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**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS**

GENEVA

**CUCUMBER, GHERKIN**  
 UPOV Code: CUCUM\_SAT  
*Cucumis sativus* L.

**GUIDELINES**

**FOR THE CONDUCT OF TESTS**

**FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

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	Gurke	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.

\* 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](http://www.upov.int)), for the latest information.]

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## 1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Cucumis 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 submitted in the form of seed for seed-propagated varieties, or in the form of plants for vegetatively propagated varieties.

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

1,500 seeds for seed-propagated varieties, or  
50 plants for vegetatively propagated varieties.

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.

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 on single plants should be made on 20 plants or parts taken from each of 20 plants and any other observations made on all plants in the test.

### 3.6 *Additional Tests*

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

## 4. Assessment of Distinctness, Uniformity and Stability

### 4.1 *Distinctness*

#### 4.1.1 General Recommendations

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

#### 4.1.2 Consistent Differences

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

#### 4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative

manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

## 4.2 *Uniformity*

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

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

4.2.3 For the assessment of uniformity of varieties other than cross-pollinated 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 40 plants, 2 off-types are allowed. 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:

- (a) Cotyledon: bitterness (characteristic 1)
- (b) Plant: sex expression (characteristic 13)
- (c) Ovary: color of vestiture (characteristic 15)
- (d) Parthenocarpy (characteristic 16)
- (e) Fruit: length (characteristic 17)
- (f) Fruit: ground color of skin at market stage (characteristic 25)
- (g) Resistance to *Cladosporium cucumerinum* (Ccu) (characteristic 44)
- (h) Resistance to *Cucumber mosaic virus* (CMV) (characteristic 45)

- (i) Resistance to Powdery mildew (*Podosphaera xanthii*) (Px) (characteristic 46)
- (j) Resistance to Corynespora blight and target leaf spot (*Corynespora cassiicola*) (Cca) (characteristic 48)
- (k) Resistance to *Cucumber vein yellowing virus* (CVYV) (characteristic 49)

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

## 6. Introduction to the Table of Characteristics

### 6.1 *Categories of Characteristics*

#### 6.1.1 Standard Test Guidelines Characteristics

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

#### 6.1.2 Asterisked Characteristics

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

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

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

### 6.3 *Types of Expression*

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

### 6.4 *Example Varieties*

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

## 6.5 Legend

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

MG, MS, VG, VS: See Chapter 3.3.2

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

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

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

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>1. VG</b> (*) (+)	<b>Cotyledon: bitterness</b>	<b>Cotylédon: amertume</b>	<b>Keimblatt: Bitterstoff</b>	<b>Cotiledón: amargor</b>		
<b>QL</b>	absent	absente	fehlend	ausente	Rocket GS, Sandra	1
	present	présente	vorhanden	presente	Farbio	9
<b>2. VG</b> (*)	<b>Plant: growth type</b>	<b>Plante: type de croissance</b>	<b>Pflanze: Wuchstyp</b>	<b>Planta: porte</b>		
<b>QL</b>	determinate	déterminée	begrenzt wachsend	determinado	Bush Crop, Shachal	1
	indeterminate	indéterminée	unbegrenzt wachsend	indeterminado	Corona, Levina	2
<b>3. MG</b> (+)	<b>Plant: total length of first 15 internodes</b>	<b>Plante: longueur totale des 15 premiers entrenœuds</b>	<b>Pflanze: Gesamtlänge der ersten 15 Internodien</b>	<b>Planta: longitud total de los primeros 15 entrenudos</b>		
<b>QN</b>	very short	très courte	sehr kurz	muy corta		1
	short	courte	kurz	corta	Kora, Maram, Naf	3
	medium	moyenne	mittel	media	Marketmore	5
	long	longue	lang	larga	Avir, Nimbus, Pepinex 69	7
	very long	très longue	sehr lang	muy larga	Cerrucho	9
<b>4. VG</b> (+)	<b>Leaf blade: attitude</b>	<b>Limbe: port</b>	<b>Blattspreite: Haltung</b>	<b>Limbo: porte</b>		
<b>QN</b>	(a) erect	dressé	aufrecht	erecto	Akito	1
	horizontal	horizontal	waagerecht	horizontal	Jazzzer	2
	drooping	retombant	hängend	colgante	Nabil	3
<b>5. VG/ MS</b> (+)	<b>Leaf blade: length</b>	<b>Limbe: longueur</b>	<b>Blattspreite: Länge</b>	<b>Limbo: longitud</b>		
<b>QN</b>	(a) short	court	kurz	corta	Adam	3
	medium	moyen	mittel	media	Briljant	5
	long	long	lang	larga	Corona	7



	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
<b>6.</b>	<b>VG/ MS</b>	<b>Leaf blade: ratio length of terminal lobe/length of blade</b>	<b>Limbe: rapport longueur du lobe terminal/ longueur du limbe</b>	<b>Blattspreite: Verhältnis Länge des Endlappens/ Länge der Spreite</b>	<b>Limbo: relación longitud del lóbulo terminal/longitud del limbo</b>		
(+)							
<b>QN</b>	(a)	very small	très petit	sehr klein	muy pequeña	Delikatess	1
		small	petit	klein	pequeña	Galileo	3
		medium	moyen	mittel	media	Corona	5
		large	grand	groß	grande	Melody	7
		very large	très grand	sehr groß	muy grande	Defense	9
<b>7.</b>	<b>VG</b>	<b>Leaf blade: shape of apex of terminal lobe</b>	<b>Limbe: forme de la pointe du lobe terminal</b>	<b>Blattspreite: Form der Spitze des Endlappens</b>	<b>Limbo: forma del ápice del lóbulo terminal</b>		
(+)							
<b>PQ</b>	(a)	acute	aiguë	spitz	aguda	Delikatess	1
		right-angled	à angle droit	rechteckig	en ángulo recto	Hana	2
		obtuse	obtuse	stumpf	obtusa	Melody	3
		rounded	arrondie	abgerundet	redondeada	Jizzer	4
<b>8.</b>	<b>VG</b>	<b>Leaf blade: intensity of green color</b>	<b>Limbe: intensité de la couleur verte</b>	<b>Blattspreite: Intensität der Grünfärbung</b>	<b>Limbo: intensidad del color verde</b>		
<b>QN</b>	(a)	light	claire	hell	clara	De Russie	3
		medium	moyenne	mittel	media	Rocket GS, Stereo	5
		dark	foncée	dunkel	oscura	Marketmore, Sandra, Tokyo Slicer	7
		very dark	très foncée	sehr dunkel	muy oscura	Akito	9
<b>9.</b>	<b>VG</b>	<b>Leaf blade: blistering</b>	<b>Limbe: cloûre</b>	<b>Blattspreite: Blasigkeit</b>	<b>Limbo: abullonado</b>		
<b>QN</b>	(a)	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Silor	1
		weak	faible	gering	débil	Pepinex 69, Rocket GS	3
		medium	moyenne	mittel	medio	Monir	5
		strong	forte	stark	fuerte	Tokyo Slicer	7
		very strong	très forte	sehr stark	muy fuerte		9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota	
<b>10.</b>	<b>VG</b>	<b>Leaf blade: undulation of margin</b>	<b>Limbe: ondulation du bord</b>	<b>Blattspreite: Wellung des Randes</b>	<b>Limbo: ondulación del borde</b>		
<b>QN</b>	<b>(a)</b>	absent or weak	nulle ou faible	fehlend oder gering	ausente o débil	Jazzer	1
		moderate	modérée	mittel	moderada		2
		strong	forte	stark	fuerte	Tokyo Slicer	3
<b>11.</b>	<b>VG</b>	<b>Leaf blade: dentation of margin</b>	<b>Limbe: denture du bord</b>	<b>Blattspreite: Zählung des Randes</b>	<b>Limbo: dentado del margen</b>		
<b>QN</b>	<b>(a)</b>	very weak	très faible	sehr gering	muy débil	Jazzer	1
		weak	faible	gering	débil	Hana, Silor	3
		medium	moyenne	mittel	medio	Susan	5
		strong	forte	stark	fuerte	Travito	7
		very strong	très forte	sehr stark	muy fuerte	Moneta	9
<b>12.</b>	<b>MG</b>	<b>Time of development of female flowers (80% of plants with at least one female flower)</b>	<b>Époque de développement des fleurs femelles (80% des plantes avec au moins une fleur femelle)</b>	<b>Zeitpunkt der Bildung weiblicher Blüten (80 % der Pflanzen mit mindestens einer weiblichen Blüte)</b>	<b>Época de desarrollo de flores femeninas (80% de plantas con una flor femenina como mínimo)</b>		
<b>QN</b>		early	précoce	früh	temprana	Avir	3
		medium	moyenne	mittel	media		5
		late	tardive	spät	tardía	Fin de Meaux, Riesenschäl	7
<b>13.</b>	<b>VG</b>	<b>Plant: sex expression</b>	<b>Plante: expression du sexe</b>	<b>Pflanze: Geschlechts- verteilung</b>	<b>Planta: expresión del sexo</b>		
<b>QL</b>	<b>(b)</b>	monoecious	monoïque	monözisch	monóica	Hokus	1
		subgynoecious	sous-monoïque	subgynözisch	subginóica	Toska 70	2
		gynoecious	gynoiïque	gynözisch	ginóica	Farbio, Sandra, Wilma	3
		hermaphrodytic	hermaphrodite	hermaphroditisch	hermafrodita	Sunsweet	4

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
<b>14. VG</b>	<b>Plant: number of female flowers per node</b>	<b>Plante: nombre de fleurs femelles par nœud</b>	<b>Pflanze: Anzahl weiblicher Blüten je Knoten</b>	<b>Planta: número de flores femeninas por nudo</b>		
(+)						
<b>QN</b>	<b>(b)</b>					
	predominantly one	essentiellement une	vorwiegend eine	predominantemente una	Dasher, Faraón	1
	predominantly one or two	essentiellement une ou deux	vorwiegend eine oder zwei	predominantemente una o dos	Brunex, Marumba	2
	predominantly two	essentiellement deux	vorwiegend zwei	predominantemente dos	Corona	3
	predominantly two or three	essentiellement deux ou trois	vorwiegend zwei oder drei	predominantemente dos o tres	Tempo	4
	predominantly three or four	essentiellement trois ou quatre	vorwiegend drei oder vier	predominantemente tres o cuatro	Tornac	5
	predominantly four or five	essentiellement quatre ou cinq	vorwiegend vier oder fünf	predominantemente cuatro o cinco	Melody	6
	predominantly more than five	essentiellement plus de cinq	vorwiegend mehr als fünf	predominantemente más de cinco	Olympos	7
<b>15. VG</b>	<b>Ovary: color of vestiture</b>	<b>Ovaire: couleur de l'ornementation</b>	<b>Fruchtknoten: Farbe des Besatzes</b>	<b>Ovario: color de la cobertura</b>		
(*)						
(+)						
<b>QL</b>	<b>(b)</b>					
	white	blanche	weiß	blanco	Jazzer	1
	black	noire	schwarz	negro	Vert petit de Paris	2
<b>16. VG</b>	<b>Parthenocarpy</b>	<b>Parthénocarpie</b>	<b>Parthenokarpie</b>	<b>Partenocarpia</b>		
(*)						
(+)						
<b>QL</b>	absent	absente	fehlend	ausente	Toska 70	1
	present	présente	vorhanden	presente	Farbio, Rocket GS, Sandra, Wilma	9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
<b>17. MS/ (*) VG</b>	<b>Fruit: length</b>	<b>Fruit: longueur</b>	<b>Frucht: Länge</b>	<b>Fruto: longitud</b>		
<b>QN</b>	(c) very short	très court	sehr kurz	muy corta	De Russie, Sunsweet	1
	short	court	kurz	corta		3
	medium	moyen	mittel	media	Gemini, Jazzer	5
	long	long	lang	larga	Corona	7
	very long	très long	sehr lang	muy larga		9
<b>18. MS/ (*) VG</b>	<b>Fruit: diameter</b>	<b>Fruit: diamètre</b>	<b>Frucht: Durchmesser</b>	<b>Fruto: diámetro</b>		
<b>QN</b>	(c) small	petit	klein	pequeño	Picobello, Wilma	3
	medium	moyen	mittel	medio	Corona, Diamant	5
	large	grand	groß	grande	Delikatess, Riesenschäl,	7
<b>19. MS/ (*) VG</b>	<b>Fruit: ratio length/diameter</b>	<b>Fruit: rapport longueur/diamètre</b>	<b>Frucht: Verhältnis Länge/Durchmesser</b>	<b>Fruto: relación longitud/diámetro</b>		
<b>QN</b>	(c) very small	très petit	sehr klein	muy pequeña	Sunsweet	1
	small	petit	klein	pequeña	Akord, Sonate	3
	medium	moyen	mittel	media	Jazzer, Picobello, Wilma	5
	large	grand	groß	grande	Corona	7
	very large	très grand	sehr groß	muy grande	Kyoto 3 Feet	9
<b>20. VG</b>	<b>Fruit: core diameter in relation to diameter of fruit</b>	<b>Fruit: diamètre du cœur par rapport au diamètre du fruit</b>	<b>Frucht: Kernhaus-durchmesser im Verhältnis zum Fruchtdurchmesser</b>	<b>Fruto: diámetro del corazón en relación con el diámetro del fruto</b>		
<b>QN</b>	(c) very small	très petit	sehr klein	muy pequeño		1
	small	petit	klein	pequeño	Riesenschäl, Telepathy	3
	medium	moyen	mittel	medio	Corona	5
	large	grand	groß	grande	Vert petit de Paris	7
	very large	très grand	sehr groß	muy grande	Sunsweet	9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
<b>21. VG</b>	<b>Fruit: shape in transverse section</b>	<b>Fruit: forme en section transversale</b>	<b>Frucht: Form im Querschnitt</b>	<b>Fruto: forma en sección transversal</b>		
(+)						
<b>QN</b>	(c) round	arrondie	rund	redonda	Telepathy , Susan	1
	round to angular	arrondie à anguleuse	rund bis winklig	entre redonda y angular	Dasher	2
	angular	anguleuse	winklig	angular	Anico, Gele Tros, Regal,	3
<b>22. VG</b>	<b>Fruit: shape of stem end</b>	<b>Fruit: forme de la base</b>	<b>Frucht: Form des Stielendes</b>	<b>Fruto: forma de la base</b>		
(*)						
(+)						
<b>PQ</b>	(c) necked	avec col	mit Hals	en forma de cuello	Sandra, Tasty Green	1
	acute	pointue	spitz	aguda	De Massy	2
	obtuse	obtuse	stumpf	obtusa	Maram, Score	3
<b>23. VG</b>	<b><u>Only necked varieties:</u> Fruit: length of neck</b>	<b><u>Seulement les variétés à col:</u> Fruit: longueur du col</b>	<b><u>Nur Sorten mit Hals:</u> Frucht: Länge des Halses</b>	<b><u>Sólo variedades con cuello:</u> Fruto: longitud del cuello</b>		
<b>QN</b>	(c) very short	très court	sehr kurz	muy corta		1
	short	court	kurz	corta	Saskia	3
	medium	moyen	mittel	media	Corona, Telepathy	5
	long	long	lang	larga	Kamaron	7
	very long	très long	sehr lang	muy larga	Tasty Green	9
<b>24. VG</b>	<b>Fruit: shape of calyx end</b>	<b>Fruit: forme du sommet</b>	<b>Frucht: Form des Kelchendes</b>	<b>Fruto: forma del extremo del cáliz</b>		
(+)						
<b>PQ</b>	(c) acute	pointu	spitz	aguda	Dardos	1
	obtuse	obtus	stumpf	obtusa	Reno	2
	rounded	arrondi	abgerundet	redondeada	Bellissima	3
	truncate	tronqué	gerade	truncada	Medusa	4

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
<b>25. VG</b> (*) (+)	<b>Fruit: ground color of skin at market stage</b>	<b>Fruit: couleur de fond de l'épiderme à maturité commerciale</b>	<b>Frucht: Grundfarbe der Epidermis zum Zeitpunkt der Marktreife</b>	<b>Fruto: color de fondo de la epidermis al estado de comercialización</b>		
<b>PQ</b>	white	blanche	weiß	blanco	Bonneuil	1
	yellow	jaune	gelb	amarillo	Gele Tros	2
	green	verte	grün	verde	Corona	3
<b>26. VG</b>	<b><u>Excluding white varieties:</u> Fruit: intensity of ground color of skin (as for 25)</b>	<b><u>À l'exclusion des variétés blanches:</u> Fruit: intensité de la couleur de fond de l'épiderme (comme pour 25)</b>	<b><u>Ohne weiße Sorten:</u> Frucht: Intensität der Grundfarbe der Epidermis (wie unter 25)</b>	<b><u>Excepto variedades de color blanco:</u> Fruto: intensidad del color de fondo de la epidermis (como para el carácter. 25)</b>		
<b>QN</b>	light	claire	hell	clara		3
	medium	moyenne	mittel	media		5
	dark	foncée	dunkel	oscura		7
<b>27. VG</b> (*) (+)	<b>Fruit: ribs</b>	<b>Fruit: cannelures</b>	<b>Frucht: Rippen</b>	<b>Fruto: acostillado</b>		
<b>QN</b>	(c) absent or weak	absentes ou faibles	fehlend oder gering	ausente o débil	Darius, Diana	1
	medium	moyennes	mittel	media	Sprint	2
	strong	fortes	stark	fuerte	Vert petit de Paris	3
<b>28. VG</b> (*) (+)	<b>Fruit: sutures</b>	<b>Fruit: sutures</b>	<b>Frucht: Rillen</b>	<b>Fruto: suturas</b>		
<b>QL</b>	(c) absent	absentes	fehlend	ausentes	Corona, Hana	1
	present	présentes	vorhanden	presentes	Nabil, Silor	9
<b>29. VG</b> (*) (+)	<b>Fruit: creasing</b>	<b>Fruit: plissement</b>	<b>Frucht: Faltung</b>	<b>Fruto: arrugamiento</b>		
<b>QL</b>	(c) absent	absent	fehlend	ausente	Jazzer	1
	present	présent	vorhanden	presente	Corona, Nabil	9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>30.</b>	<b>VG Fruit: degree of creasing</b>	<b>Fruit: degré de plissement</b>	<b>Frucht: Stärke der Faltung</b>	<b>Fruto: grado de arrugamiento</b>		
<b>QN</b>	(c) very weak	très faible	sehr gering	muy débil	Silor	1
	weak	faible	gering	débil	Nabil	3
	medium	moyen	mittel	medio	Corona, Galileo	5
	strong	fort	stark	fuerte	Grizzly	7
	very strong	très fort	sehr stark	muy fuerte	Suyo Long	9
<b>31.</b>	<b>VG Fruit: type of vestiture</b>	<b>Fruit: type d'ornementation</b>	<b>Frucht: Art des Besatzes</b>	<b>Fruto: tipo de cobertura</b>		
<b>(*)</b>						
<b>(+)</b>						
<b>QL</b>	(c) hairs only	poils seulement	nur Haare	sólo pelos	Silor	1
	hairs and prickles	poils et épines	Haare und Stacheln	pelos y espinas	De Bourbonne, De Massy	2
	prickles only	épines seulement	nur Stacheln	sólo espinas	Corona, Jazzer	3
<b>32.</b>	<b>VG Fruit: density of vestiture</b>	<b>Fruit: densité de l'ornementation</b>	<b>Frucht: Dichte des Besatzes</b>	<b>Fruto: densidad de la cobertura</b>		
<b>QN</b>	(c) very sparse	très lâche	sehr locker	muy baja	Vert petit de Paris	1
	sparse	lâche	locker	baja		3
	medium	moyenne	mittel	media	Tasty Green	5
	dense	dense	dicht	alta	Silor, Suyo Long	7
	very dense	très dense	sehr dicht	muy alta	Moneta, Parmel	9
<b>33.</b>	<b>VG <u>Only varieties with white ovary vestiture (char. 15):</u> Fruit: color of vestiture</b>	<b><u>Seulement les variétés à ornementation des ovaires blanche (car. 15):</u> Fruit: couleur de l'ornementation</b>	<b><u>Nur Sorten mit weißem Fruchtknotenbesatz (Merkmal 15):</u> Frucht: Farbe des Besatzes</b>	<b><u>Sólo variedades con color blanco de la cobertura del ovario (carácter 15):</u> Fruto: color de la cobertura</b>		
<b>(*)</b>						
<b>PQ</b>	(c) white	blanche	weiß	blanco	Jazzer	1
	light brown	brun clair	hellbraun	marrón claro	Akito	2
	dark brown	brun foncé	dunkelbraun	marrón oscuro	Satina	3

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
<b>34. VG</b>	<b>Fruit: warts</b>	<b>Fruit: verrues</b>	<b>Frucht: Warzen</b>	<b>Fruto: verrugas</b>		
(*)						
<b>QL</b>	(c) absent	absentes	fehlend	ausentes	Diana	1
	present	présentes	vorhanden	presentes	Chinese Slangen, Dumex, Regal	9
<b>35. VG</b>	<b>Fruit: size of warts</b>	<b>Fruit: taille des verrues</b>	<b>Frucht: Größe der Warzen</b>	<b>Fruto: tamaño de las verrugas</b>		
<b>QN</b>	(c) very small	très petites	sehr klein	muy pequeño	Parmel	1
	small	petites	klein	pequeño	Jazzer	3
	medium	moyennes	mittel	medio	Regal	5
	large	grandes	groß	grande	Chinese Slangen	7
	very large	très grandes	sehr groß	muy grande	Tasty Green	9
<b>36. VG</b>	<b>Fruit: length of stripes</b>	<b>Fruit: longueur des rayures</b>	<b>Frucht: Länge der Streifen</b>	<b>Fruto: longitud de las estriás</b>		
(+)						
<b>QN</b>	(c) absent or very short	absentes ou très courtes	fehlend oder sehr kurz	ausentes o muy corta		1
	short	courtes	kurz	corta	Astrea	3
	medium	moyennes	mittel	media	Breso	5
	long	longues	lang	larga	Pioneer, Tokyo Slicer	7
	very long	très longues	sehr lang	muy larga	Suyo Long	9
<b>37. VG</b>	<b>Fruit: dots</b>	<b>Fruit: mouchetures</b>	<b>Frucht: Punkte</b>	<b>Fruto: punteado</b>		
(*)						
<b>QL</b>	(c) absent	absentes	fehlend	ausentes	Sensation	1
	present	présentes	vorhanden	presentes	Delicatesse, Hanpaku-Fushinari, Sagami-Fanpaku, White Sun	9



	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota	
<b>38.</b>	<b>VG</b>	<b>Fruit: distribution of dots</b>	<b>Fruit: répartition des mouchetures</b>	<b>Frucht: Verteilung der Punkte</b>	<b>Fruto: distribución del punteado</b>		
(+)							
<b>PQ</b>	(c)	in bands only	par zones uniquement	nur in Banden	sólo en bandas	Vert petit de Paris	1
		predominantly in bands	essentiellement par zones	überwiegend in Banden	más concentrados en bandas	Levina	2
		evenly distributed	uniformément réparties	gleichmäßig verteilt	distribuidos de manera uniforme	Sagami-Fanpaku	3
<b>39.</b>	<b>VG</b>	<b>Fruit: length of fruit containing dots</b>	<b>Fruit: longueur du fruit présentant des mouchetures</b>	<b>Frucht: Länge der Frucht mit Punkten</b>	<b>Fruto: longitud de la porción del fruto que presenta punteado</b>		
<b>PQ</b>	(c)	distal $\frac{1}{3}$	$\frac{1}{3}$ de la longueur	distal $\frac{1}{3}$	distal $\frac{1}{3}$		1
		distal $\frac{1}{2}$	$\frac{1}{2}$ de la longueur	distal $\frac{1}{2}$	distal $\frac{1}{2}$		2
		distal $\frac{2}{3}$	$\frac{2}{3}$ de la longueur	distal $\frac{2}{3}$	distal $\frac{2}{3}$		3
		excluding area around peduncle	à l'exclusion de la zone autour du pédoncule	außer Zone um den Fruchstiel	excluida el área alrededor del pedúnculo		4
		whole length	toute la longueur	ganze Länge	longitud total		5
<b>40.</b>	<b>VG</b>	<b>Fruit: density of dots</b>	<b>Fruit: densité des mouchetures</b>	<b>Frucht: Dichte der Punkte</b>	<b>Fruto: densidad del punteado</b>		
(+)							
<b>QN</b>	(c)	very sparse	très lâche	sehr locker	muy baja		1
		sparse	lâche	locker	baja	Raider	3
		medium	moyenne	mittel	media	Le Généreux	5
		dense	dense	dicht	alta	Mesa, Paro	7
		very dense	très dense	sehr dicht	muy alta	Carnito, Hanpaku-Fushinari, White Sun	9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
<b>41.</b>	<b>VG Fruit: glaucosity</b>	<b>Fruit: glaucescence</b>	<b>Frucht: Bereifung</b>	<b>Fruto: glaucescencia</b>		
(+)						
<b>QN</b>	(c) absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Corona	1
	weak	faible	gering	débil	Crispina, Joen-bakdadaki	3
	medium	moyenne	mittel	media	Jazzer, Nakdong-chungjang	5
	strong	forte	stark	fuerte	Dongji-chungjang	7
	very strong	très forte	sehr stark	muy fuerte		9
<b>42.</b>	<b>VG/ MS Fruit: length of peduncle</b>	<b>Fruit: longueur du pédoncule</b>	<b>Frucht: Länge des Stieles</b>	<b>Fruto: longitud del pedúnculo</b>		
<b>QN</b>	(c) short	court	kurz	corta	Admirable	3
	medium	moyen	mittel	media	Femdan	5
	long	long	lang	larga	Pepinex 69	7
<b>43.</b>	<b>VG Fruit: ground color of skin at physiological ripeness</b>	<b>Fruit: couleur de fond de l'épiderme à maturité physiologique</b>	<b>Frucht: Grundfarbe der Epidermis zum Zeitpunkt der physiologischen Reife</b>	<b>Fruto: color de fondo de la epidermis en la madurez fisiológica</b>		
(+)						
<b>PQ</b>	white	blanche	weiß	blanco		1
	yellow	jaune	gelb	amarillo		2
	green	verte	grün	verde		3
	orange	orange	orange	anaranjado		4
	brown	brune	braun	marrón	Vert petit de Paris	5
<b>44.</b>	<b>Resistance to <i>Cladosporium cucumerinum</i> (Ccu)</b>	<b>Résistance à <i>Cladosporium cucumerinum</i> (Ccu)</b>	<b>Resistenz gegen <i>Cladosporium cucumerinum</i> (Ccu)</b>	<b>Resistencia a la <i>Cladosporium cucumerinum</i> (Ccu)</b>		
(+)						
<b>QL</b>	absent	absente	fehlend	ausente	Cherubino, Frontera, Pepinex 69	1
	present	présente	vorhanden	presente	Corona, Marketmore 76, Sheila	9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>45.</b>	<b>Resistance to <i>Cucumber mosaic virus</i> (CMV)</b>	<b>Résistance au virus de la mosaïque du concombre (CMV)</b>	<b>Resistenz gegen Gurkenmosaikvirus (CMV)</b>	<b>Resistencia al virus del mosaico del pepino (CMV)</b>		
(+)						
<b>QN</b>	susceptible	sensible	anfällig	susceptible	Bosporus, Corona, Ventura	1
	moderately resistant	moyennement résistant	mäßig resistent	intermedia	Capra, Gardon, Verdon	2
	highly resistant	hautement résistant	hochresistent	alta	Naf, Picolino	3
<b>46.</b>	<b>Resistance to Powdery mildew (<i>Podosphaera xanthii</i>) (Px)</b>	<b>Résistance à l'oïdium (<i>Podosphaera xanthii</i>) (Px)</b>	<b>Resistenz gegen Echten Mehltau (<i>Podosphaera xanthii</i>) (Px)</b>	<b>Resistencia al oidio blanco (<i>Podosphaera xanthii</i>) (Px)</b>		
(+)						
<b>QN</b>	susceptible	sensible	anfällig	susceptible	Corona, Ventura	1
	moderately resistant	moyennement résistant	mäßig resistent	intermedia	Flamingo	2
	highly resistant	hautement résistant	hochresistent	alta	Aramon, Bella, Cordoba	3
<b>47.</b>	<b>Resistance to Downy mildew (<i>Pseudoperonospora cubensis</i>) (Pcu)</b>	<b>Résistance au mildiou (<i>Pseudoperonospora cubensis</i>) (Pcu)</b>	<b>Resistenz gegen Falschen Mehltau (<i>Pseudoperonospora cubensis</i>) (Pcu)</b>	<b>Resistencia al mildiú del pepino (<i>Pseudoperonospora cubensis</i>) (Pcu)</b>		
(+)						
<b>QL</b>	absent	absente	fehlend	ausente	Pepinex 69, Wisconsin	1
	present	présente	vorhanden	presente	Poinsett 76	9
<b>48.</b>	<b>Resistance to Corynespora blight and target leaf spot (<i>Corynespora cassiicola</i>) (Cca)</b>	<b>Résistance à la pourriture corynespora et à la septoriose (<i>Corynespora cassiicola</i>) (Cca)</b>	<b>Resistenz gegen Corynespora- Blattfleckenkrank- heit (<i>Corynespora cassiicola</i>) (Cca)</b>	<b>Resistencia a la mancha foliar (<i>Corynespora cassiicola</i>) (Cca)</b>		
(+)						
<b>QL</b>	absent	absente	fehlend	ausente	Bodega, Pepinova	1
	present	présente	vorhanden	presente	Corona, Cumlaude	9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
<b>49.</b>	<b>Resistance to <i>Cucumber vein yellowing virus</i> (CVYV)</b>	<b>Résistance au virus du jaunissement des nervures du concombre (CVYV)</b>	<b>Resistenz gegen <i>Cucumber vein yellowing virus</i> (CVYV)</b>	<b>Resistencia al virus de las venas amarillas del pepino (CVYV)</b>		
(+)						
<b>QL</b>	absent	absente	fehlend	ausente	Corinda, Corona, Ventura	1
	present	présente	vorhanden	presente	Dina, Summerstar, Tornac	9
<b>50.</b>	<b>Resistance to <i>Zucchini yellow mosaic virus</i> (ZYMV)</b>	<b>Résistance au virus de la mosaïque jaune de la courgette (ZYMV)</b>	<b>Resistenz gegen <i>Zucchini gelb- mosaikvirus</i> (ZYMV)</b>	<b>Resistencia al virus del mosaico amarillo del calabacín (ZYMV)</b>		
(+)						
<b>QL</b>	absent	absente	fehlend	ausente	Corona, Hilton, Ventura	1
	present	présente	vorhanden	presente	Dina, Summerstar, Thunder	9
<b>51.</b>	<b>Resistance to <i>Cucurbit yellow stunting disorder virus</i> (CYSDV)</b>	<b>Résistance au <i>Cucurbit yellow stunting disorder virus</i> (CYSDV)</b>	<b>Resistenz gegen <i>Cucurbit yellow stunting disorder virus</i> (CYSDV)</b>	<b>Resistencia al <i>Cucurbit yellow stunting disorder virus</i> (CYSDV)</b>		
(+)						
<b>QL</b>	absent	absente	fehlend	ausente	Burgos, Castro, Corona	1
	present	présente	vorhanden	presente	Atalaya, Fortyca	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) Leaf blade: observations on the leaf blade should be made on a fully developed leaf blade, from the 7<sup>th</sup> node upwards
- (b) Flowers: all observations on the flowers should be made on flowers between the 5<sup>th</sup> and the 15<sup>th</sup> node.
- (c) Fruit: all observations on the fruit should, except when stated otherwise, be made on fruits around 14 days after flowering, between the 5<sup>th</sup> and 15<sup>th</sup> node.

### 8.2 *Explanations for individual characteristics*

#### Ad. 1: Cotyledon: bitterness

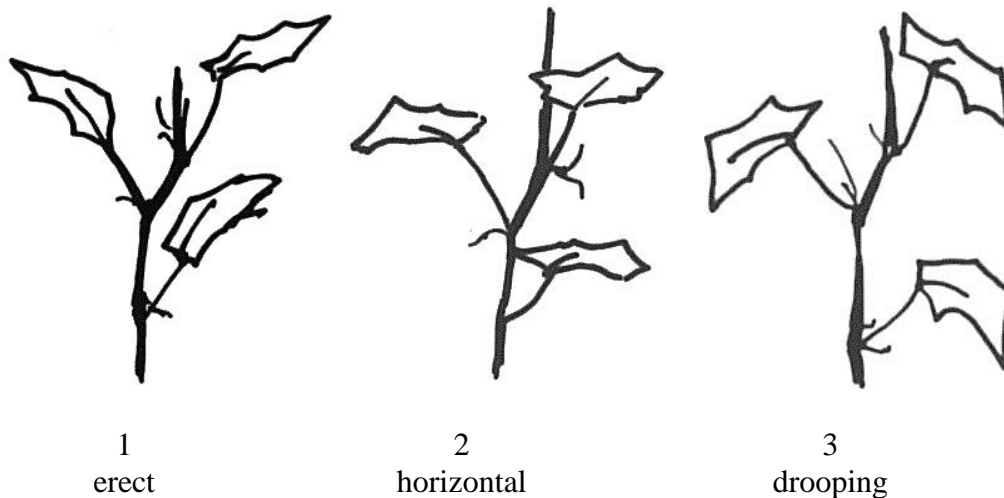
The bitterness of the cotyledon should be observed by tasting just before the development of the first true leaf.

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

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

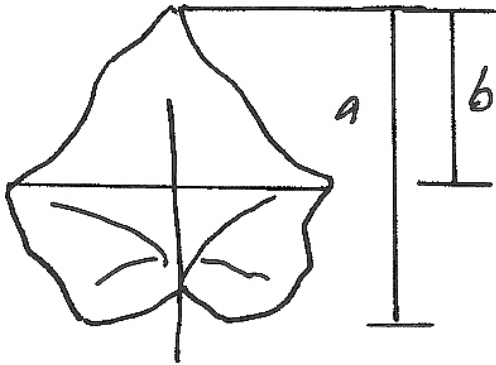
#### Ad. 4. Leaf blade: attitude

To be observed only for staked, vertically grown varieties.



Ad. 5: Leaf blade: length

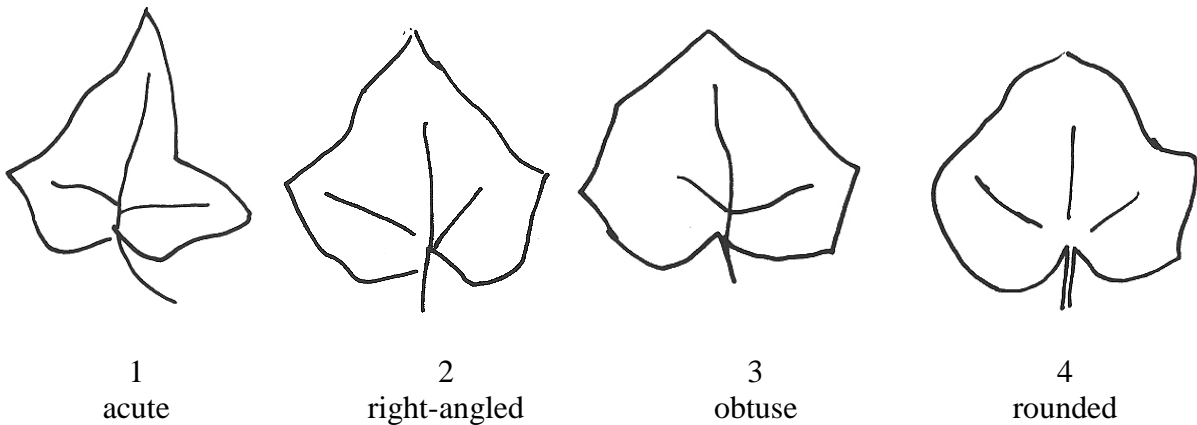
Ad. 6: Leaf blade: ratio length of terminal lobe/length of blade



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.

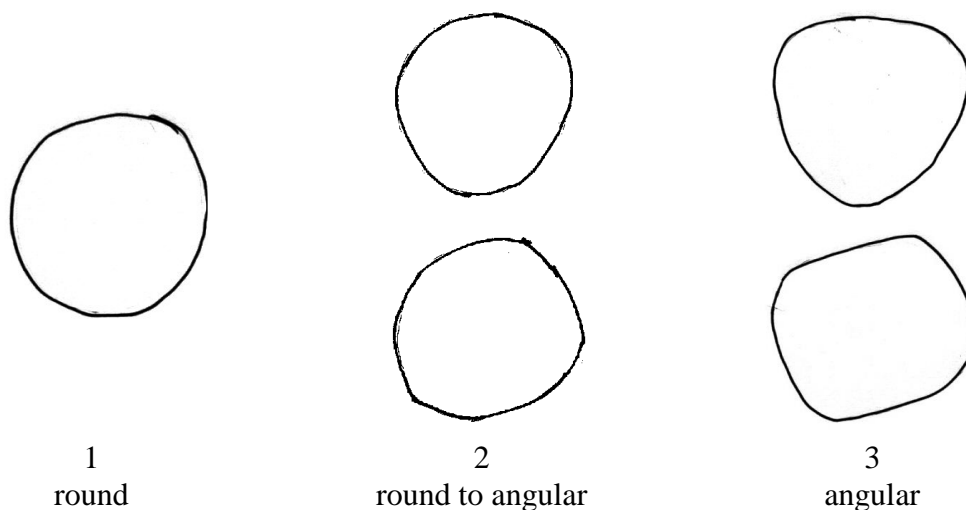
Ad. 15: Ovary: color of vestiture

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

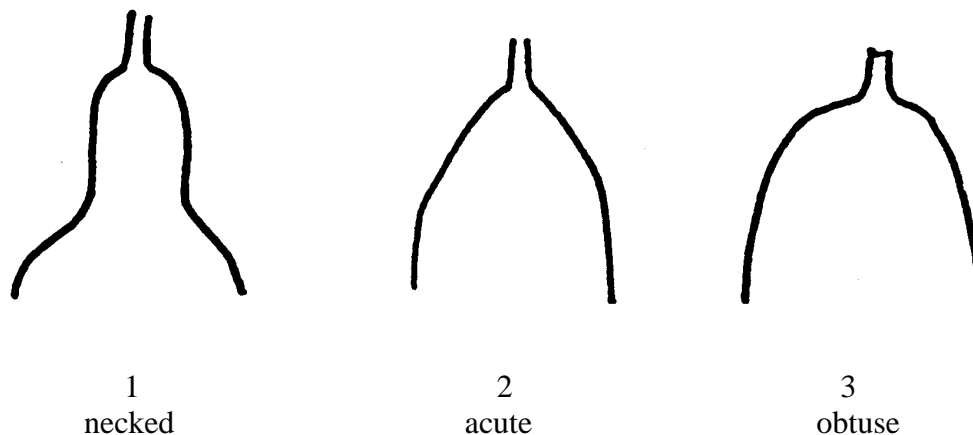
Ad. 16: Parthenocarpy

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.

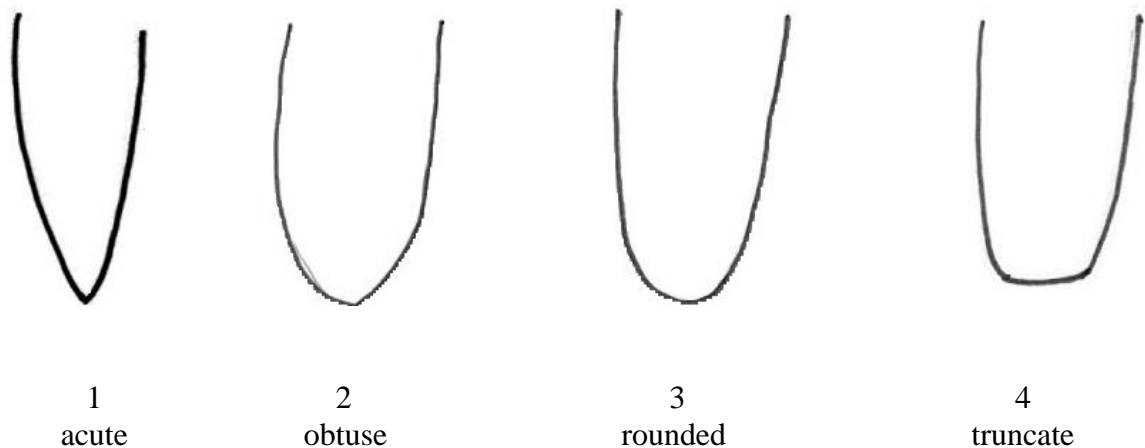
Ad. 21: Fruit: shape in transverse section



Ad. 22: Fruit: shape of stem end



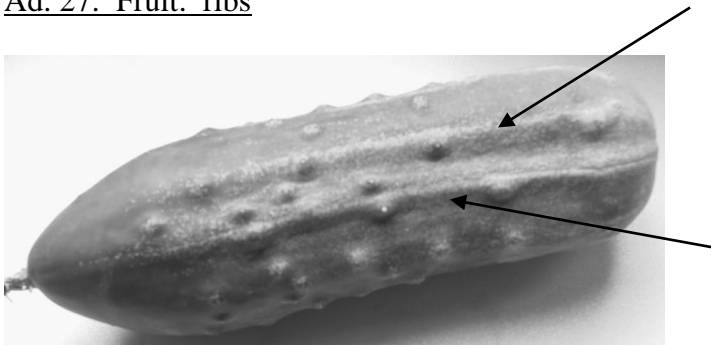
Ad. 24: Fruit: shape of calyx end



Ad. 25: Fruit: ground color 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

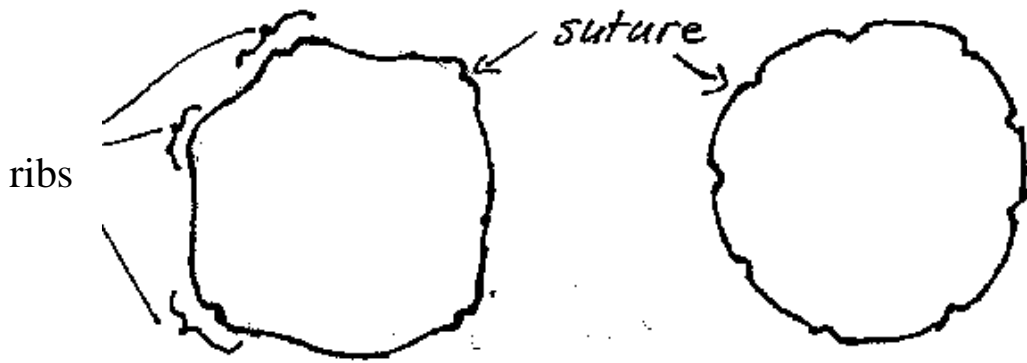


Ad. 28: Fruit: sutures

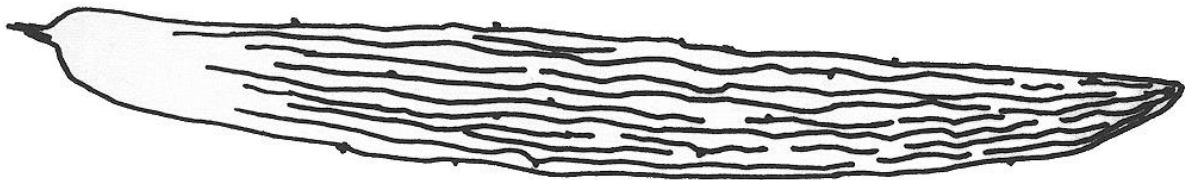


Sutures are slightly depressed in relation to the fruit surface.

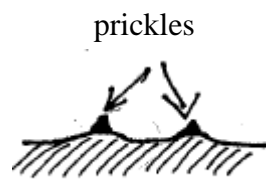
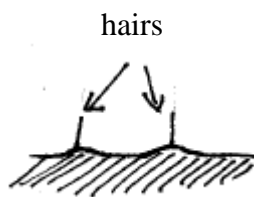




Ad. 29: Fruit: creasing



Ad. 31: Fruit: type of vestiture



Ad. 36: Fruit: length of stripes

Stripes are characterized by color 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 grayish waxy layer which can be removed by rubbing.

Ad. 43: Fruit: ground color 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 color of the skin, before the fruit starts to rot.

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

1.	Pathogen	<i>Cladosporium cucumerinum</i>
2.	Quarantine status	no
3.	Host species	<i>Cucumis sativus</i> (cucumber or gherkin)
4.	Source of inoculum	Naktuinbouw (NL)
5.	Isolate	natural; to be taken from any source of infection in the field
6.	Establishment isolate identity	expected reactions on resistant standard varieties
7.	Establishment pathogenicity	symptoms on susceptible standard varieties
8.	Multiplication inoculum	
8.1	Multiplication medium	agar medium e.g.: Potato Dextrose Agar (PDA)
8.2	Multiplication variety	-
8.3	Plant stage at inoculation	-
8.4	Inoculation medium	sterile demineralized water
8.5	Inoculation method	scrape the Petri dishes and spread over new plates
8.6	Harvest of inoculum	from 7-8 days old subcultures in the dark at 20°C
8.7	Check of harvested inoculum	-
8.8	Shelflife/viability inoculum	4 days at 4°C
9.	Format of the test	
9.1	Number of plants per genotype	at least 20
9.2	Number of replicates	1
9.3	Control varieties	Cherubino, Frontera, Pepinex 69 (susceptible) Corona, Marketmore 76, Sheila (resistant)
9.4	Test design	e.g. after every 8 samples 16 resistant and 16 susceptible plants
9.5	Test facility	-
9.6	Temperature	18 or 22/20°C day/night
9.7	Light	at least 16 hours
9.8	Season	-
9.9	Special measures	make sure soil is not dry at time of inoculation; plastic tent closed day and night during first three days after inoculation; thereafter slightly opened during daytime
10.	Inoculation	
10.1	Preparation inoculum	optional: add 0.01% Tween to spore suspension
10.2	Quantification inoculum	0.5*10 <sup>5</sup> -0.5*10 <sup>6</sup> spores/mL
10.3	Plant stage at inoculation	young cotyledon or first true leaf
10.4	Inoculation method	spraying spore suspension
10.5	First observation	6 days post inoculation
10.6	Second observation	8 days post inoculation
10.7	Final observations	8 days post inoculation
11.	Observations	
11.1	Method	visual, comparative

11.2	Observation scale	
	[1] absent: Frontera	brown lesions on cotyledons and plant death
	[9] present: Corona	without symptoms, or with green lesions, or browning of the leaves
11.3	Validation of test	on standards
11.4	Off-types	maximum 1 out of 6-35 plants
12.	Interpretation of data in terms of UPOV characteristic states	QL
13.	Critical control points	temperature and humidity

Ad. 45: Resistance to *Cucumber mosaic virus* (CMV)

1.	Pathogen	<i>Cucumber mosaic virus</i>
2.	Quarantine status	no
3.	Host species	<i>Cucumis sativus</i> (cucumber or gherkin)
4.	Source of inoculum	Naktuinbouw (NL), GEVES (FR)
5.	Isolate	e.g. UK 6
6.	Establishment isolate identity	resistant and susceptible controls or ELISA dipstick (Agdia)
7.	Establishment pathogenicity	susceptible control inoculation
8.	Multiplication inoculum	
8.1	Multiplication medium	on susceptible living plants
8.2	Multiplication variety	susceptible control
8.3	Plant stage at inoculation	cotyledons
8.4	Inoculation medium	ice-cold Phosphate Buffer Solution + carborundum + active charcoal
8.5	Inoculation method	rubbing
8.6	Harvest of inoculum	fresh symptomatic leaf
8.7	Check of harvested inoculum	mock inoculation with PBS + carborundum
8.8	Shelflife/viability inoculum	8 hours at 4°C or on ice
9.	Format of the test	
9.1	Number of plants per genotype	at least 30
9.2	Number of replicates	3
9.3	Control varieties	Bosporus, Corona, Ventura (susceptible) Capra, Gardon, Verdon (moderately resistant) Naf, Picolino (highly resistant)
9.4	Test design	e.g. replicates on different tablets in glasshouse
9.5	Test facility	glasshouse or climatic chamber
9.6	Temperature	18-25°C / 15-20°C day/night or 22°C constant
9.7	Light	at least 16 hours
9.8	Season	best results in Apr/May; Sep/Oct
9.9	Special measures	keep glasshouse free of aphids

10.	Inoculation	
10.1	Preparation inoculum	fresh leaf ground in cold PBS
10.2	Quantification inoculum	-
10.3	Plant stage at inoculation	Cotyledons, e.g.: 8 and 11 days after sowing
10.4	Inoculation method	rubbing, rinse carborundum off
10.5	First observation	7 days post inoculation
10.6	Second observation	14 days post inoculation
10.7	Final observations	21 days post inoculation, first and second leaf symptoms; only needed when second observation is not decisive
11.	Observations	
11.1	Method	visual estimate of mosaic severity on 1st leaf
11.2	Observation scale	
	[1] susceptible: 3, Corona, Ventura	mosaic; clear border between yellow and green
	[1] susceptible: 4, Bosporus	heavy mottle; confluent chlorosis
	[2] moderately resistant: 5, Gardon, Verdon	light mottle; chlorotic islands
	[2] moderately resistant: 6, Capra	some chlorotic stippling
	[3] highly resistant: 7, Naf, Picolino	no symptoms
11.3	Validation of test	standards should conform to description; describe if different variation within standard should not exceed 1 scale point
11.4	Off-types	2 scale points difference with majority type, maximum 1 out of 6-35 plants
12.	Interpretation of data in terms of UPOV characteristic states	QN [1] 3-4 susceptible, [2] 5-6 moderately resistant, [3] 7 highly resistant
13.	Critical control points	<p>1. Symptoms will develop from ring spot into mosaic (Ventura) or mottle (Gardon) or spots (Capra) Observation should focus on mature symptoms.</p> <p>2. Aphids may transmit CMV as well as other viruses that may contaminate the CMV strain. Test should be in aphid-free compartment.</p> <p>3. Growth inhibition is usually not strong enough to measure in young plants; severe growth inhibition is more likely caused by genetic aberration than by virus infection.</p> <p>4. Leaf curling is not mentioned as a CMV symptom because leaf curling is usually caused by unbalanced growing conditions.</p> <p>5. Replicates are intended to control the main source of variation. For CMV this is usually the amount of sunlight. Therefore, replicate tablets should represent the different levels of shading within one greenhouse compartment.</p>

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

1.	Pathogen	Powdery mildew <i>Podosphaera xanthii</i> ( <i>Sphaerotheca fuliginea</i> )
2.	Quarantine status	no
3.	Host species	<i>Cucumis sativus</i> (cucumber or gherkin)
4.	Source of inoculum	natural or Naktuinbouw (NL)
5.	Isolate	natural; to be taken from any source of infection in the field
6.	Establishment isolate identity	expected reactions on resistant standard varieties
7.	Establishment pathogenicity	symptoms on susceptible standard varieties
8.	Multiplication inoculum	
8.1	Multiplication medium	plants
8.2	Multiplication variety	susceptible variety (e.g. Ventura)
8.3	Plant stage at inoculation	first leaf appearing
8.4	Inoculation medium	demineral water
8.5	Inoculation method	spraying
8.6	Harvest of inoculum	wash spores off from sporulating leaves with demineralized water, option: add Tween20 at 5 µL (1 drop) /liter filter with cheese-cloth. 0,75 ml/pl
8.7	Check of harvested inoculum	count spores; target concentration is $1.10^5$ spores/ml
8.8	Shelflife/viability inoculum	15 minutes
9.	Format of the test	
9.1	Number of plants per genotype	at least 20
9.2	Number of replicates	1
9.3	Control varieties	Corona, Ventura (susceptible) Flamingo (moderately resistant) Aramon, Bella, Cordoba (highly resistant)
9.4	Test design	-
9.5	Test facility	-
9.6	Temperature	20°C constant
9.7	Light	16 hours
9.8	Season	best results in autumn (Sep/Nov)
9.9	Special measures	-
10.	Inoculation	
10.1	Preparation inoculum	as above at 8.6
10.2	Quantification inoculum	$1.10^5$ spores/ml
10.3	Plant stage at inoculation	cotyledon at 1 <sup>st</sup> inoculation, first leaf at final inoculation
10.4	Inoculation method	spraying, inoculation repeated on day 3, 5 and 6 after 1 <sup>st</sup>
10.5	First observation	10 days post inoculation
10.6	Second observation	-
10.7	Final observations	14 days post inoculation

11.	Observations	
11.1	Method	visual, comparative; mainly on first leaf
11.2	Observation scale	sporulation on cotyledons and hypocotyls; heavy sporulation on first leaf
	[1] susceptible: Corona, Ventura	sporulation on cotyledons and hypocotyls; heavy sporulation on first leaf
	[2] moderately resistant: Flamingo	no sporulation on hypocotyls, moderate sporulation on cotyledons and the first leaf;
	[3] highly resistant: Aramon, Bella, Cordoba	symptoms on cotyledons are disregarded sometimes very light sporulation on first leaf
11.3	Validation of test	on standard varieties
11.4	Off-types	no more than 1 out of 6-35 plants
12.	Interpretation of data in terms of UPOV characteristic states	QN [1] susceptible, [2] moderately resistant, [3] highly resistant
13.	Critical control points	Some types of moderate resistance may break down at higher temperatures.

Ad. 47: Resistance to Downy mildew (*Pseudoperonospora cubensis*) (Pcu)

1.	Pathogen	Downy mildew ( <i>Pseudoperonospora cubensis</i> )
2.	Quarantine status	no
3.	Host species	<i>Cucumis sativus</i> (cucumber or gherkin)
4.	Source of inoculum	natural
5.	Isolate	natural; to be taken from any source of infection in the field
6.	Establishment isolate identity	expected reactions on resistant standard varieties Pepinex 69, Wisconsin (absent) Poinsett 76 (present)
7.	Establishment pathogenicity	symptoms on susceptible standard varieties
8.	Multiplication inoculum	
8.1	Multiplication medium	living plants
8.2	Multiplication variety	susceptible variety
8.3	Plant stage at inoculation	two leaves
8.4	Inoculation medium	cold distilled water
8.5	Inoculation method	spraying
8.6	Harvest of inoculum	by washing a sporulating leaf
8.7	Check of harvested inoculum	by counting the spores
8.8	Shelflife/viability inoculum	-
9.	Format of the test	
9.1	Number of plants per genotype	at least 20
9.2	Number of replicates	1
9.3	Control varieties	Pepinex 69, Wisconsin (absent) Poinsett 76 (present)

9.4	Test design	-
9.5	Test facility	-
9.6	Temperature	22/20°C day/night
9.7	Light	at least 16 hours
9.8	Season	-
9.9	Special measures	Keep 100% humidity for 24 hours. A plastic cover is placed over the plants. After 24 hours, the plastic cover is slightly opened during daytime.
10.	Inoculation	
10.1	Preparation inoculum	by washing sporulating leaves
10.2	Quantification inoculum	counting spores 10 <sup>3</sup> spores per ml
10.3	Plant stage at inoculation	first two leaves fully developed
10.4	Inoculation method	by spraying spore suspension on leaves
10.5	First observation	7 days post inoculation
10.6	Second observation	-
10.7	Final observations	10 days post inoculation
11.	Observations	
11.1	Method	visual, comparative
11.2	Observation scale	
	[1] absent: Pepinex 69, Wisconsin	large lesions with abundant sporulation, leaf tissue becoming necrotic within 5 days
	[9] present: Poinsett76	small circular lesions, necrotic in the center, sporulation visible macroscopically no highly resistant standard is available
11.3	Validation of test	-
11.4	Off-types	-
12.	Interpretation of data in terms of UPOV characteristic states	QL [1] absent, [9] present
13.	Critical control points	

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

1.	Pathogen	<i>Corynespora cassicola</i> (Target leaf spot)
2.	Quarantine status	no
3.	Host species	<i>Cucumis sativus</i> (cucumber or gherkin)
4.	Source of inoculum	Naktuinbouw (NL)
5.	Isolate	all sources of inoculums are equal
6.	Establishment isolate identity	expected reactions on resistant standard varieties
7.	Establishment pathogenicity	symptoms on susceptible standard varieties
8.	Multiplication inoculum	
8.1	Multiplication medium	PDA at 20°C in darkness
8.2	Multiplication variety	-
8.3	Plant stage at inoculation	-
8.4	Inoculation medium	demineralized water



8.5	Inoculation method	scraping the Petri dishes and spread over new plates
8.6	Harvest of inoculum	from 12-14 days old subcultures
8.7	Check of harvested inoculum	-
8.8	Shelflife/viability inoculum	max. 4 days at 4°C
9.	Format of the test	
9.1	Number of plants per genotype	at least 20
9.2	Number of replicates	1
9.3	Control varieties	Bodega, Pepinova (absent) Corona, Cumlaude (present)
9.4	Test design	-
9.5	Test facility	-
9.6	Temperature	25/15°C day/night or 23°C day/night in climatic chamber
9.7	Light	at least 16 hours
9.8	Season	best results obtained in February-April due to temperature
9.9	Special measures	make sure soil is not dry at time of inoculation; plastic tent closed day and night 3 days post inoculation, closed only in night >3 days post inoculation
10.	Inoculation	
10.1	Preparation inoculum	filter through cheesecloth; add 0.01% Tween to spore suspension
10.2	Quantification inoculum	0,5x10 <sup>5</sup> spores/ml
10.3	Plant stage at inoculation	diameter first true leaf around 3 cm transplant on day 7, then inoculate on day 12
10.4	Inoculation method	spraying spore suspension
10.5	First observation	8 days post inoculation
10.6	Second observation	-
10.7	Final observations	8-11 days post inoculation
11.	Observations	
11.1	Method	visual; comparative; mainly on cotyledon and first leaf
11.2	Observation scale	
	[1] highly susceptible: 1, Bodega	cotyledons dead, first leaves dead, growth retardation
	[1] susceptible: 2, Pepinova	cotyledons dead or covered with lesions, first leaves with lesions, growth retardation
	[9] resistant: 3, Cumlaude	cotyledons with a few lesions, first leaf with no or sometimes a few lesions
	[9] highly resistant: 4, Corona	cotyledons without lesions; first leaf without lesions
11.3	Validation of test	standards should conform to description; describe if different
11.4	Off-types	maximum 1 out of 6-35 plants
12.	Interpretation of data in terms of UPOV characteristic states	QL [1] 1-2 absent, [9] 3-4 present
13.	Critical control points	-

Ad. 49: Resistance to *Cucumber vein yellowing virus* (CVYV)

1.	Pathogen	<i>Cucumber vein yellowing virus</i>
2.	Quarantine status	no
3.	Host species	<i>Cucumis sativus</i> (cucumber or gherkin)
4.	Source of inoculum	Naktuinbouw (NL)
5.	Isolate	e.g. KB18
6.	Establishment isolate identity	resistant and susceptible controls
7.	Establishment pathogenicity	susceptible control inoculation
8.	Multiplication inoculum	
8.1	Multiplication medium	leaf
8.2	Multiplication variety	susceptible variety (e.g. Corinda)
8.3	Plant stage at inoculation	cotyledons / appearance of first leaf
8.4	Inoculation medium	leaf in ice-cold PBS + carborundum
8.5	Inoculation method	rubbing
8.6	Harvest of inoculum	freeze-dried leaf
8.7	Check of harvested inoculum	-
8.8	Shelflife/viability inoculum	8 hours at 4°C or on ice
9.	Format of the test	
9.1	Number of plants per genotype	at least 30
9.2	Number of replicates	1
9.3	Control varieties	Corinda, Corona, Ventura (susceptible) Dina, Summerstar, Tornac (resistant)
9.4	Test design	-
9.5	Test facility	greenhouse
9.6	Temperature	16-30°C
9.7	Light	at least 16 hours
9.8	Season	best results in Apr/May; Sep/Oct
9.9	Special measures	12.000 lux suggested; keep glasshouse free of aphids
10.	Inoculation	
10.1	Preparation inoculum	fresh leaf ground in 0.03 M phosphate buffer + carborundum + active coal
10.2	Quantification inoculum	-
10.3	Plant stage at inoculation	cotyledons
10.4	Inoculation method	rubbing, option: rinse carborundum off to prevent leaf damage
10.5	First observation	7 days post inoculation; cotyledon symptoms
10.6	Second observation	14 days post inoculation; first leaf symptoms
10.7	Final observations	21 days post inoculation, first and second leaf symptoms
11.	Observations	
11.1	Method	visual; comparative; mainly on first leaf

11.2	Observation scale	
	[1] susceptible: 3, Corinda, Corona	mosaic; clear border between yellow and green
	[1] susceptible: 4, Ventura	heavy mottle; confluent chlorosis
	[9] resistant: 5, Dina	light mottle; chlorotic islands
	[9] resistant: 6, Summerstar	some chlorotic stippling
	[9] resistant: 7, Tornac	no symptoms
11.3	Validation of test	Standards should conform to description; describe if different. Variation within standard should not exceed 1 scale point
11.4	Off-types	maximum 1 out of 6-35 plants
12.	Interpretation of data in terms of UPOV characteristic states	QL [1] 3-4 absent, [9] 5-7 present
13.	Critical control points	Resistant varieties may have a slight discoloration of the veins of older leaves.

Ad. 50: Resistance to *Zucchini yellow mosaic virus* (ZYMV)

1.	Pathogen	<i>Zucchini yellow mosaic virus</i>
2.	Quarantine status	no
3.	Host species	<i>Cucumis sativus</i> (cucumber or gherkin)
4.	Source of inoculum	Naktuinbouw (NL)
5.	Isolate	e.g. CU61
6.	Establishment isolate identity	resistant and susceptible controls;
7.	Establishment pathogenicity	susceptible control inoculation
8.	Multiplication inoculum	
8.1	Multiplication medium	leaf
8.2	Multiplication variety	susceptible control
8.3	Plant stage at inoculation	cotyledons / appearance of first leaf
8.4	Inoculation medium	ice-cold PBS + carborundum
8.5	Inoculation method	rubbing
8.6	Harvest of inoculum	fresh or dried leaf
8.7	Check of harvested inoculum	
8.8	Shelflife/viability inoculum	8 hours at 4°C or on ice
9.	Format of the test	
9.1	Number of plants per genotype	at least 30
9.2	Number of replicates	1
9.3	Control varieties	Corona, Hilton, Ventura (susceptible) Dina, Summerstar, Thunder (resistant)
9.4	Test design	-
9.5	Test facility	greenhouse or climatic chamber

9.6	Temperature	18-25°C /15-25°C day/night
9.7	Light	at least 16 hours
9.8	Season	best results in Apr/May; Sep/Oct
9.9	Special measures	12.000 lux suggested; keep glasshouse free of aphids
10.	Inoculation	
10.1	Preparation inoculum	fresh leaf ground in cold PBS
10.2	Quantification inoculum	-
10.3	Plant stage at inoculation	cotyledons / appearance of first leaf -(e.g. 8 days; repeat 3 days later)
10.4	Inoculation method	rubbing, rinse carborundum off
10.5	First observation	7 - 14 days post inoculation; cotyledon symptoms
10.6	Second observation	14 - 21 days post inoculation; first leaf symptoms
10.7	Final observations	21 days post inoculation, first and second leaf symptoms
11.	Observations	
11.1	Method	visual; comparative, mainly on first leaf
11.2	Observation scale	
	[1] absent: 4, Corona, Ventura	mosaic; leaf deformation
	[1] absent: 5, Hilton	mosaic; weak leaf deformation
	[9] present: 6, Thunder	weak mottle
	[9] present: 7, Dina, Summerstar	vein necrosis
11.3	Validation of test	Standards should conform to description; describe if different. Variation within standard should not exceed 1 scale point
11.4	Off-types	2 scale points difference with most present type, maximum 1 out of 30 plants
12.	Interpretation of data in terms of UPOV characteristic states	QL [1] 4-5 absent, [9] 6-7 present
13.	Critical control points	Resistant varieties may have a slight discoloration of the veins of older leaves. Susceptible varieties have systemic mosaic symptoms.

Ad. 51: Resistance to *Cucurbit yellow stunting disorder virus* (CYSDV)

1.	Pathogen	<i>Cucurbit yellow stunting disorder virus</i>
2.	Quarantine status	yes
3.	Host species	<i>Cucumber sativus</i> , <i>Cucumis melo</i> , <i>Cucurbita pepo</i> , <i>Citrullus lanatus</i>
4.	Source of inoculum	CSIC-La Mayora (Spain)
5.	Isolate	CYSDV La Mayora
6.	Establishment isolate identity	-
7.	Establishment pathogenicity	-
8.	Multiplication inoculum	

8.1	Multiplication medium	-
8.2	Multiplication variety	-
8.3	Plant stage at inoculation	-
8.4	Inoculation medium	-
8.5	Inoculation method	-
8.6	Harvest of inoculum	-
8.7	Check of harvested inoculum	-
8.8	Shelflife/viability inoculum	-
9.	Format of the test	
9.1	Number of plants per genotype	20
9.2	Number of replicates	2
9.3	Control varieties	
	Susceptible	( <i>Cucumis sativus</i> ) Burgos, Castro, Corona
	Resistant	( <i>Cucumis sativus</i> ) Atalaya, Fortyca
9.4	Test design	-
9.5	Test facility	Greenhouse/plastic tunnel/climatic chamber
9.6	Temperature	-
9.7	Light	-
9.8	Season	-
9.9	Special measures	prevent spread of white-flies. Plants should be covered with a white-fly-proof net in the greenhouse
10.	Inoculation	
10.1	Preparation inoculum	-
10.2	Quantification inoculum	-
10.3	Plant stage at inoculation	2-4 weeks
10.4	Inoculation method	vector ( <i>Bemisia</i> white-flies carrying CYSDV)
10.5	First observation	-
10.6	Second observation	-
10.7	Final observations	1-2 months after inoculation
11.	Observations	
11.1	Method	visual
11.2	Observation scale	symptoms: leaf yellowing
11.3	Validation of test	evaluation of variety resistance should be calibrated with results of resistant and susceptible controls
11.4	Off-types	-
12.	Interpretation of data in terms of UPOV characteristic states	
	absent	[1] severe symptoms
	present	[9] no or mild symptoms

13.	Critical control points	In the not recommended case of natural infection, the source of inoculum is not controlled. Then, the identity of the virus should be confirmed by PCR or hybridization, because the symptoms may be similar to those caused by other virus.
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## 9. Literature

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10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
<b>TECHNICAL QUESTIONNAIRE</b> to be completed in connection with an application for plant breeders' rights		
1. Subject of the Technical Questionnaire		
1.1 Botanical name	<input type="text" value="Cucumis sativus L."/>	
1.2 Common name	<input type="text" value="Cucumber, Gherkin"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	



TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#4.	Information on the breeding scheme and propagation of the variety	
4.1	Breeding scheme	
	Variety resulting from:	
4.1.1	Crossing	
	(a) controlled cross (please state parent varieties)	[ ]
	(b) partially known cross (please state known parent variety(ies))	[ ]
	(c) unknown cross	[ ]
4.1.2	Discovery and development (please state where and when discovered and how developed)	[ ]
4.1.3	Other (please provide details)	[ ]
4.2	Method of propagating the variety	
4.2.1	Seed-propagated varieties (including inbred lines)	
	(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) <i>in vitro</i> propagation	[ ]
	(c) other (state method)	[ ]
4.2.3	Other (please provide details)	[ ]

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

Characteristics	Example Varieties	Note
<b>5.1 Cotyledon: bitterness</b> (1)		
absent	Rocket GS, Sandra	1 [ ]
present	Farbio	9 [ ]
<b>5.2 Plant: sex expression</b> (13)		
monoecious	Hokus	1 [ ]
subgynoecious	Toska 70	2 [ ]
gynoecious	Farbio, Sandra, Wilma	3 [ ]
hermaphroditic	Sunsweet	4 [ ]
<b>5.3 Ovary: color of vestiture</b> (15)		
white	Jazzer	1 [ ]
black	Vert petit de Paris	2 [ ]
<b>5.4 Parthenocarpy</b> (16)		
absent	Toska 70	1 [ ]
present	Farbio, Rocket GS, Sandra, Wilma	9 [ ]
<b>5.5 Fruit: length</b> (17)		
very short	De Russie, Sunsweet	1 [ ]
short		3 [ ]
medium	Gemini, Jazzer	5 [ ]
long	Corona	7 [ ]
very long		9 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
Characteristics	Example Varieties	Note
<b>5.6 Fruit: shape of stem end (22)</b>		
necked	Sandra, Tasty Green	1 [ ]
acute	De Massy	2 [ ]
obtuse	Maram, Score	3 [ ]
<b>5.7 Fruit: ground color of skin at market stage (25)</b>		
white	Bonneuil	1 [ ]
yellow	Gele Tros	2 [ ]
green	Corona	3 [ ]
<b>5.8 Fruit: type of vestiture (31)</b>		
hairs only	Silor	1 [ ]
hairs and prickles	De Bourbonne, De Massy	2 [ ]
prickles only	Corona, Jazzer	3 [ ]
<b>5.9 Resistance to <i>Cladosporium cucumerinum</i> (Ccu) (44)</b>		
absent	Cherubino, Frontera, Pepinex 69	1 [ ]
present	Corona, Marketmore 76, Sheila	9 [ ]
not tested		[ ]
<b>5.10 Resistance to <i>Cucumber mosaic virus</i> (CMV) (45)</b>		
susceptible	Bosporus, Corona, Ventura	1 [ ]
moderately resistant	Capra, Gardon, Verdon	2 [ ]
highly resistant	Naf, Picolino	3 [ ]
not tested		[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
Characteristics	Example Varieties	Note
<b>5.11 Resistance to Powdery mildew (<i>Podosphaera xanthii</i>) (Px)</b>		
<b>(46)</b>		
susceptible	Corona, Ventura	1 [ ]
moderately resistant	Flamingo	2 [ ]
highly resistant	Aramon, Bella, Cordoba	3 [ ]
not tested		[ ]
<b>5.12 Resistance to <i>Corynespora</i> blight and target leaf pot</b>		
<b>(48)</b>		
absent	Bodega, Pepinova	1 [ ]
present	Corona, Cumlaude	9 [ ]
not tested		[ ]
<b>5.13 Resistance to <i>Cucumber vein yellowing virus</i> (CVYV)</b>		
<b>(49)</b>		
absent	Corinda, Corona, Ventura	1 [ ]
present	Dina, Summerstar, Tornac	9 [ ]
not tested		[ ]

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6. Similar varieties and differences from these varieties

*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.*

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety
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<i>Example</i>	<i>Cotyledon: bitterness</i>	<i>absent</i>	<i>present</i>
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Comments:



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7.3.4 Fruit type

- (a) Gherkin [ ]
- (b) Cucumber
- (i) Beth Alpha [ ]
  - (ii) Dutch type [ ]
  - (iii) American Slicer [ ]
  - (iv) Asian [ ]
  - (v) other [ ]
- (c) other [ ]  
(please provide details)

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

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9. Information on plant material to be examined or submitted for examination.

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, pesticide) | Yes [ ] | No [ ] |
| (c) Tissue culture  | Yes [ ] | No [ ] |
| (d) Other factors   | Yes [ ] | No [ ] |

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

.....

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

Applicant's name	<input type="text"/>		
Signature	<input type="text"/>	Date	<input type="text"/>

[End of document]