Characteristics 23)
3. Stage 2: color at maturity
4. Change from Stage 2 to Stage 3 (Characteristic 53)
5. Stage 3: color at over maturity.

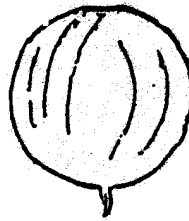
Some examples are given in the following table:

Variety	Stage 1: color of the young fruit	Change from Stage 1 to Stage 2 (Ch. 23)	Stage 2: color at maturity (Ch. 29)	Change from Stage 2 to Stage 3 (Ch. 53)	Stage 3: color at over maturity
Galia	green	late	yellow	absent	yellow
Amarillo Oro	green	late	yellow	absent	yellow
Doral	green	late	yellow	absent	yellow
Charentais	green	early	grey	fast	yellow
Alpha	green	early	grey	medium	yellow
Clipper	green	early	grey	absent	grey
Vendome	green	early	grey	medium	yellow
Corin	green	early	grey	fast	yellow
Nembo	green	early	grey	fast	yellow
Albino	green	late	white	absent	white
Honey Dew	green	late	white	absent	white
Dulcinea	green	late	white	medium	yellow
Marina	green	no-change	green	fast	yellow
Futuro	green	no change	green	medium	yellow
Goloso	green	no change	green	slow	yellow
Piel de Sapo	green	no change	green	absent	green

Ad. 27: Fruit: position of maximum diameter



1  
toward stem end

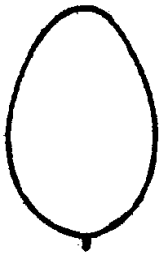


2  
at middle

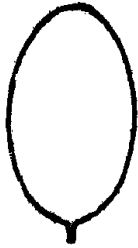


3  
toward blossom end

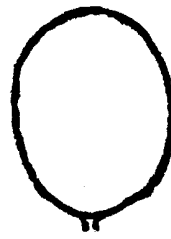
Ad. 28: Fruit: shape in longitudinal section



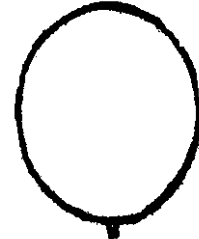
1  
ovate



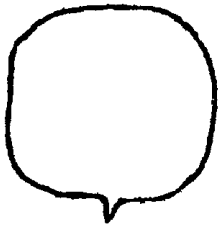
2  
medium elliptic



3  
broad elliptic



4  
circular



5  
quadrangular



6  
oblate



7  
obovate



8  
elongated

Ads. 29 and 31: Fruit: ground color of skin (29) and hue of color of skin (31)

For example:

All the Galia type would be considered as yellow color. Hues ochre, orange, pure yellow or greenish can be considered in the group, but in a separate characteristic (31).

All the Charentais type would be considered as grey. Greenish, whitish, or yellowish hues (Ch. 31) can be used for distinctness, but not recommended for grouping.

The color given in brackets after each of the example varieties indicates the ground color of skin of the variety in question.



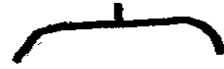
Ad. 40: Fruit: shape of base



1  
pointed



2  
rounded



3  
truncate

Ad. 41: Fruit shape of apex



1  
pointed

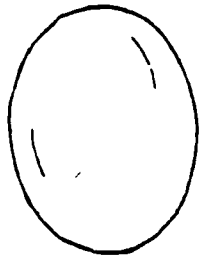


2  
rounded

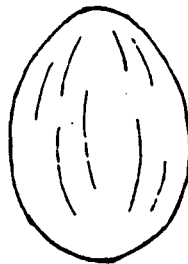


3  
truncate

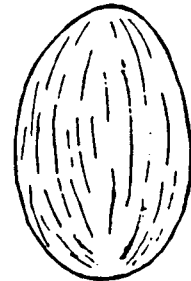
Ad. 48: Fruit: creasing of surface



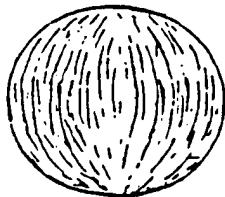
1  
absent or very weak



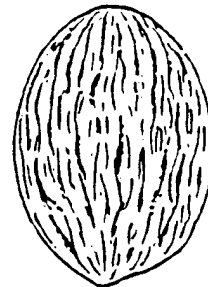
3  
weak



5  
medium

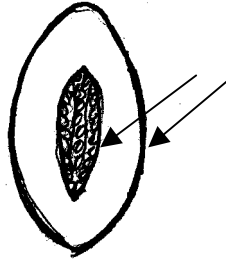


7  
strong



9  
very strong

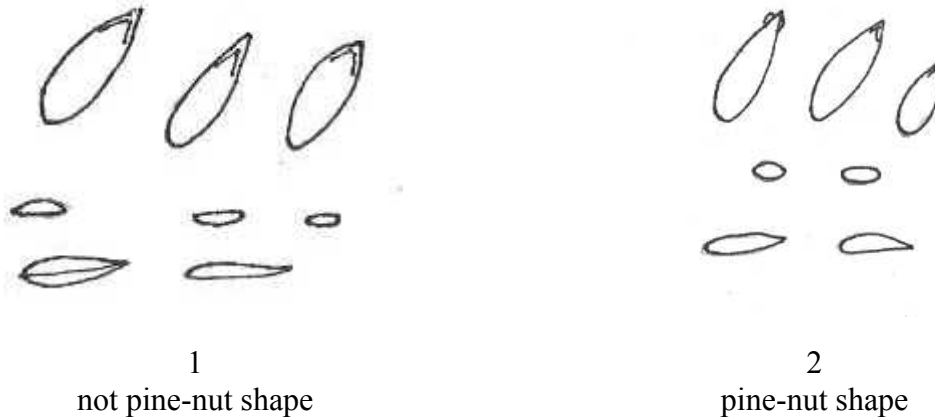
Ad. 54: Fruit: maximum width of flesh in longitudinal section



Ad. 58: Firmness of flesh

Firmness of flesh may be assessed pushing the flesh in the central third, and similar distance between the skin and the mucilage with the blunt end of a pencil or a similar tool.

Ad. 63: Seed: shape [Large illustration of single seed to be provided]



**Pine-nut shape** seed (Piñonet) is controlled by a recessive characteristic with simple genetic regulation. Seed with pine-nut shape resembles the shape of a pine nut and has the following features:

- the hilum end is slightly more pointed, with very small wings;
- the apical end has a tendency to be more rounded;
- in cross section the seed has a tendency to be more symmetrically elliptical;
- the surface is not covered with arista.

Ad. 69: Shelf life of fruit

Shelf life is the time that the fruit remains firm in storage.

Five fruits per plot are stored in boxes in single layers. The boxes can be stored one on top on another if air can circulate between them. The storage area does not need to be climatically controlled, but must have naturally good conditions for storing fruits.

Observations are made at regular intervals of 3 to 4 days, noting the firmness of fruits, taking care not to damage them, and removing those which are damaged or rotten. The observation is to determine when the firmness of fruits becomes equal to or lower than Note 3 "soft" in characteristic 58.

Ads. 70. 1 - 70.3: Resistance to *Fusarium oxisporum* f. sp. *melonis*, races 0, 1 and 2

Maintenance of races

Type of medium:	on agar medium at 22 to 25 C
Special conditions:	transplantation of races each month

Execution of test

Growth stage of plants:	cotyledons expanded
Temperature:	24 C during day, 18 C during night
Light:	10 - 12 hours per day
Growing method:	Petri dishes in climatic chambers
Method of inoculation:	soaking of the root system in a suspension of liquid medium of fungus
Duration of test	
- from sowing to inoculation:	10-15 days
- from inoculation to reading:	20 days, death of susceptible plants
Number of plants tested:	30 plants
Remarks:	plants raised and transplanted in sterilized sand, irrigation with nutrient solution

Ad. 70.4: Resistance to *Fusarium oxisporum* f. sp. *melonis*, race 1-2

Maintenance of races

Type of medium:	on agar medium at 22 to 25 C
Special conditions:	transplantation of races each month

Execution of test

Growth stage of plants:	cotyledons expanded
Temperature:	24°C during day, 18°C during night
Light:	12 hours per day
Growing method:	dishes in climatic chambers

Method of inoculation: absorption of 700 ml of a very diluted (30 to 50 times) fungus culture

Duration of test

- from sowing to inoculation: 10 to 15 days

- from inoculation to reading: 3 weeks, until the death of the susceptible control

Number of plants tested: 30 plants

Remarks: a moderately aggressive type of race 1-2 should be used as this is likely to show the difference between the presence and absence of resistance **most clearly**.

Ads. 71 and 72: Resistance to *Sphaerotheca fuliginea*, races 1, 2 and 5 and *Erysiphe fuliginea* race 1

1. Inoculum

Production of cotyledons

Cotyledons to be inoculated and tested: sow the seed in disinfected peat inside a closed mini glasshouse. When **the** cotyledons **have** expanded, **remove them** from the plant.

Desinfect the cotyledons by soaking them **for 3 minutes** in a mercuric chloride solution (0.05%). Rinse them twice with sterilized water. Dry the cotyledons with sterile paper towel, **then** place them in Petri dishes with the following medium:

sucrose	10 g
mannitol	20 g
agar	5 g
distilled water	1 liter

Propagation of the strains

**Scatter** conidia on the cotyledons and blow them. Incube the inoculated cotyledons in Petri dishes at 23°C during 14 hours in the light and at 18°C during 10 hours in the dark.

**Nine** to 11 days after the inoculation, the cotyledons will be covered with spores and can be used as **an** inoculum.

Maintenance of races

Type of medium: on inoculated cotyledons

Special conditions: 17°C, under very low light intensity. Maximum storage **time is** 1 to 1.5 **months**, after the inoculation.

## 2. Execution of Test

### Inoculation on leaf disks (to be used as routine method)

Leaf disks, 2 cm in diameter, are taken from young plants and placed in polystyrene boxes (180 x 125 mm, 54 leaf disks per box) on a medium (mannitol 40g/l, benzamidazole 30 mg/l, agar 4 g/l). The leaf disks are inoculated by placing the boxes at the base of an inoculation tower (height: 1.00 m, diameter 0.25 m).

A cotyledon, already covered with inoculum, is placed on the top of the tower and blown with a Pasteur pipette to detach spores. Wait 1 to 2 minutes so that the conidia fall down through the tower onto the leaf discs. The leaf disks are kept for 24 hours in the dark by covering the boxes with a black polyethylene sheet. The boxes are then placed in a climatised chamber (20°C in the light for 14 hours; 24°C in the dark, for 10 hours per day).

### Duration of test/Number of plants

- from inoculation to reading: 10 days
- number of plants tested: 5

### Scoring:

- 0 no development of the fungi
- 1 isolated colonies (less than 10% of the disk surface)
- 2 isolated colonies (often along the nerves and blade)
- 3 all the disk surface is covered with weak sporulation
- 4 sporulation on all the disk surface
- 5 intense sporulation

[Explanation to be provided on the conversion of score into resistance/susceptibility]

Inoculation on young plants (to be used as a complementary method to the disk method, if necessary)

Take spores from a cotyledon already covered with conidia and deposit them on a leaf taken from a young plant. You can also proceed by blowing the spores from a cotyledon by the method mentioned above.

### Scoring

- 0 no development of the fungi
- 1 weak sporulation
- 2 medium sporulation
- 3 intense sporulation

[Explanation to be provided on the conversion of score into resistance/susceptibility]

3. Host differentials

	Sphaerotheca					Erysiphe	
	race 0	race 1	race 2	race 4	race 5	race 0	race 1
Iran H	S	S	S	S	S	S	S
Védrantais	R	S	S	S	S	R	S
PMR 45	R	R	S	S	S	R	S
WMR 29	R	R	R	S	S	R	S
Edisto 47	R	R	R	R	S	R	R
MR-1, PI 124112	R	R	R	R	R	R	R
PMR 5							
Nantais Oblong	R	S	S	S	S	R	R

S: susceptible (high sporulation)

R: resistant (low sporulation)

Ad. 73: Resistance to colonization by *Aphis gossypii*

Maintenance of strain

Maintenance and multiplication: on susceptible variety (Vedrantais)  
 Special conditions: low aphid density to avoid having too many winged types. “Synchronous”-type breeding in order to have only aphids of the same age and, therefore, at the same growing stage on a plant

Conduct of the test

Plant stage: 1st leaf measuring 2-3 cm  
 Temperature: 21°C  
 Light: 16 hours per day  
 Planting: plants sown in sand, pricked out at cotyledon stage in compost-filled pots  
 Manner of inoculation: deposit of ten adult wingless aphid per plant  
 Duration of test:  
 - from sowing to inoculation: 15-18 days  
 - from inoculation to reading: one day  
 Number of plants tested: 30  
 Recording:  
 - Resistance present = less than 7 adult aphids per plant; eggs rare.  
 - Resistance absent = 9 or 10 adult aphids per plant; eggs frequent.  
 - Record number of aphids per plant, 24 hours after inoculation.

Ad. 74: Resistance to Zucchini Yellow Mosaic Virus (ZYMV), race F

Maintenance of strain

Maintenance: dried on anhydrous calcium chloride at 5°C  
 Special conditions: premultiplication of the virus on non-wilting variety (Vedrantais) prior to testing

### Conduct of the test

Plant stage:	1st emergent leaf
Temperature:	25°C during day, 18°C during night
Light:	12 hours per day
Manner of inoculation:	mechanical inoculation by rubbing of cotyledons
Duration of test:	
- from sowing to inoculation:	15 days
- from inoculation to reading:	15 days
Number of plants tested:	30

### Remarks

Reading difficulty:	- heterozygotes (Fn/Fn+) wither and die more slowly than homozygotes (Fn/Fn) <b>- use the F pathotype of ZYMV</b>
Example varieties:	
Vedrantaïs (Fn+/Fn+):	mosaic (resistance present)
Cantor (Fn/Fn+):	slower necrosis with wilting (resistance absent)
Doublon (Fn/Fn):	necrosis with wilting (resistance absent)

### Ad. 75: Resistance to Papaya Ringspot Virus (PRV), race GVA and race E2

#### Maintenance of strain

Maintenance:	dried on anhydrous calcium chloride at 5°C
Special conditions:	premultiplication of the virus on susceptible variety (Vedrantaïs) prior to testing

#### Conduct of the test

Plant stage:	1 <sup>st</sup> emergent leaf
Temperature:	25°C during day, 18°C during night
Light:	12 hours per day
Manner of inoculation:	mechanical inoculation by rubbing cotyledons
Duration of test:	
- from sowing to inoculation:	15 days
- from inoculation to reading:	15-20 days
Number of plants tested:	30

### Remarks

Identification of two strains of **the** PRV virus and of the two alleles concerned:

Genotypes/Strains	GVA strain	E2 strain
Vedrantais (Prv <sup>+</sup> )	Mosaic (vein-clearing) = resistance absent	Mosaic (vein-clearing) = resistance absent
72025 (Prv <sup>2</sup> )	- No systemic symptoms - Local necrotic lesions on cotyledons (irregular) = resistance present	- Apical necrosis = Necrosis of plant instead of local lesions: resistance absent
WMRV 29 (Prv <sup>1</sup> )	- No systemic symptoms - Occasional local necrotic lesions on cotyledons = resistance present	- No systemic symptoms - Occasional local necrotic lesions on cotyledons = resistance present

Ad. 76: Resistance to Muskmelon Necrosis Spot Virus (MNSV), race E8

Maintenance of strain

Maintenance: dried on anhydric calcium chloride at 5°C  
 Special conditions: premultiplication on susceptible variety (Vedrantais) prior to test

Conduct of the test

Plant stage: 1<sup>st</sup> emergent leaf  
 Temperature: 25°C during day, 18°C during night  
 Light: 12 hours per day  
 Manner of inoculation: mechanical inoculation by rubbing of cotyledons  
 Duration of test:  
 - from sowing to inoculation: 15 days  
 - from inoculation to reading: 8 days  
 Number of plants tested: 30  
 Remark: - necrotic lesions on the inoculated organs (cotyledons) of susceptible plants  
 - no lesion on resistant plants

Ad. 77: Resistance to Cucumber Mosaic Virus (CMV)

A. INOCULUM

1. Crushed solution

Phosphate disodic (Na <sub>2</sub> HPO <sub>4</sub> , 12 H <sub>2</sub> O) (0,03M)	1,075 g
Diéthylthiocarbamate of sodium (= DIECA)	0,2 g
Distilled water	qsp 100 ml



The phosphate disodic solution can be stored in a refrigerator. Once the DIECA is added, the solution should be used within the next two hours.

## 2. Crushing the leaves

The source of the inoculum comes from crushing either the fresh leaves, or leaves desiccated in anhydrous calcium chloride (Ca Cl<sub>2</sub>), in a cold mortar.

Crush 1 gram of leaves with 4 ml of phosphate disodic solution at 5°C. Add active carbon (0,5 g) and carborendum (0,4 g) for each 1 gram of leaves. After crushing, put the mortar on a bed of ice.

Before using leaves dried with CaCl<sub>2</sub> to inoculate a plant test, do a multiplication of the inoculum on some 10 susceptible plants which would be used as inoculum.

## 3. Strains maintenance

CMV can be stored for several years by desiccation with anhydrous CaCl<sub>2</sub>. Leaves showing mosaic symptoms should be chopped finely with a razor blade and placed in cups. Put a layer of anhydrous calcium chloride (0,5 cm) in a plastic box and cover it with filter paper. Place the cups on this layer. Close the box well with adhesive tape, and then place it in a tightly closed plastic bag. Store it in a refrigerator at 5°C.

## B. INOCULATION AND INCUBATION

Cotyledons or young leaves should be inoculated by rubbing them with a latex-protected finger. After a few minutes, rinse the cotyledons with running water. Place the plants for incubation in a growth chamber (generally at 18°C at night and 25°C in the day, with 12 to 14 hours of daylight).

## C. SYMPTOMS AND OBSERVATIONS

The “common” strains of CMV bring out mosaic symptoms on susceptible plants one week after inoculation. Resistant plants show no symptoms.

### Remarks:

When light intensity and daylight are not sufficient (winter period), resistant plants (in particular PI 161375) may present chlorotic lesions on the first leaf.

### Strains:

Use “common” strains (as T1, P9) rather than “song” strains (14, T2).

		CMV common strains (T1, P9)	CMV song strains (14, T2)
Susceptible	Vedrantais	mosaic	mosaic
Resistant	PI 161375	no symptoms	mosaic, chlorotic lesions
	Virgos		

P9 brings out “aucuba” mosaic on susceptible varieties

P9 is less aggressive than T1

It is preferable to use Virgos rather than PI 161375 (lower germination, weaker growth).

Observations, notes:

The genetic resistance is polygenic. Use a notation with classes. It is preferable to use the two strains P9 and T1 to have a better evaluation of the resistance.

High resistance confers resistance on all common strains. Some genotypes may present a resistance to P9 (no symptoms), and a slight susceptibility to T1 (slight mosaic).

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10. Technical Questionnaire

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	Application date: (not to be filled in by the applicant)
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TECHNICAL QUESTIONNAIRE  
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 Botanical name

1.2 Common Name

2. Applicant

Name

Address

Telephone No.

Fax No.

E-mail address

Breeder (if different from applicant)

3. Proposed denomination and breeder's reference

Proposed denomination  
(if available)

Breeder's reference

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

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

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

4.1.2 Discovery and development  [ ]  
(please state where and when discovered  
and how developed)

.....  
.....

4.1.3 Other  [ ]  
(please provide details)

.....  
.....

4.2 Method of propagating the variety

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
<b>5.1</b>	<b>Inflorescence: sex expression (at full flowering)</b>		
<b>(12)</b>			
	monoecious	Alpha, Categoría	1[ ]
	andromonoecious	Piel de Sapo	2[ ]
<b>5.2</b>	<b>Fruit: shape in longitudinal section</b>		
<b>(28)</b>			
	oblate	Jívaro, Noir de Carmes	1[ ]
	circular	Alpha, Galia	2[ ]
	quadrangular	Zatta	3[ ]
	ovate	De Cavaillon, Piolín	4[ ]
	obovate	Cganchi	5[ ]
	medium elliptic	Piel de Sapo	6[ ]
	broad elliptic	Corin, Sardo	7[ ]
	elongated	Alficoz, Banana	8[ ]
<b>5.3</b>	<b>Fruit: ground color of skin</b>		
<b>(29)</b>			
	white	Albino, Honey Dew	1[ ]
	yellow	Amarillo-Canario, Edén, Galia, Passport, Solarking	2[ ]
	green	Gohyang, Piel de Sapo	3[ ]
	grey	Sirio, Romeo, Supporter, Geaprince, Geamar, Vedrantais	4[ ]

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics	Example Varieties	Note	
<b>5.4 Fruit: density of patches (36)</b>			
absent or very sparse	Rochet	1[ ]	
sparse		3[ ]	
medium	Braco	5[ ]	
dense	Piel de Sapo	7[ ]	
very dense	Oranje Ananas	9[ ]	
<b>5.5 Fruit: warts (38)</b>			
absent	Piel de Sapo	1[ ]	
present	Zatta	9[ ]	
<b>5.6 Fruit: grooves (43)</b>			
absent or sometimes present	Piel de Sapo	1[ ]	
always present	Ogen, Vedrantaï	2[ ]	
<b>5.7 Fruit: cork formation (49)</b>			
absent	Alpha	1[ ]	
present	Dalton	9[ ]	
<b>5.8 Fruit: pattern of cork formation (51)</b>			
dots only	Hermes, Vedrantaï	1[ ]	
dots and linear	Jivaro, Topper	2[ ]	
linear only	Futuro, Riosol	3[ ]	
linear and netted	Anatol, Chantal	4[ ]	
netted only	Galia, Perlita	5[ ]	

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics	Example Varieties	Note	
<b>5.9 Fruit: density of pattern of cork formation (52)</b>			
very sparse	Alpha, Amarillo Oro	1[ ]	
sparse	Vedrantais	3[ ]	
medium	Regal, Vital	5[ ]	
dense	Galia, Geamar	7[ ]	
very dense	Honey Rock, Perlita	9[ ]	
<b>5.10 Fruit: main color and hue of flesh (55)</b>			5[ ]
white	Piel de Sapo	1[ ]	
white greenish	Galia	2[ ]	
green	Radical	3[ ]	
white yellowish	Guaraní	4[ ]	
orange	Vedrantais	5[ ]	
reddish orange	Magenta	6[ ]	
<b>5.11 Seed: length (61)</b>			
very short	Golden Crispi, Geumssaraki	1[ ]	
short	Elario, Katsura Giant	2[ ]	
medium	Arava, Sancho	3[ ]	
long	Amarillo Oro, Toledo	4[ ]	
very long	Albino	5[ ]	
<b>5.12 Seed: color (64)</b>			
whitish	Amarillo Oro s.b.	1[ ]	
cream yellow	Galia, Piel de Sapo	2[ ]	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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	Characteristics	Example Varieties	Note
<b>5.13</b>	<b>Shelf life of fruit</b>		
<b>(69)</b>			
	very short	Charentais	1[ ]
	short	Galia	3[ ]
	medium	Clipper	5[ ]
	long	Piel de Sapo	7[ ]
	very long	Tendral Negro	9[ ]

6. Similar varieties and differences from these varieties

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

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety
	<i>Density of pattern of cork formation</i>	<i>Dense</i>	<i>Medium</i>

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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7. Additional information which may help in the examination of the variety

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

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Special conditions for the examination of the variety

Yes [ ] No [ ]

If yes, please give details:

.....

7.3 Other information

A representative color photograph of the variety should accompany 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 (b) is yes, please attach a copy of the authorization.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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9. Information on plant material to be examined.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

- |   |         |        |
|---|---------|--------|
| (a) Microorganisms (e.g. virus, bacteria, phytoplasma)      | Yes [ ] | No [ ] |
| (b) Chemical treatment (e.g. growth retardant or pesticide) | Yes [ ] | No [ ] |
| (c) Tissue culture  | Yes [ ] | No [ ] |
| (d) Other factors   | Yes [ ] | No [ ] |

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

.....  
.....  
.....

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

Applicant's name

Signature

Date

[End of document]