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OF NEW VARIETIES OF
PLANTS

UNION INTERNATIONALE
POUR LA PROTECTION
DES OBTENTIONS
VÉGÉTALES

INTERNATIONALER
VERBAND ZUM SCHUTZ
VON PFLANZEN-
ZÜCHTUNGEN

UNIÓN INTERNACIONAL
PARA LA PROTECCIÓN
DE LAS OBTENCIONES
VEGETALES

DRAFT

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

TOMATO

(Lycopersicon lycopersicum
(L.) Karsten ex Farw.)

These Guidelines should be read in conjunction with document TG/1/2, which contains explanatory notes on the general principles on which the Guidelines have been established.

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
I. Subject of these Guidelines	3
II. Material Required	3
III. Conduct of Tests	3
IV. Methods and Observations.....	3
V. Grouping of Varieties	4
VI. Characteristics and Symbols	4
VII. Table of Characteristics	5
VIII. Explanations on the Table of Characteristics	23
IX. Literature	39
X. Technical Questionnaire	40

I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Lycopersicon lycopersicum* (L.) Karsten ex Farw. (*Lycopersicon esculentum* P. Mill)

II. Material Required

1. The competent authorities decide when, where and in what quantity and quality the seed required for testing the variety is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must make sure that all customs formalities are complied with. The minimum quantity of plant material to be supplied by the applicant in one or several samples should be:

- (a) vegetatively propagated varieties: 25 plants
- (b) seed propagated varieties: 10 g of seed

The plant material/seed supplied should be visibly healthy, not lacking in vigor or affected by any important pest or disease. The seed should at least meet the minimum requirements for germination capacity, moisture content and purity for marketing seed in the country in which the application is made. The germination capacity should be as high as possible.

2. The plant material must not have undergone any treatment unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

III. Conduct of Tests

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

2. The tests should normally be conducted at one place. If any important characteristics of the variety cannot be seen at that place, the variety may be tested at an additional place.

3. The tests should be carried out under conditions ensuring normal growth. The size of the plots should be such that plants or parts of plants may be removed for measurement and counting without prejudice to the observations which must be made up to the end of the growing period. Each test should include a total of 20 plants in the glasshouse or 40 plants in the open which should be divided between two or more replicates. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions. Varieties stemming from tissue culture should, in addition, be compared to plant material of comparable varieties raised under the same conditions.

4. Additional tests for special purposes may be established.

IV. Methods and Observations

1. Unless otherwise indicated, all observations determined by measurement, weighting or counting should be made on 20 plants or parts taken from each of 20 plants.

2. For the assessment of uniformity, 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, the maximum number of off-types allowed would be 1. In the case of a sample size of 40 plants, the maximum number of off-types allowed would be 2.
3. When resistance characteristics are used for assessing distinctness, uniformity and stability, records must be taken under conditions of controlled infection and, unless otherwise specified, on at least 10 plants.
4. All observations on the leaf should be made before ripening of fruit.

V. Grouping of Varieties

1. The collection of varieties to be grown should be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety. Their various states of expression should be fairly evenly distributed throughout the collection.
2. It is recommended that the competent authorities use the following characteristics for grouping varieties:
 - (a) Plant: growth type (characteristic 2)
 - (b) Leaf: division of blade (characteristic 10)
 - (c) Peduncle: abscission layer (characteristic 21)
 - (d) Fruit: shape in longitudinal section (characteristic 25)
 - (e) Fruit: predominant number of locules (characteristic 34)
 - (f) Fruit: green shoulder (before maturity) (characteristic 35)
 - (g) Fruit: color at maturity (characteristic 39)

VI. Characteristics and Symbols

1. To assess distinctness, uniformity and stability, the characteristics and their states as given in the Table of Characteristics should be used.
2. Notes (numbers), for the purposes of electronic data processing, are given opposite the states of the different characteristics.
3. Legend:
 - (*) Characteristics that should be used on all varieties in every growing period over which the examinations are made and always be included in the variety descriptions, except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible.
 - (+) See Explanations on the Table of Characteristics in Chapter VIII.

VII. Table of Characteristics/Tableau des caractères/Merkmalestabelle/Tabla de caracteres

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. (* (*)	Seedling: anthocyanin coloration of hypocotyl	Plantule: pigmentation anthocyanique de l'hypocotyle	Keimpflanze: Anthocyanfärbung des Hypocotyls	Plántula: pigmentación antociánica del hipocotilo		
	absent	absente	fehlend	ausente		1
	present	présente	vorhanden	presente	Montfavet H 63.4	9
2. (* (+)	Plant: growth type	Plante: type de croissance	Pflanze: Wuchstyp	Planta: hábito de crecimiento		
	determinate	déterminé	begrenzt wachsend	determinado	Campbell 1327, Prisca	1
	semi-determinate	semi-déterminé	halb begrenzt wachsend	semideterminado	Marmande VR	2
	indeterminate	indéterminé	unbegrenzt wachsend	indeterminado	Saint-Pierre	3
3.	<u>Only determinate growth type varieties: Plant: number of inflorescences on main stem (side shoots to be removed)</u>	<u>Seulement variétés à type de croissance déterminé: Plante: nombre de nœuds sur la tige principale (bourgeons axillaires à éliminer)</u>	<u>Nur begrenzt wachsende Sorten: Pflanze: Anzahl der Knoten am Haupttrieb (Seitentriebe sind zu entfernen)</u>	<u>Sólo para variedades determinadas: Planta: número de inflorescencias (eliminar ramas laterales)</u>		
	few	petit	gering	bajo	Campbell 1327	3
	medium	moyen	mittel	medio	Montfavet H 63.4	5
	many	grand	groß	alto	Prisca	7

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
4.1	<u>Only semi-determinate and indeterminate growth type varieties:</u> Plant: speed of growth (when fastest variety reached at least 1.5 m height)	<u>Seulement variétés à types de croissance semi-déterminé et indé-</u> terminé: Plante: vitesse de croissance (quand la variété à croissance la plus rapide atteint au moins 1,5 m de hauteur)	<u>Nur halb begrenzt wachsende oder unbegrenzt wachsende Sorten:</u> Pflanze: Wuchsgeschwindigkeit (wenn schnellste Sorte mindestens 1,5 m Höhe erreicht hat)	<u>Sólo variedades semi-determinadas e indeterminadas:</u> Planta: velocidad de crecimiento (cuando la variedad más rápida alcanzó al menos 1,5m de altura)		
	slow	lente	langsam	lenta	Colombo, Dombello, Dombito	3
	medium	moyenne	mittel	media	Bandor, Blizzard, Furiak	5
	fast	rapide	schnell	rápida	Favorset, Fignon, Goldstar	7
4.2	<u>Only determinate varieties:</u> Plant: speed of growth	<u>Seulement variétés à type de croissance déterminé:</u> Plante: vitesse de croissance	<u>Nur begrenzt wachsende Sorten:</u> Pflanze: Wuchsgeschwindigkeit	<u>Sólo variedades determinados:</u> Planta: velocidad de crecimiento		
	slow	lente	langsam	lenta	Duke	3
	medium	moyenne	mittel	media	Luxor	5
	fast	rapide	schnell	rápida	Tesar	7
5. (*)	Stem: anthocyanin coloration of upper third	Tige: pigmentation anthocyanique du tiers supérieur	Stengel: Anthocyanfärbung des oberen Drittels	Tallo: pigmentación anthociánica del tercio superior		
	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil	Montfavet H 63.5	3
	medium	moyenne	mittel	media	Rondello	5
	strong	forte	stark	fuerte	Grinta, Nemato	7
	very strong	très forte	sehr stark	muy fuerte		9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	<u>Only indeterminate varieties:</u> Stem: length of internode (between 1st and 4th inflorescence)	<u>Seulement variétés à type de croissance indéterminé:</u> Tige: longueur de l'entrenœud entre la 1 ^{ère} et la 4 ^e inflorescence	<u>Nur unbegrenzt wachsende Sorten:</u> Stengel: Internodienlänge (zwischen dem 1. und dem 4. Blütenstand)	<u>Sólo variedades indeterminados:</u> Tallo: longitud del entrenudo (entre la 1 ^{er} y 4 ^a inflorescencia)		
	short	court	kurz	corta	Trend, Dombito, Manific, Paso	3
	medium	moyen	mittel	media	Montfavet H 63.5	5
	long	long	lang	larga	Berdy, Calimero	7
7. (*)	Leaf: attitude (in middle third of plant)	Feuille: port (au tiers moyen de la plante)	Blatt: Stellung (im mittleren Drittel der Pflanze)	Hoja: porte (en el tercio medio de la planta)		
	semi-erect	demi-dressé	halbaufrecht	semierecto	Allround, Drakar, Vitador	3
	horizontal	horizontal	waagrecht	horizontal	Triton, Aromata	5
	semi-drooping	demi-retombant	halbüberhängend	semicolgante	Montfavet H 63.5	7
8. (*)	Leaf: length	Feuille: longueur	Blatt: Länge	Hoja: longitud		
	short	courte	kurz	corta	Nelson, Red Robin, Tiny Tim	3
	medium	moyenne	mittel	media	Lorena	5
	long	longue	lang	larga	Montfavet H 63.5	7
9. (*)	Leaf: width	Feuille: largeur	Blatt: Breite	Hoja: anchura		
	narrow	étroite	schmal	estrecho	Marmande VR, Tiny Tim, Red Robin	3
	medium	moyenne	mittel	medio		5
	broad	large	breit	ancho	Saint-Pierre	7
10. (*)	Leaf: division of blade	Feuille: division du limbe	Blatt: Fiederung	Hoja: división del limbo		
	pinnate	penné	gefiedert	pinnada	Pilot, Red Jacket, Mikado	1

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
	bipinnate	bipenné	doppelt gefiedert	bipinnada	Lukullus, Saint-Pierre	2
11.	Leaf: size of leaflets (in middle of leaf)	Feuille: taille des folioles (au centre de la feuille)	Blatt: Größe des Blättchens (in der Blattmitte)	Hoja: tamaño de los folioles (en el medio de la hoja)		
	very small	très petits	sehr klein	muy pequeña	Minitom	1
	small	petits	klein	pequeña	Tiny Tim	3
	medium	moyens	mittel	media	Marmande VR, Royesta	5
	large	grands	groß	grande	Daniela, Hynema	7
	very large	très grands	sehr groß	muy grande	Dombo	9
12.	Leaf: intensity of green color	Feuille: intensité de la couleur verte	Blatt: Intensität der Grünfärbung	Hoja: intensidad del color verde		
	light	claire	hell	claro	Macero II, Rossol, Poncette	3
	medium	moyenne	mittel	medio	Lucy	5
	dark	foncée	dunkel	oscuro	Allround, Lorena, Red Robin, Daniela	7
13.	Leaf: glossiness (as for 7)	Feuille: brillance (comme pour 7)	Blatt: Glanz (wie unter 7)	Hoja: brillo (como en 7)		
	weak	faible	gering	débil	Daniela	3
	medium	moyenne	mittel	media	Marmande VR	5
	strong	forte	stark	fuerte	Guindilla	7
14.	Leaf: blistering (as for 7)	Feuille: cloqûre (comme pour 7)	Blatt: Blasigkeit (wie unter 7)	Hoja: abullonado (como en 7)		
	weak	faible	gering	débil	Daniela	3
	medium	moyenne	mittel	media	Marmande VR	5
	strong	forte	stark	fuerte	Delfine, Tiny Tim	7
15.	Leaf: size of blisters (as for 7)	Feuille: taille des cloques	Blatt: Größe der Blasen	Hoja: tamaño de las ondulaciones		
	small	petites	klein	pequeño	Husky Cherrie Red	3
	medium	moyennes	mittel	medio	Marmande VR	5
	large	grandes	groß	grande	Daniela, Egéris	7

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16.	Leaf: attitude of leaflets in relation to main axis (as for 7)	Feuille: port des folioles par rapport à l'axe central (comme pour 7)	Blatt: Stellung der Seitenfieder im Verhältnis zur Hauptachse (wie unter 7)	Hoja: porte de los foliolos en relación con el eje principal (como para 7)		
	semi-erect	demi-dressé	halbaufrecht	semierecto	Blizzard, Marmande VR	3
	horizontal	horizontal	waagrecht	horizontal	Sonatine	5
	semi-drooping	demi-retombant	halbüberhängend	semicolgante	Montfavet H63.5	7
17. (*)	Inflorescence: type (2nd and 3rd truss)	Inflorescence: type (2^e et 3^e cymes)	Blütenstand: Typ (2. und 3. Blütenstand)	Inflorescencia: tipo (2^o y 3^{er} racimo)		
	mainly uniparous	principalement unipare	hauptsächlich nur einen Ast treibend	principalmente unipara	Dynamo	1
	partly uniparous, partly multiparous	partiellement unipare, partiellement multipare	teilweise nur einen Ast treibend, teilweise mehrere Äste treibend	parcialmente unipara, parcialmente multipara	Harzfeuer	2
	mainly multiparous	principalement multipare	hauptsächlich mehrere Äste treibend	principalmente multipara	Marmande VR	3
18.	Flower: fasciation (1st flower of inflorescences)	Fleur: fasciation (1^{ère} fleur des inflorescences)	Blüte: Verbänderung (1. Blüte der Blütenstände)	Flor: fasciación (1^o flor de las inflorescencias)		
	absent	absente	fehlend	ausente	Monalbo, Moneymaker	1
	present	présente	vorhanden	presente	Marmande VR	9
19.	Flower: pubescence of style	Fleur: pilosité du style	Blüte: Behaarung des Griffels	Flor: pubescencia del estilo		
	absent	absente	fehlend	ausente	Campbell 1327	1
	present	présente	vorhanden	presente	Saint-Pierre	9
20. (*)	Flower: color	Fleur: couleur	Blüte: Farbe	Flor: color		
	yellow	jaune	gelb	amarillo	Marmande VR	1
	orange	orange	orange	naranja	Pericherry	2

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21. (*)	Peduncle: abscission layer	Pédoncule: assise d'abscission	Blütenstandstiel: Bruchstelle	Pedúnculo:		
	absent	absente	fehlend	ausente	Aledo, Bandera, Count, Lerica	1
	present	présente	vorhanden	presente	Montfavet H 63.5, Roma	9
22. (*)	Pedicel: length (from abscission layer to calyx)	Pédoncule: longueur (du point d'abscission au calice)	Blütenstandstiel: Länge (von der Bruchstelle bis zum Kelch)	Pedúnculo: longitud (desde la zona de abscisión hasta el cáliz)		
	short	court	kurz	corta	Cerise, Montfavet H 63.18, Rossol, Ferline	3
	medium	moyen	mittel	media	Dario, Primosol	5
	long	long	lang	larga	Erlidor, Ramy, Ranco	7
23. (*)	Fruit: size	Fruit: taille	Frucht: Größe	Fruto: tamaño		
	very small	très petit	sehr klein	muy pequeño	Cerise, Sweet 100	1
	small	petit	klein	pequeño	Early Mech, Europeel, Roma	3
	medium	moyen	mittel	medio	Alphamech, Diego	5
	large	grand	groß	grande	Carmello, Ringo	7
	very large	très grand	sehr groß	muy grande	Erlidor, Lydia, Muril	9
24. (*)	Fruit: ratio length/diameter	Fruit: rapport longueur/diamètre	Frucht: Verhältnis Länge/Breite	Fruto: relación longitud/diámetro		
	very small	très petit	sehr klein	muy pequeña	Campbell 28, Marmande VR	1
	small	petit	klein	pequeña	Alicia	3
	medium	moyen	mittel	media	Early Mech, Peto Gro	5
	large	grand	groß	grande	Rio Grande, Rimone	7
	very large	très grand	sehr groß	muy grande	Macero II, Elko	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25. (* (+)	Fruit: shape in longitudinal section	Fruit: forme en section longitudinale	Frucht: Form im Längsschnitt	Fruto: forma en sección longitudinal		
	flattened	aplatie	abgeflacht	aplanada	Campbell 28, Marmande	1
	slightly flattened	légèrement aplatie	leicht abgeflacht	ligeramente aplanada	Montfavet H 63.5, Montfavet H 63.4	2
	round	arrondie	rund	redonda	Cerise Moneymaker	3
	rectangular	rectangulaire	rechteckig	rectangular	Early Mech, Peto Gro	4
	cylindrical	cyindrique	zylindrisch	cilíndrica	Hypeel 244, Macero II, San Marzano 2	5
	heart-shaped	cordiforme	herzförmig	cordiforme	Valenciano	6
	obovoid	obovoïde	verkehrt eiförmig	oboval	Barbara	7
	ovoid	ovoïde	eiförmig	ovoidal	Rimone, Rio Grande	8
pear-shaped	forme de poire	birnförmig	forma de pera	Europeel	9	
26. (*	Fruit: ribbing at peduncle end	Fruit: cannelures à l'attache pédonculaire	Frucht: Rippung am Stielende	Fruto: acostillado en la zona pedúncular		
	absent or very weak	absentes ou très faibles	fehlend oder sehr gering	ausente o muy débil	Calimero, Cerise	1
	weak	faibles	gering	débil	Early Mech, Hypeel 244, Melody, Peto Gro, Rio Grande	3
	medium	moyennes	mittel	media	Montfavet H 63.4, Montfavet H 63.5	5
	strong	fortes	stark	fuerte	Campbell 1327, Carmello, Count	7
very strong	très fortes	sehr stark	muy fuerte	Costeluto firentino, Marmande VR	9	
27.	Fruit: cross section	Fruit: section transversale	Frucht: Querschnitt	Fruto: sección transversal		
	not round	non arrondie	nicht rund	no redonda	Ranco, San Marzano	1
	round	arrondie	rund	redonda	Cerise, Ferline, Rondello	2

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
28.	Fruit: depression at peduncle end	Fruit: dépression à l'attache pédon- culaire	Frucht: Einsen- kung am Stielende	Fruto: depreciación en la zona pedúncular		
(+)	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Europeel, Heinz 1706, Rossol, Sweet Baby	1
	weak	faible	gering	débil	Futura, Melody	3
	medium	moyenne	mittel	media	Carmello, Count, Fandango, Saint-Pierre	5
	strong	forte	stark	fuerte	Ballon Rouge, Marmande VR	7
	very strong	très forte	sehr stark	muy fuerte		9
29.	Fruit: size of pe- duncle scar	Fruit: taille de l'attache pédon- culaire	Frucht: Größe des Stielansatzes	Fruto: tamaño de la cicatriz pedúncular		
	very small	très petite	sehr klein	muy pequeña	Cerise, Heinz 1706, Sweet Baby	1
	small	petite	klein	pequeña	Early Mech, Peto Gro, Rio Grande	3
	medium	moyenne	mittel	media	Montfavel H 63 4, Montfavel H 63 5	5
	large	grande	groß	grande	Apla, Campbell 1327, Carmello, Fandango, Flora Dade	7
	very large	très grande	sehr groß	muy grande	Marmande VR	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
30.	Fruit: size of blossom scar	Fruit: taille de l'attache pistillaire	Frucht: Größe des Blütenansatzes	Fruto: tamaño de la cicatriz pistilar		
	very small	très petite	sehr klein	muy pequeña	Cerise, Early Mech, Europeel, Heinz 1706, Peto Gro, Rio Grande	1
	small	petite	klein	pequeña	Montfavet H 63.4, Montfavet H 63.5	3
	medium	moyenne	mittel	media	Alphamech, Apla, Carmello, Floradade	5
	large	grande	groß	grande	Campbell 1327, Count, Marmande VR, Saint-Pierre	7
	very large	très grande	sehr groß	muy grande		9
31. (* (+)	Fruit: shape at blossom end	Fruit: forme au sommet	Frucht: Form am Blütenende	Fruto: forma del extremo distal		
	indented	déprimée	eingesenkt	hundida	Marmande VR, Super Mech	1
	indented to flat	déprimée à aplatie	eingesenkt bis flach	hundida a	plana	2
	flat	aplatie	flach	plana	Montfavet H 63.4, Montfavet H 63.5	3
	flat to pointed	aplatie à pointue	flach bis spitz	plana a puntiaguda	Cal J, Early Mech, Peto Gro	4
	pointed	pointue	spitz	puntiaguda	Europeel, Heinz 1706, Hypeel 244, Roma VF	5

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
32. (+)	Fruit: size of core in cross section (in relation to total diameter)	Fruit: taille du cœur en coupe transversale (par rapport au diamètre)	Frucht: Herzgröße im Querschnitt (im Verhältnis zum Durchmesser)	Fruto: tamaño del corazón en corte transversal (en relación al diámetro total)		
	very small	très petit	sehr klein	muy pequeño	Cerise	1
	small	petit	klein	pequeño	Early Mech, Europee, Heinz 1706, Peto Gro, Rio Grande, Rossol	3
	medium	moyen	mittel	medio	Montfavet H 63.4, Monfavet H 63.5	5
	large	grand	groß	grande	Apla, Campbell 1327, Carmello, Count, Fandango, Flora Dade	7
very large	très grand	sehr groß	muy grande	Marmande VR	9	
33. (*)	Fruit: thickness of pericarp	Fruit: épaisseur du péricarpe	Frucht: Dicke des Perikarps	Fruto: espesor del pericarpio		
	thin	mince	dünn	delgado	Marmande VR	3
	medium	moyen	mittel	medio	Carmello, Europeel, Floradade, Heinz 1706, Montfavet H 63.5	5
thick	épais	dick	grueso	Cal J, Ferline, Peto Gro, Rio Grande, Daniela	7	
34. (*)	Fruit: predominant number of locules	Fruit: nombre prédominant de loges	Frucht: überwiegende Anzahl Kammern	Fruto: número predominante de lóculos		
	only two	seulement deux	nur zwei	sólo dos	Early Mech, Europeel, San Marzano	1
	two or three	deux ou trois	zwei oder drei	dos o tres	Alphamech, Futuria	2
	three or four	trois ou quatre	drei oder vier	tres o cuatro	Montfavet H 63.5	3
	four, five or six	quatre, cinq ou six	vier, fünf oder sieben	cuatro, cinco o seis	Carmello	4
more than six	plus que six	mehr als sechs	màs que seis	Marmande VR	5	

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35. (*)	Fruit: green shoulder (before maturity)	Fruit : collet vert (avant maturité)	Frucht: Flammung (vor der Reife)	Fruto: hombro verde (antes de madurez)		
	absent	absent	fehlend	ausente	Rio Grande, Felicia, Trust	1
	present	présent	vorhanden	presente	Montfavet H 63.5, Daniela	9
36. (*)	Fruit: extent of green shoulder (as for 35)	Fruit: taille du collet vert (comme pour 35)	Frucht: Größe der Flammung (wie unter 35)	Fruto: tamaño del hombro verde (como en 35)		
	small	petit	klein	pequeña	Cristy, Firestone	3
	medium	moyen	mittel	media	Erlidor, Foxy, Montfavet H 63.5	5
	large	grand	groß	grande	Cobra, Delisa, Epona, Manific	7
37. (*)	Fruit: intensity of green color of shoulder (as for 35)	Fruit: intensité de la couleur verte du collet (comme pour 35)	Frucht: Intensität der Grünfärbung der Flammung (wie unter 35)	Fruto: intensidad del color verde del hombro (como en 35)		
	light	claire	hell	claro	Juboline	3
	medium	moyenne	mittel	medio	Montfavet H 63.5	5
	dark	foncée	dunkel	oscuro	Erlidor, Xenon, Ayala	7
38. (*)	Fruit: intensity of green color <u>before</u> maturity	Fruit: intensité de la couleur verte <u>avant</u> maturité	Frucht: Intensität der Grünfärbung <u>vor</u> der Reife	Fruto: intensidad del color verde <u>antes</u> de madurez		
	light	claire	hell	claro	Capello, Duranto, Trust	3
	medium	moyenne	mittel	medio	Rody	5
	dark	foncée	dunkel	oscuro	Ayala, Tatiana, Uragano	7

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
39. (*)	Fruit: color at maturity	Fruit: couleur à maturité	Frucht: Farbe zur Reife	Fruto: color a la madurez		
	cream	crème	cremefarben	crema	Jazon, White Mirabell	1
	yellow	jaune	gelb	amarillo	Goldene Königin, Yellow Pear	2
	orange	orange	orange	naranja	Sungold	3
	pink	rose	rosa	rosa	House Momotaro	4
	red	rouge	rot	rojo	Ferline, Montfavet H 63.5, Daniela	5
	brown	marron	braun	braun	Marrón	6
40. (*)	Fruit: color of flesh (time as for 39)	Fruit: couleur de la chair (même époque qu'au 39)	Frucht: Fleischfarbe (Zeitpunkt wie unter 39)	Fruto: color de la pulpa (época como en 39)		
	cream	crème	cremefarben	crema	Jazon	1
	yellow	jaune	gelb	amarillo	Jubilée	2
	orange	orange	orange	naranja	Sungold	3
	pink	rose	rosa	rosa	Regina	4
	red	rouge	rot	rojo	Ferline, Saint-Pierre	5
	brown	marron	braun	braun	Ozyrys	6
41. (*) (+)	Fruit: firmness	Fruit: fermeté	Frucht: Festigkeit	Fruto: firmeza		
	very soft	très mou	sehr weich	muy blanda	Marmande VR	1
	soft	mou	weich	blanda	Trend	3
	medium	moyen	mittel	media	Cristina	5
	firm	ferme	fest	firme	Tradiro, Fernova, Konsul	7
	very firm	très ferme	sehr fest	muy firme	Karat, Lolek	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
42. (+)	Fruit: shelf-life	Fruit: durée de vie sur l'étalage	Frucht: Lebensdauer auf dem Regal	Fruto: vida de estanteria		
	very short	très courte	sehr kurz	muy corta	Marmande VR	1
	short	courte	kurz	corta	Rambo	3
	medium	moyenne	mittel	media	Durinta	5
	long	longue	lang	larga	Daniela	7
	very long	très longue	sehr lang	muy larga	Ernesto	9
43. (+)	Time of flowering	Époque de floraison	Zeitpunkt der Blüte	Época de floración		
	early	précoce	früh	precoz	Feria, Primabel	3
	medium	moyenne	mittel	media	Montfavet H 63.5, Prisca	5
	late	tardive	spät	tardía	Manific, Saint-Pierre	7
44. (*)	Time of maturity	Époque de maturité	Reifezeit	Época de madurez		
	very early	très précoce	sehr früh	muy precoz	Sungold, Sweet Baby, Dolcevida	1
	early	précoce	früh	precoz	Feria, Rossol	3
	medium	moyenne	mittel	medio	Montfavet H 63.5	5
	late	tardive	spät	tardía	Manific, Saint-Pierre	7
	very late	très tardive	sehr spät	muy tardía	Daniela	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
45.	Fruit; dry matter content (as for 39)	Fruit: teneur en matière sèche (même époque qu'au 39)	Frucht: Trocken- substanzgehalt (wie unter 39)	Fruto: contenido de materia seca (como en 39)		
	low	faible	niedrig	bajo	Bonset	3
	medium	moyenne	mittel	medio		5
	high	forte	hoch	alto	Coudoulet, Aloha	7
46. (+)	Sensitivity to expression of silvering	Sensibilité à l'expression d'argenture	Empfindlichkeit gegen Silberblatt- ausprägung	Sensibilidad a expresión argétea		
	insensitive	insensible	unempfindlich	insensible	Sonatine	1
	sensitive	sensible	empfindlich	sensible	Marathon, Sano	9
47. (+)	Resistance to <u>Meloidogyne incognita</u>	Résistance au <u>Meloidogyne incognita</u>	Resistenz gegen <u>Meloidogyne incognita</u>	Resistencia a <u>Meloidogyne incognita</u>		
	absent	absente	fehlend	ausente	Casaque Rouge, Clairvil	1
	present	présente	vorhanden	presente	Anabel, Anahu	9
48. (* (+)	Resistance to <u>Verticillium</u>	Résistance au <u>Verticillium</u>	Resistenz gegen <u>Verticillium</u>	Resistencia a <u>Verticillium</u>		
	- Race 0	- Race 0	- Pathotyp 0	- Raza 0		
	absent	absente	fehlend	ausente	Anabel, Marmande verte	1
	present	présente	vorhanden	presente	Clairvil, Marmande VR	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
49. (+)	Resistance to <u>Fusarium</u> <u>oxysporum f. sp.</u> <u>lycopersici</u>	Résistance au <u>Fusarium</u> <u>oxysporum f. sp.</u> <u>lycopersici</u>	Resistenz gegen <u>Fusarium</u> <u>oxysporum f. sp.</u> <u>lycopersici</u>	Resistencia a <u>Fusarium</u> <u>oxysporum f. sp.</u> <u>lycopersici</u>		
49.1 (*)	- Race 0	- Race 0	- Pathotyp 0	- Raza 0		
	absent	absente	fehlend	ausente	Marmande verte	1
	present	présente	vorhanden	presente	Anabel, Marporum, Marsol	9
49.2 (*)	- Race 1	- Race 1	- Pathotyp 1	- Raza 1		
	absent	absente	fehlend	ausente	Marmande verte	1
	present	présente	vorhanden	presente	Motelle, Walter	9
50. (+)	Resistance to <u>Fusarium</u> <u>oxysporum f. sp.</u> <u>radicis lycopersici</u>	Résistance au <u>Fusarium</u> <u>oxysporum f. sp.</u> <u>radicis lycopersici</u>	Resistenz gegen <u>Fusarium</u> <u>oxysporum f. sp.</u> <u>radicis lycopersici</u>	Resistencia a <u>Fusarium</u> <u>oxysporum f. sp.</u> <u>radicis lycopersici</u>		
	absent	absente	fehlend	ausente	Motelle	1
	present	présente	vorhanden	presente	Momor	9
51. (+)	Resistance to <u>Cladosporium</u> <u>fulvum</u>	Résistance au <u>Cladosporium</u> <u>fulvum</u>	Resistenz gegen <u>Cladosporium</u> <u>fulvum</u>	Resistencia a <u>Cladosporium</u> <u>fulvum</u>		
51.1	- Race 0	- Race 0	- Pathotyp 0	- Raza 0		
	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Angela, Estrella, Sonatine, Sonato, Vemone	9
51.2	- Group A	- Groupe A	- Gruppe A	- Grupo A		
	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Angela, Estrella, Sonatine, Sonato	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
51.3	- Group B	- Groupe B	- Gruppe B	- Grupo B		
	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Angela, Estrella, Sonatine, Sonato, Vemone	9
51.4	- Group C	- Groupe C	- Gruppe C	- Grupo C		
	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Angela, Estrella, Sonatine,	9
51.5	- Group D	- Groupe D	- Gruppe D	- Grupo D		
	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Estrella, Sonatine, Vemone	9
51.6	- Group E	- Groupe E	- Gruppe E	- Grupo E		
	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Sonatine	9
52.	<u>Resistance to Tobacco Mosaic Virus</u>	<u>Résistance au virus de la mosaïque du tabac</u>	<u>Resistenz gegen das Tabakmosaikvirus</u>	<u>Resistencia al virus del mosaico del tabaco</u>		
52.1	- Strain 0	- Souche 0	- Pathotyp 0	- Cepa 0		
(*)	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Mobaci, Mocimor, Moperou	9
52.2	- Strain 1	- Souche 1	- Pathotyp 1	- Cepa 1		
(*)	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Mocimor, Moperou	9
52.3	- Strain 2	- Souche 2	- Pathotyp 2	- Cepa 2		
(*)	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Mobaci, Mocimor	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
53. (+)	<u>Resistance to <i>Phytophthora infestans</i></u>	<u>Résistance au <i>Phytophthora infestans</i></u>	<u>Resistenz gegen <i>Phytophthora infestans</i></u>	<u>Resistencia a <i>Phytophthora infestans</i></u>		
	absent	absente	fehlend	ausente	Heinz 1706, Saint Pierre	1
	present	présente	vorhanden	presente	Heline, Pieraline, Pyros	9
54. (+)	<u>Resistance to <i>Pyrenochaeta lycopersici</i></u>	<u>Résistance au <i>Pyrenochaeta lycopersici</i></u>	<u>Resistenz gegen <i>Pyrenochaeta lycopersici</i></u>	<u>Resistencia a <i>Pyrenochaeta lycopersici</i></u>		
	absent	absente	fehlend	ausente	Montfavet H 63.5	1
	present	présente	vorhanden	presente	Kyndia, Moboglan, Pyrella	9
55. (+)	<u>Resistance to <i>Stemphylium</i> spp.</u>	<u>Résistance au <i>Stemphylium</i> spp</u>	<u>Resistenz gegen <i>Stemphylium</i> spp</u>	<u>Resistencia a <i>Stemphylium</i> spp</u>		
	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Motelle	9
56. (+)	<u>Resistance to <i>Pseudomonas syringae</i> pv. <i>tomato</i></u>	<u>Résistance au <i>Pseudomonas syringae</i> pv. <i>tomato</i></u>	<u>Resistenz gegen <i>Pseudomonas syringae</i> pv. <i>tomato</i></u>	<u>Resistencia a <i>Pseudomonas syringae</i> pv. <i>tomato</i></u>		
	absent	absente	fehlend	ausente	Monalbo	1
	present	présente	vorhanden	presente	Ontario 7710	9
57. (+)	<u>Resistance to <i>Pseudomonas syringae</i> pv. <i>solanacearum</i> - race 1</u>	<u>Résistance au <i>Pseudomonas syringae</i> pv. <i>solanacearum</i> - race 1</u>	<u>Resistenz gegen <i>Pseudomonas syringae</i> pv. <i>solanacearum</i> – Pathotyp 1</u>	<u>Resistencia a <i>Pseudomonas syringae</i> pv. <i>solanacearum</i> - Raza 1</u>		
	absent	absente	fehlend	ausente	Floradel	1
	present	présente	vorhanden	presente	Caraïbo	9
58. (+)	<u>Resistance to <i>Tomato Yellow Leaf Curl Virus</i></u>	<u>Résistance au <i>virus des feuilles jaunes en cuillères de la tomate</i></u>	<u>Resistenz gegen <i>gelbes Tomatenblattrollvirus</i></u>	<u>Resistencia a <i>virus de la hoja encuchara</i></u>		
	absent	absente	fehlend	ausente	Montfavet H 63.5	1
	present	présente	vorhanden	presente	TY 20	9

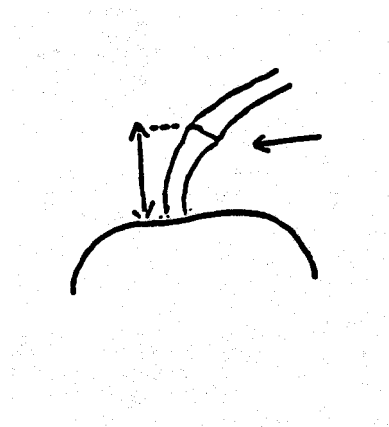
Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
59. (+)	<u>Resistance to Tomato Spotted Wilt Virus</u>	<u>Résistance au Tomato Spotted Wilt Virus</u>	<u>Resistenz gegen das gefleckte Tomatenwelke- virus</u>	<u>Resistencia a <u>virus</u> de la peste negra</u>		
	absent	absente	fehlend	ausente	Montfavet H 63.5	1
	present	présente	vorhanden	presente	Lisboa	9
60. (+)	<u>Resistance to <i>Leveillula taurica</i></u>	<u>Résistance au <i>Leveillula taurica</i></u>	<u>Resistenz gegen <i>Leveillula taurica</i></u>	<u>Resistencia a <i>Leveillula taurica</i></u>		
	absent	absente	fehlend	ausente	Montfavet H 63.5	1
	present	présente	vorhanden	presente	Atlanta	9
61. (+)	<u>Resistance to <i>Oidium</i> <i>lycopersicum</i></u>	<u>Résistance au <i>Oidium</i> <i>lycopersicum</i></u>	<u>Resistenz gegen <i>Oidium</i> <i>lycopersicum</i></u>	<u>Resistencia a <i>Oidium</i> <i>lycopersicum</i></u>		
	absent	absente	fehlend	ausente	Montfavet H 63.5	1
	present	présente	vorhanden	presente	Romiro	9

VIII. Explanations on the Table of Characteristics

Ad. 2: Plant: growth type

[explanation to be provided]

Ad. 22: Pedicel: length (from abscission layer to calyx)



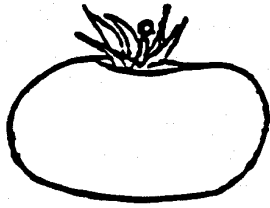
abscission layer
 point d'abscission
 Bruchstelle

short	3	7-9 mm
medium	5	9-14 mm
long	7	14-18 mm

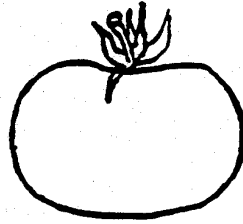
Ad. 21: Fruit: ratio length/diameter

very small	1	0.6
small	3	0.85
medium	5	1.0
large	7	1.15
very large	9	1.5

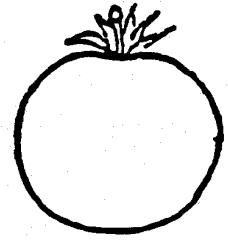
Ad. 25: Fruit: shape in longitudinal section



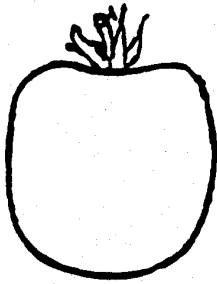
1
flattened



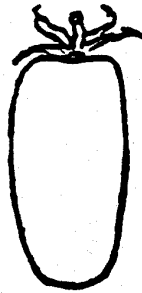
2
slightly flattened



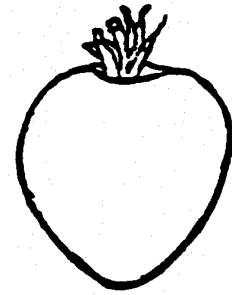
3
round



4
rectangular



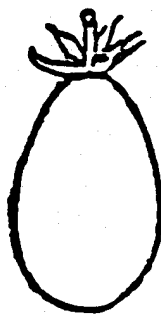
5
cylindrical



6
heart shaped



7
obovoid



8
ovoide



9
pear-shaped

Ad. 28: Fruit: depression at peduncle end

[drawings to be prepared]

1	3	5	7	9
absent or very weak	weak	medium	strong	very strong

Ad. 31: Fruit: shape at blossom end

[drawings to be prepared]

1	2	3	4	5
indented	indented to flat	flat	flat to pointed	pointed

Ad. 41: Fruit: firmness

Method

Harvesting stage: fruits should be harvested when they are completely colored.

Determining firmness: determine by hand the firmness of the fruits compared to the standard varieties.

Ad. 42: Fruit: shelf-life

[Explanation to be prepared]

Ad. 46: Sensitivity to expression of silvering

Method

<u>Evaluation:</u>	Evaluation is done on fullgrown plants
<u>Execution of test:</u>	As silvering only occurs under specific growing conditions, these conditions have to be present during growth.
Sowing:	under short day conditions (November/December in Northern Europe). Normal planting in the soil or on an artificial medium in the greenhouse
Temperature:	day temperature maximum 18°C
Light:	normal daylight
Growing method:	no special method necessary
<u>Duration of test:</u>	4 - 5 months
<u>Number of plants tested:</u>	minimum of 20
<u>Observation of the expression:</u>	A visual survey has to be made on the presence of leaves that show signs of silvering
<u>Standard varieties:</u>	expression absent: Marathon, Sano expression present: Sonatine

Ad 47: Resistance to *Meloidogyne incognita*

Method

Maintenance of strain

Type of medium: on roots of susceptible varieties (grown in the glass-house)

Special conditions: avoid rotting of roots

Execution of test

Temperature: Not over 28° C

Growing method: in the glasshouse

Method of inoculation: dishes are inoculated with eggs (totally or on sowing lines)

Duration of test

- from sowing to inoculation: inoculation before sowing
- from inoculation to reading: 30 to 45 days

Number of plants tested: 10 to 20

Remarks: avoid rotting of roots avoid high temperature on hybrid varieties
heterozygot varieties can have a slightly lower level of expression in the test

Standard varieties: susceptible: CLAIRVIL, CASAQUE ROUGE
resistant : ANABEL, ANAHU, F1 "ANAHU x MONALBO"

Ad 48: Resistance to Verticillium race 0

Method

Maintenance of races

Type of medium: on agar medium
Special conditions: transplantation of races each month

Execution of test

Growth stage of plants: cotyledons expanded
Temperature: day: 22° C, night: 16 - 18° C
Light: 10 hours
Growing method: in the glasshouse, under high humidity
Method of inoculation: soaking of root system in liquid medium of fungi,
after cutting radicles, thereafter replanting

Duration of test

- from sowing to inoculation: 15 to 20 days
- from inoculation to reading: 25 to 30 days

Number of plants tested: 10 to 20 plants

Remarks: reading: control presence of Verticillium by external symptoms and inside vessels.
heterozygot varieties can show symptoms of a slightly lower level of expression

Standard varieties: susceptible: ANABEL, MARMANDE Verte
resistant : CLAIRVIL - MARMANDE VR,
F1 "MARMANDE Verte x MARMANDE VR"

Ad. 49.1 + 49.2:Resistance to Fusarium oxysporum f. sp. lycopersici race 0 (ex 1) and race 1 (ex 2)

Method

Maintenance of races

Type of medium: on agar medium
Special conditions: 22 - 25° C, transplantation of races each month

Execution of test

Growth stage of plants: cotyledons expanded
Temperature: day: 28° C, night: 25° C
Light: 12 hours
Growing method: under high humidity, in the glasshouse or climatic room
Method of inoculation: soaking of roots, plants in liquid medium of fungi, after cutting radicles, thereafter replanting

Duration of test

- from sowing to inoculation: 10 to 20 days
- from inoculation to reading: 20 to 25 days

Number of plants tested:

Remarks: reading: test with heterozygous F1 varieties must be interpreted carefully because on test race 1, and even race 0, can attack some plants.
heterozygot varieties can show symptoms of a slightly lower level of expression

Standard varieties: susceptible : MARMANDE Verte
resistant to race 0: MARSOL, ANABEL,
MARPORUM, F1 "MARSOL x MARMANDE Verte"
resistant to race 0 and race 1: WALTER, MOTELLE,
F1 "MOTELLE x MONALBO"

Ad. 50: Resistance to Fusarium oxysporum f. sp. radicum lycopersici

Method

Maintenance of race

Type of medium: on synthetic medium (according to Messiaen)

Special conditions: fridge 4° C

Execution of test

Growth stage of plants: appearance of third leaf

Temperature: day: 22° C, night: 16° C

Light: 14 hours

Growing method: climatic room

Method of inoculation: soaking of roots and of hypocotyl axis for five minutes in

the inoculum. After inoculation, transplantation of plantlets in steam disinfected sand

Duration of test

- from sowing to inoculation: 18 to 20 days

- from inoculation to reading: 10 days

Number of plants tested: 10 to 20 plants

Remarks: need for frequent renewal of races because of loss of pathogeneity

Standard varieties:

susceptible: MOTELLE

resistant: - MOMOR (homozygot)

- F1 MOMOR x MOTELLE (heterozygot)

- the Frl gene does not completely control the disease in the heterozygot stage

Ad 51.1 - 51.5: Resistance to Cladosporium fulvum

Method

Maintenance of races

Type of medium: synthetic medium
Special conditions: 20 - 22° C, transplantation of races every six weeks

Execution of test

Growth stage of plants: 3 leaves expanded
Temperature: day: 24° C, night: 16° C
Light: 12 hours
Growing method: in climatic room, highest possible humidity, arresting growth a few days before inoculation by irrigation of roots with ALAR 85 (daminozide)

Method of inoculation: spraying of a solution with the fungus on leaves

Duration of test

- from sowing to inoculation: 22 to 25 days
- from inoculation to reading: 20 to 25 days

Number of plants tested: 30 plants

Remarks: the level of expression of symptoms may vary between plants
due to alleles of resistance

Standard varieties: susceptible: MONALBO
resistant : has to be chosen with the concerned alleles
cf1: STIRLING CASTLE
cf2: VETOMOLD
cf3: V 121
cf4: PURDUE 135
cf5: IVT 1149
cf2 cf4: VAGABOND
cf2 cf5: F1 "VETOMOLD x IVT 1149"
cf2 cf4 cf5: F1 "VAGABOND x IVT 1149"
cf6: F 77-38
cf9: IVT 1154

Race 0: Angela, Estrella, Sonatine, Sonato, Vemone

Group A: Angela, Estrella, Sonatine, Sonato
Group B: Angela, Estrella, Sonatine, Sonato, Vemone
Group C: Angela, Estrella, Sonatine
Group D: Estrella, Sonatine, Vemone
Group E: Sonatine

Ad 52.1 - 52.4: Resistance to Tobacco Mosaic Virus, strains 0, 1, 2 and 1-2

Method

Maintenance of strains

Type of medium: on plants or dry leaf

Special conditions: congelation or BOS method

Identification: use the strain 0 inducing necrosis on varieties with allele
Tm2²

Execution of test

Growth stage of plants: expanded cotyledons

Temperature: day: 30 to 35° C, night: 25 to 30° C

Light: 12 hours

Growing method: in the glasshouse

Method of inoculation: mechanical, by rubbing of cotyledons

Duration of test

- from sowing to inoculation: 12 to 14 days
- from inoculation to reading: 10 to 12 days

Number of plants tested: 15 to 30 plants

Standard varieties: susceptible : MONALBO
resistant :
- with alleles Resistant to race

<u>Tm 1</u>	: MOBACI	strains 0 and 2
<u>Tm 2</u>	: MOPEROU	strains 0 and 1
<u>Tm 2²</u>	: MOMOR - RAPIDS	strains 0, 1, 2 and 1-2
<u>Tm 1 - Tm 2²</u>	: MOCIMOR	strains 0, 1, 2 and 1-2
<u>Tm 2²/+</u>	: MOMOR x MONALBO	strains 0, 1, 2 and 1-2

Ad 53: Resistance to Phytophthora infestans

Method

Maintenance of race

Type of medium: on agar medium

Special conditions: 18° C

Execution of test

Growth stage of plants: 10 leaves developed

Temperature: 18° C

Light: after inoculation darkness during 24 hours, thereafter 10 hours darkness per day

Growing method: climatic room

Method of inoculation: spraying of spore suspension, use race replicated 3 weeks before inoculation

Duration of test

- from sowing to inoculation: 6 to 7 weeks

- from inoculation to reading: 7 to 8 days

Hygrometry: very high during the first four days after inoculation (cover plants with polyethylen cover)

Remarks: heterozygot varieties can show symptoms of a slightly lower level of expression

Standard varieties: susceptible: SAINT PIERRE, HEINZ 1706
resistant : PIERALINE, HELINE, PYROS,
F1 "PIERALINE x PIERALBO"

Ad 54: Resistance to Pyrenochaeta lycopersici

Method

Maintenance of race: method 1: on roots obtained from plants grown in the glasshouse on naturally contaminated soil (or with enforced natural contamination);

method 2: inoculum grown on sand or mould, mixed with oat-meal and sterilized in the autoclave (artificial infection)

Execution of test:

Growth stage of plants: method 1: on adult plants around fruit maturity
method 2: 4 to 6 weeks after sowing (first flowering inflorescence)

Temperature: day: 24° C; night: 14° C

Light: 12 hours minimum

Growing method and Method of inoculation: method 1: plants are planted in contaminated soil mixed with cut contaminated roots
method 2: plants are sown in steam-disinfected sandy mould mixed with inoculum

Duration of test

- from sowing to inoculation: method 1: 6 weeks
method 2: when sowing

- from inoculation to reading: method 1: 3 to 4 months
method 2: 4 to 6 weeks

Number of plants tested: 10 minimum

Remarks: method 1: is more efficient to clearly separate susceptible from resistant plants
method 2: pathogenicity of the strains has to be tested before inoculation on roots of young plants

Standard varieties: susceptible: MONTFAVET H 63.5
resistant : KYNDIA, MOBOGLAN, PYRELLA

Ad. 55: Resistance to Stemphylium spp.

Method

Maintenance of isolate

Type of medium: on synthetic medium

Special conditions: fridge 4° C without light

Execution of test

Growth stage of plants: three leaves expanded

Temperature: constant, day: 24° C, night: 24° C

Light: 12 hours

Growing method: climatic room

Method of inoculation: pulverisation on leaves

Duration of test

- from sowing to inoculation: 20 to 22 days
- from inoculation to reading: 10 days

Number of plants tested: 30 plants

Remarks: production of inoculum on medium V8 under light

Standard varieties: susceptible: MONALBO
resistant : MOTELLE
F1 MOTELLE x MONALBO

Ad. 56: Resistance to Pseudomonas syringae pv. tomato

Method

Maintenance of races

Type of medium: on KING B medium

Special conditions: 20 - 22° C in the dark, transplantation every 10 days

Execution of test

Growth stage of plants: three leaves expanded

Temperature: day: 22° C, night: 16° C

Light: 12 hours

Growing method: climatic room in summer, glasshouse in winter

Method of inoculation: pulverisation on leaves

Duration of test

- from sowing to inoculation: 20 to 22 days

- from inoculation to reading: 8 days

Number of plants tested: 30 plants

Remarks: races to be renewed each year

Standard varieties: susceptible: MONALBO
resistant : ONTARIO 7710
F1 MONALBO x ONTARIO 7710

Ad. 57: Resistance to Pseudomonas solanacearum, race 1

Method

Maintenance of race Two races may affect Tomato: race 1 (active between 25-30° C) and race 3 (active between 20-23° C)

Type of medium: freezing at -80 C; culture in PYDAC emersed in oil; suspension in sterile distilled water

Special conditions: conservation at 15 C in sterile distilled water

Execution of test

Growth stage of plants: three to four well-developed leaves

Temperature (in climatic chamber): day: 26-30° C; night: 25° C

Light: 10 - 12 hours

Growing method: two possibilities:
- in climatic chamber: rapid test
- in the field: long test
(applicable in tropical climate only)

Method of inoculation: deposit of at least 2 ml of inoculum, adjusted to 10⁷ colonies per ml, at the foot of each plantlet prior to planting

Duration of test

- from sowing to inoculation: 3 to 4 weeks
- from inoculation to reading: - 3 weeks for the fast test
- 2 months for the long test

Number of plants tested: minimum of 30

Remarks: maintain high humidity

Standard varieties: susceptible: FLORADEL

resistant : CARAIBO

Ad. 58: Resistance to Tomato Yellow Leaf Curl Virus (T.Y.L.C.V.)

Method

Execution of test

Plants are tested under field crop conditions respecting a period of planting and a place where the disease has been proven to exist. 100% contaminated plants are grown of susceptible local varieties to ensure natural transmission by Bemisia insect and repeatability of the results

Growth stage of plants: on adult plants of field crop outside

Method of inoculation: natural inoculation by Bemisia

Duration of test

- from sowing to inoculation: 6 weeks minimum
- from inoculation to reading: 2.5 months maximum

Number of plants tested: 20 plants minimum

Remarks:

Standard varieties: susceptible: local varieties
resistant : TY 20 or accessions from L. pimpinellifolium and from L. peruvianum

Ad. 59: Resistance to Tomato Spotted Wilt Virus

[Method to be provided]

Ad. 60: Resistance to *Leveillula taurica*

[Method to be provided]

Ad. 61: Resistance to *Oidium lycopersicum*

[Method to be provided]

IX. Literature

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X. Technical Questionnaire

	<p>Reference Number (not to be filled in by the applicant)</p>
<p style="text-align: center;">TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p>	
1. Species	<p>Lycopersicon lycopersicum (L.) Karstsen ex Farw. Tomato</p>
2. Applicant (Name and address)	
3. Proposed denomination or breeder's reference	

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

4.1 Method of maintenance and reproduction

- | | |
|----------------------------|-----|
| (a) vegetative propagation | [] |
| (b) seed propagation | [] |
| (a) hybrid | [] |
| (b) open-pollinated | [] |
-

4.2 Other information

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

Characteristics	Example Varieties	Note
5.1 Plant: growth type (2)		
determinate	Campbell 1327	1[]
semi-determinate	Marmande	2[]
indeterminate	Saint-Pierre	3[]
5.2 Leaf: division of blade (10)		
pinnate	Pilot, Red Jacket, Mikado	1[]
bipinnate	Lukullus, Saint-Pierre	2[]
5.3 Peduncle: abscission layer (21)		
absent	Aledo, Bandera, Count, Lerica	1[]
present	Montfavet h 63.5, Roma	9[]
5.4 Fruit: size (23)		
very small	Cerise, Sweet 1000	1[]
small	Early Mech, Europeel, Roma	3[]
medium	Alphamech, Diego	5[]
large	Carmello, Ringo	7[]
very large	Erlidor, Lydia, Muril	9[]

Characteristics	Example Varieties	Note
5.5 Fruit: shape in longitudinal section (25)		
flattened	Campbell 28, Marmande	1[]
slightly flattened	Montfavet H 63.5, Montfavet H 63.4	2[]
round	Cerise Moneymaker	3[]
rectangular	Early Mech, Peto Gro	4[]
cylindrical	Hypeel 244, Macero II, San Marzano 2	5[]
heart-shaped	Cobra	6[]
obovoid	Barbara	7[]
ovoid	Rimone, Rio Grande	8[]
pear-shaped	Europeel	9[]
5.6 Fruit: ribbing at stalk end (26)		
absent or very weak	Cerise	1[]
weak	Early Mech, Hypeel 244, Melody, Peto Gro, Rio Grande	3[]
medium	Montfavet H 63.4, Montfavet H 63.5	5[]
strong	Campbell 1327, Carmello, Count	7[]
very strong	Marmande	9[]

Characteristics	Example Varieties	Note
5.7 Fruit: predominant number of locules (34)		
only two	Early Mech, Europeel, San Marzano	1[]
two or three	Alphamech, Futuria	2[]
three or four	Montfavet H 63.5	3[]
four, five or six	Carmello	4[]
more than six	Marmande VR	5[]
5.9 Fruit: green shoulder (before maturity) (35)		
absent	Rio Grande	1[]
present	Daniela	9[]
5.10 Fruit: color at maturity (39)		
cream	Jazon, White Miraball	1[]
yellow	Golden Königin, Yellow Pear	2[]
orange	Sungold	3[]
pink	House Momotaro	4[]
red	Daniela, Ferline, Montfavet H 63.5	5[]
brown	Marrón	6[]
5.11 Fruit: firmness (41)		
very soft	Marmande VR	1[]
soft	Trend	3[]
medium	Cristina	5[]
firm	Fernova, Konsul, Tradiro	7[]
very firm	Karat, Lolek	9[]

6. Similar varieties and differences between these varieties

Denomination of similar variety	Characteristic in which the similar variety is different ^{o)}	State of expression of similar variety	State of expression of candidate variety
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^{o)} In the case of identical states of expressions of both varieties, please indicate the size of the difference.

7. Additional information which may help to distinguish the variety

7.1 Resistance to pests and diseases (please specify races/strains if possible)

	absent	present	Not tested
- <i>Meloidogyne incognita</i> (characteristic 47))	[]	[]	[]
- <i>Verticillium</i> race/Pathotyp 0 (characteristic 48))	[]	[]	[]
- <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> ; Race/Pathotyp 0 (ex 1) (characteristic 49.1)	[]	[]	[]
Race/Pathotyp 0 (ex 2) (characteristic 49.2)	[]	[]	[]
- <i>Fusarium oxysporum</i> f. sp. <i>radicis lycopersici</i> (characteristic 50)	[]	[]	[]
- <i>Cladosporium fulvum</i> ; Race 0 (characteristic 50.1)	[]	[]	[]
Group A (characteristic 50.2)	[]	[]	[]
Group B (characteristic 50.3)	[]	[]	[]
Group C (characteristic 50.4)	[]	[]	[]
Group D (characteristic 50.5)	[]	[]	[]
Group E (characteristic 50.6)	[]	[]	[]
-Tomato Mosaic Virus Strain 0 (characteristic 52.1)	[]	[]	[]
Strain 1 (characteristic 52.2)	[]	[]	[]
Strain 2 (characteristic 52.3)	[]	[]	[]

- Phytophthora infestans (characteristic 53)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Pyrenochaeta lycopersici (characteristic 54)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Stemphylium spp. (characteristic 55)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Pseudomonas tomato (characteristic 56)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Pseudomonas solanacearum race 1(characteristic 57)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Tomato Yellow Leaf Curl Virus (characteristic 58)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Tomato Spotted Wilt Virus (characteristic 59)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Leveillula taurica (characteristic 60)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Oidium lycopersicum (characteristic 61)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others (specify)/Autres (á préciser)/ Andere (angegeben)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.2.1 Special conditions for the examination of the variety

- i. Type of culture:
- under glass
 - in the open
- ii. Main use:
- fresh market or garden
 - industrial processing (indicate type)
 - pot plant
- ii. Main use:
- fresh market or garden
 - industrial processing (indicate type)
 - pot plant

7.2.2 Other conditions

7.3 Other information

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 that question is yes, please attach a copy of such an authorization.

[End of document]