European Union
Community Plant Variety Office

PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

***Cucumis melo* L.**

MELON

UPOV Species Code: CUCUM_MEL

Adopted on 21/03/2007

I SUBJECT OF THE PROTOCOL

The protocol describes the technical procedures to be followed in order to meet the Council Regulation (EC) No. 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on general UPOV Document TG/1/3 and UPOV Guideline TG/104/5 dated 05/04/2006 for the conduct of tests for Distinctness, Uniformity and Stability. This protocol applies for all varieties of *Cucumis melo* L.

II SUBMISSION OF SEED AND OTHER PLANT MATERIAL

1. The Community Plant Variety Office (CPVO) is responsible for informing the applicant of

   - the closing date for the receipt of plant material;
   - the minimum amount and quality of plant material required;
   - the Examination Office to which material is to be sent.

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

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

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

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

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

3. Plant material requirements

   The current quality and quantity requirements as well as the final dates for submission of the plant material are available on the CPVO website (www.cpvo.europa.eu) and are published in the CPVO gazette ‘S2’.

Quality of seeds:..... Should not be less than the standards laid down for certified seed in Annex II of EC Council Directive 2002/55/EC.

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

Special requirement:..... -

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

III CONDUCT OF TESTS

1. Variety collection

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

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

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

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

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

2. Material to be examined

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

3. Characteristics to be used

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

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation (EC) No. 1239/95, to insert additional characteristics and their expression in respect of a variety.

4. Grouping of varieties

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

a) Inflorescence: sex expression (at full flowering) (characteristic 12)

b) Fruit: length (characteristic 24)

c) Fruit: shape in longitudinal section (characteristic 28)

d) Fruit: ground colour of skin (characteristic 29)

e) Fruit: density of patches (characteristic 36)

f) Fruit: grooves (characteristic 43)

g) Fruit: cork formation (characteristic 48)

h) Fruit: pattern of cork formation (characteristic 50)

i) Fruit: main colour of flesh (characteristic 54)

j) Seed: length (characteristic 59)

k) Seed: colour (characteristic 62)

l) Resistance to race 0 of *Fusarium oxysporum* f. sp *melonis* (characteristic 68.1)

m) Resistance to race 1 of *Fusarium oxysporum* f. sp *melonis* (characteristic 68.2)

n) Resistance to race 2 of *Fusarium oxysporum* f. sp *melonis* (characteristic 68.3)

5. Trial designs and growing conditions

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

The test design is as follows

Each test should include 20 plants divided between two or more replicates.

All observations determined by measurement or counting should be made on 20 plants or parts of 20 plants.

6. Special tests

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

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

7. Standards for decisions

a) **Distinctness**

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

b) **Uniformity**

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

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

Number of plants	off-types allowed
6-35	1

For the assessment of uniformity of open-pollinated varieties, relative uniformity standards should be used.

c) **Stability**

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

IV REPORTING OF RESULTS

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

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

The CPVO must receive interim reports from the Examination Office and final reports by the date agreed between the CPVO and the Examination Office.

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

V LIAISON WITH THE APPLICANT

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

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

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ANNEXES TO FOLLOW

ANNEX I

PAGE

Legend:

Note: For the CPVO numbered characteristics, all characteristics in the table are compulsory; notwithstanding, in the case of disease resistance characteristics, only those resistances marked with an asterisk (*) in the CPVO column are compulsory. The asterisks in the UPOV numbered characteristics are there for information purposes and denote those characteristics which should always be observed when a UPOV guideline is utilised.
In general for the assessment of resistance characteristics, the facilities of other Examination Offices or specialised institutions might be used, subject to previous arrangements. Some characteristics may be discarded: if there are already phytosanitary restrictions.

(+) See explanations on the Table of characteristics
(a) – (e) See explanations on the table of characteristics

Types of expression of characteristics:

QL – Qualitative characteristic
QN – Quantitative characteristic
PQ – Pseudo-qualitative characteristic

Type of observation 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

When a method of observation is attributed to a certain characteristic, the first differentiation is made depending if the action taken is a visual observation (V) or a measurement (M).

The second differentiation deals with the number of observations the expert attributes to each variety, thus the attribution of either G or S.
If a single observation of a group consisting of an undefined number of individual plants is appropriate to assess the expression of a variety, we talk about a visual observation or a measurement made on a group of plants, thus we attribute the letter G (either VG or MG). If the expert makes more than one observation on that group of plants, the decisive part is that we have at the end only one data entry per variety which means that we have to deal with G (e.g. measurement of plant length on a plot – MG, visual observation of green colour of leaves on a plot – VG).

If it is necessary to observe a number of individual plants to assess the expression of a variety, we should attribute the letter S (thus either VS or MS). Single plant data entries are kept per variety for further calculations like the variety mean (e.g. measurement of length of ears – MS, visual observation of growth habit of single plants in grasses – VS). The number of individual plants to be observed in such cases is stated in section III.5.

ANNEX II

Technical Questionnaire

ANNEX I

TABLE OF CHARACTERISTICS TO BE USED IN DUS TESTS AND PREPARATION OF DESCRIPTIONS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1.	**1.**	**QN**	**Seedling: length of hypocotyl**		
(a)	**(a)**	**VG**	very short	Golden Crispy	1
			short	Arava, Clipper	3
			medium	Doral, Futuro	5
			long	Bimbo, Ronda	7
			very long	Noy	9
2.	**2.**	**QN**	**Seedling: size of cotyledon**		
(a)	**(a)**	**VG**	very small	Golden Crispy	1
			small	Candy, Lunasol	3
			medium	Futuro, Sancho	5
			large	Bimbo, Nicolás	7
			very large	Noy	9
3.	**3.**	**QN**	**Seedling: intensity of green colour of cotyledon**		
(a)	**(a)**	**VG**	light	Bimbo, Lucas	3
			medium	Candy, Piel de Sapo	5
			dark	Clipper, Lunasol	7
4.	**4.**	**QN**	**Leaf blade: size**		
(b)	**(b)**	**VG**	small	Geaprince, Lunasol	3
			medium	Candy, Total	5
			large	Don, Sucrero	7
5.	**5.**	**QN**	**Leaf blade: intensity of green colour**		
(b)	**(b)**	**VG**	light	Fimel, Yuma	3
			medium	Doral, Galia	5
			dark	Gama, Gustal	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
6.	**6.**	**QN**	**Leaf blade: development of lobes**		
(+)	**(+)**	**VG**	weak	Boule d'or	3
(b)	**(b)**		medium	Piel de Sapo	5
			strong	Galia	7
7.	**7.**	**QN**	**Leaf blade: length of terminal lobe**		
(+)	**(+)**	**VG**	short	Perlita	3
(b)	**(b)**		medium	Clipper, Gama	5
			long	Gustal, Primal	7
8.	**8.**	**QN**	**Leaf blade: dentation of margin**		
(b)	**(b)**	**VG**	weak	Clipper, Védrantais	3
			medium	De Cavaillon espagnol à chair rose, Piel de Sapo	5
			strong	Boule d'or, Portoluz	7
9.	**9.**	**QN**	**Leaf blade: blistering**		
(b)	**(b)**	**VG**	weak	Galia	3
			medium	Costa	5
			strong	Haros	7
10.	**10.**	**QN**	**Petiole: attitude**		
(b)	**(b)**	**VG**	erect	Alfredo	1
			semi-erect	Peko	3
			horizontal	Creso	5
11.	**11.**	**QN**	**Petiole: length**		
(b)	**(b)**	**VG/MS**	short	Costa	3
			medium	Arava, Sancho	5
			long	Goldgen	7
12.	**12.**	**QL**	**Inflorescence: sex expression (at full flowering)**		
	(*)	**VG**	monoecious	Alpha, Categoría	1
G			andromonoecious	Piel de Sapo	2

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
13.	**13.**	**PQ**	**Young fruit: hue of green colour of skin**		
(+)	**(+)**	**VG**	whitish green	Geasol	1
(c)	**(c)**		yellowish green	Fimel	2
			green	Lucas	3
			greyish green	Spanglia	4
14.	**14.**	**QN**	**Young fruit: intensity of green colour of skin**		
(c)	**(*)**	**VG**	very light	Solarking	1
	(c)		light	Fimel	3
			medium	Eros	5
			dark	Galia	7
			very dark	Edén	9
15.	**15.**	**QN**	**Young fruit: density of dots**		
(c)	**(c)**	**VG**	absent or very sparse	Solarking	1
			sparse	Fimel	3
			medium	Lucas	5
			dense	Arava	7
			very dense	Edén	9
16.	**16.**	**QN**	**Young fruit: size of dots**		
(c)	**(c)**	**VG**	small	Lucas	3
			medium	Arava	5
			large	Spanglia	7
17.	**17.**	**QN**	**Young fruit: contrast of dot colour/ground colour**		
(c)	**(c)**	**VG**	weak	Lucas	3
			medium	Arava	5
			strong	Total	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
18.	**18.**	**QN**	**Young fruit: conspicuousness of groove colouring**		
(c)	**(c)**	**VG**	absent or very weak	Solarking	1
			weak	Geaprince, Total	3
			medium	Gama	5
			strong	Clipper, Galia	7
			very strong	Nembo	9
19.	**19.**	**QN**	**Young fruit: intensity of groove colouring**		
(c)	**(c)**	**VG**	light		3
			medium	Gama, Topper	5
			dark	Century, Drake	7
20.	**20.**	**QN**	**Young fruit: length of peduncle**		
(c)	**(c)**	**VG/MS**	short	Lince, Haros	3
			medium	Arava, Romeo	5
			long	Corín	7
21.	**21.**	**QN**	**Young fruit: thickness of peduncle 1 cm from fruit**		
(c)	**(c)**	**VG/MS**	thin	Solarking	3
			medium	Geaprince, Védrantais	5
			thick	Charentais, Doral	7
22.	**22.**	**QN**	**Young fruit: extension of darker area around peduncle**		
(c)	**(c)**	**VG**	absent or very small	Doral	1
			small	Boule d’or	3
			medium	Mirasol, Geaprince	5
			large		7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
23.	**23.**	**QN**	**Fruit: change of skin colour from young fruit to maturity**		
(+)	**(+)**	**VG**	early in fruit development	Alpha, Charentais, Clipper	1
			late in fruit development	Amarillo Oro, Galia	2
			very late in fruit development or no change	Futuro, Piel de Sapo	3
24.	**24.**	**QN**	**Fruit: length**		
(d)	**(*)**	**VG/MS**	very short	Doublon, Golden Crispy	1
	(d)		short	Topper, Védrantais	3
			medium	Marina, Spanglia	5
			long	Categoría, Toledo	7
G			very long	Katsura Giant, Valdivia	9
25.	**25.**	**QN**	**Fruit: diameter**		
(d)	**(*)**	**VG/MS**	very narrow	Banana, Golden Crispy	1
	(d)		narrow	Alpha, Maestro	3
			medium	Categoría, Galia	5
			broad	Albino, Kinka	7
			very broad	Noir des Carmes	9
26.	**26.**	**QN**	**Fruit: ratio length/diameter**		
(d)	**(*)**	**VG/MS**	very small	Noir des Carmes	1
	(d)		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

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
27.	**27.**	**QN**	**Fruit: position of maximum diameter**		
(+)	**(+)**	**VG**	toward stem end	Piolín , Sapo de Oro	1
	(*)		at middle	Piel de Sapo, Védrantais	2
(d)	**(d)**		toward blossom end	Cganchi, Edén, Katsura Giant	3
28.	**28.**	**PQ**	**Fruit: shape in longitudinal section**		
(+)	**(+)**	**VG**	ovate	De Cavaillon, Piolín	1
	(*)		medium elliptic	Piel de Sapo	2
(d)	**(d)**		broad elliptic	Corin, Sardo	3
			circular	Alpha, Galia	4
			quadrangular	Zatta	5
			oblate	Jívaro, Noir de Carmes	6
			obovate	Cganchi	7
G			elongated	Alficoz, Banana	8
29.	**29.**	**PQ**	**Fruit: ground colour of skin**		
(+)	**(+)**	**VG**	white	Albino, Honey Dew	1
	(*)		yellow	Amarillo-Canario, Edén, Galia, Passport, Solarking	2
(d)	**(d)**		green	Gohyang, Piel de Sapo	3
G			grey	Geaprince, Geamar, Romeo, Sirio, Supporter, Védrantais	4
30.	**30.**	**QN**	**Fruit: intensity of ground colour of skin**		
(d)	**(d)**	**VG**	light		3
			medium		5
			dark		7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
31.	**31.**	**PQ**	**Fruit: hue of ground colour of skin**		
(+)	**(+)**	**VG**	absent or very weak	Amarillo-Canario, Albino, Piel de Sapo, Sirio	1
(d)	**(d)**		whitish	Romeo	2
			yellowish	Geaprince, Supporter	3
			orange	Edén	4
			ochre	Passport	5
			greenish	Geamar, Honey Dew, Solarking	6
			greyish	Gohyang	7
32.	**32.**	**QN**	**Fruit: density of dots**		
(d)	**(d)**	**VG**	absent or very sparse	Charentais	1
			sparse		3
			medium	Petit Gris de Rennes	5
			dense	Piel de Sapo	7
			very dense	Albino	9
33.	**33.**	**QN**	**Fruit: size of dots**		
(d)	**(d)**	**VG**	small	Doral	3
			medium	Toledo	5
			large	Futuro	7
34.	**34.**	**PQ**	**Fruit: colour of dots**		
(d)	**(d)**	**VG**	white	Edén	1
			yellow	Piel de Sapo	2
			green	Tendral Negro	3
35.	**35.**	**QN**	**Fruit: intensity of colour of dots**		
(d)	**(d)**	**VG**	light	Kinka, Mesol	3
			medium	Sapiel, Toledo	5
			dark	Soprano, Víctor	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
36.	**36.**	**QN**	**Fruit: density of patches**		
	(*)	**VG**	absent or very sparse	Rochet	1
(d)	**(d)**		sparse		3
			medium	Braco	5
			dense	Piel de Sapo	7
G			very dense	Oranje Ananas	9
37.	**37.**	**QN**	**Fruit: size of patches**		
(d)	**(d)**	**VG**	small	Baltasar	3
			medium	Sancho	5
			large	Taurus	7
38.	**38**	**QL**	**Fruit: warts**		
	(*)	**VG**	absent	Piel de Sapo	1
(d)	**(d)**		present	Zatta	9
39.	**39.**	**QN**	**Fruit: strength of attachment of peduncle at maturity**		
	(*)	**VG**	very weak	Edén	1
(d)	**(d)**		weak	Arava, Maestro	3
			medium	Doral, Védrantais	5
			strong	Clipper, Costa	7
			very strong	Daimiel, Eloro	9
40.	**40.**	**PQ**	**Fruit: shape of base**		
(+)	**(+)**	**VG**	pointed	Edén	1
	(*)		rounded	Arava	2
(d)	**(d)**		truncate	Zatta	3
41.	**41.**	**PQ**	**Fruit: shape of apex**		
(+)	**(+)**	**VG**	pointed	Canador, Futuro	1
	(*)		rounded	Alpha, Honey Dew	2
(d)	**(d)**		truncate	Noir des Carmes	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
42.	**42.**	**QN**	**Fruit: size of pistil scar**		
	(*)	**VG**	small	Alpha, Categoría	3
(d)	**(d)**		medium	Charentais, Eros, Verdol	5
			large	Drake, Supermarket	7
43.	**43.**	**QL**	**Fruit: grooves**		
	(*)	**VG**	absent or very weakly expressed	Piel de Sapo, Arava	1
(d)	**(d)**		weakly expressed	Total, Hobby	2
G			strongly expressed	Védrantais, Galia	3
44.	**44.**	**QN**	**Fruit: width of grooves**		
(d)	**(d)**	**VG**	narrow	Auraprince	3
			medium	Biga	5
			broad	Nembo, Sirio	7
45.	**45.**	**QN**	**Fruit: depth of grooves**		
(d)	**(d)**	**VG**	very shallow	Amber	1
			shallow	Galia	3
			medium	Alpha	5
			deep	Panamá, Supermarket	7
			very deep	Noir des Carmes, Sucrin de Tours	9
46.	**46.**	**PQ**	**Fruit: colour of grooves**		
(d)	**(d)**	**VG**	white	Geumssaraki	1
			yellow	Futuro, Galia	2
			green	Charentais	3
47.	**47.**	**QN**	**Fruit: creasing of surface**		
(+)	**(+)**	**VG**	absent or very weak	Védrantais	1
	(*)		weak	Melchor, Sirocco	3
(d)	**(d)**		medium	Costa, Piolín	5
			strong	Tendral Negro	7
			very strong	Balbey, Kirkagac	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
48.	**48.**	**QL**	**Fruit: cork formation**		
(d)	**(*)**	**VG**	absent	Alpha	1
G	**(d)**		present	Dalton	9
49.	**49.**	**QN**	**Fruit: thickness of cork layer**		
	(*)	**VG**	very thin	Amarillo Oro	1
(d)	**(d)**		thin	Riosol, Védrantais	3
			medium	Marina	5
			thick	Geamar, PMR 45	7
			very thick	Honey Rock, Perlita	9
50.	**50.**	**PQ**	**Fruit: pattern of cork formation**		
	(*)	**VG**	dots only	Hermes, Védrantais	1
(d)	**(d)**		dots and linear	Jívaro, Topper	2
			linear only	Futuro, Riosol	3
			linear and netted	Anatol, Chantal	4
G			netted only	Galia, Perlita	5
51.	**51.**	**QN**	**Fruit: density of pattern of cork formation**		
(d)	**(d)**	**VG**	very sparse	Alpha, Amarillo Oro	1
			sparse	Védrantais	3
			medium	Regal, Vital	5
			dense	Galia, Geamar	7
			very dense	Honey Rock, Perlita	9
52.	**52.**	**QN**	**Fruit: rate of change of skin colour from maturity to over maturity**		
(+)	**(+)**	**VG**	absent or very slow	Clipper, Doral, Galia, Honey dew, Piel de Sapo	1
(d)	**(d)**		slow	Goloso	3
			medium	Futuro, Vendôme Dulcinea	5
			fast	Corin, Marina, Nembo	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
53.	**53.**	**QN**	**Fruit: width of flesh in longitudinal section (at position of maximum fruit diameter)**		
(+)	**(+)**	**VG**	thin	Gama	3
(d)	**(d)**		medium	Toledo	5
			thick	Tito	7
54.	**54.**	**PQ**	**Fruit: main colour of flesh**		
	(*)	**VG**	white	Piel de Sapo	1
(d)	**(d)**		greenish white	Galia	2
			green	Radical	3
			yellowish white	Guaraní	4
			orange	Védrantais	5
G			reddish orange	Magenta	6
55.	**55.**	**QN**	**Only varieties with main colour of flesh: orange: Fruit: intensity of orange colour of flesh**		
(d)	**(d)**	**VG**	light	Fantasy, Oloroso	3
			medium	Lunasol	5
			dark	Geamar	7
56.	**56.**	**QN**	**Only varieties with main colour of flesh: white; greenish white; green; yellowish white: Fruit: secondary salmon colouring of flesh**		
(d)	**(d)**	**VG**	absent or very weak	Gustal	1
			weak	Auraprince, Toledo	3
			medium	Arizo, Eloro	5
			strong		7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
57.	**58.**	**PQ**	**Only varieties with change of skin colour from maturity to over maturity: Fruit at over maturity: hue of colour of skin**		
		VG	yellow	Futuro, Marina	1
			orangish yellow	Drake, Gama	2
			creamish	Figaro, Vendôme	3
58.	**59.**	**QN**	**Only varieties with change of skin colour from maturity to over maturity and with yellow or orangish yellow colour of skin: Fruit at over maturity: intensity of yellow colour of skin**		
		VG	light	Dulcinea	3
			medium	Futuro	5
			dark	Trapío	7
59.	**60.**	**QN**	**Seed: length**		
	(*)	**MS/VG**	very short	Geumssaraki, Golden Crispi	1
(e)	**(e)**		short	Elario, Katsura Giant	3
			medium	Arava, Sancho	5
			long	Amarillo Oro, Toledo	7
G			very long	Albino	9
60.	**61.**	**QN**	**Seed: width**		
(e)	**(e)**	**MS/VG**	very narrow	Golden Crispi	1
			narrow	Aurabel	3
			medium	Arava, Sancho	5
			broad	Amarillo Oro	7
			very broad	Ronda	9
61.	**62.**	**QL**	**Seed: shape**		
(+)	**(+)**	**VG**	not pine-nut shape	Toledo	1
(e)	**(e)**		pine-nut shape	Piel de Sapo	2

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
62.	**63.**	**QL**	**Seed: colour**		
(e)	**(*)**	**VG**	whitish	Amarillo Oro s.b.	1
G	**(e)**		cream yellow	Galia, Piel de Sapo	2
63.	**64.**	**QN**	**Only varieties with cream yellow seed colour: Seed: intensity of colour**		
		VG	light	Goldgen	3
			medium	Galia	5
			dark	Doral	7
64.	**65.**	**QN**	**Time of male flowering**		
		MG	early	Clipper, Vital	3
			medium	Categoría	5
			late	Nicolás, Rocín	7
65.	**66.**	**QN**	**Time of female flowering**		
		MG	early	Clipper	3
			medium	Braco, Categoría, Vital	5
			late	Nicolás	7
66.	**67.**	**QN**	**Time of ripening**		
		MG	very early	Goldstar, Sun	1
			early	Galia	3
			medium	Védrantais	5
			late	Pinonet, Piel de Sapo, Rochet	7
			very late	Clipper, Supporter, Tendral	9
67.	**68.**	**QN**	**Shelf life of fruit**		
(+)	**(+)**	**MG**	very short	Charentais	1
	(*)		short	Galia	3
			medium	Clipper	5
			long	Piel de Sapo	7
			very long	Tendral Negro	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
68. **(+)**	**69.** **(+)**	**QL** **VG**	**Resistance to *Fusarium oxysporum f. sp. melonis***		
68.1	**69.1**		**Race 0**		
(*)			absent	Jaune Canari 2	1
G			present	Jador, Joker, Védrantais	9
68.2	**69.2**		**Race 1**		
(*)			absent	Jaune Canari 2, Védrantais	1
G			present	Jador, Joker	9
68.3	**69.3**		**Race 2**		
(*)			absent	Jaune Canari 2, Joker	1
G			present	Jador, Védrantais	9
68.4	**69.4**		**Race 1-2**		
(+)	**(+)**		absent	Jaune Canari 2 Joker, Védrantais	1
			present	Jador	9
69. **(+)**	**70.** **(+)**	**QN** **VG**	**Resistance to *Sphaerotheca fuliginea (Podosphaera xanthii)* (Powdery mildew)**		
69.1	**70.1**		**Race 1**		
			susceptible	Alpha, Boneto, Delta, Jerac	1
			intermediate resistant	Escrito	2
			highly resistant	Cézanne, Anasta, Théo	3
69.2	**70.2**		**Race 2**		
			susceptible	Boneto, Galoubet	1
			intermediate resistant	Flores, Enzo, Escrito	2
			highly resistant	Anasta, Cézanne, Théo	3
69.3	**70.3**		**Race 5**		
			susceptible	Védrantais	1
			intermediate resistant	Enzo, Flores	2
			highly resistant	Gaetano, Lucas, Théo	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
70. **(+)**	**71.** **(+)**	**QN** **VG**	**Resistance to *Erysiphe cichoracearum* *(Golovinomyces cichoracearum)* Race 1 (Powdery mildew)**		
			susceptible	Bastion, Boneto	1
			intermediate resistant	Flores, Anasta	2
			highly resistant	Cézanne, Heliobel, Théo	3
71. **(+)**	**72.** **(+)**	**QL**	**Resistance to colonization by *Aphis gossypii***		
		VG	absent	Charentais	1
			present	AR, Margot, Top Mark	9
72. **(+)**	**73.** **(+)**	**QL** **VG**	**Resistance to Zucchini Yellow Mosaic Virus (ZYMV) Race F**		
			absent	Alpha, Boule d'Or, Cantor, Doublon	1
			present	Eloro, Hermes, Védrantais	9
73. **(+)**	**74.** **(+)**	**QL** **VG**	**Resistance to Papaya Ring Spot Virus (PRSV)**		
73.1	**74.1**		**Race GVA**		
			absent	Védrantais	1
			present	WMRV 29, 72025	9
73.2	**74.2**		**Race E2**		
			absent	Védrantais, 72025	1
			present	WMRV 29	9
74. **(+)**	**75.** **(+)**	**QL** **VG**	**Resistance to Muskmelon Necrotic Spot Virus (MNSV) Race E8**		
			absent	Védrantais	1
			present	Primal, VA 435	9
75. **(+)**	**76.** **(+)**	**QL** **VG**	**Resistance to Cucumber Mosaic Virus (CMV)**		
			absent	Cézanne, Dalton	1
			present	Lunaduke	9

EXPLANATIONS AND METHODS

Explanations covering several characteristics

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

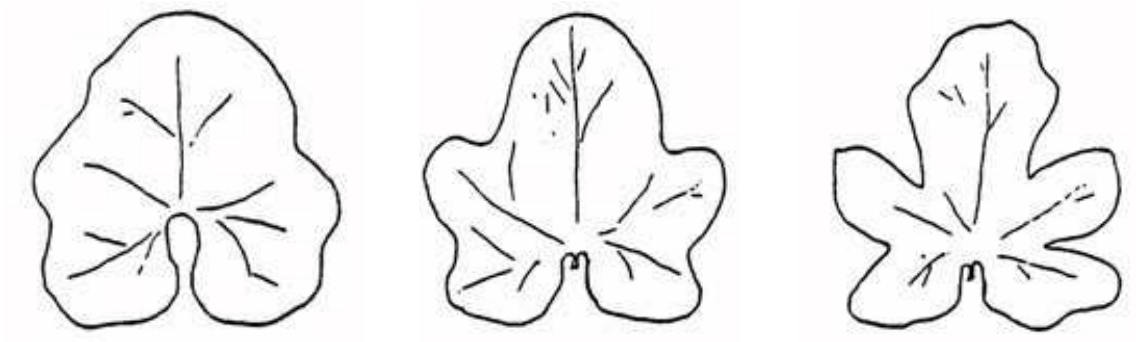
(b) Leaf blade: Unless otherwise indicated, all observations on the leaf blade should be made on fully developed but not old leaves, preferably between the 5th and 8th node when the plant has at least 11 nodes.

(c) Young fruit: All observations on the young fruit should be made on green, unripe fruits, before the colour 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 colour must not start to change to the over maturity colour. When appropriate, for the flesh characteristics it is recommended to wait at least one week after the harvest before opening the fruits.

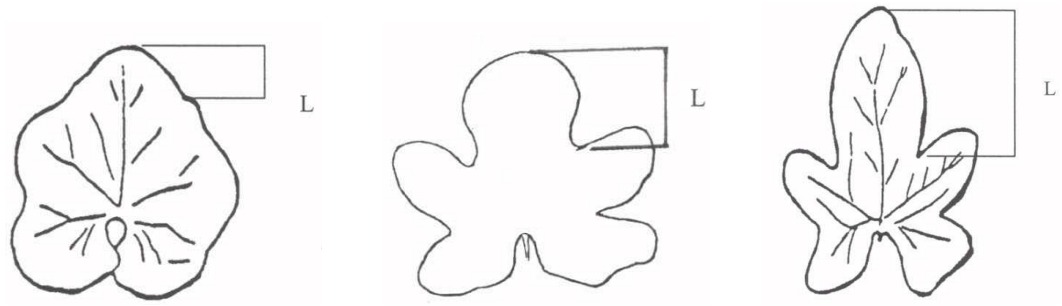
(e) Seed: All observations on the seed should be made on fully developed and dry seeds, after washing and drying in the shade.

Ad. 6: Leaf blade: development of lobes



3	5	7
weak	medium	strong

Ad. 7: Leaf blade: length of terminal lobe



3 short | 5 medium | 7 long

Ad. 13: Young fruit: hue of green colour of skin

The basic colour 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 colour, and two other hue levels “greyish” that is rather a low saturation of the green colour and “whitish” that results from a very light intensity of the green colour.

Ad. 23: Fruit: change of skin colour from young fruit to maturity
Ad. 52: Fruit: Rate of change of skin colour from maturity to over maturity

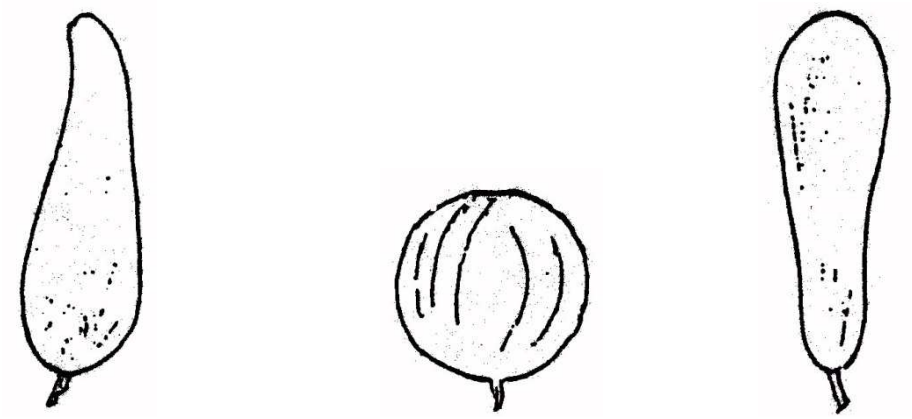
The melon fruit may have up to three different skin colours in the course of its development. The speed of evolution of the colour depends on the type of variety, but within a type different speeds can also be observed. Please note that in cases where the colour change is closely linked to maturity, the observation should be clear: either on the colour change related to maturity (characteristic 23) or within mature fruits from mature to over mature (characteristic 52). The changing of fruit skin colour can be described by using the following characteristics:

1. Stage 1: colour of the young fruit (green colour)
2. Change from Stage 1 to Stage 2 (Characteristics 23)
3. Stage 2: colour at maturity
4. Change from Stage 2 to Stage 3 (Characteristic 52)
5. Stage 3: colour at over maturity.

Some examples are given in the following table:

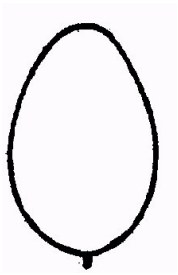
Variety	Stage 1: colour of the young fruit	Change from Stage 1 to Stage 2 (Ch. 23)	Stage 2: colour at maturity (Ch. 29)	Change from Stage 2 to Stage 3 (Ch. 52)	Stage 3: colour at over maturity
Galia	green	late	yellow	absent	yellow
Amarillo Oro	green	late	yellow	absent	yellow
Doral	green	late	yellow	absent	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

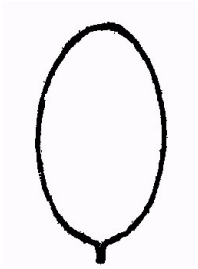


1 toward stem end | 2 at middle | 3 toward blossom end

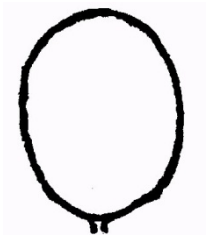
Ad. 28: Fruit: shape in longitudinal section



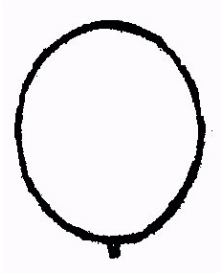
1
ovate



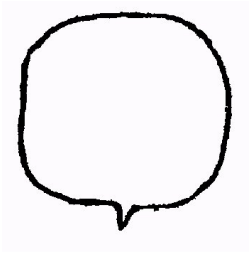
2
medium elliptic



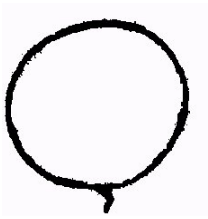
3
broad elliptic



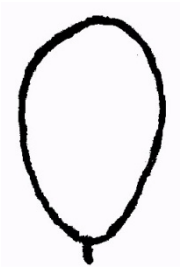
4
circular



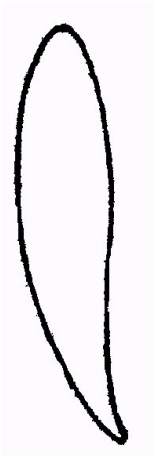
5
quadrangular



6
oblate



7
obovate



8
elongate

Ad. 29: Fruit: ground colour of skin
Ad. 31: Fruit: hue of ground colour of skin

For example:

All the Galia type would be considered as yellow colour. 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 (characteristic 31) can be used for distinctness, but are not recommended for grouping.

Ochre is pale brownish yellow.

The colours given below indicate the ground colour of skin of the variety in question.

		Hue of ground colour (characteristic 31)	
Example variety	Ground colour (characteristic 29)	State	Note
Amarillo-Canario	yellow	absent or very weak	1
Albino	white	absent or very weak	1
Piel de Sapo	green	absent or very weak	1
Sirio	grey	absent or very weak	1
Romeo	grey	whitish	2
Geaprince	grey	yellowish	3
Supporter	grey	yellowish	3
Edén	yellow	orange	4
Passport	yellow	ocre	5
Geamar	grey	greenish	6
Honey Dew	white	greenish	6
Solarking	yellow	greenish	6
Gohyang	green	greyish	7

Ad. 40: Fruit: shape of base

1
pointed

2
rounded

3
truncate

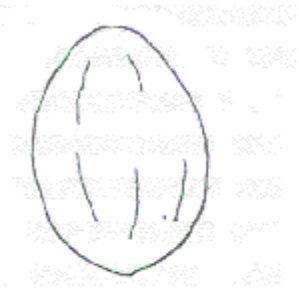
Ad. 41: Fruit shape of apex

1
pointed

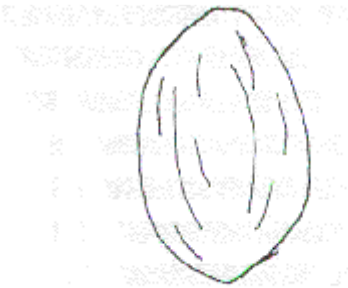
2
rounded

3
truncate

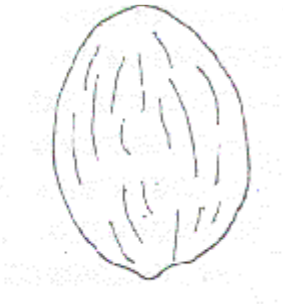
Ad. 47: Fruit: creasing of surface



3
weak



5
medium

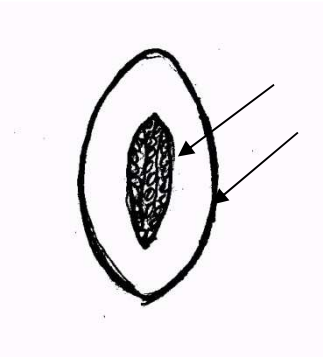


7
strong

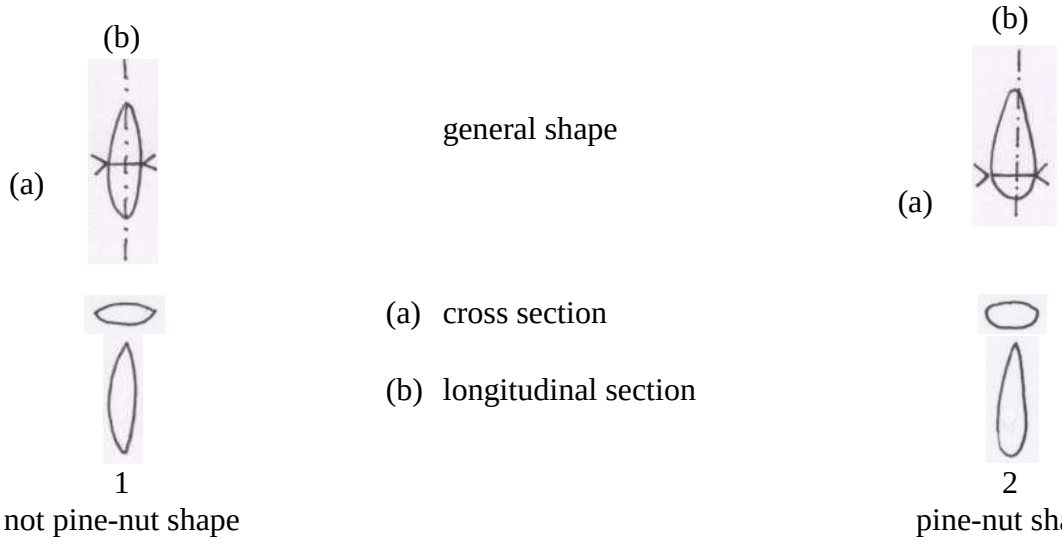
Ad. 52: Fruit: Rate of change of skin colour from maturity to over maturity

See Ad. 23, Ad. 52

Ad. 53: Fruit: width of flesh in longitudinal section (at position of maximum fruit diameter)



Ad. 61: Seed: shape



1
not pine-nut shape

2
pine-nut shape

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. 67: 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 fruits become soft, i.e. when the firmness of the fruit becomes equal or lower than Note 3 “soft” in characteristic 57.

Ads. 68.1 - 68.3: Resistance to *Fusarium oxysporum* 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. 68.4: Resistance to *Fusarium oxysporum* 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. 69.1 to 69.3: Resistance to *Sphaerotheca fuliginea (Podosphaera xanthii)*, races 1, 2 and 5
Ad. 70: Resistance to *Erysiphe cichoracearum (Golovinomyces cichoracearum)*, 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. Incubate 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.

9 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

Highly resistant varieties (Note 3)
0 no development of the fungi
1 isolated colonies (less than 10% of the disk surface)
Intermediate resistant varieties (especially for *Erysiphe cichoracearum (Golovinomyces cichoracearum)) (Note 2)*
2 isolated colonies (more than 10 % of the disk surface)
3 all the disk surface is covered with weak sporulation
Susceptible varieties (Note 1)
4 sporulation on all the disk surface
5 intense sporulation

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

Highly resistant varieties (Note 3)
0 no development of the fungi
1 isolated colonies (less than 10% of the leaves)
Intermediatel resistant varieties (especially for *Erysiphe cichoracearum (Golovinomyces cichoracearum)) (Note 2)*
3 isolated colonies (more than 10% of the leaves)
5 weak sporulation
Susceptible varieties (Note 1)
7 medium sporulation
9 intense sporulation

3. Host differentials

	***Sphaerotheca fuliginea* (*Podosphaera xanthii*)**					***Erysiphe cichoracearum* (*Golovinomyces cichoracearum*)**	
	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. 72: Resistance to colonization by *Aphis gossypii*

Maintenance of strain

Maintenance and multiplication:	on susceptible variety (Védrantais)
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 aphids 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. 73: Resistance to Zucchini Yellow Mosaic Virus (ZYMV), race F

A. INOCULUM

Maintenance of strain

Maintenance:	5ºC and kept dry using anhydrous calcium chloride
Special conditions:	pre-multiplication of the virus on non-wilting variety (Védrantais) prior to testing

B. INOCULATION AND INCUBATION

Conduct of the test

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

C. SYMPTOMS AND OBSERVATIONS

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

Ad. 74: Resistance to Papaya Ring Spot Virus (PRSV), race GVA and race E2

A. INOCULUM

Maintenance of strain

Maintenance:	5ºC and kept dry using anhydrous calcium chloride
Special conditions:	pre-multiplication of the virus on susceptible variety (Védrantais) prior to testing

B. INOCULATION AND INCUBATION

Conduct of the test

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

C. SYMPTOMS AND OBSERVATIONS

Identification of two strains of the PRSV virus and of the two alleles concerned:

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

Ad. 75: Resistance to Muskmelon Necrosis Spot Virus (MNSV), race E_8

A. INOCULUM

Maintenance of strain

Maintenance:	5ºC and kept dry using anhydrous calcium chloride
Special conditions:	pre-multiplication on susceptible variety (Védrantais) prior to test

B. INOCULATION AND INCUBATION

Conduct of the test

Plant stage:	1st emergent leaf
Temperature:	25ºC during day, 18ºC during night
Light:	12 hours per day
Manner of inoculation:	mechanical inoculation by rubbing of cotyledons with inoculum
Duration of test:	
- from sowing to inoculation:	15 days
- from inoculation to reading:	8 days
Number of plants tested:	30

C. SYMPTOMS AND OBSERVATIONS

Susceptible plants:	necrotic lesions on the inoculated organs (cotyledons)
Resistant plants:	no lesions

Ad. 76: Resistance to Cucumber Mosaic Virus (CMV)

A. INOCULUM

1. Crushed solution

Sodium hydrogen phosphate (Na_2HPO_4, 12 H_2O) (0,03M):	1,075 g
Diethyldithiocarbamate of sodium (= DIECA):	0,2 g
Distilled water:	qsp 100 ml

The sodium hydrogen phosphate 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 $Cl_{2)}$, 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 $CaCl_2$ 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 $CaCl_2$.. 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	Védrantais	mosaïc	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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ANNEX II

The Technical Questionnaire is available on the CPVO website under the following reference: CPVO-TQ/104/2