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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

MELON

(*Cucumis melo* L.)

[*]

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

to be considered by the
Technical Working Party for Vegetables at its thirty-seventh session,
to be held in Roelofarendsveen, Netherlands, from June 23 to 27, 2003

Alternative Names:[*]

Latin	*English*	*French*	*German*	*Spanish*
Cucumis melo L.	Melon	Melon	Melone	Melón

ASSOCIATED DOCUMENTS

These guidelines should be read in conjunction with document TG/1/3, "General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants" (hereinafter referred to as the "General Introduction") and its associated "TGP" documents.

[*] 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

(Explanation)
Formula

X= total number of growing trials	*3*
p=number of plants per growing trial	*30*
a= level of plant establishment/submitted seeds	*1/3*
Y = number of special tests	*10*
r = number of plants per test	*60*
b =level of plant establishment in test/submitted seed	*1/2*
Z =number of years of stock required for reference	*10*
s = rate of deterioration in store	*0,60*

Number of seeds required
N=X(p/a)+Y(r/b)+Z(p/as)=3(30*3)+10*(60*2)+10*(30*3/0,6)=270+1200+1500=2970 - >3000 seeds*

Quantity of seeds required
*Q=N/1000*TSW= 2970*50/1000 = 148,5gr →150 gr*

2.4 The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. [In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.]

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

2.6 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 Duration of Tests

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

3.2 Testing Place

The tests should normally be conducted at one place. If any characteristics of the variety, which are relevant for the examination of DUS, cannot be observed at that place, the variety may be tested at an additional place.

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.

3.3.1 Type of observation – visual or measurement

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

3.3.2 Observation of color

3.3.2.1 General explanation about different components of colors characteristics

The color is defined for the resultant of three basic components: blue-green-red.

It is very difficult to quantify visually, with sufficient precision, each component which would be the exact form of define one color.

There exist three indexes or ratios composed of the relative quantities of the components that are easier to perceive by the human eye:

saturation: this is a parameter that indicates the vivacity of the colors. The bigger the difference between the quantity of the dominant and the less abundant component, the higher the saturation. The opposite concept is the ***grey hue*** of the colors, also named ***glaucescence*** in many crops, that is easy to observe;

brightness: this parameter varies depending on the total quantity of the addition of both the dominant and the less abundant components. This opposite concept is the ***intensity*** of the color, easily assessed by eyes;

hue: this is determined by the relative proportion of 2 principal components: There is a continuous transition between adjacent hues. Others, non-adjacent hues are clearly separated. This characteristic can be considered as pseudo-qualitative or qualitative, depending on the range of hues that appear in one concrete crop. In the case of qualitative characteristic (clear discontinuities between the possible expressions), it will be simply called "color". as for the case of pseudo-qualitative, to be of possible use for grouping, it must be divided in two characteristics: one named "***color***", that will join different hues in the common basic color (red, blue, white, yellow etc.), clearly different of all the others basic colors, consequently qualitative and useful for grouping. One second characteristic, named "***hue"*** would describe more finely using adjacent hues, and would be used not for grouping, but mainly for distinctness (scarlet-pink-vermillion, ochre-orange-creme, yellowish-green –bluish green).

3.3.2.2 Examples in melon:

Color of young fruit

There are different ***grey-hues*** (saturation), and different color ***intensities*** (brightness). The basic ***color*** must be considered always green, but would be a continuous lineal gradation from the yellowish ***hue*** (slight predominance of the red over the blue), "perfect" or "vivid" green (red and blue components in similar proportion), bluish ***hue*** (when the blue component is slightly stronger than the red one) is not included in the possible expressions of this characteristic because no example varieties are known by us. In order not to increase too much the number of characteristics, we propose to include in characteristic number 14, two true hues: (*yellowish*, and *green*), the *greyish* that really is not a hue but a low saturation and the *whitish* that is a very light intensity of green. When one of this two untrue hues is present, it makes not relevant the true hue.

Color of mature fruit

All the Galia type would be considered as yellow color. Hues ochre, orange, vivid yellow or greenish can be considered into the group, but in a separate characteristic. All the Charentais type would be considered as ***grey***. Greenish, whitish, bluish or yellowish hues can be used for distinctness, but no recommended for grouping.

Color at over maturity.

It's always yellow (if there is change of color after the maturity). The differences would be in hue: cream, orange, vivid yellow, greenish, or in intensity of the yellow color.

3.3.2.3 Changing of Colors in Melon

The growing fruit of melon can have successively one, two or three different colors. The speed of evolution of the color varies a lot depending on the group of the variety, but also into the same group. It is very difficult to conduct one or several occasions for observation that would be sufficient for characterizing all the varieties, as the description should include a complete information about an important grouping characteristic, without introducing differences in the description that could produce mistakes in the grouping.

These characteristics could be named as “dynamic” characteristics. A good solution to describe them, could be to divide them in several qualitative characteristics, expressing the different steps in evolution of color, completed with the information of the speed of changing between the different steps.

Thus for melon the description of the colors could be:

1. color of the young fruit (stage 1)
2. speed of changing to color at maturity
3. color at maturity (stage 2)
4. speed of changing to color at over maturity
5. color at over maturity (stage 3).

The three mentioned stages must be considered not as very precise stages, but approximately. Thus, the description of the color in a stage must not vary for differences in the speed of changing (only if there is no change).

Some examples could illustrate these arguments:

Variety	Stage 1: color of the young fruit	Speed to change from Stage 1 to Stage 2 (Ch. 23)	Stage 2: color at maturity (Ch. 29)	Speed to change from Stage 2 to Stage 3 (Ch. 52)	Stage 3: color at over maturity
Galia	green	slow	yellow	no	yellow
Amarillo Oro	green	medium	yellow	no	yellow
Charentais	green	quick	grey	quick	yellow
Alfa	green	quick	grey	medium	yellow
Clipper	green	quick	grey	no	grey
Albino	green	medium	white	no	white
Dulcinea	green	medium	white	medium	yellow
Futuro	green	no	green	quick	yellow
Piel de Sapo	green	no	green	no	green

The speed of changing color (characteristics nº 23 and nº52) are useful mainly for distinctness.

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 at least on 10 plants or parts taken from each of 10 plants.

3.6 Additional Tests

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

The minimum duration of tests recommended in section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

4.1.3 Clear Differences

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

4.2 Uniformity

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 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 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 to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

4.3.3 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 is aided by the use of grouping characteristics.

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

5.3 The following characteristics and types have been agreed as useful for grouping:

5.3.1 Characteristics to be used for grouping:

(a) Inflorescence: sex expression (characteristic 12)
(b) Young fruit: intensity of green color of skin (characteristic 14)
(*Netherlands propose not include)*
(c) Fruit: ground color of skin (characteristic 29)
(d) Fruit: density of patches (characteristic 36)
(e) Fruit: grooves (characteristic 43)
(f) Fruit: density of pattern of cork formation (characteristic 50)
(g) Fruit: main color of flesh (characteristic 54)
(h) Seed: color (characteristic 63)
(i) Resistance to race 0 of *Fusarium oxyxporum* f. sp. melonis (Characteristic 69)

5.3.2 Types of *Cucumis melo* L. for grouping (see the table overleaf):

(i) Carentais
(ii) Italian Cnatalup
(iii) Zatta
(iv) Galia
(v) Ananas
(vi) Rochet
(vii) Piel de Sapo
(viii) Amarillo Oro
(ix) Blanco
(x) Others

Types of varieties of *Cucumis melo* L.

Fruit: type	Young fruit: intensity of green color of skin (Ch. 14)	Fruit: ratio length/ diameter (Ch. 26)	Fruit: ground color of skin (Ch. 29)	Fruit: hue of color of skin (Ch. 30)	Fruit: density of patches (Ch. 36)	Fruit: warts (Ch. 38)	Fruit: grooves (Ch. 43)	Fruit: density of pattern of cork formation (Ch. 50)	Fruit: main color of flesh (Ch. 54)	Example varieties
Charentais	1-5		gregregrey		1-3	absent	present		orange	
Italian cantalup	7-9	1-4			1-3	absent		7-9	*orange*	
Zatta			green			present	present		orange	
Galia	1-7	1-3	*yellow*		1-3	absent		5-8	green or white	
Ananas	7-9	1-4	yellow	orange		absent	absent	5-8	white	
Rochet			green		1-3	absent			white	
Piel de Sapo			*green*		5-9	absent			white	
Amarillo Oro	3-4		yellow		1	absent		1-5	green or white	
Blanco	3-4		*white*		1	absent			green or white	
Others										

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

(*) Asterisked characteristic – see Section 6.1.2

(QL) Qualitative characteristic – see Section 6.3
(QN) Quantitative characteristic – see Section 6.3
(PQ) Pseudo-qualitative characteristic – see Section 6.3

(a) – (f) See Explanations on the Table of Characteristics in Chapter 8, Section 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8, Section 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
1.		**Seedling: length of cotyledon**					
	VG	very short					1
	(a)	short				Arava, Clipper	3
QN		medium				Doral, Futuro	5
		long				Bimbo, Ronda	7
		very long					9
2.		**Seedling: size of cotyledon**					
	VG	small				Candy, Lunasol	3
QN	**(a)**	medium				Futuro, Sancho	5
		large				Bimbo, Nicolás	7
3.		**Seedling: green color of cotyledon**					
	VG	light				Bimbo, Lucas	3
QN	**(a)**	medium				Candy, Piel de Sapo	5
		dark				Clipper, Lunasol	7
4.		**Leaf blade: green color**					
	VG	light				Fimel, Yuma	3
QN	**(b)**	medium				Doral, Galia	5
		dark				Gama, Gustal	7
5.		**Leaf blade: development of lobes**					
(+)	**VG**	weak				Boule d‘or	3
QN	**(b)**	medium				Piel de Sapo	5
		strong				Galia	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6.		**Leaf blade: length of terminal lobe**					
(+)	**VG**	short				Perlita	3
QN	**(b)**	medium				Clipper, Gama	5
		long				Gustal, Primal	7
7.		**Leaf blade: dentation of margin**					
	VG	weak				Clipper, Vedrantais	3
QN	**(b)**	medium				Piel de Sapo, De Cavaillon espagnol	5
		strong				Portoluz, Boule d'or	7
8.	**VG**	**Leaf blade: blistering**					
	(b)	weak				Galia	3
QN		medium				Costa	5
		strong				Haros	7
9.		**Leaf blade: size (in plant stage of 7-10 nodes)**					
	VG	small				Geaprince, Lunasol,	3
QN		medium				Candy, Total	5
		large				Don, Sucrero	7
10.		**Petiole: attitude**	**(Netherlands to supply example varieties)**				
	VG	erect					3
QN		semi-erect					5
		horizontal					7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11.		**Petiole: length**					
	MS	short				Costa	3
QN		medium				Arava, Sancho	5
		long				Goldgen	7
12. (*)		**Inflorescence: sex expression**					
	VS	monoecius				Alpha, Categoría	1
QL		andromonoecius				Piel de Sapo	2
13.		**Young fruit: hue of green color of skin**	**(Netherlands propose to observe it before maturity)**				
	VG	whitish				Geasol	1
PQ	**(c)**	yellowish				Fimel	2
		green				Lucas	3
		greyish				Spanglia	4
14. (*)		**Young fruit: intensity of green color of skin**	**(Netherlands propose to observe it before maturity)**	**(Netherlands propose to observe it only in green hue varieties)**			
	VG	very light				Solarking	1
QN	**(c)**	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
15.		**<u>Varieties with densely corked fruit at maturity only (see Ch. 50)</u> : Young fruit : density of dots**	**(Netherlands propose to observe it before maturity)**	**(Netherlands propose to observe it in all groups)**			
	VG	absent or very sparse				Solarking	1
QN	**(c)**	sparse				Fimel	3
		medium				Lucas	5
		dense				Arava	7
		Very dense				Edén	9
16.		**<u>Varieties with densely corked fruit at maturity only (see Ch. 50)</u> : Young fruit: size of dots**	**(Netherlands propose to observe it before maturity)**	**(Netherlands propose to observe it in all groups)**			
	VG	small				Lucas	3
QN	**(c)**	medium				Arava	5
		large				Spanglia	7
17.		**<u>Varieties with densely corked fruit at maturity only (see Ch. 50)</u> : Young fruit: contrast of dots color/ground color**	**(Netherlands propose to observe it before maturity)**	**(Netherlands propose to observe it in all groups)**			
	VG	weak				Lucas	3
QN	**(c)**	medium				Arava	5
		strong				Total	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18.		**<u>Varieties with densely corked fruit at maturity only (see Ch. 50)</u> : Young fruit: extension of grooves color**	**(Netherlands propose to observe it before maturity)**	**(Netherlands propose to observe it in all groups)**	**(Netherlands propose to add an explanation)**		
	VS	absent or very weak				Solarking	1
QN	**(c)**	weak				Geaprince, Total	3
		medium				Gama	5
		strong				Clipper, Galia	7
		very strong				Nembo	9
19.		**Young fruit: intensity of grooves color**	**(Netherlands propose to observe it before maturity)**				
	VS	light					3
QN	**(c)**	medium				Gama, Topper	5
		dark				Century, Drake	7
20.		**Young fruit: length of peduncle**					
	MS	short				Lince Haros	3
QN	**(c)**	medium				Arava, Romeo	5
		long				Corín	7
21.		**Young fruit: thickness of peduncle 1 cm from fruit**	**(Netherlands propose to delete)**				
	MS	thin					3
QN	**(c)**	medium					5
		thick					7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
22.		**Young fruit: marked area around peduncle**					
	VG	absent or very weak				Doral	1
QN	**(c)**	weak				Boule d'or	3
		medium				Mirasol	5
		strong					7
		very strong					9
23.		**Speed of changing from green to ripen color**	**(Netherlands propose to add an explanation)**				
	VG	no change				Piel de Sapo	1
QN		slow				Galia	3
		medium				Doral, Eloro	5
		quick				Drake, Geaprince	7
24. **(*)**		**Fruit: length**					
	MS	very short				Doublon, Golden Crispy	1
QN	**(d)**	short				Topper, Total	3
		medium				Marina, Spanglia	5
		long				Categoría, Toledo	7
		very long				Katsura Giant, Valdivia	9
25.	**MS**	**Fruit: diameter**					
(*)	**(d)**	very narrow				Banana, Golden Crispy	1
QN		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
26. (*)		**Fruit: ratio length/diameter**					
	MS	very small				Noir des Carmes	1
QN	**(d)**	very small to small				Arava, Clipper	2
		small				Buster, Galia	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, Trujillo	8
		very large				Banana	9
27. (*)		**Fruit: position of maximum width**					
(+)	**VG**	toward blossom end				Edén, Katsura Giant	1
PQ	**(d)**	at center				Piel de Sapo, Vedrantais	2
		toward stem end				Piolín , Sapo de Oro	3
28. (*)		**Fruit: shape of longitudinal section**					
(+)	**VG**	oblate				Jívaro	1
PQ	**(d)**	circular				Galia	2
		ovate				Piolín	3
		broad elliptic					4
		elliptic				Piel de Sapo	5
		elongated				Banana	6
		quadrangular				Zatta	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29. (*)		**Fruit: ground color of skin**					
	VG	white				Albino	1
QL	**(d)**	yellow				Galia	2
		green				Piel de Sapo	3
		grey				Vedrantais	4
30.		**Fruit: intensity of ground color of skin**					
	VG	light					3
QN	**(d)**	medium					5
		dark					7
31.		**Fruit: hue of color of skin**					
	VG	whitish				(Charentais type)	1
PQ	**(d)**	yellowish				(Charentais type)	2
		orange				Edén (Ananás type)	3
		ochre				Passport (Galia type)	4
		creme				(Charentais type)	5
		greenish				Geamar (Charentais type), Solarking (Galia type), Honey Dew (White type)	6
		greyish				Clipper (Charentais type)	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
32.		**Varieties with non-corked or sparsely corked fruit only (see Ch. 50): Fruit: density of dots**	**(Netherlands propose to delete)**				
	VS	absent or very sparse				Charentais	1
QN	**(d)**	sparse					3
		medium					5
		dense				Piel de Sapo	7
		very dense				Albino	9
33.		**Fruit: color of dots**					
	VG	white				Edén	1
QL	**(d)**	yellow				Piel de Sapo	2
		green				Tendral Negro	3
34.		**Fruit: intensity of color of dots**					
	VS	light				Kinka, Mesol	3
QN	**(d)**	medium				Sapiel, Toledo	5
		dark				Soprano, Víctor	7
35.		**Varieties with non-corked or sparsely corked fruit only (see Ch. 50): Fruit: size of the dots**	**(Netherlands propose not to add)**				
	VS	small				Doral	3
QN	**(d)**	medium				Toledo	5
		big				Futuro	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
36. (*)		**Fruit : density of patches**					
	VG	absent or very sparse				Rochet	1
QN	**(d)**	sparse					3
		medium				Braco	5
		dense				Piel de Sapo	7
		very dense					9
37.		**Fruit : size of patches**					
	VG	small				Baltasar	3
QN	**(d)**	medium				Sancho	5
		large				Taurus	7
38.	**VG**	**Fruit: warts**					
QL	**(d)**	absent				Piel de Sapo	1
		present				Zatta	9
39. (*)		**Fruit: abscission of peduncle**					
	VS	absent or very weak				Daimiel, Eloro	1
QN	**(d)**	weak				Clipper, Costa	3
		medium				Doral, Vedrantais	5
		strong				Arava, Maestro	7
		Very strong				Edén	9
40. (*)		**Fruit: shape of base**					
	VS	pointed				Edén	1
PQ	**(d)**	rounded				Arava	2
		flattened				Zatta	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
41. (*)		**Fruit: shape of apex**					
	VS	pointed				Futuro	1
PQ	**(d)**	rounded				Alpha	2
		flattened				Noir des Carmes	3
42. (*)		**Fruit: size of pistil scar**					
	VS	small				Alpha, Categoría	3
QN	**(d)**	medium				Charentais, Eros, Verdol	5
		large				Colmo, Drake	7
43. (*)	**VG**	**Fruit: grooves**					
QL	**(d)**	absent or very weak				Piel de Sapo	1
		present				Vedrantais	9
44.		**Fruit: width of grooves**					
	VS	narrow				Auraprince	3
QN	**(d)**	medium				Biga	5
		broad				Nembo, Sirio	7
45.		**Fruit: depth of grooves**					
	VS	very shallow				Amber	1
QN	**(d)**	shallow				Galia	3
		medium				Alpha	5
		deep				Panamá	7
		very deep				Noir des Carmes	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
46. (*)		**Fruit: creasing of surface**					
(+)	**VS**	absent or very weak				Vedrantais	1
QN	**(d)**	weak				Melchor, Sirocco	3
		medium				Costa, Piolín	5
		strong				Tendral Negro	7
		very strong					9
47. (*)		**Fruit: cork formation (to delete asterisk)**					
	(d)	absent					1
		present					9
48. (*)		**Fruit: thickness of cork layer**					
	VS	very thin					1
QN	**(d)**	thin				Riosol	3
		medium				Marina	5
		thick				Geamar	7
		very thick				Honey Rock	9
49. (*)		**Fruit: pattern of cork formation**					
	VS	in small dots				Hermes, Vedrantais	1
PQ	**(d)**	dots and linear				Jívaro, Topper	2
		linear				Futuro, Riosol	3
		linear and netted				Anatol, Chantal	4
		netted				Galia, Perlita	5

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
50. (*)		**Fruit: density of pattern of cork formation**					
	VS	absent or very sparse	(Netherlands propose only very sparse)			Alpha, Amarillo Oro	1
QN	**(d)**	sparse				Vedrantais	3
		medium				Regal, Vital	5
		dense				Galia, Geamar	7
		very dense				Honey Rock, Perlita	9
51 (*)		**Fruit: color of grooves/ground skin**					
QL	**VG**	similar				Galia	1
	(d)	different				Vedrantais	2
52.		**Fruit: Speed of changing to over maturity color**					
	VG	no change				Clipper, Doral, Galia, Honey dew, Piel de Sapo	
QN		slow				Dulcinea, Goloso	3
		medium				Futuro, Vendôme	5
		quick				Corin, Marina, Nembo	7
53.		**Fruit: maximum width of flesh in cross section**					
(+)	**(d)**	thin				Gama	3
		medium				Toledo	5
		thick				Tito	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
54. (*)		**Fruit: main color of flesh**					
	(d)	white				Piel de Sapo	1
		green				Galia	2
		orange				Vedrantais	3
55.		**Fruit: intensity of main color of flesh**					
	VS	light					3
QN	**(d)**	medium					5
		dark					7
56.		**<u>Varieties with green and white flesh only</u>: Fruit: salmon hue of flesh**					
	VS	absent or very weak				Gustal	1
QN	**(d)**	weak				Floraprince, Toledo	3
		medium				Arizo, Eloro	5
		strong					7
57.		**Fruit: firmness of the flesh**	**(Netherlands ask to give an explanation on how to assess)**				
	VS	soft				Galia, Marina	3
QN	**(d)**	medium				Sancho, Supporter	5
		firm				Braco, Geamar	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
58.		**<u>Varieties of which the color of fruit changes at over maturity only</u>: Fruit at over maturity: hue of yellow color**					
	VG	yellow				Futuro, Marina	3
PQ	**(e)**	orange				Drake, Gama	5
		cream				Figaro, Vendôme	7
59.		**<u>Varieties of which the color of fruit changes at over maturity only</u>: Fruit at over maturity: intensity of color**					
	VS	light					3
QN	**(e)**	medium					5
		dark					7
60.		**Seed: length**					
	MS	very short				Golden Crispi	1
QN	**(f)**	short				Katsura Giant	3
		medium				Arava, Sancho	5
		long				Amarillo Oro, Toledo	7
		very long				Albino	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
61.		**Seed :width**					
	MS	very narrow				Golden Crispi	1
QN	**(f)**	narrow				Aurabel	3
		medium				Arava, Sancho	5
		large				Amarillo Oro	7
		very large				Ronda	9
62.		**Seed: shape**					
(+)	**VS**	not pine-nut shape				Toledo	1
PQ	**(f)**	pine-nut shape				Piel de Sapo	2
63. (*)		**Seed: color**					
QL	**VG**	ivory				Amarillo Oro s.b.	1
		cream-yellow				Piel de Sapo	2
64.		**Seed: intensity of color**					
	VG	light				Goldgen	3
QN	**(f)**	medium				Galia	5
		dark				Doral	7
65.		**Time of male flowering**					
	MS	early				Clipper, Vital	3
QN		medium				Categoría	5
		late				Nicolás, Rocín	7
66.		**Time of female flowering**					
	MS	early				Clipper	3
QN		medium				Categoría, Braco, Vital	5
		late				Nicolás	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
67.		**Time of ripening**					
	MS	early					3
QN		medium					5
		late					7
68.		**Conservation of fruits**					
(+)	**VS**	short				Charentais, Galia	3
QN		medium				Clipper	5
		long				Piel de Sapo	7
		very long				Tendral Negro	9
69.		**Resistance to <u>race 0</u> of *Fusarium oxysporum* f. sp. *melonis***					
(+)		absent				Jaune Canari 2	1
		present				Jador, Joker, Vedrantais	9
70.		**Resistance to <u>race 1</u> of *Fusarium oxysporum* f. sp. *melonis***					
(+)		absent				Jaune Canari 2, Vedrantais	1
		present				Jador, Joker	9
71.		**Resistance to <u>race 2</u> of *Fusarium oxysporum* f. sp. *melonis***					
(+)		absent				Jaune Canari 2, Joker	1
		present				Jador, Vedrantais	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
72.	**Resistance to <u>race 1-2</u> of *Fusarium oxysporum* f. sp. *melonis***					
(+)	absent				Jaune Canari2 Joker, Vedrantais	1
	present				Jador	9
73.	**Resistance to *Sphaeroteca fuliginea***	**(Netherlands propose to gives races and define a protocol)**				
	absent				Piel de Sapo	1
	present				Eloro	9
74.	**Resistance to colonization by *Aphis gossypii***					
(+)	absent				Charentais	1
	present				AR, Margot, Top Mark	9
75.	**Resistance to <u>race F</u> of Zucchini Yellow Mosaic Virus (ZYMV)**					
(+)	absent				Alpha, Boule d'Or Cantor, Doublon	1
	present				Eloro, Hermes, Vedrantais	9
76.	**Resistance to <u>race GVA</u> of Papaya**					
(+)	**Ringspot Virus (PRV)**					
	absent				Vedrantais	1
	present				WMRV 29, 72025	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
77.	**Resistance to race E_2 of Papaya Ringspot Virus (PRV)**					
(+)	absent				Vedrantais, 72025	1
	present				WMRV 29	9
78.	**Resistance to race E_8 of Muskmelon Necrotic Spot Virus (MNSV)**					
(+)	absent				Vedrantais	1
	present				Primal, VA 435	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 between the 5th and the 8th nodes counting from the apex of main stem, and never in the 3 first nodes counting from the base of the stem.

(c) Young fruit: All observations on the young fruit should be made on fruits with less than the half of the final size, preferably 7-10 cm of diameter. The fruit should have loosed the hairiness. In some groups of varieties it is recommended to harvest one small fruit per plant to observe them in groups (for characteristics VG).

*It is considered that the expression "young fruit" instead of fruit before maturity (when the fruit has **almost reached its final size, but before the start of corking and the change of color**) because a great variability in the speed of the change of color is observed in this crop, depending on the variety, increase the risk of misunderstanding. In fact many varieties don't have this stage according the above definition, because start the changes much before of to reach the final size . In groups of varieties with slow evolution of the fruits, the stage may be prolonged to before maturity*

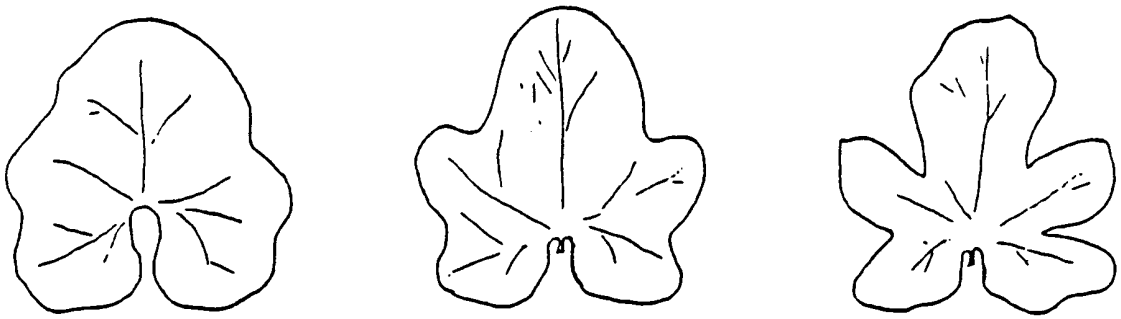
(d) Fruit: All observations on the fruit should be made on ripened fruit. The color must be **not changing** to the over maturity. It is convenient to harvest the fruits to observe them side by side. In general for the flesh characteristics it is recommended to wait at least a week after the harvest before opening the fruits.

(e) Fruit at over maturity: All observations on the fruit at over maturity should be made when the fruit has lost its commercial state.

(f) Seed: All observations on the seed, should be made on full grown and dry seeds, after washing and drying in the shade.

8.2 Explanations for individual characteristics]

Ad. 5: Leaf blade: development of Lobes

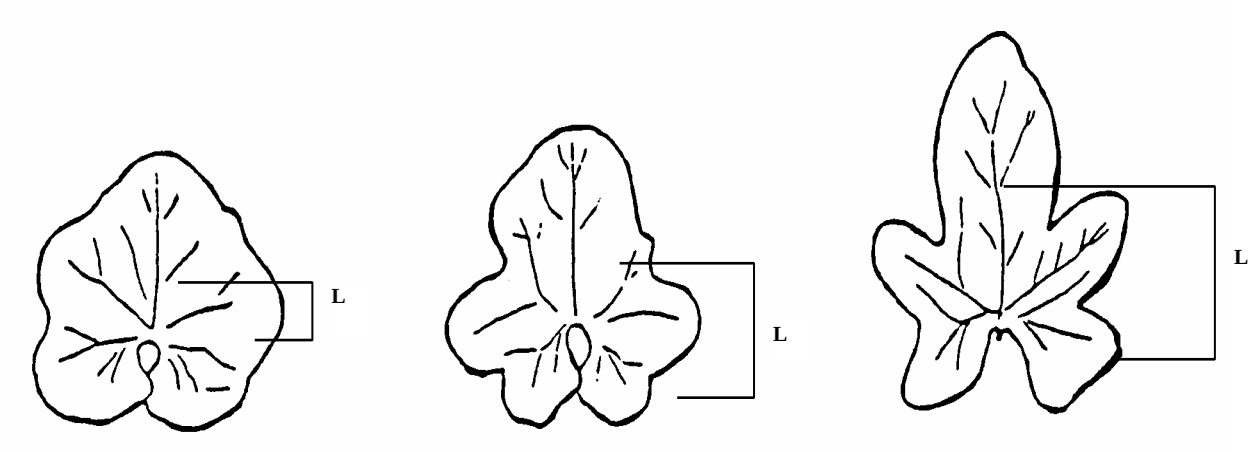


3
weak

5
medium

7
strong

Ad. 6: Leaf blade: length of terminal lobe

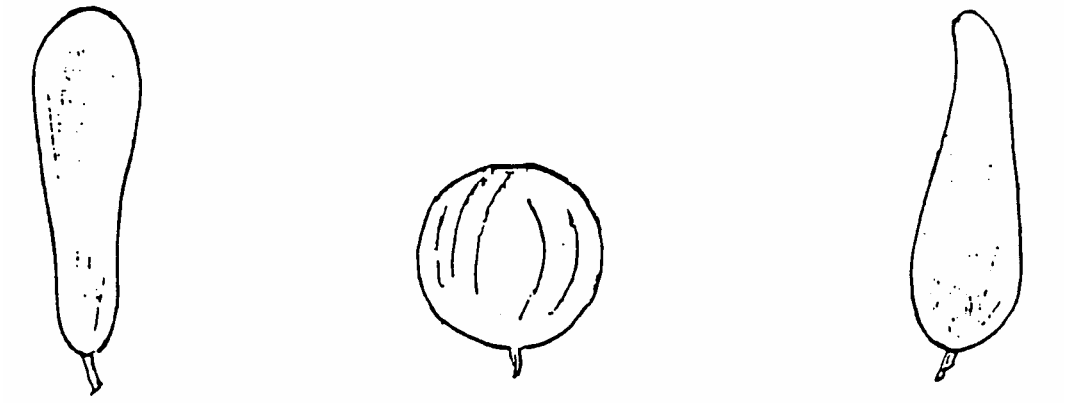


3
short

5
medium

7
long

Ad. 27: Fruit: position of maximum width

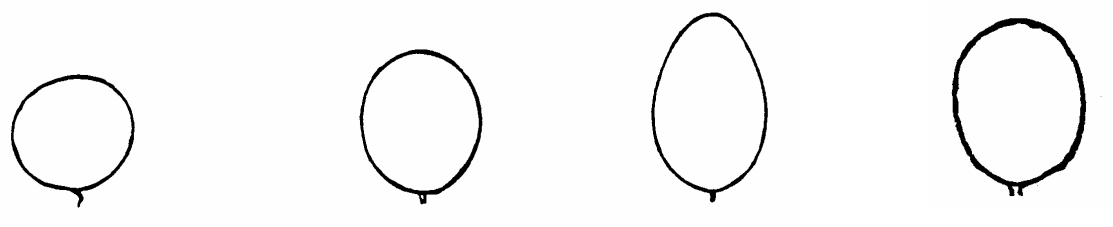


1
toward blossom end

2
at center

3
toward stem end

Ad. 28: Fruit: shape of longitudinal section

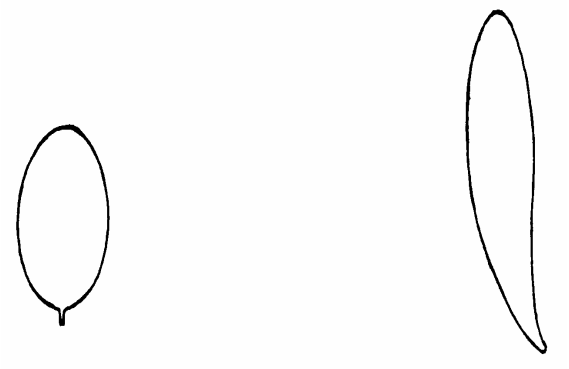


1
oblate

2
circular

3
ovate

4
broad elliptic

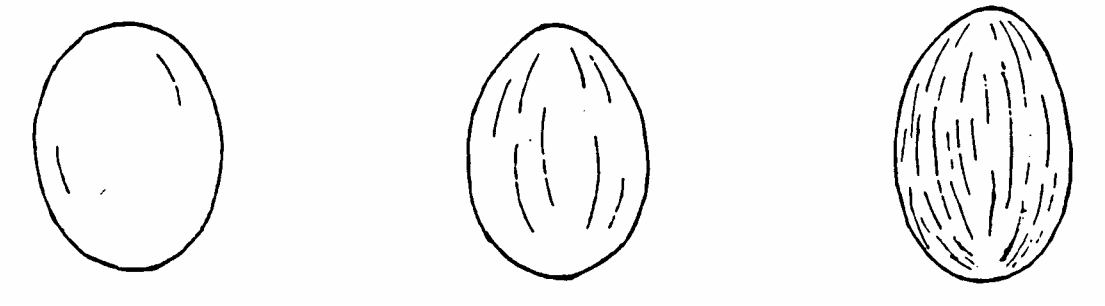


5
elliptic

6
elongated

7
quadrangular

Ad. 46: Fruit: creasing of surface



1
absent or
very weak

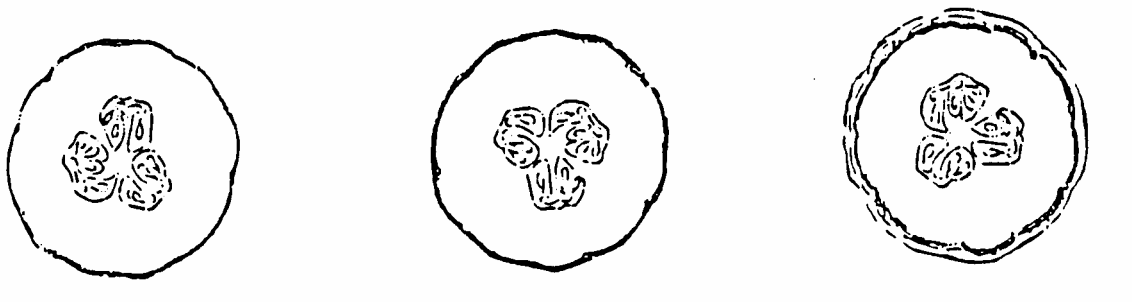
3
weak

5
medium

7
strong

9
very strong

Ad. 53: Fruit: maximum width of flesh in cross section



3
thin

5
medium

7
thick

Ad. 62: Seed: shape

2
Not pine-nut shape

3
Pine

Ad. 68: Conservation of fruit

This can be observed by assessing the duration of the fruits with commercial quality, on stored samples of 5 fruits per plot, harvested at maturity stage. The frequency of observations would be at least once a week

Ad. 69-71: Resistance to races 0, 1 and of *Fusarium oxuxporum* f. sp. *melonis*

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:	dishes in climatic chambers
Method of inoculation:	soaking of root system in suspension of liquid medium of fungus
Duration of test	
- from sowing to inoculation:	30 days
- from inoculation to reading:	20 days
Number of plants tested:	30 plants
Remarks:	plants raised and transplanted in sterilized sand, irrigation with nutritive solution

Ad. 72: Resistance to race 1-2 of *Fusarium oxuxporum* f. sp. *melonis*

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 via the lower holes of the seed dish
Duration of test	
- from sowing to inoculation:	4 to 5 weeks
- from inoculation to reading:	3 weeks
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 most clearly between the presence and absence of resistance

Ad. 74: Resistance to colonization by *Aphis gossypii*

Maintenance of strain

Maintenance and multiplication:	on susceptible variety (Vedrantais)
Special conditions:	weak greenfly density so as not to have too many winged types. "Synchronous"-type breeding so as to have only greenfly 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 greenfly 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. 75: Resistance to race F of Zucchini Yellow Mosaic Virus (ZYMV)

Maintenance of strain

Maintenance and multiplication:	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)
- use the F pathotype of ZYMV

Example varieties:

Vedrantais (Fn+/Fn+):	mosaic	(resistance present)
Cantor (Fn/Fn+):	slower necrosis with wilting	(resistance absent)
Doublon (Fn/Fn):	necrosis with wilting	

Ad. 76 and 77: Resistance to race GVA (76) and race E_2 (77) of Papaya Ringspot Virus (PRV)

Maintenance of strain

Maintenance and multiplication: dried on anhydrous calcium chloride at 5 C
Special conditions: premultiplication of the virus on susceptible 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 15-20 days
Number of plants tested: 30

Remarks

Identification of two strains of Prv virus and of the two alleles concerned

Genotypes/Strains	GVA strain	E2 strain
Vedrantais (Prv^+)	Mosaic (vein-clearing) = SUSCEPTIBLE	Mosaic (vein-clearing) = SUSCEPTIBLE
72025 (Prv^2)	- No systemic symptoms - Local necrotic lesions on cotyledons (irregular) = RESISTANT	- Apical necrosis = Necrosis of plant instead of local lesions
WMRV 29 (Prv^1)	- No systemic symptoms - Occasional local necrotic lesions on cotyledons = RESISTANT	- No systemic symptoms - Occasional local necrotic lesions on cotyledons = RESISTANT

Ad. 78: Resistance to race E_8 of Muskmelon Necrosis Spot Virus (MNSV)

Maintenance of strain

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

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	8 days
Number of plants tested:	30
Remark:	- necrotic lesions on the inoculated organs (cotyledons) of susceptible plants - no lesion on resistant plants

9. Literature

Invuflec, 1976: “Le melon cantaloup,” publication de l’Institut National de vulgarisation pour les fruits, légumes et champignons, FR (191 pp.)

CTIFL, 1985: “Melon, marché et techniques de production,” publication du Centre technique interprofessionnel des fruits et légumes, FR (270 pp.)

10. Technical Questionnaire

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

	Application date: (not to be filled in by the applicant)

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

[In the case of hybrid varieties which are the subject of an application for plant breeders' rights, and where the parent lines are to be submitted as a part of the examination of the hybrid variety, this Technical Questionnaire should be completed for each of the parent lines, in addition to being completed for the hybrid variety.]

1. Subject of the Technical Questionnaire

1.1 *Latin Name*	*Cucumis melo* L.
1.2 Common Name	Melon

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

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

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery [ ]
(please state where, when and how developed)

4.1.4 Other [ ]
(please provide details)

4.2 Method of propagating the variety

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

	Characteristics	Example Varieties	Note
5.1 (12)	**Inflorescence: sex expression**		
	monoecius	Alpha, Categoría	1[…]
	andromonoecius	Piel de Sapo	2[…]
5. 2 (14)	**Young fruit: intensity of green color of skin**		
	very light	Solarking	1[…]
	light	Fimel	3[…]
	medium	Eros	5[…]
	dark	Galia	7[…]
	very dark	Eden	9[…]

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

5.3 (26)	**Fruit: ratio length/diameter**		
	very small	Noir des Carmes	1[…]
	very small to small	Arava, Clipper	2[…]
	small	Buster, Galia	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, Trujillo	8[…]
	very large	Banana	9[…]
5.4 (28)	**Fruit: shape of longitudinal section**		
	oblate	Jívaro	1[…]
	circular	Galia	2[…]
	ovate	Piolín	3[…]
	broad elliptic		4[ ]
	elliptic	Piel de Sapo	5[…]
	elongated	Banana	6[…]
	quadrangular	Zatta	7[…]
5.5 (29)	**Fruit: ground color of skin**		
	white	Albino	1[…]
	yellow	Galia	2[…]
	green	Piel de Sapo	3[…]
	grey	Vedrantais	4[…]
5.6 (36)	**Fruit: density of patches**		
	absent or very weak	Rochet	1[…]
	sparse		3[…]
	medium	Braco	5[…]
	dense	Piel de Sapo	7[…]
	very dense		9[…]

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

5.7 (43)	**Fruit: grooves**		
	absent or very weak	Piel de Sapo	1[ ]
	present	Vedrantais	9[ ]
5.8 (49)	**Fruit: pattern of cork formation**		
	in small dots	Hermes, Vedrantais	1[ ]
	dots and linear	Jívaro, Topper	2[ ]
	linear	Futuro, Riosol	3[…]
	linear and netted	Anatol, Chantal	4[…]
	netted	Galia, Perlita	5[…]
5.9 (50)	**Fruit: density of pattern of cork formation**		
	absent or very sparse	Hermes, Vedrantais	1[ ]
	sparse	Jívaro, Topper	3[…]
	medium	Futuro, Riosol	5[…]
	dense	Anatol, Chantal	7[…]
	very dense	Galia, Perlita	9[ ]
5.10 (54)	**Fruit: <u>main color</u> of flesh**		
	white	Piel de Sapo	1[…]
	green	Galia	2[…]
	orange	Vedrantais	3[…]
5.11 (63)	**Seed:color**		3[…]
	ivory	Amarillo oro s.b.	1[…]
	cream-yellow	Piel de Sapo	2[…]

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

5.12 (68)	Conservation of fruits		
	short	Charentais, 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 **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example		*(example to be inserted)*	*(example to be inserted)*

Comments:

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Special conditions for the examination of the variety

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

Yes [ ] No [ ]

7.2.2 If yes, please give details:

7.3 Other information

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.

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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]