E

TG/76/8 Rev. 2
ORIGINAL: English
DATE: 2006-04-05 + 2015-03-25 + 2018-09-20

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

SWEET PEPPER, HOT PEPPER, PAPRIKA, CHILI

UPOV Code: CAPSI_ANN

Capsicum annuum L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Capsicum annuum L.	Sweet Pepper, Hot Pepper, Paprika, Chili	Piment, Poivron	Paprika	Aji, Chile, Pimiento

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), for the latest information.]

TABLE OF CONTENTS PAGE

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Capsicum annuum* L.

2. Material Required

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

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

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

2,500 seeds.

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

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

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

3. Method of Examination

3.1 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

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 20 plants which should be divided between 2 replicates.

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

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, all observations should be made 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 For the assessment of uniformity of cross-pollinated varieties, a population standard of 2% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 20 plants, 2 off-types are allowed.

4.2.3 For the assessment of uniformity of hybrids, 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 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) Seedling: anthocyanin coloration of hypocotyl (characteristic 1)
(b) Plant: shortened internode (in upper part) (characteristic 4)
(c) Fruit: color (before maturity) (characteristic 21)
(d) Fruit: shape in longitudinal section (characteristic 28)
(e) Fruit: color (at maturity) (characteristic 33)
(f) Fruit: capsaicin in placenta (characteristic 45)
(g) Resistance to Tobamovirus - *Tobacco mosaic virus* Pathotype 0 (TMV: 0) (characteristic 48.1)
(h) Resistance to Tobamovirus - *Pepper mild mottle virus* Pathotype 1.2 (PMMoV: 1.2) (characteristic 48.2)

(i) Resistance to Tobamovirus - *Pepper mild mottle virus* Pathotype 1.2.3 (PMMoV: 1.2.3) (characteristic 48.3)
(j) Resistance to *Potato Y virus* Pathotype 0 (PVY: 0) (characteristic 49.1)
(k) Resistance to *Tomato spotted wilt virus* Pathotype 0 (TSWV: 0) (characteristic 52)

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

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

6.2 States of Expression and Corresponding Notes

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

6.3 Types of Expression

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

6.4 Example Varieties

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

6.5 Legend

(*) Asterisked characteristic – see 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: See Chapter 3.3.2

(a) and (b) 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
1. (*)	**VG**	**Seedling: anthocyanin coloration of hypocotyl**	**Plantule: pigmentation anthocyanique de l'hypocotyle**	**Keimpflanze: Anthocyanfärbung des Hypokotyls**	**Plántula: pigmentación antociánica del hipocotilo**		
QL		absent	absente	fehlend	ausente	Albaregia, Albena	1
		present	présente	vorhanden	presente	Lamuyo	9
2.	**VG**	**Plant: habit**	**Plante: port**	**Pflanze: Wuchsform**	**Planta: porte**		
QN		upright	érigé	aufrecht	erecto	De Cayenne, Doux très long des Landes, Piquant d'Algérie	1
		semi-upright	demi-érigé	halbaufrecht	semierecto	Clovis, Sonar	2
		prostrate	étalé	liegend	postrado	Delphin, Trophy	3
3.	**MS**	**Plant: length of stem**	**Plante: longueur de la tige**	**Pflanze: Länge des Stengels**	**Planta: longitud del tallo**		
(+)							
QN		short	courte	kurz	corta	Delphin, Trophy	3
		medium	moyenne	mittel	media	Belsir, Lamuyo	5
		long	longue	lang	larga	Lipari, Marconi, Rouge long ordinaire	7
4. (*) (+)	**VG**	**Plant: shortened internode (in upper part)**	**Plante: entre-nœud raccourci (à la partie supérieure)**	**Pflanze: verkürztes Internodium (im oberen Teil)**	**Planta: entrenudo acortado (en la parte superior)**		
QL		absent	absent	fehlend	ausente	California wonder, De Cayenne	1
		present	présent	vorhanden	presente	Fehér, Kalocsai 601, Kalocsai 702	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5. MS (+)	**Varieties with shortened internodes only: Plant: number of internodes between the first flower and shortened internodes**	**Variétés à entre-nœuds raccourcis seulement: Plante: nombre d'entre-nœuds entre la première fleur et les entre-nœuds raccourcis**	**Nur Sorten mit verkürzten Internodien: Pflanze: Anzahl Internodien zwischen der ersten Blüte und den verkürzten Internodien**	**Variedades con entrenudos acortados únicamente: Planta: número de entrenudos entre la primera flor y los entrenudos acortados**		
PQ	none	aucun	keine	ninguno	Kalocsai 601	1
	one to three	un à trois	eins bis drei	uno a tres	Fehér	2
	more than three	plus de trois	mehr als drei	más de tres	Kalocsai 702	3
6. MS	**Varieties without shortened internodes only: Plant: length of internode (on primary side shoots)**	**Variétés sans entre-nœuds raccourcis seulement: Plante: longueur de l'entre-nœud (sur ramifications primaires)**	**Nur Sorten ohne verkürzte Internodien: Pflanze: Länge des Internodiums (an Verzweigungen erster Ordnung)**	**Variedades sin entrenudos acortados únicamente: Planta: longitud del entrenudo (en los brotes laterales principales)**		
QN	very short	très court	sehr kurz	muy corta	Albaregia	1
	short	court	kurz	corta	Bandero, Blondy, Danubia, Tenor	3
	medium	moyen	mittel	media	Dolmi, Florian, Órias	5
	long	long	lang	larga	Corno di toro rosso	7
	very long	très long	sehr lang	muy larga	Fenice, Kalocsai M, Sienor	9
7. VG	**Plant: anthocyanin coloration of nodes**	**Plante: pigmentation anthocyanique des nœuds**	**Pflanze: Anthocyanfärbung der Knoten**	**Planta: pigmentación antociánica los nudos**		
QL	absent	absent	fehlend	ausente	Albaregia	1
	present	présent	vorhanden	presente	California wonder	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
8.	**VG**	**Stem: intensity of anthocyanin coloration of nodes**	**Tige: intensité de la pigmentation anthocyanique des nœuds**	**Stengel: Intensität der Anthocyanfärbung der Knoten**	**Tallo: intensidad de la pigmentación antociánica de los nudos**		
QN		very weak	très faible	sehr gering	muy débil		1
		weak	faible	gering	débil	California wonder, Clio, Doux d'Espagne, Doux très long des Landes, Golden calwonder	3
		medium	moyenne	mittel	media	Clovis, Lamuyo, Sonar	5
		strong	forte	stark	fuerte	Piquant d'Algérie, Zarai	7
		very strong	très forte	sehr stark	muy fuerte	Alwin, Koral, Lito, Pusztagold	9
9.	**VG**	**Stem: hairiness of nodes**	**Tige: pilosité des nœuds**	**Stengel: Behaarung der Knoten**	**Tallo: pilosidad de los nudos**		
QN		absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Arlequin	1
		weak	faible	gering	débil	Andevalo, Clovis	3
		medium	moyenne	mittel	media	Doux très long des Landes, Farnese	5
		strong	forte	stark	fuerte	Fenice, Solario	7
		very strong	très forte	sehr stark	muy fuerte	Mino	9
10. **(+)**	**VG/ MS**	**Plant: height**	**Plante: hauteur**	**Pflanze: Höhe**	**Planta: altura**		
QN	(b)	very short	très basse	sehr niedrig	muy baja	Kalocsai 601	1
		short	basse	niedrig	baja	Albaregia	3
		medium	moyenne	mittel	media	HRF	5
		tall	haute	hoch	alta	Century, Orias	7
		very tall	très haute	sehr hoch	muy alta	Hot chili	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11.	**MS/ VG**	**Leaf: length of blade**	**Feuille: longueur du limbe**	**Blatt: Länge der Blattspreite**	**Hoja: longitud del limbo**		
QN		very short	très courte	sehr kurz	muy corta	Macska sárga, Tüzes piros	1
		short	courte	kurz	corta	De Cayenne, Szentesi cseresznye	3
		medium	moyenne	mittel	media	Atol, Blondy, Marconi, Merit, Anthea	5
		long	longue	lang	larga	Cupido, Dolmy, Encore, Mazurka, Monte	7
		very long	très longue	sehr lang	muy larga	Predi, Solario	9
12.	**MS/ VG**	**Leaf: width of blade**	**Feuille: largeur du limbe**	**Blatt: Breite der Blattspreite**	**Hoja: anchura del limbo**		
QN		very narrow	très étroite	sehr schmal	muy estrecha	Macska sárga, Recio, Tüzes piros	1
		narrow	étroite	schmal	estrecha	De Cayenne, Pusztagold, Szentesi cseresznye	3
		medium	moyenne	mittel	media	Albaregia, Balaton, Danubia, Marconi, Merit	5
		broad	large	breit	ancha	California wonder, Golden calwonder, Sienor, Solario	7
13.	**VG**	**Leaf: intensity of green color**	**Feuille: intensité de la couleur verte**	**Blatt: Intensität der Grünfärbung**	**Hoja: intensidad del color verde**		
QN		very light	très claire	sehr hell	muy claro	Amaryllis, Lombardo	1
		light	claire	hell	claro	Piquant d'Algérie, Pusztagold	3
		medium	moyenne	mittel	medio	Doux très long des Landes, Merit	5
		dark	foncée	dunkel	oscuro	Dolmy,Tinto	7
		very dark	très foncée	sehr dunkel	muy oscuro	Hot chili, Recio, Soleor	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
14. VG	**Leaf: shape**	**Feuille: forme**	**Blatt: Form**	**Hoja: forma**		
(+)						
PQ	lanceolate	lancéolée	lanzettlich	lanceolada	Diavolo, Recio	1
	ovate	ovale	eiförmig	oval	Balico, Sonar	2
	broad elliptic	elliptique large	breit elliptisch	elíptica ancha	Solario	3
15. VG	**Leaf: undulation of margin**	**Feuille: ondulation du bord**	**Blatt: Randwellung**	**Hoja: ondulación del margen**		
QN	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	De Cayenne	1
	weak	faible	gering	débil	Doux très long des Landes	3
	medium	moyenne	mittel	media	Tenor	5
	strong	forte	stark	fuerte	Sucette de Provence, Tosca	7
	very strong	très forte	sehr stark	muy fuerte	Farya	9
16. VG	**Leaf: blistering**	**Feuille: cloqûre**	**Blatt: Blasigkeit**	**Hoja: abullonado**		
QN	very weak	très faible	sehr gering	muy débil	Century, Recio, Sofiane	1
	weak	faible	gering	débil	Pusztagold	3
	medium	moyenne	mittel	medio	Merit	5
	strong	forte	stark	fuerte	Greygo, PAZ pallagi	7
	very strong	très forte	sehr stark	muy fuerte	Florian	9
17. VG	**Leaf: profile in cross section**	**Feuille: profil en section transversale**	**Blatt: Profil im Querschnitt**	**Hoja: perfil en sección transversal**		
(+)						
QN	strongly concave	fortement concave	stark konkav	muy cóncavo	Slávy	1
	moderately concave	modérément concave	mäßig konkav	moderadamente cóncavo	Doux italien, Favolor	3
	flat	plat	flach	plano	De Cayenne, Recio	5
	moderately convex	modérément convexe	mäßig konvex	moderadamente convexo	Albaregia	7
	strongly convex	fortement convexe	stark konvex	muy convexo	Tinto	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18. VG	**Leaf: glossiness**	**Feuille: brillance**	**Blatt: Glanz**	**Hoja: brillo**		
QN	very weak	très faible	sehr gering	muy débil	Diavolo	1
	weak	faible	gering	débil	De Cayenne, Doux très long des Landes	3
	medium	moyenne	mittel	medio	Alby, Eolo	5
	strong	forte	stark	fuerte	Andevalo, Floridor	7
	very strong	très forte	sehr stark	muy fuerte	Cubor, Petit marseillais	9
19. VG (*) (+)	**Peduncle: attitude**	**Pédoncule: port**	**Blütenstiel: Haltung**	**Pedúnculo: porte**		
PQ	erect	dressé	aufrecht	erecto	Fehér, Red Chili	1
	semi-drooping	intermédiaire	intermediär	intermedio	Blondy	2
	drooping	retombant	hängend	colgante	Heldor, Lamuyo	3
20. VG	**Flower: anthocyanin coloration in anther**	**Fleur: pigmentation anthocyanique de l'anthère**	**Blüte: Anthocyanfärbung des Staubbeutels**	**Flor: pigmentación antociánica de la antera**		
QL	absent	absente	fehlend	ausente	Danza	1
	present	présente	vorhanden	presente	Lamuyo	9
21. VG (*)	**Fruit: color (<u>before</u> maturity)**	**Fruit: couleur (<u>avant</u> maturité)**	**Frucht: Farbe (<u>vor</u> der Reife)**	**Fruto: color (<u>antes</u> de la madurez)**		
PQ (a)	greenish white	blanc verdâtre	grünlichweiß	blanco verdoso	Blanc d'Espagne	1
	yellow	jaune	gelb	amarillo	Fehér, Sweet banana	2
	green	vert	grün	verde	California wonder, Lamuyo	3
	purple	pourpre	purpurn	púrpura	Nigra, Violetta	4

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
22. VG	**Fruit: intensity of color (<u>before</u> maturity)**	**Fruit: intensité de la couleur (<u>avant</u> maturité)**	**Frucht: Intensität der Farbe (<u>vor</u> der Reife)**	**Fruto: intensidad del color (<u>antes</u> de la madurez)**		
QN (a)	very light	très claire	sehr hell	muy clara		1
	light	claire	hell	clara		3
	medium	moyenne	mittel	media		5
	dark	foncée	dunkel	oscura		7
	very dark	très foncée	sehr dunkel	muy oscura		9
23. VG	**Fruit: anthocyanin coloration**	**Fruit: pigmentation anthocyanique**	**Frucht: Anthocyanfärbung**	**Fruto: pigmentación antociánica**		
QL (a)	absent	absente	fehlend	ausente	Lamuyo	1
	present	présente	vorhanden	presente	Alabástrom, Purple beauty, Violette	9
24. VG	**Fruit: attitude**	**Fruit: port**	**Frucht: Haltung**	**Fruto: porte**		
PQ (b)	erect	dressé	aufrecht	erecto	Kalocsai 601, Red Chili	1
	horizontal	horizontal	waagerecht	horizontal	PAZ szentesi, Vinedale	2
	drooping	retombant	hängend	colgante	De Cayenne, Lamuyo	3
25. VG/ MS	**Fruit: length**	**Fruit: longueur**	**Frucht: Länge**	**Fruto: longitud**		
QN (b)	very short	très courte	sehr kurz	muy corta	Cherry Sweet, Topgirl	1
	short	courte	kurz	corta	Delphin, Petit carré doux	3
	medium	moyenne	mittel	media	Fehér, Lamuyo	5
	long	longue	lang	larga	Doux d'Espagne, Majister	7
	very long	très longue	sehr lang	muy larga	Arabal, Corno di toro, Marconi	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
26.	**VG/ MS**	**Fruit: diameter**	**Fruit: diamètre**	**Frucht: Durchmesser**	**Fruto: diámetro**		
QN	**(b)**	very narrow	très étroit	sehr schmal	muy estrecho	De Cayenne, Recio	1
		narrow	étroit	schmal	estrecho	Doux très long des Landes	3
		medium	moyen	mittel	medio	Doux italien, Corno di toro	5
		broad	large	breit	ancho	Clovis, Lamuyo	7
		very broad	très large	sehr breit	muy ancho	Floridor, Ibleor, Inca, Joly rosso, Quadrato d'Asti, Surpas	9
27.	**MS (*)**	**Fruit: ratio length/diameter**	**Fruit: rapport longueur/diamètre**	**Frucht: Verhältnis Länge/Durchmesser**	**Fruto: relación entre la longitud y el diámetro**		
QN	**(b)**	very small	très faible	sehr klein	muy pequeña	Liebesapfel, PAZ szentesi, Rotopa	1
		small	faible	klein	pequeña	Bucano, Topgirl	3
		medium	moyen	mittel	media	Adra, Cherry Sweet, Daniel, Delphin, Edino	5
		large	élevé	groß	grande	Heldor, Lamuyo, Magister, Tenno, Vidi	7
		very large	très élevé	sehr groß	muy grande	De Cayenne, Kusamon, Spadi	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
28. VG (*) (+)	**Fruit: shape in longitudinal section**	**Fruit: forme de la section longitudinale**	**Frucht: Form des Längsschnitts**	**Fruto: forma en sección longitudinal**		
PQ (b)	oblate	aplatie	breitrund	plana	Liebesapfel, PAZ szentesi, Topepo rosso	1
	circular	circulaire	kreisförmig	circular	Cherry Sweet	2
	cordate	cordiforme	herzförmig	acorazonada	Daniel	3
	square	quadrangulaire	quadratisch	cuadrada	Delphin, Yolo Wonder	4
	rectangular	rectangulaire	rechteckig	rectangular	Clovis, Nocera rosso	5
	trapezoidal	trapézoïdale	trapezförmig	trapezoidal	Delta, Piperade	6
	moderately triangular	modérément triangulaire	leicht dreieckig	moderadamente triangular	Fehér, Marconi	7
	narrowly triangular	triangulaire étroite	schmal dreieckig	triangular estrecha	De Cayenne, Demon	8
	hornshaped	en corne	hornförmig	en forma de cuerno	Tauro	9
29. VG	**Fruit: shape in cross section (at level of placenta)**	**Fruit: forme de la section transversale (au niveau du placenta)**	**Frucht: Form des Querschnitts (auf Höhe der Plazenta)**	**Fruto: forma en sección transversal (a nivel de la placenta)**		
PQ (b)	elliptic	elliptique	elliptisch	elíptica	Sweet banana	1
	angular	angulaire	eckig	angular	Vinedale	2
	circular	arrondie	rund	circular	Cherry Sweet, Doux très long des Landes	3
30. VG (+)	**Fruit: sinuation of pericarp at basal part**	**Fruit: sinuosité du péricarpe sur la partie basale**	**Frucht: Wellung des Perikarps am basalen Teil**	**Fruto: sinuosidad del pericarpio de la parte basal**		
QN (b)	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Delphin, Kalocsai V-2, Milord	1
	weak	faible	gering	débil	Donat	3
	medium	moyenne	mittel	media	Duna, Banán	5
	strong	forte	stark	fuerte	Alfa	7
	very strong	très forte	sehr stark	muy fuerte	Édes spiral, Doux italien	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
31. VG (+)		**Fruit: sinuation of pericarp excluding basal part**	**Fruit: sinuosité du péricarpe hors base**	**Frucht: Wellung des Perikarps ohne basalen Teil**	**Fruto: sinuosidad del pericarpio excluida la parte basal**		
QN	**(b)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Delphin, Milord	1
		weak	faible	gering	débil	Clovis, Sonar	3
		medium	moyenne	mittel	media	Ursus	5
		strong	forte	stark	fuerte	De Cayenne, Doux italien	7
		very strong	très forte	sehr stark	muy fuerte	Arabal	9
32. VG (*)		**Fruit: texture of surface**	**Fruit: texture de la surface**	**Frucht: Beschaffenheit der Oberfläche**	**Fruto: textura de la superficie**		
QN	**(b)**	smooth or very slightly wrinkled	lisse ou très légèrement ride	glatt oder sehr leicht gerieft	lisa o muy ligeramente arrugada	Milord	1
		slightly wrinkled	légèrement ridée	leicht gerieft	ligeramente arrugada	Doux très long des Landes	2
		strongly wrinkled	fortement ridée	stark gerieft	fuertemente arrugada	Sierra Nevada	3
33. VG (*)		**Fruit: color (at maturity)**	**Fruit: couleur (à maturité)**	**Frucht: Farbe (bei Reife)**	**Fruto: color (a la madurez)**		
PQ	**(b)**	yellow	jaune	gelb	amarillo	Golden calwonder, Heldor	1
		orange	orange	orange	naranja	Ariane	2
		red	rouge	rot	rojo	Fehér, Lamuyo	3
		brown	brun	braun	marrón	Brupa, Negral	4
		green	vert	grün	verde	Green6203	5
34. VG		**Fruit: intensity of color (at maturity)**	**Fruit: intensité de la couleur (à maturité)**	**Frucht: Intensität der Farbe (bei Reife)**	**Fruto: intensidad del color (a la madurez)**		
QN	**(b)**	light	claire	hell	clara		3
		medium	moyenne	mittel	media		5
		dark	foncée	dunkel	oscura		7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
35. VG	**Fruit: glossiness**	**Fruit: brillance**	**Frucht: Glanz**	**Fruto: brillo**		
QN (b)	very weak	très faible	sehr gering	muy débil	Macska sárga, Pikanta	1
	weak	faible	gering	débil	Doux très long des Landes	3
	medium	moyenne	mittel	medio	Carré doux extra hâtif, Lamuyo, Sonar	5
	strong	forte	stark	fuerte	Doux italien, Trophy	7
	very strong	très forte	sehr stark	muy fuerte	Floridor, Kappy	9
36. VG (*)	**Fruit: stalk cavity**	**Fruit: dépression pédonculaire**	**Frucht: Stielhöhle**	**Fruto: cavidad peduncular**		
QL (b)	absent	absente	fehlend	ausente	Corinto, Corno di toro, Sweet banana, Sucette de Provence	1
	present	présente	vorhanden	presente	Bingor, Lamuyo	9
37. VG	**Fruit: depth of stalk cavity**	**Fruit: profondeur de la dépression pédonculaire**	**Frucht: Tiefe der Stielhöhle**	**Fruto: profundidad de la cavidad peduncular**		
QN (b)	very shallow	très peu profonde	sehr flach	muy poco profunda	Flush, Kaméleon, Niagara	1
	shallow	peu profonde	flach	poco profunda	Delphin, Doux italien, Fehér, Latino	3
	medium	moyenne	mittel	media	Lamuyo, Magister	5
	deep	profonde	tief	profunda	Osir, Quadrato d'Asti rosso, Surpas	7
	very deep	très profonde	sehr tief	muy profunda	Cancun, Cubor, Pablor, Shy Beauty	9
38. VG	**Fruit: shape of apex**	**Fruit: forme du sommet**	**Frucht: Form der Spitze**	**Fruto: forma del ápice**		
PQ (b)	very acute	très pointue	sehr spitz	muy aguda	De Cayenne, Hot chili	1
	moderately acute	pointue	spitz	aguda		2
	rounded	arrondie	abgerundet	redondeada	Cherry Sweet	3
	moderately depressed	déprimée	eingesenkt	hundida	Quadrato d'Asti rosso	4
	very depressed	très déprimée	stark eingesenkt	muy hundida	Kerala, Monte, Osir	5

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
39. (+)	**VG**	**Fruit: depth of interlocular grooves**	**Fruit: profondeur des dépressions interloculaires**	**Frucht: Tiefe der Furchen zwischen den Kammern**	**Fruto: profundidad de los surcos interloculares**		
QN	**(b)**	absent or very shallow	nulles ou très peu profondes	fehlend oder sehr flach	ausente o muy poco profunda	De Cayenne	1
		shallow	peu profondes	flach	poco profunda	Milord, Topgirl	3
		medium	moyennes	mittel	media	Clovis, Lamuyo, Marconi	5
		deep	profondes	tief	profunda	Majister, Surpas	7
40. (*)	**MG**	**Fruit: number of locules**	**Fruit: nombre de loges**	**Frucht: Anzahl Kammern**	**Fruto: número de lóculos**		
QN	**(b)**	predominantly two	le plus souvent deux	vorwiegend zwei	predominante dos	De Cayenne	1
		equally two and three	également deux et trois	gleichermaßen zwei und drei	igualmente dos y tres	Fehér	2
		predominantly three	le plus souvent trois	vorwiegend drei	predominante tres	Century	3
		equally three and four	également trois et quatre	gleichermaßen drei und vier	igualmente tres y cuatro	Lamuyo, Sonar	4
		predominantly four and more	le plus souvent quatre et plus	vorwiegend vier und mehr	predominante cuatro y más	Palio, PAZ szentesi	5
41. (*)	**VG**	**Fruit: thickness of flesh**	**Fruit: épaisseur de la chair**	**Frucht: Dicke des Fleisches**	**Fruto: espesor de la pulpa**		
QN	**(b)**	very thin	très mince	sehr dünn	muy delgado	De Cayenne, Macska sárga, Petit marseillais, Recio	1
		thin	mince	dünn	delgado	Banán, Carré doux extra hâtif, Doux très long des Landes	3
		medium	moyenne	mittel	medio	Fehér, Lamuyo	5
		thick	épaisse	dick	grueso	Andevalo, Bingor, Daniel, Topgirl	7
		very thick	très épaisse	sehr dick	muy grueso	Dragox Roda, Regolo, Solario	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
42.	**VG/ MS**	**Stalk: length**	**Pédoncule: longueur**	**Fruchtstiel: Länge**	**Pedúnculo: longitud**		
QN	**(b)**	very short	très courte	sehr kurz	muy corta	Greygo, Golden calwonder	1
		short	courte	kurz	corta	Surpas, Yolo Wonder, Zenith	3
		medium	moyenne	mittel	media	Fehér, Sonar	5
		long	longue	lang	larga	De Cayenne, Sierra Nevada, Sweet banana	7
		very long	très longue	sehr lang	muy larga	Farnese, Lipari, Oasis	9
43.	**VG/ MS**	**Stalk: thickness**	**Pédoncule: grosseur**	**Fruchtstiel: Dicke**	**Pedúnculo: espesor**		
QN	**(b)**	very thin	très mince	sehr dünn	muy delgado	De Cayenne, Doux très long des Landes, Macska sárga, Recio	1
		thin	mince	dünn	delgado	Sweet banana	3
		medium	moyenne	mittel	medio	Doux italien, Surpas	5
		thick	épaisse	dick	grueso	Lamuyo, Trophy Palio	7
		very thick	très épaisse	sehr dick	muy grueso	Domingo, Galaxy, Paraiso	9
44.	**VG**	**Calyx: aspect**	**Calice: aspect**	**Kelch: Aussehen**	**Cáliz: aspecto**		
(+)							
QL	**(b)**	non enveloping	non enrobant	nicht umhüllend	no envolvente	Lamuyo, Sonar	1
		enveloping	enrobant	umhüllend	envolvente	De Cayenne, Sweet banana	2
45.	**VG**	**Fruit: capsaicin in placenta**	**Fruit: capsaicine dans le placenta**	**Frucht: Capsaicin in der Plazenta**	**Fruto: capsaicina en la placenta**		
(*)							
(+)							
QL	**(b)**	absent	absent	fehlend	ausente	Sonar	1
		present	présent	vorhanden	presente	De Cayenne	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
46. VG	**Time of beginning of flowering (first flower on second flowering node)**	**Époque de début de floraison (première fleur au deuxième nœud florifère)**	**Zeitpunkt des Blühbeginns (erste Blüte am zweiten blütentragenden Knoten)**	**Época de comienzo de la floración (primera flor en el segundo nudo floral)**		
QN	early	précoce	früh	temprana	Carré doux extra hâtif, Cupido, Fehér, Flaviano, Lito, Trophy	3
	medium	moyenne	mittel	media	Lamuyo, Latino	5
	late	tardive	spät	tardía	Daniel, Piquant d'Algérie, Zingaro	7
47. VG	**Time of maturity**	**Époque de maturité**	**Zeitpunkt der Reife**	**Época de madurez**		
(+)						
QN	very early	très précoce	sehr früh	muy temprana	Koral, Macska sárga, Madison	1
	early	précoce	früh	temprana	Fehér, Lady Bell, Topgirl	3
	medium	moyenne	mittel	media	Lamuyo, Latino, Sonar	5
	late	tardive	spät	tardía	Daniel, Doux d'Espagne	7
	very late	très tardive	sehr spät	muy tardía	Cancun, California wonder	9
48. VG	**Resistance to Tobamovirus**	**Résistance au tobamovirus**	**Resistenz gegen Tobamovirus**	**Resistencia al tobamovirus**		
(+)						
48.1 (*)	***Tobacco mosaic virus* Pathotype 0 (TMV: 0)**	***Tobacco mosaic virus* Pathotype 0 (TMV: 0)**	***Tobacco mosaic virus* Pathotyp 0 (TMV: 0)**	***Tobacco mosaic virus* Patotipo 0 (TMV: 0)**		
QL	absent	absente	fehlend	ausente	Lamu, Pepita, Piquillo	1
	present	présente	vorhanden	presente	Fehérözön, Turia, Yolo Wonder	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
48.2 (*)	***Pepper mild mottle virus*** **Pathotype 1.2 (PMMoV: 1.2)**	***Pepper mild mottle virus*** **Pathotype 1.2 (PMMoV: 1.2)**	***Pepper mild mottle virus*** **Pathotyp 1.2 (PMMoV: 1.2)**	***Pepper mild mottle virus*** **Patotipo 1.2 (PMMoV: 1.2)**		
QL	absent	absente	fehlend	ausente	Fehérözön, Lamu, Turia, Yolo Wonder	1
	present	présente	vorhanden	presente	Candela, Ferrari, Novi 3, PI152225	9
48.3 (*)	***Pepper mild mottle virus*** **Pathotype 1.2.3 (PMMoV: 1.2.3)**	***Pepper mild mottle virus*** **Pathotype 1.2.3 (PMMoV: 1.2.3)**	***Pepper mild mottle virus*** **Pathotyp 1.2.3 (PMMoV: 1.2.3)**	***Pepper mild mottle virus*** **Patotipo 1.2.3 (PMMoV: 1.2.3)**		
QL	absent	absente	fehlend	ausente	Candela, Ferrari, Yolo Wonder	1
	present	présente	vorhanden	presente	Bisonte, Friendly, Tom 4	9
49. VG (+)	**Resistance to *Potato Y virus (*PVY)**	**Résistance au *Potato Y virus (*PVY)**	**Resistenz gegen *Potato Y virus (*PVY)**	**Resistencia al *Potato Y virus (*PVY)**		
49.1 (*)	**Pathotype 0 (PVY: 0)**	**Pathotype 0 (PVY: 0)**	**Pathotyp 0 (PVY: 0)**	**Patotipo 0 (PVY: 0)**		
QL	absent	absente	fehlend	ausente	Yolo Wonder	1
	present	présente	vorhanden	presente	Balico, Gerico, Solario	9
49.2	**Pathotype 1 (PVY: 1)**	**Pathotype 1 (PVY: 1)**	**Pathotyp 1 (PVY: 1)**	**Patotipo 1 (PVY: 1)**		
QL	absent	absente	fehlend	ausente	Yolo Wonder	1
	present	présente	vorhanden	presente	Sileno, Solario, Vidi	9
49.3	**Pathotype 1.2 (PVY: 1.2)**	**Pathotype 1.2 (PVY: 1.2)**	**Pathotyp 1.2 (PVY: 1.2)**	**Patotipo 1.2 (PVY: 1.2)**		
QL	absent	absente	fehlend	ausente	Yolo Wonder	1
	present	présente	vorhanden	presente	Fenice, Navarro, Solario	9
50. VG (+)	**Resistance to *Phytophthora capsici* (Pc)**	**Résistance à *Phytophthora capsici* (Pc)**	**Resistenz gegen *Phytophthora capsici* (Pc)**	**Resistencia al *Phytophthora capsici* (Pc)**		
QL	absent	absente	fehlend	ausente	Jupiter, Yolo Wonder	1
	present	présente	vorhanden	presente	Favolor, Solario	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
51. **(+)**	**VG**	**Resistance to *Cucumber mosaic virus* (CMV)**	**Résistance au *Cucumber mosaic virus* (CMV)**	**Resistenz gegen *Cucumber mosaic virus* (CMV)**	**Resistencia al *Cucumber mosaic virus* (CMV)**		
QL		absent	absente	fehlend	ausente	Yolo Wonder	1
		present	présente	vorhanden	presente	Alby, Ducato, Favolor	9
52. **(+)**	**VG**	**Resistance to *Tomato spotted wilt virus* Pathotype 0 (TSWV: 0)**	**Résistance au *Tomato spotted wilt virus* Pathotype 0 (TSWV: 0)**	**Resistenz gegen *Tomato spotted wilt virus* Pathotyp 0 (TSWV: 0)**	**Resistencia al *Tomato spotted wilt virus* Patotipo 0 (TSWV: 0)**		
QL		absent	absente	fehlend	ausente	Lamuyo, Yolo Wonder	1
		present	présente	vorhanden	presente	Galileo, Jackal, Jackpot, Prior	9
53. **(+)**	**VG**	**Resistance to *Xanthomonas campestris* pv. *vesicatoria* (Xcv)**	**Résistance au *Xanthomonas campestris* pv. *vesicatoria* (Xcv)**	**Resistenz gegen *Xanthomonas campestris* pv. *vesicatoria* (Xcv)**	**Resistencia al *Xanthomonas campestris* pv. *vesicatoria* (Xcv)**		
53.1		**Pathotype 1**	**Pathotype 1**	**Pathotyp 1**	**Patotipo 1**		
QL		absent	absente	fehlend	ausente	Fehérözön, Yolo Wonder	1
		present	présente	vorhanden	presente	Emiro, Filidor, Gotico, San Marco, Solanor	9
53.2		**Pathotype 2**	**Pathotype 2**	**Pathotyp 2**	**Patotipo 2**		
QL		absent	absente	fehlend	ausente	Fehérözön, Yolo Wonder	1
		present	présente	vorhanden	presente	Emiro, Filidor, Gotico, San Marco, Solanor	9
53.3		**Pathotype 3**	**Pathotype 3**	**Pathotyp 3**	**Patotipo 3**		
QL		absent	absente	fehlend	ausente	Fehérözön, Yolo Wonder	1
		present	présente	vorhanden	presente	Emiro, Filidor, Gotico, San Marco, Solanor	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) Fruit characteristics which should be examined before maturity, i.e. before the first color change

(b) Fruit characteristics which should be examined at maturity, i.e. after the time of the first color change

8.2 Explanations for individual characteristics

Ad. 3: Plant: length of stem

The length of the stem is measured from the cotyledons to the first flower branch.

Ad. 4: Plant: shortened internode (in upper part)

Ad. 5: Varieties with shortened internodes only: Plant: number of internodes between the first flower and shortened internodes

The tests should be done on plants which have not been pruned. The shoot system of pepper consists of main stems, which are branched off from the main axis and side shoots. Two growth types of the main stems can be distinguished:

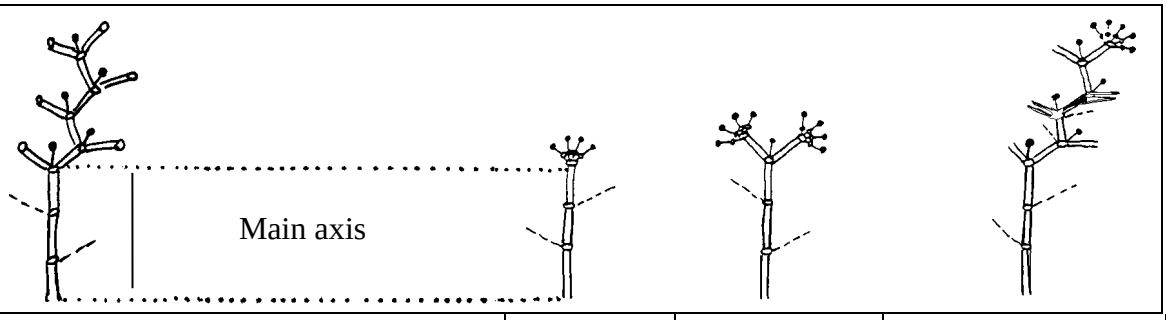
Growth type A: the main stems grow indeterminately; one or two flowers develop per node and shortened internodes never develop.

Growth type B: after the first branching of the main axis, shorter internodes appear and the growth of the main stem ends in a bunch of flowers (it appears as if there are more than two flowers per node).

Side shoots develop from the nodes on the main axis and on the main stems.

Growth type A Growth type B

Char. 4: Plant: shortened internodes (in upper part)	
absent	present



Char. 5: Varieties with shortened internodes only: Plant: number of internodes between the first flower and shortened internodes	none (1)	one to three (2)	more than three (3)

flower

node

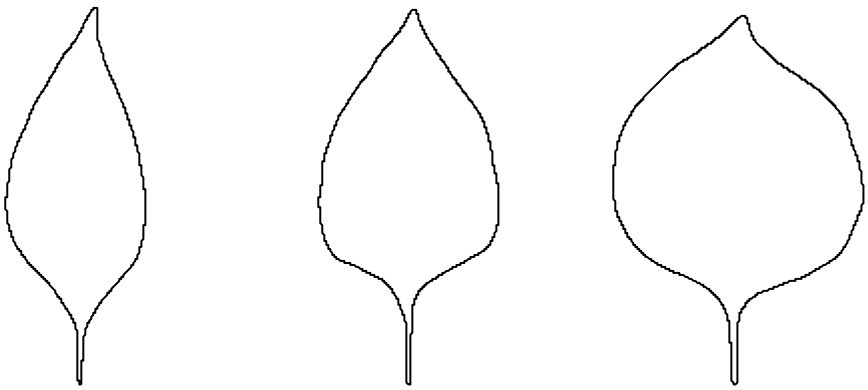
main stem

side shoots

Ad. 10: Plant: height

To be observed after a fruit set on several nodes. Poor fruit set may influence the vigor and thus the height of the plant.

Ad. 14: Leaf: shape



1 lanceolate

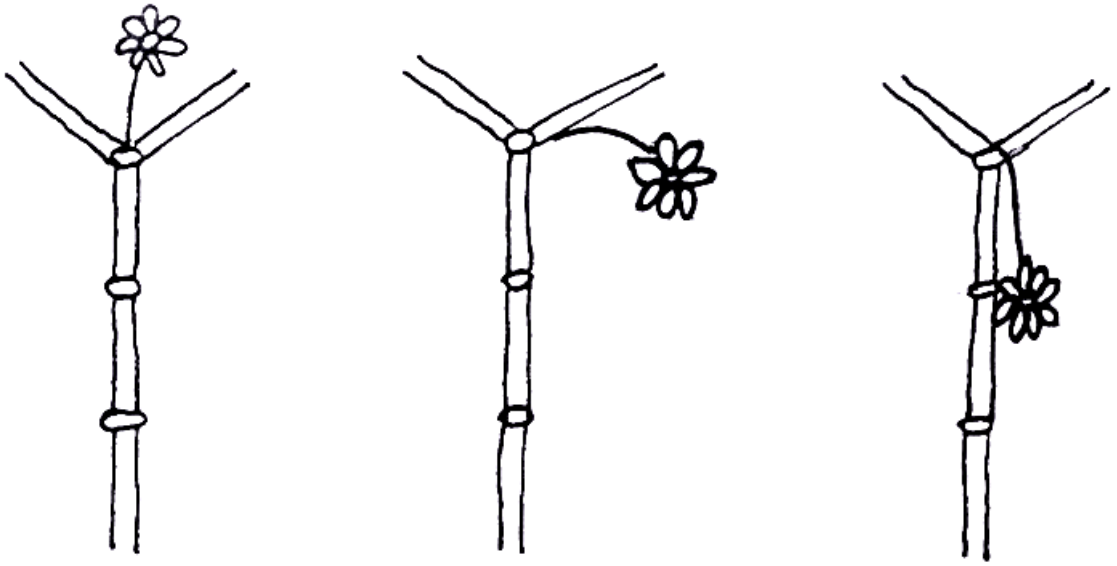
2 ovate

3 broad elliptic

Ad. 17: Leaf: profile in cross section

1	3	5	7	9
strongly concave	moderately concave	flat	moderately convex	strongly convex

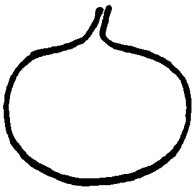
Ad. 19: Peduncle: attitude



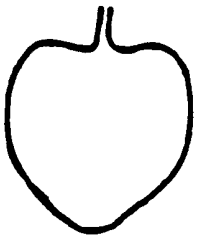
1	2	3
erect	semi-drooping	drooping

Ad. 28: Fruit: shape in longitudinal section

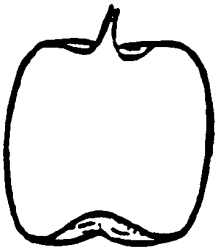
1
oblate



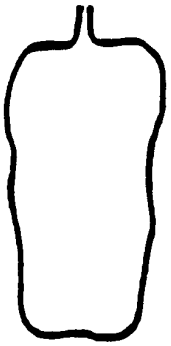
2
circular



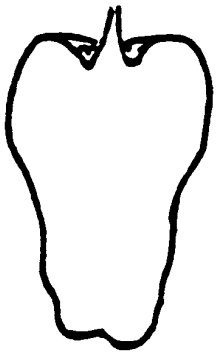
3
cordate



4
square



5
rectangular



6
trapezoidal

7
moderately triangular

8
narrowly triangular

9
hornshaped

Ad. 30: Fruit: sinuation of pericarp at basal part

1
absent or very weak

3
weak

5
medium

7
strong

9
very strong

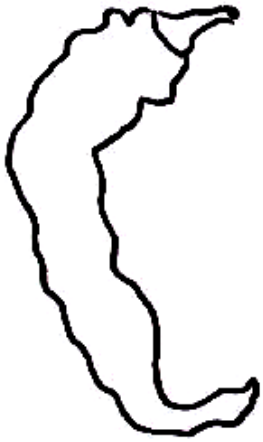
Ad. 31: Fruit: sinuation of pericarp excluding basal part

1
absent or very weak

3
weak

5
medium

7
strong

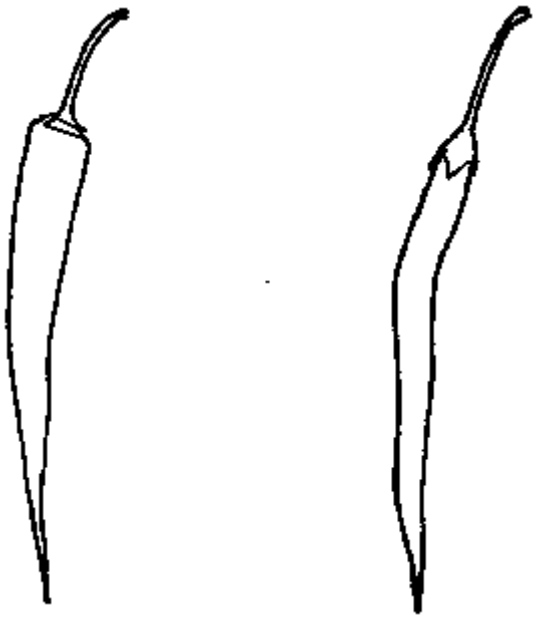


9
very strong

Ad. 39: Fruit: depth of interloculary grooves

To be observed in the middle part of the fruit.

Ad. 44: Calyx: aspect



1
non enveloping

2
enveloping

Ad. 45: Fruit: capsaicin in placenta

The presence of capsaicin is observed by tasting the pepper flesh together with the locules, in the placenta area.

Ad. 47: Time of maturity

Maturity is reached at the first color change of the fruit.

Ad. 48: Resistance to Tobamovirus

1.	Pathogen	*Tobacco mosaic virus* and *Pepper mild mottle virus*
2.	Quarantine status	no
3.	Host species	Sweet pepper, hot pepper, paprika and chili – *Capsicum annuum* L.
4.	Source of inoculum	GEVES[1] (FR), Naktuinbouw[2] (NL) or INIA[3] (ES)
5.	Isolate	*Tobacco mosaic virus* pathotype 0 (TMV: 0) strain Vi-6 *Pepper mild mottle virus* pathotype 1.2 (PMMoV: 1.2) strain nt203 *Pepper mild mottle virus* pathotype 1.2.3 (PMMoV: 1.2.3) strain Eve The test protocols have been validated in a CPVO co-funded project[4] with these 3 isolates/pathotypes.
6.	Establishment isolate identity	genetically defined pepper differentials (see ISF website: http://www.worldseed.org/isf/differential_hosts.html)
7.	Establishment pathogenicity	Test on susceptible plants
8.	Multiplication inoculum	
8.1	Multiplication medium	-
8.2	Multiplication variety	tomato or pepper (e.g. Lamu) or *Nicotiana tabacum* (e.g. Samsung)
8.3	Plant stage at inoculation	-
8.4	Inoculation medium	-
8.5	Inoculation method	-
8.6	Harvest of inoculum	Symptomatic fresh leaves
8.7	Check of harvested inoculum	option: on young leaves of *Nicotiana tabacum* "Xanthi", check for local lesions after 5-7 days at 20-25°C.
8.8	Shelflife/viability inoculum	fresh < 1 day in fridge, desiccated < 1 year in fridge or juice < 1 year in freezer at -20°C
9.	Format of the test	
9.1	Number of plants per genotype	At least 20 plants.
9.2	Number of replicates	-

[1] matref@geves.fr
[2] resistentie@naktuinbouw.nl
[3] resistencias@inia.es
[4] Harmores 2 CPVO project (http://www.cpvo.europa.eu/main/en/home/documents-and-publications/technical-projects-reports)

9.3	Control varieties	TMV: 0: Susceptible controls: Lamu, Pepita, Piquillo Resistant controls: Fehérözön, Yolo Wonder PMMoV: 1.2: Susceptible controls: Fehérözön, Lamu, Yolo Wonder Resistant controls: Ferrari, Novi 3 PMMoV: 1.2.3: Susceptible controls: Ferrari, Yolo Wonder Resistant controls: Friendly, Tom 4
9.4	Test design	Add non inoculated plants
9.5	Test facility	Climate room or greenhouse
9.6	Temperature	20-25°C
9.7	Light	12 hours or longer
9.8	Season	-
9.9	Special measures	-
10.	Inoculation	
10.1	Preparation inoculum	1 g leaf with symptoms with 10 mL PBS or similar buffer or dilution of juice in water. Homogenize, add carborundum to buffer
10.2	Quantification inoculum	-
10.3	Plant stage at inoculation	TMV: 0, cotyledons to first leaf stage PMMoV: 1.2, cotyledon stage PMMoV: 1.2.3, cotyledon stage
10.4	Inoculation method	rubbing with the virus suspension.
10.5	First observation	TMV:0: 4-7 days post-inoculation for observation of local necrosis. PMMoV: 1.2 and PMMoV: 1.2.3: 4-7 days post-inoculation for observation of local necrotic lesions which can lead to cotyledon drop. After this date these necrosis can hardly be seen on fallen cotyledons.
10.6	Second observation	TMV: 0: two weeks post-inoculation for observation of symptoms of susceptibility. PMMoV: 1.2 and PMMoV: 1.2.3: two weeks post-inoculation for observation of symptoms of susceptibility.
10.7	Final observations	TMV:0 : three weeks post-inoculation. PMMoV: 1.2 and PMMoV: 1.2.3: three weeks post-inoculation. For TMV:0, PMMoV: 1.2 and PMMoV: 1.2.3, two of these three observations may be sufficient; the third notation is optional for observation of evolution of symptoms (depending on symptoms on controls or heterogeneous behaviour).
11.	Observations	
11.1	Method	Visual

11.2	Observation scale	TMV: 0: Susceptibility: mosaic (aucuba in case of aucuba strain as Vi-6), growth reduction, death of plants. Resistance: local necrotic lesions which can lead to leave drop, systemic necrosis, vein necrosis, stem necrosis. PMMoV: 1.2 and PMMoV: 1.2.3: Susceptibility: mosaic (green), growth reduction. Resistance: local necrotic lesions which can lead to cotyledon drop, systemic necrosis.
11.3	Validation of test	evaluation of variety resistance should be calibrated with results of resistant and susceptible controls.
12.	Interpretation of data in terms of UPOV characteristic states	
	absent…….	[1] susceptible
	present……	[9] resistant
13.	Critical control points	For TMV: 0, plants with no symptoms at all have to be interpreted as escapes of inoculation.
	The dates of observation should be defined according to the expression of symptoms on the controls varieties. Environmental conditions can have an effect on the expression of symptoms over time. Two observations are sufficient if clear symptoms are observed, otherwise a third observation could be necessary.	

Ad. 49: Resistance to *Potato Y virus* (PVY)

1.	Pathogen	*Potato Y virus* (PVY)
2.	Quarantine status	no
3.	Host species	*Capsicum annuum*
4.	Source of inoculum	GEVES (FR), Naktuinbouw (NL)
5.	Isolate	Pathotypes 0, 1, and 1.2
6.	Establishment isolate identity	on differential table (S = susceptible; R = resistant)

	PVY pathotypes		
Pepper variety	0	1	1.2
Yolo Wonder	S	S	S
Yolo Y	R	S	S
Florida VR2	R	R	S *
Serrano Criollo de Morelos 334, Solario, W4	R	R	R

* Florida VR2 may show vague and very late symptoms with pathotype 1.2

7.	Establishment pathogenicity	on susceptible plant (e.g. on *Nicotiana tabacum* 'Xanthi' and *N. glutinosa)*
8.	Multiplication inoculum	
8.1	Multiplication medium	living plant
8.2	Multiplication variety	on susceptible variety (e.g. *N. tabacum* 'Xanthi')
8.3	Plant stage at inoculation	3 leaf stage

8.4	Inoculation medium	ice-cold buffer solution 0.03 M PBS + Carborundum + 0.2% DIECA
8.5	Inoculation method	rubbing
8.6	Harvest of inoculum	-
8.7	Check of harvested inoculum	-
8.8	Shelflife/viability inoculum	freeze-dried leaves dry storage at 4°C for ten years
9.	Format of the test	
9.1	Number of plants per genotype	at least 20 plants
9.2	Number of replicates	e.g. 1
9.3	Control varieties	-

Resistance	PVY: 0	PVY: 1	PVY: 1.2
absent	Yolo Wonder	Yolo Wonder	Yolo Wonder
present	Balico, Gerico, Solario	Sileno, Solario, Vidi	Fenice, Navarro, Solario

9.4	Test design	to add untreated plant
9.5	Test facility	glasshouse or climatic chamber
9.6	Temperature	22°C constant
9.7	Light	at least 12h
9.8	Season	-
9.9	Special measures	-
10.	Inoculation	
10.1	Preparation inoculum	leaf in PBS - grinding with mortar
10.2	Quantification inoculum	-
10.3	Plant stage at inoculation	cotyledons fully developed or at “first leaf” stage or 3 leaf stage
10.4	Inoculation method	rubbing with a virus solution
10.5	First observation	6 - 14 days post inoculation
10.6	Second observation	14 - 21 days post inoculation
10.7	Final observations	21 days post inoculation
11.	Observations	
11.1	Method	visual, comparative
11.2	Observation scale	
	[1] absent	growth retardation, leaf malformation, light mosaic in youngest leaves, or red veins; stem necrosis, plant death
	[9] present	no symptoms.
11.3	Validation of test	on standards
11.4	Off-types	maximum 1 on 20 plants
12.	Interpretation of data in terms of UPOV characteristic states	QL
13.	Critical control points	remark: avoid high temperatures (>30°C)

Ad. 50: Resistance to *Phytophthora capsici* (Pc)

1.	Pathogen	*Phytophthora capsici* (Pc)
2.	Quarantine status	no
3.	Host species	*Capsicum annuum*
4.	Source of inoculum	Naktuinbouw (NL) - INRA GAFL (FR)
5.	Isolate	moderately aggressive (e.g. strain 101)
6.	Establishment isolate identity	on standards Jupiter, Yolo Wonder (susceptible), Favolor (moderately resistant), Solario, Phyo 636 (resistant)
7.	Establishment pathogenicity	in biotest on plants
8.	Multiplication inoculum	
8.1	Multiplication medium	V8 juice-agar (1%) or 10% V8A or PDA+
8.2	Multiplication variety	-
8.3	Plant stage at inoculation	-
8.4	Inoculation medium	10% V8A or PDA+
8.5	Inoculation method	see 10.4
8.6	Harvest of inoculum	-
8.7	Check of harvested inoculum	-
8.8	Shelflife/viability inoculum	10% V8A 3 months, PDA+ 2 months
9.	Format of the test	
9.1	Number of plants per genotype	at least 20 (2 untreated plants)
9.2	Number of replicates	e.g. 1
9.3	Control varieties	Jupiter, Yolo Wonder (susceptible), Favolor (moderately resistant), Solario (resistant)
9.4	Test design	-
9.5	Test facility	glasshouse
9.6	Temperature	22°C d/n
9.7	Light	at least 12h
9.8	Season	-
9.9	Special measures	-
10.	Inoculation	
10.1	Preparation inoculum	growing on Petri dishes
10.2	Quantification inoculum	-
10.3	Plant stage at inoculation	first flower bud
10.4	Inoculation method	stem is cut just below point of first branching, a 4mm-agar plug is placed carefully on the wound and covered with aluminum foil
10.5	First observation	7 days post inoculation
10.6	Second observation	14 days post inoculation
10.7	Final observations	21 days post inoculation
11.	Observations	

11.1	Method	visual, comparative or measurement of stem necrosis length; for repeated measurements, the stem is marked with permanent ink
11.2	Observation scale	
	[1] absent	e.g. length increase > 0.8 cm/week
	[9] present (moderately resistant)	e.g. length increase ≥ 0.5 cm ≤ 0.8 cm/week
	[9] present (highly resistant)	e.g. length increase < 0.5 cm/week
11.3	Validation of test	on standards
11.4	Off-types	maximum 1 on 20 plants
12.	Interpretation of data in terms of UPOV characteristic states	QL Based on the stem necrosis increase compared to the standards. [1] susceptible: Jupiter, Yolo Wonder [9] moderately resistant: Favolor [9] resistant: Solario
13.	Critical control points	absence of differential interactions between host and pathogen

Ad. 51: Resistance to *Cucumber mosaic virus* (CMV)

1.	Pathogen	*Cucumber mosaic virus* (CMV)
2.	Quarantine status	no
3.	Host species	*Capsicum annuum*
4.	Source of inoculum	INRA GAFL (FR)
5.	Isolate	e.g. 'Fulton'
6.	Establishment isolate identity	-
7.	Establishment pathogenicity	-
8.	Multiplication inoculum	
8.1	Multiplication medium	living plant
8.2	Multiplication variety	e.g. *Vinca rosea*
8.3	Plant stage at inoculation	-
8.4	Inoculation medium	0.03 M PBS + 0.1% DIECA
8.5	Inoculation method	rubbing with carborundum
8.6	Harvest of inoculum	1 g on 4 ml buffer
8.7	Check of harvested inoculum	-
8.8	Shelflife/viability inoculum	-
9.	Format of the test	
9.1	Number of plants per genotype	50
9.2	Number of replicates	e.g. 1
9.3	Control varieties	Yolo Wonder (susceptible), Ducato (moderately resistant), Alby, Favolor (resistant)

9.4	Test design	-
9.5	Test facility	-
9.6	Temperature	20-22°C
9.7	Light	12h
9.8	Season	-
9.9	Special measures	-
10.	Inoculation	
10.1	Preparation inoculum	-
10.2	Quantification inoculum	-
10.3	Plant stage at inoculation	cotyledon, before emergence of first leaf (12-13 days after sowing)
10.4	Inoculation method	rubbing cotyledons with carborundum, followed by 48h darkness
10.5	First observation	10 days post inoculation
10.6	Second observation	15 days post inoculation
10.7	Final observations	21 days post inoculation
11.	Observations	
11.1	Method	visual, comparative
11.2	Observation scale	
	[1] susceptible	many local lesion, mosaic
	[9] moderately resistant	intermediate symptoms
	[9] highly resistant	few local lesions, no or light symptoms
11.3	Validation of test	on standards
11.4	Off-types	maximum 1 on 20 plants
12.	Interpretation of data in terms of UPOV characteristic states	QL
13.	Critical control points	-

Ad. 52: Resistance to *Tomato spotted wilt virus* Pathotype 0 (TSWV: 0)

1.	Pathogen	*Tomato spotted wilt virus*, Pathotype 0 (TSWV: 0)
2.	Quarantine status	yes
3.	Host species	*Capsicum annuum*
4.	Source of inoculum	GEVES (FR), Naktuinbouw (NL), INIA (ES)
5.	Isolate	e.g. LYE 51 or Br-01
6.	Establishment isolate identity	-
7.	Establishment pathogenicity	on susceptible plant or *Nicotiana benthamiana*, *N. rustica*
8.	Multiplication inoculum	
8.1	Multiplication medium	living plant
8.2	Multiplication variety	Yolo Wonder or *N. benthamiana*, *N. rustica*
8.3	Plant stage at inoculation	cotyledons fully developed or at “first leaf” pointed stage or 1- 3 leaves
8.4	Inoculation medium	ice-cold buffer suspension or 0.03 M PBS + optional addition of 0.1% sodium sulfite freshly added

8.5	Inoculation method	rubbing with carborundum
8.6	Harvest of inoculum	-
8.7	Check of harvested inoculum	-
8.8	Shelflife/viability inoculum	stability in ice cold suspension ca. 15-20 minutes
9.	Format of the test	
9.1	Number of plants per genotype	at least 20
9.2	Number of replicates	e.g. 1
9.3	Control varieties	Lamuyo, Yolo Wonder (susceptible), Galileo, Jackal, Jackpot, Prior (resistant)
9.4	Test design	-
9.5	Test facility	growth chamber or insect proof glasshouse
9.6	Temperature	18-20°C or 20-22°C
9.7	Light	12 h
9.8	Season	all seasons, but winter reduce the risk of thrips infestation
9.9	Special measures	biohazard sign on compartment for countries with a TSWV quarantine status
10.	Inoculation	
10.1	Preparation inoculum	-
10.2	Quantification inoculum	-
10.3	Plant stage at inoculation	cotyledons fully developed / at “first leaf” pointed stage or 1-3 leaves
10.4	Inoculation method	rubbing with carborundum, then apply shading or darkness for 24h option: repeat the inoculation 2-3 days later to reduce accidental escapes
10.5	First observation	5-6 days to10 - 15 days post inoculation
10.6	Second observation	10-11 days post inoculation to 15 - 21 days post inoculation
10.7	Final observations	21 days post inoculation
11.	Observations	
11.1	Method	visual, comparative
11.2	Observation scale	
	[1] absent	mosaic on young leaf, some leaf malformation
	[9] present	necrosis or only mechanical damage
11.3	Validation of test	on standards
11.4	Off-types	maximum 1 on 20 plants
12.	Interpretation of data in terms of UPOV characteristic states	QL

13.	Critical control points	Monitor and control the presence of thrips. TSWV is transmitted by thrips (*Thrips tabaci* and *Frankliniella occidentalis*.). TSWV has a broad host range. After a few multiplication the virus could be ineffective. New isolates can be obtained from practice by harvesting fruits of L4 pepper varieties infected naturally with TSWV. The fruits are kept at -70°C temperature. The presence of other viruses must be checked before using this material.

Ad. 53: Resistance to *Xanthomonas campestris pv. vesicatoria* (Xcv) Pathotype 1, Pathotype 2, Pathotype 3

1.	Pathogen	*Xanthomonas campestris pv. vesicatoria* (Xcv)
2.	Quarantine status	-
3.	Host species	*Capsicum annuum*
4.	Source of inoculum	natural; to be taken from any source of infection in the field
5.	Isolate	expected reactions on resistant standard varieties
6.	Establishment isolate identity	on differentials

Differential	Pathotype 1	Pathotype 2	Pathotype 3
Early California Wonder	S	S	S
Early California Wonder-10R (gene Bs1)	S	R	S
Early California Wonder-20R (gene Bs2)	R	R	R
Early California Wonder-30R (gene Bs3)	R	S	S
PI 235047 (gene Bs4)	R	S	R

7.	Establishment pathogenicity	-
8.	Multiplication inoculum	
8.1	Multiplication medium	a bacterial growth medium, e.g. LPGA
8.2	Multiplication variety	-
8.3	Plant stage at inoculation	-
8.4	Inoculation medium	-
8.5	Inoculation method	-
8.6	Harvest of inoculum	48h culture
8.7	Check of harvested inoculum	-
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	e.g. 1
9.3	Control varieties	Fehérözön, Yolo Wonder (susceptible), Emiro, Filidor, Gotico, San Marco, Solanor (resistant)
9.4	Test design	-

9.5	Test facility	-
9.6	Temperature	20-26°C day/night
9.7	Light	30.000 lux suggested, 16h/day
9.8	Season	-
9.9	Special measures	80% RH
10.	Inoculation	
10.1	Preparation inoculum	harvest cells from LPGA plate after 48 h growing
10.2	Quantification inoculum	10^7 -10^8 cells per ml (Stronger reaction with the higher concentration.)
10.3	Plant stage at inoculation	6-8 true leaves
10.4	Inoculation method	infiltration into abaxial surface of the interveinal region on either side of the midrib of a fully expanded leaf in 13-20mm diameter spots
10.5	First observation	2-5 days post inoculation
10.6	Second observation	6-8 days post inoculation
10.7	Final observations	10-14 days post inoculation
11.	Observations	
11.1	Method	visual, comparative
11.2	Observation scale	
	[1] absent	water soaking near infiltration site
	[9] present	necrotic reaction at infiltration site
11.3	Validation of test	on standards
11.4	Off-types	maximum 1 on 20 plants
12.	Interpretation of data in terms of UPOV characteristic states	QL
13.	Critical control points	-

9. Literature

GENERAL INFORMATION

Palloix, A., Phaly, T., 1996: Histoire du piment: de la plante sauvage aux variétés modernes, PHM Revue Horticole, FR, no. 365; 41-43

Pochard, E., 1987: Histoire du piment et recherche, INRA Mensuel, FR, no. 29; 5-8

Pochard, E., Palloix, A., Daubeze, A.M., 1992: Le piment, Gallais, A. (ed.), Bannerot, H. (ed.), Amelioration des especes vegetales cultivees. Objectifs et critères de selection 420-434, INRA; Paris, FR

Smilde, W.D. and D. Peters (2007) Pathotyping TSWV in pepper and tomato. In: Niemorowicz-Szczytt, K.

2007: Progress in Research on Capsicum and Eggplant, Eucarpia conference proceedings, Warsaw, pp. 231-236 (http://www.eucarpia.org/03publications/#Abstracts)

Genetic Resources

Daunay, M.C., Jullian, E., Dauphin, F., 2001: Management of eggplant and pepper genetic resources in Europe: networks are emerging, EUCARPIA, European Association for Research on Plant Breeding, Paris, FR, Genetics and breeding of Capsicum and eggplant 11th EUCARPIA Meeting, Antalya, TR, 2001 1-5

Disease Resistance

Caranta, C., Palloix, A., Gébré-Sélassié, K., Marchoux, G., Lefebvre, V., Daubèze, A.M., 1996: Genomic organization of multi-virus resistance factors in pepper (Capsicum annuum): Co-localization between QTLs and major genes. Poster

Lefebvre, V., Caranta, C., Moury, B., Pflieger, S., Daubèze, A.M., Blattes, A., Phaly, T., Nemouchi, G., Palloix, A., 1997: Status of the intraspecific molecular map of pepper: genome distribution of multiple disease resistance loci and defence genes, Sherago International Inc., New York, US, Plant and animal genome V, International Conference on the Status of Plant and Animal Genome Research, San Diego, US, 1997/01/12-16, 115

Pflieger, S., Lefebvre, V., Blattes, A., Caranta, C., Palloix, A., 1998: Candidate gene approach for identifying QTLs involved in pepper/pathogen interactions, EUCARPIA, European Association fo Research on Plant Breeding, Avignon, FR, Genetics and breeding of Capsicum and eggplant, 10th Meeting EUCARPIA, Avignon, FR, 1998/09/07-11, 245-248

Stacey, G. (ed.), Mullin, B. (ed.), Gresshoff, P.M. (ed.), Biology of plant-microbe interactions 8. International Symposium on molecular plant-microbe interactions, Knoxville (USA), 1996/07/12-19, 1 p., International Society for Molecular Plant-Microbe Interactions, Saint-Paul, US

Potyvirus

Parrella, G., Ruffel, S., Moretti, A., Morel, C., Palloix, A., Caranta, C., 2002: Recessive resistance genes against potyviruses are localized in colinear genomic regions of the tomato (Lycopersicon spp.) and pepper (Capsicum spp.) genomes, Theoretical and Applied Genetics, DE, vol. 105; 855-861

Ruffel, S., Dussault, M.H., Palloix, A., Moury, B., Bendahmane, A., Robaglia, C., Caranta, C., 2002: A natural recessive resistance gene against potato virus Y in pepper corresponds to the eukariotic initiation factor 4E (elF4E), Plant Journal, GB, vol. 32 no. 6; 1067-1075

CMV

Caranta, C., Daubèze, A.M., Pflieger, S., Lefebvre, V., Thabuis, A., Blattes, A., Nemouchi, G., Phaly, T., Signoret, P., Palloix, A., 2001: Identification of quantitative trait loci involved in partial restriction of cucumber mosaic virus (CMV) long-distance movement in pepper, EUCARPIA, European Association for Research on Plant Breeding, Paris (FRA), Genetics and breeding of Capsicum and eggplant, 11th EUCARPIA Meeting, Antalya, TR, 2001 176-180

Caranta, C., Palloix, A., Lefebvre, V., Daubèze, A.M., 1997: QTLs for a component of partial resistance to cucumber mosaic virus in pepper: restriction of virus installation in host-cells, Theoretical and Applied Genetics, DE, no. 94; 431-438

Caranta, C., Pflieger, S., Lefebvre, V., Daubèze, A.M., Thabuis, A., Palloix, A., 2002: QTLs involved in the restriction of cucumber mosaic virus (CMV) long-distance movement in pepper, Theoretical and Applied Genetics, DE, vol. 104; 586-591

Phytophthora

Lefèbvre, V., Palloix, A., 1995: Mapping QTL's affecting the resistance to Phytophthora capsici in pepper (Capsicum annuum), Scherago International Inc., New York, US, USDA, United States Department of Agriculture, Agricultural Research Service, Washington, US, International Conference on the Status of Plant Genome Research, Plant Genome 3, San Diego, US, 1995/01/15-19 58, USDA-ARS, Washington, US

Lefebvre, V., Palloix, A., 1996: Both epistatic and additive effects of QTLs are involved in polygenic induced resistance to disease: a case study, the interaction pepper Phytophthora capsici Leonian, Theoretical and Applied Genetics, DE, no. 93; 503-511

Thabuis, A., Palloix, A., Pflieger, S., Daubèze, A.M., Caranta, C., Lefebvre, V., 2003: Comparative mapping of Phytophthora resistance loci in pepper germplasm: evidence for conserved resistance loci across Solanaceae and for a large genetic diversity, Theoretical and Applied Genetics, DE, vol. 106; 1473-1485

Xanthomonas

Márkus, F., Kapitány, J., Csilléry, G. and Szarka, J., 2001 b: *Xanthomonas* resistance In Hungarianspice pepper varieties. Int. Jour. of Hort. Sci., Voil. 7. No. 3-4. 69-72

Szarka, J. and Csilléry, G., 1995: Defence system against *Xanthomonas campestris* pv. *vesicatoria*. Eucarpia IXth Meeting on Genetics and Breeding of Capsicum and Eggplant. Budapest, Hungary, August 21-25. 184-187

TSWV

Moury, B., Pflieger, S., Blattes, A., Lefebvre, V., Palloix, A., 2000: A CAPS marker to assist selection of tomato spotted wilt virus (TSWV) resistance in pepper, Genome, CA, no. 43; 137-142

10. Technical Questionnaire

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

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

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

1. Subject of the Technical Questionnaire

1.1 Botanical name	*Capsicum annuum* L.
1.2 Common Name	Sweet Pepper, Hot Pepper, Paprika, Chili

2. Applicant

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

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

4.1.2 Mutation [ ]
(please state parent variety)

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

4.1.4 Other [ ]
(please provide details)

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]
(b) Cross-pollination [ ]
(c) Hybrid [ ]
(d) Other [ ]
(please provide details)

4.2.2 Other [ ]
(please provide details)

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

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

	Characteristics	Example Varieties	Note
5.1 (1)	**Seedling: anthocyanin coloration of hypocotyl**		
	absent	Albaregia, Albena	1[ ]
	present	Lamuyo	9[ ]
5.2 (4)	**Plant: shortened internode (in upper part)**		
	absent	California wonder, De Cayenne	1[ ]
	present	Fehér, Kalocsai 601, Kalocsai 702	9[ ]
5.3 (19)	**Peduncle: attitude**		
	erect	Fehér, Red Chili	1[ ]
	semi-drooping	Blondy	2[ ]
	drooping	Heldor, Lamuyo	3[ ]
5.4 (21)	**Fruit: color (<u>before</u> maturity)**		
	greenish white	Blanc d'Espagne, Twiggy	1[ ]
	yellow	Fehér, Sweet banana	2[ ]
	green	California wonder, Lamuyo	3[ ]
	purple	Nigra, Violetta	4[ ]

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

	Characteristics	Example Varieties	Note
5.5 (28)	**Fruit: shape in longitudinal section**		
	oblate	Liebesapfel, PAZ szentesi, Topepo rosso	1[ ]
	circular	Cherry Sweet	2[ ]
	cordate	Daniel	3[ ]
	square	Delphin, Yolo Wonder	4[ ]
	rectangular	Clovis, Nocera rosso	5[ ]
	trapezoidal	Delta, Piperade	6[ ]
	moderately triangular	Fehér, Marconi	7[ ]
	narrow triangular	De Cayenne, Demon	8[ ]
	hornshaped	Tauro	9[ ]
5.6 (33)	**Fruit: color (<u>at</u> maturity)**		
	yellow	Golden calwonder, Heldor	1[ ]
	orange	Ariane	2[ ]
	red	Fehér, Lamuyo	3[ ]
	brown	Brupa, Negral	4[ ]
	green	Green6203	5[ ]
5.7 (40)	**Fruit: number of locules**		
	predominantly two	De Cayenne	1[ ]
	equally two and three	Fehér	2[ ]
	predominantly three	Century	3[ ]
	equally three and four	Lamuyo, Sonar	4[ ]
	predominantly four and more	Palio, PAZ szentesi	5[ ]

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

	Characteristics	Example Varieties	Note
5.8 (45)	**Fruit: capsaicin in placenta**		
	absent	Sonar	1[ ]
	present	De Cayenne	9[ ]
5.9(i) (48.1)	**Resistance to Tobamovirus - *Tobacco mosaic virus* Pathotype 0 (TMV: 0)**		
	absent	Lamu, Pepita, Piquillo	1[ ]
	present	Fehérözön, Turia, Yolo Wonder	9[ ]
5.9(ii) (48.2)	**Resistance to Tobamovirus - *Pepper mild mottle virus* Pathotype 1.2 (PMMoV: 1.2)**		
	absent	Fehérözön, Lamu, Turia, Yolo Wonder	1[ ]
	present	Candela, Ferrari, Novi 3, PI152225	9[ ]
5.9(iii) (48.3)	**Resistance to Tobamovirus - *Pepper mild mottle virus* Pathotype 1.2.3 (PMMoV: 1.2.3)**		
	absent	Candela, Ferrari, Yolo Wonder	1[ ]
	present	Bisonte, Friendly, Tom 4	9[ ]
5.10 (49.1)	**Resistance to *Potato Y virus (*PVY) Pathotype 0 (PVY: 0)**		
	absent	Yolo Wonder	1[ ]
	present	Balico, Gerico, Solario	9[ ]
5.11 (52)	**Resistance to *Tomato spotted wilt virus* Pathotype 0 (TSWV: 0)**		
	absent	Lamuyo, Yolo Wonder	1[ ]
	present	Galileo, Jackal, Jackpot, Prior	9[ ]
	not tested		[ ]

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

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 **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Fruit: color after first color change*	*yellow*	*red*

Comments:

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

7.3.1 Resistance to pests and diseases (please specify Pathotypes/strains if possible)

		absent	present	not tested
(a)	Resistance to *Potato Y virus* (PVY)	[ ]	[ ]	[ ]
	(1) Pathotype 1 (char. 49.2)	[ ]	[ ]	[ ]
	(2) Pathotype 1.2 (char. 49.3)	[ ]	[ ]	[ ]
(b)	Resistance to *Phytophthora capsici* (Pc) (char. 50)	[ ]	[ ]	[ ]
(c)	Resistance to *Cucumber mosaic virus* (CMV) (char. 51)	[ ]	[ ]	[ ]
(d)	Resistance to *Xanthomonas campestris pv. vesicatoria* (Xcv)	[ ]	[ ]	[ ]
	(1) Pathotype 1 (char. 53.1)	[ ]	[ ]	[ ]
	(2) Pathotype 2 (char. 53.2)	[ ]	[ ]	[ ]
	(3) Pathotype 3 (char. 53.3)	[ ]	[ ]	[ ]

[#] 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:

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.

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

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”.

……

9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes [ ]

(please provide details as specified by the Authority)

No [ ]

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

Applicant’s name

Signature Date

[End of document]