



EUROPEAN UNION

COMMUNITY PLANT VARIETY OFFICE

PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

Cucumis sativus L.

CUCUMBER and GHERKIN

UPOV Code: CUCUM_SAT

Adopted on 13/03/2008

I SUBJECT OF THE PROTOCOL

The protocol describes the technical procedures to be followed in order to meet the Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on general UPOV document TG/1/3 and UPOV Guideline TG/61/7 dated 28/03/2007 for the conduct of tests for Distinctness, Uniformity and Stability. This protocol applies to varieties of *Cucumis sativus* 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 seed: Should not be less than the standards laid down for certified seed in Annex II of 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 requirements: -

Labelling of sample: - Species

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

III CONDUCT OF TESTS

1. Variety collection

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

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

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

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

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

2. Material to be examined

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

3. Characteristics to be used

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

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

In the first place, the collection should be divided according to the following fruit types:

	<u>Examples</u>
1. Gherkin	Adam, Conny, Levina, Melody
2. Cucumber: Beth Alpha	Hana, Silor
3. Cucumber: Dutch type	Brunex, Corona, Dominant
4. Cucumber: American slicer	Jazzier, Marketmore, Sprint
5. Cucumber: Asian	Sagami-Fanpaku, White Sun
6. Cucumber: Other	Fatum, Tine

The characteristics used for grouping could be the following:

- a) Cotyledon: bitterness (characteristic 1)
- b) Plant: sex expression (characteristic 13)
- c) Ovary: colour of vestiture (characteristic 15)
- d) Parthenocarpy (characteristic 16)
- e) Fruit: length (characteristic 17)
- f) Fruit: ground colour of skin at market stage (characteristic 25)

5. Trial designs and growing conditions

The minimum duration of tests will normally be two independent growing cycles. For vegetatively propagated varieties, the duration of the testing may be reduced to one growing cycle if the results on distinctness and uniformity are conclusive. 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

As a minimum, each test should include a total of 40 plants for examinations conducted in the open field or 20 plants for examinations conducted in the greenhouse, which should be 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 No. 2100/94 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

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

7. Standards for decisions

a) **Distinctness**

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

b) **Uniformity**

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 of hybrid varieties and vegetatively propagated varieties.

Number of plants	off-types allowed
6-35	1
36-82	2

Open-pollinated 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 2% and an acceptance probability of 95% should be applied.

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

Number of plants	off-types allowed
6-18	1
19-41	2
42-69	3
70-99	4

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 and final reports by the date agreed between the CPVO and the examination office.

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

V LIAISON WITH THE APPLICANT

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

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

ANNEXES TO FOLLOW

ANNEX I

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Explanations and methods 20

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) – (c) See explanations on the table of characteristics

G Grouping characteristic

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.

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ANNEX II

Technical Questionnaire

ANNEX I

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

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1.	1.	VG	Cotyledon: bitterness		
(+)	(+)		absent	Rocket GS, Sandra	1
QL G	QL		present	Farbio,	9
2.	2.	VG	Plant: growth type		
	(*)		determinate	Bush Crop, Shachal	1
QL	QL		indeterminate	Corona, Levina	2
3.	3.	MG/MS	Plant: total length of first 15 internodes		
(+)	(+)		very short		1
QN	QN		short	Kora, Maram, Naf	3
			medium	Marketmore	5
			long	Avir, Nimbus, Pepinex 69	7
			very long	Cerrucho	9
4.	4.	VG	Leaf blade: attitude		
(+)	(+)		erect	Akito	1
QN	QN	(a)	horizontal	Jazzzer	2
			drooping	Nabil	3
5.	5.	VG/MS	Leaf blade: length		
(+)	(+)		short	Adam	3
QN	QN	(a)	medium	Briljant	5
			long	Corona	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
6.	6.	VG/MS	Leaf blade: ratio length of terminal lobe/length of blade		
(+)	(+)		very small	Delikatess	1
QN	QN	(a)	small	Galileo	3
			medium	Corona	5
			large	Melody	7
			very large	Defense	9
7.	7.	VG	Leaf blade: shape of apex of terminal lobe		
(+)	(+)		acute	Delikatess	1
PQ	PQ	(a)	right-angled	Hana	2
			obtuse	Melody	3
			rounded	Jazzier	4
8.	8.	VG	Leaf blade: intensity of green colour		
QN	QN	(a)	light	De Russie	3
			medium	Rocket GS, Stereo	5
			dark	Marketmore, Sandra, Tokyo Slicer	7
			very dark	Akito	9
9.	9.	VG	Leaf blade: blistering		
QN	QN	(a)	absent or very weak	Silor	1
			weak	Pepinex 69, Rocket GS	3
			medium	Monir	5
			strong	Tokyo Slicer	7
			very strong		9
10.	10.	VG	Leaf blade: undulation of margin		
QN	QN	(a)	absent or weak	Jazzier	1
			moderate		2
			strong	Tokyo Slicer	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
11.	11.	VG	Leaf blade: dentation of margin		
QN	QN	(a)	very weak	Jazzer	1
			weak	Hana, Silor	3
			medium	Susan	5
			strong	Travito	7
			very strong	Moneta	9
12.	12.	MG	Time of development of female flowers (80% of plants with at least one female flower)		
QN	QN		early	Avir	3
			medium		5
			late	Fin de Meaux, Riesenschäl	7
13.	13.	VG	Plant: sex expression		
	(*)		monoecious	Hokus	1
(+)	(+)		subgynoecious	Toska 70	2
QL	QL	(b)	gynoecious	Farbio, Sandra, Wilma	3
G			hermaphroditic	Sunsweet	4
14.	14.	VG	Plant: number of female flowers per node		
(+)	(+)		predominantly one	Dasher, Faraón	1
QN	QN	(b)	predominantly one or two	Brunex, Marumba	2
			predominantly two	Corona	3
			predominantly two or three	Tempo	4
			predominantly three or four	Tornac	5
			predominantly four or five	Melody	6
			predominantly more than five	Olympos	7
15.	15. (*)	VG	Ovary: colour of vestiture		
(+)	(+)	(b)	white	Jazzer	1
QL G	QL		black	Vert petit de Paris	2

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
16.	16.	VG	Parthenocarpy		
(*)	(*)		absent	Toska 70	1
QL	QL		present	Farbio, Rocket GS, Sandra, Wilma	9
G					
17.	17.	MS/VG	Fruit: length		
	(*)		very short	De Russie, Sunsweet	1
QN	QN	(c)	short		3
			medium	Gemini, Jazzer	5
			long	Corona	7
G			very long		9
18.	18.	MS/VG	Fruit: diameter		
QN	QN	(c)	small	Picobello, Wilma	3
			medium	Corona, Diamant	5
			large	Delikatess, Riesenschäl,	7
19.	19.	MS/VG	Fruit: ratio length/diameter		
	(*)		very small	Sunsweet	1
QN	QN	(c)	small	Akord, Sonate	3
			medium	Jazzer, Picobello, Wilma	5
			large	Corona	7
			very large	Kyoto 3 Feet	9
20.	20.	VG	Fruit: core diameter in relation to diameter of fruit		
QN	QN	(c)	very small		1
			small	Riesenschäl, Telepathy	3
			medium	Corona	5
			large	Vert petit de Paris	7
			very large	Sunsweet	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
21.	21.	VG	Fruit: shape in transverse section		
(+)	(+)		round	Telepathy , Susan	1
QN	QN	(c)	round to angular	Dasher	2
			angular	Anico, Gele Tros, Regal,	3
22.	22.	VG	Fruit: shape of stem end		
	(*)		necked	Sandra, Tasty Green	1
(+)	(+)	(c)	acute	De Massy	2
QN	QN		obtuse	Maram, Score	3
23.	23.	VG	<u>Only necked varieties:</u> Fruit: length of neck		
QN	QN	(c)	very short		1
			short	Saskia	3
			medium	Corona, Telepathy	5
			long	Kamaron	7
			very long	Tasty Green	9
24.	24.	VG	Fruit: shape of calyx end		
(+)	(+)		acute	Dardos	1
PQ	PQ	(c)	obtuse	Reno	2
			rounded	Bellissima	3
			truncate	Medusa	4
25.	25. (*)	VG	Fruit: ground colour of skin at market stage		
(+)	(+)		white	Bonneuil	1
PQ	PQ		yellow	Gele Tros	2
G			green	Corona	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
26.	26.	VG	Excluding white varieties: Fruit: intensity of ground colour of skin (as for 25)		
QN	QN		light		3
			medium		5
			dark		7
27.	27.	VG	Fruit: ribs		
	(*)		absent or weak	Darius, Diana	1
(+)	(+)		medium	Sprint	2
QN	QN	(c)	strong	Vert petit de Paris	3
28.	28. (*)	VG	Fruit: sutures		
(+)	(+)		absent	Corona, Hana	1
QL	QL	(c)	present	Nabil, Silor	9
29.	29. (*)	VG	Fruit: creasing		
(+)	(+)		absent	Jazzer	1
QL	QL	(c)	present	Corona, Nabil	9
30.	30.	VG	Fruit: degree of creasing		
QN	QN	(c)	very weak	Silor	1
			weak	Nabil	3
			medium	Corona, Galileo	5
			strong	Grizzly	7
			very strong	Suyo Long	9
31.	31.	VG	Fruit: type of vestiture		
	(*)		hairs only	Silor	1
(+)	(+)		hairs and prickles	De Bourbonne, De Massy	2
QL	QL	(c)	prickles only	Corona, Jazzer	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
32.	32.	VG	Fruit: density of vestiture		
QN	QN	(c)	very sparse	Vert petit de Paris	1
			sparse		3
			medium	Tasty Green	5
			dense	Silor, Suyo Long	7
			very dense	Moneta, Parmel	9
33.	33.	VG	<u>Only varieties with white ovary vestiture</u> <u>(char. 15): Fruit: colour of vestiture</u>		
	(*)		white	Jazzer	1
PQ	PQ	(c)	light brown	Akito	2
			dark brown	Satina	3
34.	34.	VG	Fruit: warts		
	(*)		absent	Diana	1
QL	QL	(c)	present	Chinese Slangen, Dumex, Regal	9
35.	35.	VG	Fruit: size of warts		
QN	QN	(c)	very small	Parmel	1
			small	Jazzer	3
			medium	Regal	5
			large	Chinese Slangen	7
			very large	Tasty Green	9
36.	36.	VG	Fruit: length of stripes		
(+)	(+)		absent or very short		1
QN	QN	(c)	short	Astrea	3
			medium	Breso	5
			long	Pioneer, Tokyo Slicer	7
			very long	Suyo Long	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
37.	37.	VG	Fruit: dots		
	(*)		absent	Sensation	1
QL	QL	(c)	present	Delicatesse, Hanpaku-Fushinari, Sagami-Fanpaku, White Sun	9
38.	38.	VG	Fruit: distribution of dots		
(+)	(+)		in bands only	Vert petit de Paris	1
PQ	PQ	(c)	predominantly in bands	Levina	2
			evenly distributed	Sagami-Fanpaku	3
39.	39.	VG	Fruit: length of fruit containing dots		
PQ	PQ	(c)	distal 1/3		1
			distal ½		2
			distal 2/3		3
			excluding area around peduncle		4
			whole length		5
40.	40.	VG	Fruit: density of dots		
(+)	(+)		very sparse		1
QN	QN	(c)	sparse	Raider	3
			medium	Le Généreux	5
			dense	Mesa, Paro	7
			very dense	Carnito, Hanpaku-Fushinari, White Sun	9
41.	41.	VG	Fruit: glaucosity		
(+)	(+)		absent or very weak	Corona	1
QN	QN	(c)	weak	Cripina, Joen-bakdadaki	3
			medium	Jazzzer, Nakdong-chungjang	5
			strong	Dongji-chungjang	7
			very strong		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
42.	42.	VG/MS	Fruit: length of peduncle		
QN	QN	(c)	short	Admirable	3
			medium	Femdan	5
			long	Pepinex 69	7
43.	43.	VG	Fruit: ground colour of skin at physiological ripeness		
(+)	(+)		white		1
PQ	PQ	(c)	yellow		2
			green		3
			orange		4
			brown	Vert petit de Paris	5
44.	44.	VS/VG	Resistance to <i>Cladosporium cucumerinum</i> (Ccu)		
(+)	(+)		absent	Pepinex 69	1
QL	QL		present	Maketmore 76	9
45.	45.	VS/VG	Resistance to Cucumber Mosaic Virus (CMV)		
(+)	(+)		susceptible	Gele Tros	1
QN	QN		moderately resistant	Gardon	2
			highly resistant	Hokus, Naf	3
46.	46.	VS/VG	Resistance to powdery mildew (<i>Pododospaera xanthii</i>) (Px)		
(+)	(+)		susceptible	Corona	1
QN	QN		moderately resistant	Flamingo	2
			highly resistant	Cordoba	3
47.	47.	VS/VG	Resistance to downy mildew (<i>Pseudoperonospora cubensis</i>) (Pc)		
(+)	(+)		susceptible	Pepinex 69, SMR 58	1
QN	QN		moderately resistant	Poinsett	2
			highly resistant		3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
48.	48.	VS/VG	Resistance to <i>Corynespora</i> blight and target leaf spot (<i>Corynespora cassiicola</i>) (Cca)		
(+)	(+)		absent	Cerrucho, Goya, Pepinova	1
QL	QL		present	Corona, Cumlaude, Edona	9
49.	49.	VS/VG	Resistance to Cucumber Vein Yellowing Virus (CVYV)		
(+)	(+)		absent	Corona	1
QL	QL		present	Tornac	9
50.	50.	VS/VG	Resistance to Zucchini Yellow Mosaic Virus (ZYMV)		
(+)	(+)		absent	Corona	1
QL	QL		present	Dina	9

EXPLANATIONS AND METHODS

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

- (a) Leaf blade: observations on the leaf blade should be made on a fully developed leaf blade, from the 7th node upwards
- (b) Flowers: all observations on the flowers should be made on flowers between the 5th and the 15th node.
- (c) Fruit: all observations on the fruit should, except when stated otherwise, be made on fruits around 14 days after flowering, between the 5th and 15th node.

Ad. 1: Cotyledon: bitterness

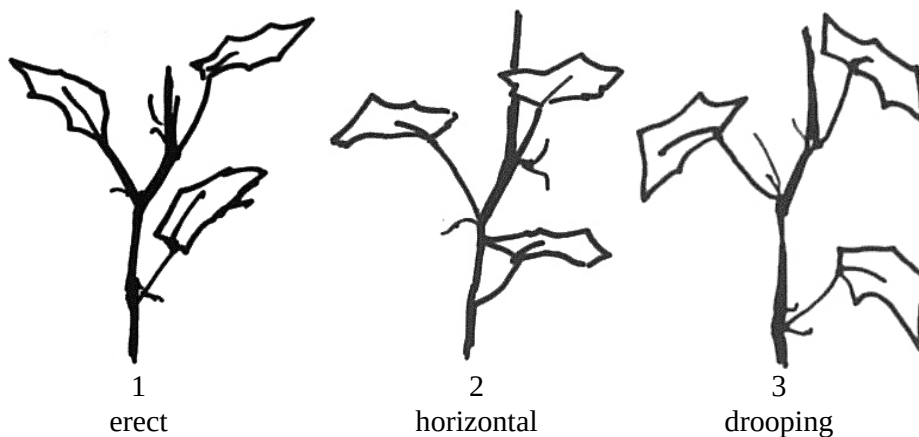
The bitterness of the cotyledon should be observed by tasting just before the development of the first true leaf.

Ad. 3: Plant: total length of first 15 internodes

To be observed when the relevant part of the main stem is fully developed.

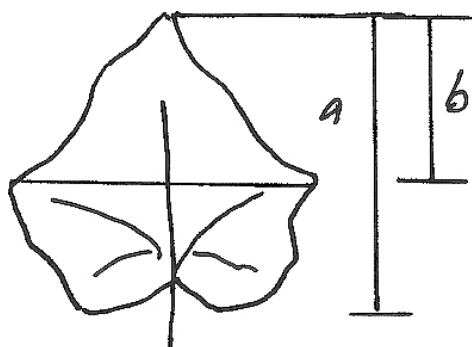
Ad. 4. Leaf blade: attitude

To be observed only for staked, vertically grown varieties.



Ad. 5: Leaf blade: length

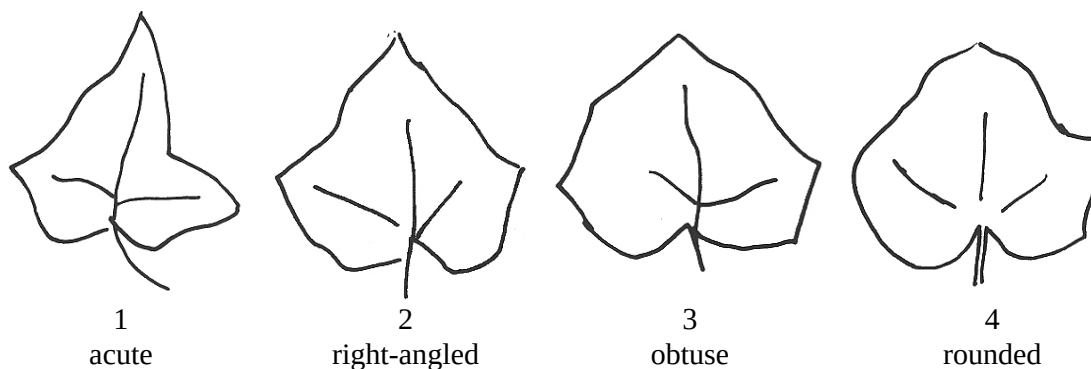
Ad. 6: Leaf blade: ratio length of terminal lobe/length of blade



a = length of blade

b = length of terminal lobe

Ad. 7: Leaf blade: shape of apex of terminal lobe



Ad. 13: Plant: sex expression

monoecious	All the nodes on the plant have both male and female flowers, with more male than female flowers on each node.	Hokus	1
subgynoecious	All the nodes have female flowers, as well as a few male flowers. Under certain conditions (light, warmth, chemical treatment), none or very few male flowers will develop on the nodes.	Toska 70	2
gynoecious	All the nodes have only female flowers. Under certain conditions (darkness, cold, chemical treatment), a few male flowers will develop.	Farbio, Sandra, Wilma	3
hermaphroditic	All the nodes have hermaphroditic and male flowers	Sunsweet	4

Ad. 14: Plant: number of female flowers per node

Where there are more than 50% of nodes with one flower or two flowers, the state of expression is predominantly one or predominantly two, respectively. In other cases, the state is that which represents the highest percentage.

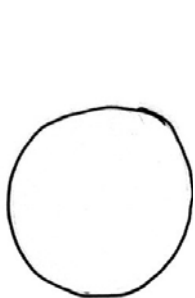
Ad. 15: Ovary: colour of vestiture

The colour of the vestiture should be observed before flower drop.

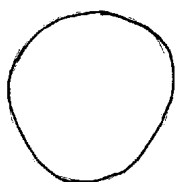
Ad. 16: Parthenocarpy

The development of the fruit without pollination should be observed under circumstances where pollination by insects (bees, bumblebees, etc.) is not possible; for example, in an insect-free greenhouse or at a time of the year when insects are not active.

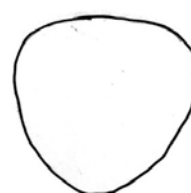
Ad. 21: Fruit: shape in transverse section



1
round

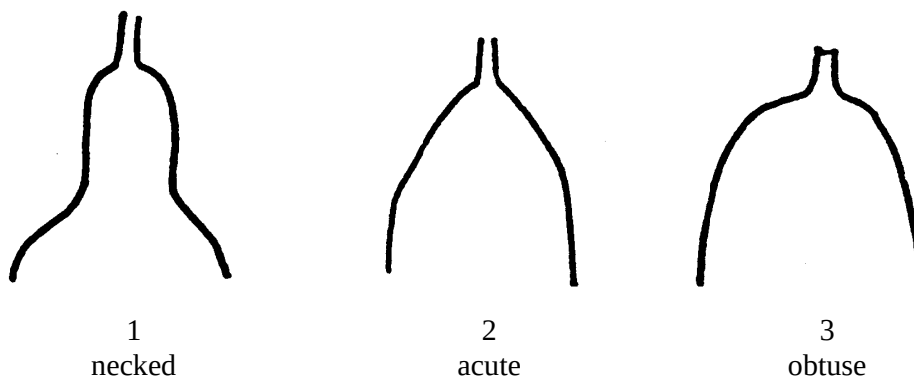


2
round to angular

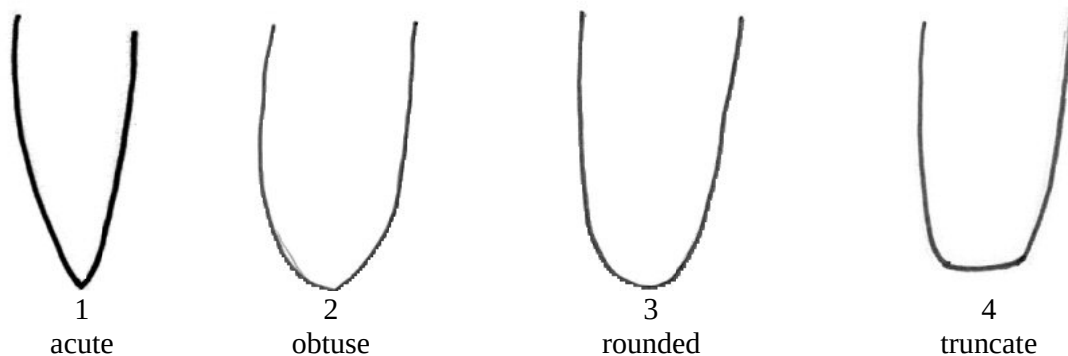


3
angular

Ad. 22: Fruit: shape of stem end



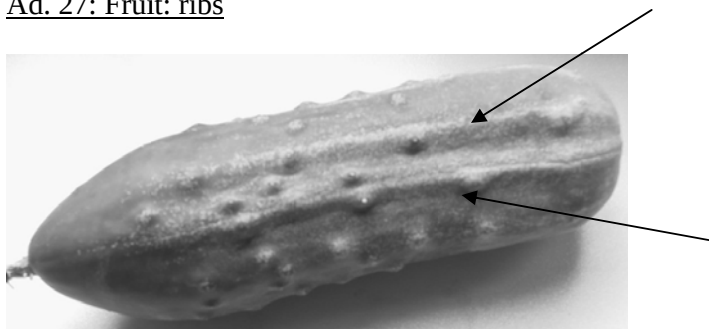
Ad. 24: Fruit: shape of calyx end



Ad. 25: Fruit: ground colour of skin at market stage

Market stage is considered to be the stage when the fruits have reached their desired length in relation to the post-harvest use of the fruit (slicing, table cucumber, gherkin etc). Market stage is, in general, reached well before the physiological ripeness of the fruit (see Ad. 43).

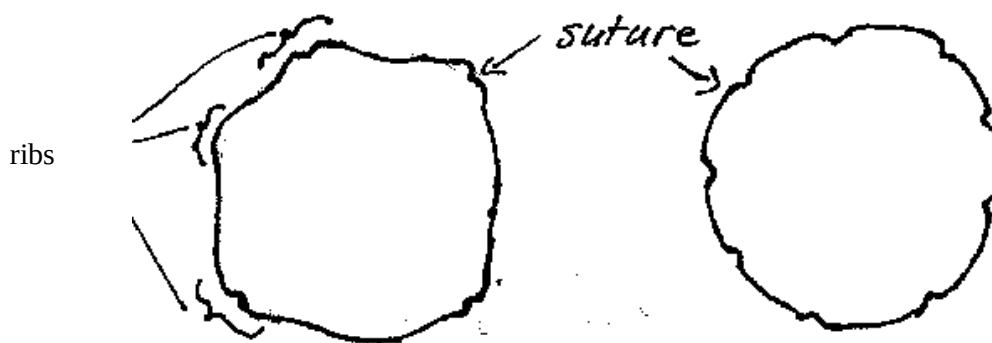
Ad. 27: Fruit: ribs



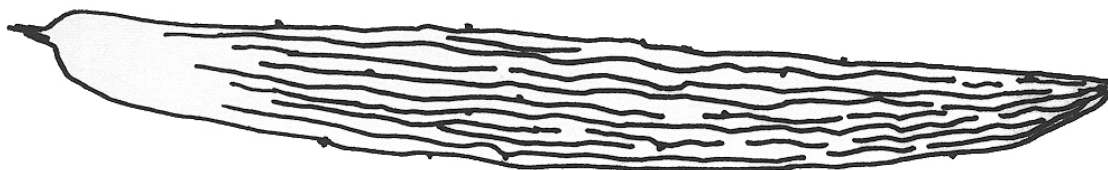
Ad. 28: Fruit: sutures



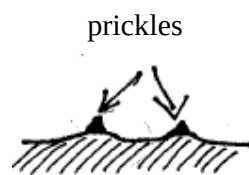
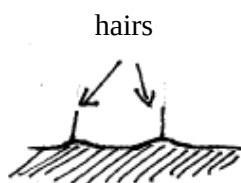
Sutures are slightly depressed in relation to the fruit surface.



Ad. 29: Fruit: creasing



Ad. 31: Fruit: type of vestiture



Ad. 36: Fruit: length of stripes

Stripes are characterized by colour and not by a depression of the fruit surface.

Ad. 38: Fruit: distribution of dots



1
in bands only



2
predominantly in bands



3
evenly distributed

Ad. 40: Fruit: density of dots

The density of dots should be observed in the areas with dots present and not on the fruit as a whole.

Ad. 41: Fruit: glaucosity

Glaucosity is a whitish or greyish waxy layer which can be removed by rubbing.

Ad. 43: Fruit: ground colour of skin at physiological ripeness

The fruit is at physiological ripeness when it is fully developed and mature and there are no further changes to the colour of the skin, before the fruit starts to rot.

Ad. 44: Resistance to *Cladosporium cucumerinum* (Ccu)

Method

Maintenance of disease

Type of medium	PDA (Potato Dextrose Agar)
Special conditions	7-8 days in the dark at 20°C

Remarks:	The spore suspension should have a concentration of 0.5×10^5 spores/ml. To be kept for a maximum of 4 days in a refrigerator at 4°C.
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<u>Preparation of inoculums</u>	Scrape off the fungus from the PDA medium, collect in a beaker and filter through a cheese-cloth.
---------------------------------	---

Raising the plants

Sowing	In potting soil or compost
Temperature	22/20°C (day/night)
Light	At least 16 hours
Number of plants	30 plants per sample

Inoculation

Growth stage of plants	The plants should have a first leaf with a diameter of 3 cm.
Method of inoculation	Spray spore suspension on leaves

Special conditions after inoculation

Temperature	22/20°C (day/night)
Light	At least 16 hours
Special conditions	Plastic cover placed over the plants. The plastic cover is closed during the first three days and thereafter slightly opened during the daytime.

Duration of test

- From sowing to inoculation	12 days
- From inoculation to last reading	6-8 days

Standard varieties

Resistance absent:	Pepinex 69
Resistance present:	Maketmore 76

Ad. 45: Resistance to Cucumber Mosaic Virus (CMV)

Method

Maintenance of disease

Type of medium	On susceptible living plants
Remarks	Greenhouse to be kept free from aphids

<u>Preparation of inoculums</u>	Mix freshly infected leaves with water. Prepare a solution with a concentration of 1:15 (inoculum: water).
---------------------------------	--

Raising the plants

Sowing	In potting soil or compost
Temperature	22/20°C (day/night)
Light	At least 16 hours
Number of plants	30 plants per sample

Inoculation

Growth stage of plants	Fully developed cotyledons
Method of inoculation	Mechanical inoculation, by rubbing the cotyledons using carborundum powder. Carborundum powder to be washed away after inoculation.

Special conditions after inoculation

Temperature	22/20°C (day/night)
Light	16 hours

Duration of test

- From sowing to inoculation	6-7 days
- From inoculation to last reading	10-21 days

Scheme of observation

1. Susceptible

II	restricted growth, cotyledon slightly blistered, leaves completely mottled	Gele Tros
III	curled leaves, heavy mosaic symptoms over whole leaf	

2. Moderately resistant

IV	curled leaves, slight mosaic symptoms	Gardon
V	slightly curled leaves, slight mosaic symptoms, many necrotic spots	
VI	leaves not curled, vague mosaic symptoms, few necrotic spots	

3. Highly resistant

VII very few virus symptoms, very few necrotic spots

VIII no symptoms

Hokus, Naf

Ad. 46: Resistance to powdery mildew (*Podosphaera xanthii*) (Px)

Method

Maintenance of disease

Type of medium

On susceptible living plants

Preparation of inoculum

Wash the spores from the infected leaves and prepare a suspension with a concentration of 10^5 spores/ml. Filter the suspension through a cheese-cloth before infecting the plants.

Raising the plants

Sowing

In potting soil or compost

Temperature:

22/20°C (day/night)

Light:

At least 16 hours

Number of plants:

30 plants per sample

Inoculation

Growth stage of plants

Fully developed cotyledons

Method of inoculation:

Spray spore suspension on leaves on the first, second and fifth day after planting out.

Special conditions after inoculation

Temperature

20/20°C (day/night)

Light

16 hours

Duration of test

- From sowing to inoculation

7, 8 and 11 days

- From inoculation to last reading:

12 days

Scheme of observation

1. Susceptible: hypocotyls and cotyledons infected, first leaf strongly infected, high sporulation.
2. Moderately resistant: hypocotyls not infected, cotyledons and first leaf moderately infected with moderate sporulation, moderate colonization.
3. Highly resistant: hypocotyls and cotyledons not infected, first leaf very weakly or not infected, few colonies, very weak sporulation.

Standard varieties

- | | | |
|----|-----------------------|----------|
| 1. | Susceptible: | Corona |
| 2. | Moderately resistant: | Flamingo |
| 3. | Highly resistant: | Cordoba |

Ad. 47: Resistance to downy mildew (*Pseudoperonospora cubensis*) (Pc)

Method

Maintenance of disease

Type of medium	On susceptible living plants
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<u>Preparation of inoculum</u>	Wash the spores from the infected leaves with cold distilled water and prepare a suspension. Suspension to be used immediately.
--------------------------------	---

Raising the plants

Sowing	In potting soil or compost
Temperature	22/20°C (day/night)
Light	At least 16 hours
Number of plants	30 plants per sample

Inoculation

Growth stage of plants	First two leaves fully developed
Method of inoculation	Spray spore suspension on leaves.

Special conditions after inoculation

Temperature	22/20°C (day/night)
Light	16 hours
Relative humidity	100%, 48 hours after inoculation
Special conditions:	Plastic cover placed over the plants. The plastic cover is closed during the first three days and thereafter slightly opened during the daytime.

Duration of test

- | | |
|-------------------------------------|-----------|
| - From sowing to inoculation: | 20 days |
| - From inoculation to last reading: | ± 10 days |

Scheme of observations

Susceptible: Large lesions with abundant spore production, leaf tissue becoming necrotic within 5 days.
Moderately resistant: Medium lesions, period of tissue yellowing prolonged to beyond 10 days.
Highly resistant: Small downy mildew lesions, round tissue in the centre becoming necrotic, no visual spore production.

Standard varieties

1	Susceptible:	Pepinex 69, SMR 58
2	Moderately resistant:	Poinsett
3	Highly resistant:	

Ad. 48: Resistance to *Corynespora* blight and target leaf spot (*Corynespora cassiicola*) (Cca)

Method

Maintenance of disease

Type of medium:	PDA (Potato Dextrose Agar)
Special conditions:	12-14 days in the dark at 20°C
Remarks:	The spore suspension should have a concentration of 0.5×10^5 spores/ml. To be kept for a maximum of 4 days in a refrigerator at 4°C

Preparation of inoculum

Scrape off the fungus from the nutrient medium, collect in a beaker and filter through a cheese-cloth.

Raising the plants

Sowing	In potting soil or compost
Temperature	22/20°C (day/night)
Light	At least 16 hours
Number of plants	30 plants per sample

Inoculation

Growth stage of plants	The plants should have a first leaf with a diameter of 3 cm.
Method of inoculation	Spray spore suspension on leaves

Special conditions after inoculation

Temperature	25/15°C (day/night)
Light	At least 16 hours
Special conditions	Plastic cover placed over the plants. The plastic cover is closed during the first three days and thereafter slightly opened during the daytime.

Duration of test

- From sowing to inoculation: 12-13 days
- From inoculation to last reading: 8-10 days

Scheme of observation:

1. Susceptible
 - a. cotyledons and first leaf dead, plant with greatly reduced growth
 - b. cotyledons dead or strongly infected, first leaf weakly infected, plant with greatly reduced growth
2. Resistant
 - a. cotyledons heavily infected, first leaf not infected, plant with normal growth
 - b. cotyledons and first leaf not infected, plant with normal growth

Standard varieties:

Susceptible:	Pepinova (1a) and Cerrucho, Goya (1b)
Resistant:	Cumlaude, Edona (2a) and Corona (2b)

Ad. 49: Resistance to Cucumber Vein Yellowing Virus (CVYV)

Method

Maintenance of isolate

Type of medium	On susceptible living plants
Special conditions	Fresh inoculum, or inoculum which has been stored for a maximum of 3 months at -20°C

Execution of test

Growth stage of plants	Appearance of first leaf	
Temperature	16 to 30°C	
Light	16 hours	
Growing method	Greenhouse	
Method of inoculation	Mechanical, by rubbing of cotyledons	
Duration of test	From inoculation to reading:	14 days
Number of plants tested	At least 15 plants	

Standard varieties:

Susceptible:	Corona
Resistant:	Tornac

Remark: Resistant varieties may have a slight discoloration of the veins of older leaves

Ad. 50: Resistance to Zucchini Yellow Mosaic Virus (ZYMV)

Method

Maintenance of isolate

Type of medium	On susceptible living plants
Special conditions	Fresh inoculum, or inoculum which has been stored for a maximum of 6 months at - 20°C

Execution of test

Growth stage of plants	Appearance of first leaf	
Temperature	23 to 25°C day and night	
Light	16 hours	
Growing method	Greenhouse	
Method of inoculation	Mechanical, by rubbing of cotyledons	
Duration of test	From inoculation to reading:	14 days
Number of plants tested	At least 15 plants	
Standard varieties:		
Susceptible:	Corona	
Resistant:	Dina	

Remark: Resistant varieties may have a slight discoloration of the veins of older leaves.
Susceptible varieties have systemic mosaic symptoms.

LITERATURE

Angelor, D., Krastera, L., 2000: Selecting downy mildew-resistant short-fruited cucumbers, Acta Horticulturae No. 510.

Grubben, G.J.H., Denton, O.A., 2004: Plant Resources of Tropical Africa 2. Vegetables, Prota Foundation, Wageningen, NL.

Harrison, B.E., Masfield, G.B., Wallis, M., 1969: The Oxford Book of Food Plants, Oxford University Press, GB.

Kristkova, E., Lebeda, A., Vinter, V., Blahousek, O., 2003: Genetic resources of the genus *Cucumis* and their morphological description, Hort. Sci. 30 (1), p. 14-42, Prague, CZ.

Lebeda, A., Paris, H., Progress in Cucurbit Genetics and Breeding Research, Proceedings of the 8th EUCARPIA meeting on Cucurbit Genetics and Breeding, Olomouc, Czech Republic, 12-17 July 2004.

Messiaen, C.M., Blancard, D., Rouxel, F., Lafon, R., 1991 : Les maladies des plantes maraîchères, INRA, Paris, FR.

Recommended Codes for Pest Organisms in Vegetable Crops, 2004, ISF.

Tapley, W.T., Enzie, W.D., Eseltine, G.P. van, 1937: The Vegetables of New York, New York State Agricultural Experiment Station, US.

Vilmorin-Andrieux, M.M., The Vegetable Garden, John Murray (Publishers), Ltd., London, GB.

Wehner, Todd C., Vegetable Cultivar Descriptions for North America, Dept. of Horticultural Science, North Carolina University, Raleigh, US.

Xie, J., Wehner, T.C., Gene List 2001 for cucumber, Dept. of Horticultural Science, North Carolina University, Raleigh, US.

ANNEX II



European Union
Community Plant Variety Office

TECHNICAL QUESTIONNAIRE

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

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

Cucumis sativus L.

CUCUMBER, GHERKIN

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

3. **Variety denomination**

a) Where appropriate proposal for a variety denomination:

b) Provisional designation (breeder's reference):

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

4.1 Breeding, maintenance and reproduction of the variety

Please indicate breeding scheme, parents, other relevant information

- (a)
- (i) hybrid []
- (ii) open-pollinated variety..... []
- (iii) parent line..... []
- (b)
- (i) seed propagated []
- (ii) vegetatively propagated []
- (c) Other information on genetic origin and breeding method[]

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

4.3 Shall the information on data relating to components of hybrid varieties including data related to their cultivation be treated as confidential?

[] YES [] NO

If yes, please give this information on the attached form for confidential information.

If no, please give information on data relating to components of hybrid varieties including data related to their cultivation:

Breeding scheme (indicate female component first)

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in the CPVO Protocol; please mark the state of expression which best corresponds).		
	Characteristics	Example varieties
5.1 (1)	Cotyledon: bitterness	
	absent	Rocket GS, Sandra
	present	Farbio
5.2 (13)	Plant: sex expression	
	monoecious	Hokus
	subgynoecious	Toska 70
	gynoecious	Farbio, Sandra, Wilma
	hermaphroditic	Sunsweet
5.3 (15)	Ovary: colour of vestiture	
	white	Jazzer
	black	Vert petit de Paris
5.4 (16)	Parthenocarpy	
	absent	Toska 70
	present	Farbio, Rocket GS, Sandra, Wilma
5.5 (17)	Fruit: length	
	very short	De Russie, Sunsweet
	short	
	medium	Gemini, Jazzer
	long	Corona
	very long	
5.6 (22)	Fruit: shape of stem end	
	necked	Sandra, Tasty Green
	acute	De Massy
	obtuse	Maram, Score

	Characteristics	Example varieties	Note
5.7 (25)	Fruit: ground colour of skin at market stage		
	white	Bonneuil	1 []
	yellow	Gele Tros	2 []
	green	Corona	3 []
5.8 (31)	Fruit: tip of vestiture		
	hairs only	Silor	1 []
	hairs and prickles	De Bourbonne, De Massy	2 []
	prickles only	Corona, Jazzer	3 []
5.9 (44)	Resistance to <i>Cladosporium cucumerinum</i> (Ccu)		
	absent	Pepinex 69	1 []
	present	Marketmore 76	9 []
5.10 (45)	Resistance to Cucumber Mosaic Virus (CMV)		
	susceptible	Gele Tros	1 []
	moderately resistant	Gardon	2 []
	highly resistant	Hokus, Naf	3 []
5.11 (46)	Resistance to powdery mildew (<i>Podosphaera xanthii</i>) (Px)		
	susceptible	Corona	1 []
	moderately resistant	Flamingo	2 []
	highly resistant	Cordoba	3 []
5.12 (48)	Resistance to <i>Corynespora</i> blight and target leaf rot (<i>Corynespora cassicola</i>) (Cca)		
	absent	Cerrucho, Goya, Pepinova	1 []
	present	Corona, Cumlaude, Edona	9 []
5.13 (49)	Resistance to Cucumber Vein Yellowing Virus (CVYV)		
	absent	Corona	1 []
	present	Tornac	9 []

Characteristics		Example varieties	Note
5.14	Fruit type		
	Gherkin	Adam, Conny, Levina, Melody	1 []
	Cucumber: Beth Alpha	Hana, Silor	2 []
	Cucumber: Dutch type	Brunex, Corona, Dominant	3 []
	Cucumber: American slicer	Jazzer, Marketmore, Sprint	4 []
	Cucumber: Asian	Sagami-Fankapu, White Sun	5 []
	Cucumber: Other	Fatum, Tine	6 []
6. Similar varieties and differences from these varieties:			
Denomination of similar variety	Characteristic in which the similar variety is different ¹⁾	State of expression of similar variety	State of expression of candidate variety
¹⁾ In the case of identical states of expressions of both varieties, please indicate the size of the difference			
7. Additional information which may help to distinguish the variety			
7.1 Resistance to pests and diseases			
		absent	present
		not tested	
a) Downy mildew (<i>Pseudoperonospora cubensis</i> (Pc)) (char. 47)	[]	[]	[]
b) Zucchini Yellow Mosaic Virus (ZYMV) (char. 50)	[]	[]	[]
c) Others (please specify)	[]	[]	[]

7.2 Special conditions for the examination of the variety

☐ YES, please specify

☐ NO

7.3 Other information

7.3.1 Main use

- a) Processing..... ☐
- b) Fresh market ☐
- c) Other (please provide details)..... ☐

7.3.2 Type of culture

- a) Greenhouse, staked..... ☐
- b) Greenhouse, non staked..... ☐
- c) In the open, staked..... ☐
- d) In the open, non staked..... ☐
- e) Other (please provide details)..... ☐

8. GMO-information required

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

☐ YES ☐ NO

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

9. Information on plant material to be examined

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

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

- | | | |
|---|------------------------------|-----------------------------|
| (a) Microorganisms (e.g. virus, bacteria, phytoplasma) | ☐ 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":

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

Date

Signature

Name

[End of document]