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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
 GENEVA

DRAFT

CUCUMBER, GHERKIN

UPOV Code: CUCUM_SAT

(*Cucumis sativus* L.)

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from the Netherlands

to be considered by the

*Technical Working Party for Vegetables (TWV) at its thirty-ninth session,
 to be held in Nitra, Slovakia, from June 6 to 10, 2005*

Alternative Names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Cucumis sativus</i> L.	Cucumber, Gherkin	Concombre, Cornichon	Gurken	Pepino, Pepinillo

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

ASSOCIATED DOCUMENTS

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

Other associated UPOV documents:

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

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1. SUBJECT OF THESE TEST GUIDELINES.....	3
2. MATERIAL REQUIRED	3
3. METHOD OF EXAMINATION.....	3
3.1 Number of Growing Cycles	3
3.2 Testing Place	3
3.3 Conditions for Conducting the Examination.....	3
3.4 Test Design	4
3.5 Number of Plants / Parts of Plants to be Examined.....	4
3.6 Additional Tests	4
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	4
4.1 Distinctness	4
4.2 Uniformity.....	5
4.3 Stability	5
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL.....	5
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS	6
6.1 Categories of Characteristics.....	6
6.2 States of Expression and Corresponding Notes.....	6
6.3 Types of Expression.....	6
6.4 Example Varieties	6
6.5 Legend.....	7
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES.....	8
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS	23
9. LITERATURE.....	33
10. TECHNICAL QUESTIONNAIRE.....	34

1. Subject of these Test Guidelines

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

2. Material Required

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

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

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

1,500 seeds or 25 plants for tests in greenhouse; or

50 plants for tests in the open.

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

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

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

3. Method of Examination

3.1 *Number of Growing Cycles*

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

3.2 *Testing Place*

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

3.3 *Conditions for Conducting the Examination*

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

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

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

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 40 plants in the open or 20 plants in the greenhouse, and should be divided between two or more replicates.

D: We agree to 40 plants in the open (50 less than in the previous guidelines).

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

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

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

3.6 *Additional Tests*

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

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

4.2 *Uniformity*

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

4.2.2 The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction.

4.2.3 For the assessment of uniformity of varieties other than hybrid varieties, a population standard of 1 % and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 20 plants, 1 off-type is allowed.

4.3 *Stability*

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

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

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

Fruit: type

- (a) Cotyledon: bitterness (characteristic)
- (b) Fruit: color of vestiture (characteristic)
- (c) Fruit: parthenocarpy (characteristic)
- (d) Fruit: length (characteristic)
- (e) Fruit: ground color of skin at market stage (characteristic)

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

6. Introduction to the Table of Characteristics

6.1 *Categories of Characteristics*

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

6.2 *States of Expression and Corresponding Notes*

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

6.3 *Types of Expression*

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

6.4 *Example Varieties*

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

6.4.2 Example varieties are followed by an indication of the type: cucumber types are indicated by (C) and gherkin types by (G).

6.5 *Legend*

- (*) Asterisked characteristic – see Chapter 6.1.2
- QL: Qualitative characteristic – see Chapter 6.3
- QN: Quantitative characteristic – see Chapter 6.3
- PQ: Pseudo-qualitative characteristic – see Chapter 6.3

- MG: single measurement of a group of plants or parts of plants – see Chapter 3.3.1
- MS: measurement of a number of individual plants or parts of plants – see Chapter 3.3.1
- VG: visual assessment by a single observation of a group of plants or parts of plants – see Chapter 3.3.1
- VS: visual assessment by observation of individual plants or parts of plants” – see Chapter 3.3.1

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

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

Comments from Spanish experts to Cucumber/Gherkin guideline project

General comments:

- We prefer to have all characteristics common for cucumber and gherkin. Its are just groups into the same crop.

-The characteristics of vestiture (type and color) are easier to observe in the flower ovary or in the first stage of the fruit. The density of vestiture in this stage give an extra information, is not totally correlated with the observation in market stage. We would keep the characteristics as they are in the actual guideline.

-The PQ in certain resistances must be convincingly explained. Actually, in our knowledge, qualitative or quantitative characteristics should be in general more appropriate for resistance characteristics.

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

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
42. (*)	MS Cotyledon: bitterness					
QL	(a) absent				Rocket GS, Sandra	1
	present				Farbio, Levo, Sporu	9
1. (*)	VG Plant: growth type					
QL	determinate				Bush Crop, Shachal	1
	indeterminate				Corona, Levina	2
2.	del Plant: vigor					
New (i) (*)	MG Plant: speed of growth					
QN	slow				Kora	3
	medium					5
	fast				Cerrucho	7

CZ: Please add explanation, how to estimate it.

D: will be o.k. for tests in the greenhouse but difficult to assess in the open.

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
3. mod	MS	Plant: total length of first 15 internodes					
QN	(b)	very short				1	
		short			Kora, Maram, Naf, Tagor	3	
		medium			Marketmore	5	
		long			Avir, Nimbus, Pepinex 69	7	
		very long			Cerrucho	9	
4. del		Plant: length of internodes of side shoots					
New (ii)	VG	Leaf blade: attitude					
QN	(c)	erect				1	
		semi-erect			Akito	3	
		horizontal			Jizzer	5	
		semi-drooping			Nabil	7	
		drooping			Kastor	9	
E: (new) <u>Leaf blade attitude</u>. In our experience is very influenced by medium conditions. Consequently should be very difficult to describe with so wide scale							
CZ Do you mean the angle between the main stem and peduncle of leaf or really attitude of blade only. How to observe it at the gherkin grown without support.							
D: we propose not to include. It is the same problem as for speed of growth: how to assess in the open.							
5. mod	VG	Leaf blade: size					
QN	(c)	small			Levo	3	
		medium			Briljant	5	
		large			Corona	7	

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
New (iii)	VG/MS	Leaf blade: length of terminal lobe in relation to length of leaf blade				
QN	(c)	very short			Defense	1
		short			Kornim	3
		medium			Corona	5
		long				7
		very long				9
New (iv)	VG	Leaf blade: shape of terminal lobe				
	(+)					
PQ	(c)	acute				1
		rectangular				2
		obtuse				3
		rounded				4
CZ: please add drawing						
D: proposal to delete if there are no example varieties						
6. mod	VG	Leaf blade: intensity of green color				
QN	(c)	very light				1
		light			De Russie	3
		medium			Rocket GS, Stereo	5
		dark			Marketmore, Sandra, Tokyo Slicer	7
		very dark			Akito	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
7.	VG	Leaf blade: blistering				
QN	(c)	absent or very weak			Silor	1
		weak			Pepinex 69, Rocket GS	3
		medium			Monir	5
		strong			Tokyo Slicer	7
		very strong				9
8.	VG	Leaf blade: undulation of margin				
mod						
QN	(c)	absent or very weak			Jizzer	1
		weak			Pepinex 69, Rocket GS	3
		medium				5
		strong			Tokyo Slicer	7
		very strong				9
E: <u>Undulation of margin.</u> Concentrate quantitative			1.absent or very weak 2.weak 3.medium to strong			
New	VG	Leaf blade: dentation of margin				
(v)						
QN	(c)	very weak			Jizzer	1
		weak			Hana, Silor	3
		medium			Susan	5
		strong			Travito	7
		very strong				9
9.	del	Leaf: length of terminal lobe				
10.	del	Width of terminal lobe				
11.	del	Leaf: ratio length/width of terminal lobe				

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
41. VS moved	Time of development of female flowers (80% of plants with at least one female flower)					
QN	early				Avir	3
	medium					5
	late				Fin de Meaux, Riesenschäl	7
12. VS mod (*)	Plant: sex expression					
QL	(d)	generally more male than female flowers			Hokus	1
		mainly female flowers			Levo, Toska 70	2
		almost exclusively female flowers			Farbio, Sandra, Wilma	3
		hermaphrodite and male flowers			Sunsweet	4
CZ: we propose to start the observation from the 2. or 3 nodes upwards because of influence of the cold at the time of initiation the first node (especially at the gherkin in the open field). Could be specified in the explanation expression “almost exclusively female flowers”						

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13. mod	MS Plant: number of female flowers per node (on first 15 nodes)					
QN	(d) generally one				Akito	1
	generally one to two				Silor	2
	generally three to five				Melody	3
	generally more than five				Olympos	4
E: We propose to add two more notes						
	generally one		1	Dasher, Faraón		
	generally one to two		2	Brunex, Marumba		
	generally two		3	Corona		
	generally two to three		4	Tempo		
	generally three to five		5			
	generally more than five		6			
D: the expression “generally two to three” should be included						
E proposes to keep characteristics 14 to 17						
14. del	Young fruit: type of vestiture					
	(see after					
15. del	Young fruit: density of vestiture					
	(see after 31)					
16. del	Young fruit: color of vestiture					
	(see after 31)					
D: should not be deleted, the color is better to be seen in this stage than on the mature fruit						
17. del	Young fruit: size of warts					
	(see after 32)					

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18.	VS	Parthenocarpy				
(*)						
QL	(e)	absent			Levo, Toska 70	1
		present			Farbio, Rocket GS, Sandra, Wilma	9
E: Parthenocarpy: Need a more extend explanation with the practical way to assess it.						
D: How should the condition (no pollination possible) be controlled?						
D: Fruit measurements should be done for both cucumber and gherkin, char. 21.2 needs the length for gherkin as well.						
19.	MS/ mod	Fruit: length			[Example varieties of gherkin to be provided]	
(*)	V					
QN	(f)	very short			De Russie (C), Sunsweet (C)	1
		short			Zena (C), Tagor (C)	3
		medium			Gemini (C), Jazzer (C)	5
		long			Corona (C)	7
		very long			Kaliber (C)	9
20	MS/ mod	Fruit: maximum diameter			[Example varieties of gherkin to be provided]	
	VG					
QN	(f)	small			Pickobello (C)	3
		medium			Zena (C), Corona (C)	5
		large			Riesenschäl (C)	7
21	MS/ mod	Fruit: ratio length/diameter			[Example varieties of gherkin to be provided]	
(*)	VG					
	(f)	very small			Sunsweet (C)	1
QN		small			Zena (C)	3
		medium			Pickobello (C), Jazzer (C)	5
		large			Corona (C)	7
		very large			Kyoto 3 Feet (C)	9

CZ: we propose to make as well all observations at cucumber on the fruit after market stage like at gherkin.

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
22. MS/ mod VG	Fruit: core diameter in relation to diameter of fruit						
QN	(f)	very small			Sunsweet	1	
		small			Riesenschäl, Telepathy	3	
		medium			Corona	5	
		large			Vert petit de Paris	7	
		very large			Sunsweet	9	
New (vi)	VS	Fruit: shape in transverse section					
	(+)						
PQ	(f)	round			Telepathy	1	
		angular			Gele Tros, Regal	2	
E: To add an intermediate class. To classify as QN							
		Generally round	1	Suzan			
		Generally round to angular	2	Dasher			
		Generally angular	3	Anico			
D: We assume there is no clear border between both expressions.							
23. mod (*)	VG	Fruit: shape of stem end					
PQ	(f)	necked			Sandra, Tasty Green	1	
		acute			De Massy	2	
		obtuse			Maram, Score, Tagor	3	
24. mod	VG	<u>Only necked</u> varieties: Fruit: length of neck					
QN	(f)	very short				1	
		short			Saskia	3	
		medium			Corona, Telepathy	5	
		long			Kamaron	7	
		very long			Tasty Green	9	

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
25.	VG	Fruit: shape of calyx end					
mod							
PQ	(f)	acute			De Massy, Pepinex 69	1	
		obtuse			Astrea, Score, Raider	2	
E : Fruit: Shape of calyx end:							
			1	Dardos			
			2	Reno			
			3	Bellísima			
			4	Medusa			
26.	VS	Fruit: ground color of skin					
mod							
(*)							
QL	(f)	white			Bonneuil	1	
		yellow			Gele Tros	2	
		green			Corona	3	
27.	VG	Fruit: intensity of ground color of skin					
(*)							
QN	(f)	light				3	
		medium				5	
		dark				7	
28.	VG	Fruit: ribs					
mod							
(*)							
(+)							
QL	(f)	absent			Corona	1	
		present			Vert Petit de Paris	9	
E: To keep, but with the new meaning of ribs							
Fruit: Prominence of ribs							
			1	Darius			
			2	Diana			
			3	Sprint			
			4	Cornichon de Paris			

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
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New VG Fruit: sutures

(vii)
(*
(+)

QL	(f)	absent			Corona, Hana	1
		present			Silor, Nabil	9

CZ: Please add explanation what you mean by it.

D: Please give details

New VG Fruit: creasing

(viii)
(*
(+)

PQ	(f)	absent			Jazzer	1
		present			Corona, Nabil	9

CZ: Please add explanation what you mean by it.

D: How to distinguish between ribs and creasing?

New VG Fruit: degree of creasing

(ix)

QN	(f)	very weak			Silor	1
		weak			Nabil	3
		medium			Corona, Galileo	5
		strong			Grizzly	7
		very strong			Suyo Long	9

29. del Fruit: prominence of ribs

30. del Fruit: coloration of ribs compared to ground color

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
New (x) (*)	VS	Fruit: type of vestiture					
QL	(f)	hairs only			Silor, Doplus	1	
		prickles only			Jazzer, Corona, Tagor	2	
		hairs and prickles			De Bourbonne, De Massy	3	
31. mod	VG	Fruit: density of vestiture					
QN	(f)	absent or very sparse			Beth Alpha, Vert Petit de Paris	1	
		sparse				3	
		medium			Tasty Green	5	
		dense			Silor, Suyo Long	7	
		very dense			Moneta, Parmel	9	
New (xi) (*)	VS new	Fruit: color of vestiture					
PQ	(f)	white			Jazzer	1	
		light brown			Akito	2	
		dark brown			Satina	3	
		black			Gele Tros, Vert Petit de Paris	4	
D: proposal to delete, see before							
32. (*)	VG	Fruit: warts					
QL	(f)	absent			Diana	1	
		present			Dumex, Regal, Chinese Slangen	9	

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
New (xii)	VG	Fruit: size of warts				
QN	(f)	very small			Parmel	1
		small			Jizzer	3
		medium			Regal	5
		large			Chinese Slangen	7
		very large			Tasty Green	9
33. mod (*)	VG	Fruit: stripes				
QL	(f)	absent			Pepinex 69	1
		present			Levo, Suyo Long	9
34. mod	VG	Fruit: length of stripes				
QN	(f)	very short				1
		short			Astrea	3
		medium			Breso	5
		long			Finvo, Pioneer, Tagor, Tokyo Slicer	7
		very long			Suyo Long	9
35. mod (*)	VG	Fruit: dots (stripes excluded)				
QL	(f)	absent			Sensation	1
		present			Delicatesse, White Sun	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
36.	VG	Fruit: type of dots					
	mod						
PQ	(f)	small and round			Finvo, Paro, Tokyo Slicer, White Sun	1	
		large and irregular			Delicatesse, Fin de Meaux, Marketer, Vert Petit de Paris	2	
<u>E: Fruit: Type of dots:</u>							
We understand it more as							
Distribution of the dots:							
		Uniformly spread	1	Marinda			
		Spread and concentrated	2	Anico			
		Concentrated on areas or lines	3	Cornichon de Paris			
37.	VG	Fruit: density of dots					
	mod						
QN	(f)	very sparse				1	
		sparse			Raider	3	
		medium			Hyclos, Le Généreux, Levo	5	
		dense			Mesa, Paro	7	
		very dense			Carnito, White Sun	9	
38.	VG/ MS	Fruit: length of peduncle					
QN	(f)	short			Admirable, Belcanto	3	
		medium			Aries, Femdan	5	
		long			Pepinex 69	7	
39.	del	Fruit: thickness of peduncle					

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
40.	VG	Fruit: ground color of skin at physiological ripening					
QL	white					1	
	yellow					2	
	green					3	
	orange					4	
	brown				Vert Petit de Paris	5	
41. moved		Time of development of female flowers (80% of plants with at least one female flower)					
42. moved		Cotyledon: bitterness					
43. (*)	MS	Fruit: bitterness at stem end					
QL	(f)	absent			Farbio, Levo, Rocket GS	1	
		present			Fin de Meaux, Imanol	9	
D: to delete? char. is quite influenced by environment							
44. mod (+)		Resistance to Cladosporium cucumerinum (Ccu)					
QL		absent			Pepinex 69	1	
		present			Maketmore 76	9	
D: no significance in our country according to Federal Biological Institute							
45. (+)		Resistance to Cucumis mosaic virus (CMV)					
PQ		absent				1	
		present				9	

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
46.	Resistance to powdery mildew (Sphaerotheca fuliginea) (Sf)					
(+)						
QL	absent					1
	present					9
47. del	Resistance to powdery mildew (Erysiphe cichoriacearum)					
48.	Resistance to downy mildew (Pseudoperonospora cubensis) (Pc)					
(+)						
QL	absent					1
	present					9
49. mod (+)	Resistance to Corynespora cassicola (Cca)					
PQ	absent					1
	present					9
D: no significance in our country according to Federal Biological Institute						
New (xiii)	Resistance to Cucumber Vein Yellowing Virus (CVYV)					
(+)						
PQ	absent					1
	present					9
New (xiv)	Resistance to Zucchini Yellow Mosaic Virus (ZYMV)					
(+)						
PQ	absent					1
	present					9

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

- (a) Cotyledon : should be observed just before the development of the first true leaf, by tasting
- (b) Plant : Should be observed when the concerned part of the main stem is fully developed
- (c) Leaf blade: should be observed on fully developed leaf blade, from the 7th node upwards
- (d) Plant: all observations on flowering should be made on the first 15 internodes
- (e) Parthenocarpy: should be observed under circumstances where pollination is not possible
- (f) Fruit: - all observations on cucumbers should be made on fruits at market stage, all observations on gherkin should be made after market stage to fully development stage, but before botanical maturity.

8.2 Explanations for individual characteristics

Drawings will follow

Ad. 44: Resistance to Cladosporium cucumerinum (Ccu)

Method

Maintenance of races

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. Keep maximum 4 days in refrigerator at 4°C.

Preparation of inoculum: Scrape off the fungus from the nutrient medium, collect it in a beaker and filter it through a cheese cloth.

Raising the plants

Sowing: In potting soil

Temperature: 22/20°C (d/n)

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 three centimeters.

Method of inoculation: Spraying of spore suspension on leaves

Special conditions after inoculation

Temperature: 22/20°C (d/n)

Light: At least 16 hours

Special conditions: A plastic cover over the plants. Closed during the first three days. Then slightly open at 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: Marketmore 76

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

Method

Maintenance of races

Type of medium: On living plants

Remarks: Keep the greenhouse free from aphids

Preparation of inoculum: Mix freshly infected leaves with water. Prepare a solution with a concentration of 1:15 (inoculum: water).

Raising the plants

Sowing: In potting soil

Temperature: 22/20°C (d/n)

Light: At least 16 hours

Number of plants: 30 plants per sample

Inoculation

Growth stage of plants: Fully developed cotyledons

Method of inoculation: Mechanical, by rubbing the cotyledons. Use carborundum powder and wash it away after inoculation.

Special conditions after inoculation

Temperature: 22/18°C (d/n)

Light: 16 hours

Duration of test

- From sowing to inoculation: 6-7 days
- From inoculation to last reading: 10-14 days

Scheme of observation:

I Resistance absent:

II

restricted growth, cotyledon
slightly blistered, leaves
completely mottled

Gele Tros

III curled leaves, heavy mosaic
symptoms over whole leave

IV curled leaves, slight mosaic
symptoms

9 Resistance present:

V slightly curled leaves, slight
mosaic symptoms, many
necrotic spots Levo

VI leaves not curled, vague mosaic
symptoms, few necrotic spots

VII very few virus symptoms, very
few necrotic spots

VIII no symptoms Hokus, Naf

Ad. 46: Resistance to powdery mildew (*Sphaerotheca fuliginea*)

Method

Maintenance of races

Type of medium: On 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

Temperature: 22/20°C (d/n)

Light: At least 16 hours

Number of plants: 30 plants per sample

Inoculation

Growth stage of plants: Fully developed cotyledons

Method of inoculation: Spraying of spore suspension on leaves: the first, the second and the fifth day after planting out.

Special conditions after inoculation

Temperature: 20/20°C (d/n)

Light: 16 hours

Duration of test

- From sowing to inoculation: 7, 8 and 11 days
- From inoculation to last reading: 12 days

Standard varieties: Resistance absent : Beth Alpha
Resistance present: Cordoba

Ad. 47: Resistance to powdery mildew (*Erysiphe cichoriacearum*)

Method

Maintenance of races

Type of medium: On 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

Temperature: 22/20°C (d/n)

Light: At least 16 hours

Number of plants: 30 plants per sample

Inoculation

Growth stage of plants: Fully developed cotyledons

Method of inoculation: Spraying of spore suspension on leaves: the first, the second and the fifth day after planting out.

Special conditions after inoculation

Temperature: 20/20°C (d/n)

Light: 16 hours

Duration of test

- From sowing to inoculation: 7, 8 and 11 days
- From inoculation to last reading: 12 days

Standard varieties: Resistance absent: Beth Alpha
Resistance present: Bresó

Ad. 48: Resistance to downy mildew (*Pseudoperonospora cubensis*)

Method

Maintenance of races

Type of medium: On living plants

Preparation of inoculum: Wash the spores from the infected leaves and prepare a suspension. Use it immediately.

Raising the plants

Sowing: In potting soil

Temperature: 22/20°C (d/n)

Light: At least 16 hours

Number of plants: 30 plants per sample

Inoculation

Growth stage of plants: Two first leaves fully developed

Method of inoculation: Spraying of spore suspension on leaves.

Special conditions after inoculation

Temperature: 22/20°C (d/n)

Light: 16 hours

Relative humidity: 48 hours after inoculation 100%

Special conditions: A plastic cover over the plants. Closed during the first three days, then slightly open during daytime.

Duration of test

- From sowing to inoculation: 20 days
- From inoculation to last reading: \pm 10 days

Standard varieties: Resistance absent: Pepinex 69
Resistance present: Ellom, Poinsett, Silor

Ad. 49: Resistance to Corynespora melonis

Method

Maintenance of races

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. Keep maximum 4 days in refrigerator at 4°C
<u>Preparation of inoculum:</u>	Scrape off the fungus from the nutrient medium, collect it in a beaker and filter it through a cheese cloth.

Raising the plants

Sowing:	In potting soil
Temperature:	22/20°C (d/n)
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 three centimeters
Method of inoculation:	Spraying of spore suspension on leaves

Special conditions after inoculation

Temperature:	25/15°C (d/n)
Light:	At least 16 hours
Special conditions:	A plastic cover over the plants. Closed during the first three days. Then slightly open at daytime.

Duration of test

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

<u>Standard varieties:</u>	Resistance absent: Beth Alpha Resistance present: Corona
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Ad. 50: Resistance to Cucumber Vein Yellowing Virus (CVYV)

Method

Maintenance of isolate

Type of medium:	On susceptible plants
Special conditions:	Fresh inoculum or stored for maximum 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:	Glasshouse
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 give a slight discoloration of the veins of older leaves

Ad. 51: Resistance to Zucchini Yellow Mosaic Virus (ZYMV)

Method

Maintenance of isolate

Type of medium:	On susceptible plants
Special conditions:	Fresh inoculum or stored for maximum 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:	Glasshouse
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 give a slight discoloration of the veins of older leaves. Susceptible varieties give systemic mosaic symptoms.

9. Literature

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

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.

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.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
<p>TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p>		
<p>1. Subject of the Technical Questionnaire</p> <p>1.1 Botanical name <input data-bbox="639 663 1357 716" type="text" value="Cucumis sativus L."/></p> <p>1.2 Common name <input data-bbox="639 737 1357 789" type="text" value="Cucumber, Gherkin"/></p>		
<p>2. Applicant</p> <p>Name <input data-bbox="639 936 1357 989" type="text"/></p> <p>Address <input data-bbox="639 1010 1357 1188" type="text"/></p> <p>Telephone No. <input data-bbox="639 1209 1357 1262" type="text"/></p> <p>Fax No. <input data-bbox="639 1283 1357 1335" type="text"/></p> <p>E-mail address <input data-bbox="639 1356 1357 1409" type="text"/></p> <p>Breeder (if different from applicant) <input data-bbox="639 1472 1357 1524" type="text"/></p>		
<p>3. Proposed denomination and breeder's reference</p> <p>Proposed denomination (if available) <input data-bbox="639 1661 1357 1713" type="text"/></p> <p>Breeder's reference <input data-bbox="639 1787 1357 1839" type="text"/></p>		

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>#4. Information on the breeding scheme and propagation of the variety</p> <p>4.1 Breeding scheme</p> <p>Variety resulting from:</p> <p>4.1.1 Crossing</p> <p>(a) controlled cross <input type="checkbox"/> [] (please state parent varieties)</p> <p>(b) partially known cross <input type="checkbox"/> [] (please state known parent variety(ies))</p> <p>(c) unknown cross <input type="checkbox"/> []</p> <p>4.1.2 Discovery and development <input type="checkbox"/> [] (please state where and when discovered and how developed)</p> <p>4.1.3 Other <input type="checkbox"/> [] (please provide details)</p> <div data-bbox="457 1026 1187 1125" style="border: 1px solid black; height: 47px; width: 449px; margin-left: 20px;"></div>		

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

- (a) Self-pollination []
- (b) Cross-pollination
 - (i) population []
 - (ii) synthetic variety []
- (c) Hybrid []
- (d) Other []
(please provide details)

4.2.2 Vegetatively propagated varieties

- (a) cuttings []
- (b) *in vitro* propagation []
- (c) other (state method) []

4.2.3 Other []

(please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>In the case of hybrid varieties the production scheme for the hybrid should be provided on a separate sheet. This should provide details of all the parent lines required for propagating the hybrid e.g.</p> <p><i>Single Hybrid</i></p> <p>(... female parent ...) x (... male parent ...)</p> <p><i>Three-Way Hybrid</i></p> <p>(... female line ...) x (... male line ...)</p> <p>=> single hybrid used as female parent x (... male parent ...)</p> <p>and should identify in particular:</p> <ul style="list-style-type: none">(a) any male sterile lines(b) maintenance system of male sterile lines.		

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
<p>5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).</p>			
Characteristics	Example Varieties	Note	
<p>6. Similar varieties and differences from these varieties</p> <p><i>Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.</i></p>			
Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the similar variety(ies)	Describe the expression of the characteristic(s) for your candidate variety
GN 33 <i>Example</i>	<i>[e.g. Flower color]</i>	<i>[e.g. orange]</i>	<i>[e.g. orange red]</i>
<p>Comments:</p>			

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>#7. Additional information which may help in the examination of the variety</p> <p>7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.2 Are there any special conditions for growing the variety or conducting the examination?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.3 Other information</p> <p>7.3.1 Main use</p> <p>(a) fresh []</p> <p>(b) pickling []</p> <p>(c) other []</p> <p>(please provide details)</p>		
<p>8. Authorization for release</p> <p>(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?</p> <p>Yes [] No []</p> <p>(b) Has such authorization been obtained?</p> <p>Yes [] No []</p> <p>If the answer to (b) is yes, please attach a copy of the authorization.</p>		

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:												
<p>9. Information on plant material to be examined or submitted for examination.</p> <p>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.</p> <p>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:</p> <table style="width: 100%; border: none;"><tr><td style="width: 60%;">(a) Microorganisms (e.g. virus, bacteria, phytoplasma)</td><td style="width: 20%;">Yes []</td><td style="width: 20%;">No []</td></tr><tr><td>(b) Chemical treatment (e.g. growth retardant, pesticide)</td><td>Yes []</td><td>No []</td></tr><tr><td>(c) Tissue culture</td><td>Yes []</td><td>No []</td></tr><tr><td>(d) Other factors</td><td>Yes []</td><td>No []</td></tr></table> <p>Please provide details for where you have indicated "yes".</p> <p>.....</p>			(a) Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes []	No []	(b) Chemical treatment (e.g. growth retardant, pesticide)	Yes []	No []	(c) Tissue culture	Yes []	No []	(d) Other factors	Yes []	No []
(a) Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes []	No []												
(b) Chemical treatment (e.g. growth retardant, pesticide)	Yes []	No []												
(c) Tissue culture	Yes []	No []												
(d) Other factors	Yes []	No []												
<p>10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:</p> <table style="width: 100%; border: none;"><tr><td style="width: 30%;">Applicant's name</td><td colspan="2" style="border: 1px solid black; height: 20px;"></td></tr><tr><td>Signature</td><td style="border: 1px solid black; width: 30%;"></td><td style="border: 1px solid black; width: 30%;">Date</td></tr></table>			Applicant's name			Signature		Date						
Applicant's name														
Signature		Date												

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