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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

*

TOMATO ROOTSTOCKS

UPOV Code: **SOLAN_LHA**

Solanum lycopersicum L. x *Solanum habroichaites* S. Knapp & D.M. Spooner

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from the Netherlands

to be considered by the

Technical Working Party for Vegetables
at its forty fifth session, to be held in Monterey, California, United States of America, from July 25 to 29, 2011

Alternative Names:[*]

Botanical name	*English*	*French*	*German*	*Spanish*
Solanum lycopersicum L. x *Solanum habroichaites* S. Knapp & D.M. Spooner.	Tomato rootstocks	Porte-greffe de tomate	Tomate Unterlagen	Portainjertos de tomate

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.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Solanum lycopersicum* L. x *Solanum habroichaites* S. Knapp & D.M. Spooner (*Lycopersicum esculentum* Mill. x *Lycopersicum hirsutum* Dunal.) Such varieties are generally used as rootstocks for tomato varieties (varieties of *Solanum lycopersicum* L (*Lycopersicum esculentum* Mill.)). Rootstocks belonging to *Solanum lycopersicum* L (*Lycopersicum esculentum* Mill.) or to *Solanum lycopersicum* L x *Solanum pimpinellifolia* L. (*Lycopersicum esculentum* Mill. x *Lycopersicum pimpinellifolia* Mill.) should be covered by UPOV Test Guidelines TG/44/10.

2. Material Required

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

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

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

a) seed-propagated varieties: 10g or 2500 seeds
b) vegetatively propagated varieties: 25 plants plus the number required for disease resistance tests.

In the case of seed, the seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. For disease resistance testing, additional plant material may be requested.

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

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

3. Method of Examination

3.1 Number of Growing Cycles

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

3.2 Testing Place

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

3.3 Conditions for Conducting the Examination

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.

3.4 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 at least two replicates.

3.4.2 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 20 plants.

3.4.3 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 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.

4.1.4 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts taken from each of 10 plants and any other observations made on all plants in the test disregarding any off-type plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the second column of the Table of Characteristics (see document TGP/9 "Examining Distinctness", Section 4 "Observation of characteristics"):

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

Type of observation: visual (V) or measurement (M)

"Visual" observation (V) is an observation made on the basis of the expert's judgment. For the purposes of this document, "visual" observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, "G" provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness."

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

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, 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 further examined by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial 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) Fruit: shape in longitudinal section (characteristic 13)
(b) Fruit: number of locules (characteristic 14)
(c) Fruit: green shoulder (before maturity) (characteristic 15)
(d) Fruit: color at maturity (characteristic 18)
(e) Resistance to *Meloidogyne incognita* (characteristic 21)
(f) Resistance to *Verticillium dahliae*. – Race 0 (characteristic 22)
(g) Resistance to *Fusarium oxysporum* f. sp. *lycopersici* – Race 0 (ex 1) (characteristic 23.1)
(h) Resistance to *Fusarium oxysporum* f. sp. *lycopersici* – Race 1 (ex 2) (characteristic 23.2)
(i) Resistance to *Fusarium oxysporum* f. sp. *lycopersici* – Race 2 (ex 3) (characteristic 23.3)
(j) Resistance to Tomato Mosaic Virus – Strain 0 (characteristic 26.1)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

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

6.2.1 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.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

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, VS		– see Chapter 4.1.5
(a)-(c)	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 Hypocotyls**	**Plántula: pigmentación antociánica del hipocótilo**		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Beaufort	9
2. **(+)**	**VG**	**Plant: height**	**Plante: hauteur**	**Pflantze: Höhe**	**Planta: altura**		
QN		short	basse	niedrig	baja	Big Power	3
		medium	moyenne	mittel	media	Maxifort	5
		tall	haute	hoch	alta	Beaufort	7
3. **(+)**	**VG**	**Stem: anthocyanin coloration of upper third**	**Tige: pigmentation anthocyanique du tiers supérieur**	**Stengel: Anthocyan-färbung des oberen Drittels**	**Tallo: pigmentación antociánica del tercio superior**		
QN	**(a)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
		weak	faible	gering	débil	Arnold	3
		medium	moyenne	mittel	media	Beaufort	5
		strong	forte	stark	fuerte	Montezuma	7
4. **(+)**	**VG/ MS**	**Stem: length of internode (between 1st and 4th inflorescence)**	**Tige: longueur de l'entrenœud (entre la 1ère et la 4ème inflorescence)**	**Stengel: Internodienlänge (zwischen dem 1. und dem 4. Blütenstand)**	**Tallo: longitud del entrenudo (entre la 1ª y 4ª inflorescencia)**		
QN	**(a)**	short	court	kurz	corta	Big Force	3
		medium	moyen	mittel	media	Maxifort	5
		long	long	lang	larga	Beaufort	7
5. **(*)**	**VG/ MG**	**Leaf: length**	**Feuille: longueur**	**Blatt: Länge**	**Hoja: longitud**		
QN	**(a)**	short	courte	kurz	corta		3
		medium	moyenne	mittel	media	Body	5
		long	longue	lang	larga	Maxifort	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6. (*)	**VG/ MG**	**Leaf: width**	**Feuille: largeur**	**Blatt: Breite**	**Hoja: anchura**		
QN	**(a)**	narrow	étroite	schmal	estrecha		3
		medium	moyenne	mittel	media	Body	5
		broad	large	breit	ancha	Emperador	7
7. (+)	**VG**	**Leaf: size of leaflets (in middle of leaf)**	**Feuille: taille des folioles (au centre de la feuille)**	**Blatt: Größe der Blattfiedern (in der Blattmitte)**	**Hoja: tamaño de los folíolos (en el medio de la hoja)**		
QN	**(a)**	very small	très petites	sehr klein	muy pequeños		1
		small	petites	klein	pequeños	Titron	3
		medium	moyennes	mittel	medios	Big Force	5
		large	grandes	groß	grandes	Beaufort	7
		very large	très grandes	sehr groß	muy grandes	Hires 1210	9
8. (*)	**VG**	**Leaf: intensity of green color**	**Feuille: intensité de la couleur verte**	**Blatt: Intensität der Grünfärbung**	**Hoja: intensidad del color verde**		
QN	**(a)**	light	claire	hell	claro		3
		medium	moyenne	mittel	medio	RS 01648542	5
		dark	foncée	dunkel	oscuro	Maxifort	7
9.	**VG**	**Leaf: glossiness (as for 6)**	**Feuille: brillance (comme pour 6)**	**Blatt: Glanz (wie unter 6)**	**Hoja: brillo (como para 6)**		
QN	**(a)**	weak	faible	gering	débil		3
		medium	moyenne	mittel	medio	Titron	5
		strong	forte	stark	fuerte	RS 01648542	7
10.	**VG**	**Leaf: blistering (as for 6)**	**Feuille: cloqûre (comme pour 6)**	**Blatt: Blasigkeit (wie unter 6)**	**Hoja: abullonado (como para 6)**		
QN	**(a)**	weak	faible	gering	débil		3
		medium	moyenne	mittel	medio	Emperador	5
		strong	forte	stark	fuerte	RS 01648542	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11. (+)	**VG/ MS**	**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 abscición hasta el cáliz)**		
QN		short	court	kurz	corta	Titron	3
		medium	moyen	mittel	media	Multifort	5
		long	long	lang	larga	Beaufort	7
12. (*)	**VG**	**Fruit: size**	**Fruit: taille**	**Frucht: Größe**	**Fruto: tamaño**		
QN	**(b)**	small	petit	klein	pequeño	Body, Optifort	3
		medium	moyen	mittel	medio	Emperador	5
		large	grand	groß	grande	Titron	7
13. (*) (+)	**VG**	**Fruit: shape in longitudinal section**	**Fruit: forme en section longitudinale**	**Frucht: Form im Längsschnitt**	**Fruto: forma en sección longitudinal**		
PQ	**(b)**	slightly flattened	légèrement aplatie	leicht abgeflacht	ligeramente aplanada	He-Wolf	1
		circular	arrondie	kreisförmig	circular	Maxifort	2
14. (*)	**VG**	**Fruit: number of locules**	**Fruit: nombre de loges**	**Frucht: Anzahl Kammern**	**Fruto: número de lóculos**		
QN	**(b)**	only two	seulement deux	nur zwei	sólo dos	Maxifort	1
		two or three	deux ou trois	zwei oder drei	dos o tres	RS 01648542	2
15. (*)	**VG**	**Fruit: green shoulder (before maturity)**	**Fruit: collet vert (avant maturité)**	**Frucht: Flammung (vor der Reife)**	**Fruto: hombro verde (antes de madurez)**		
QL	**(c)**	absent	absent	fehlend	ausente		1
		present	présent	vorhanden	presente	Maxifort	9
16. (*)	**VG**	**Fruit: extent of green shoulder (before maturity)**	**Fruit: taille du collet vert (comme pour 34)**	**Frucht: Größe der Flammung (wie unter 34)**	**Fruto: tamaño del hombro verde (como para 34)**		
QN	**(c)**	small	petit	klein	pequeño	Big Force	3
		medium	moyen	mittel	medio	RS 01648542	5
		large	grand	groß	grande	He-man	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. (*)	**VG**	**Fruit: intensity of green color of shoulder (before maturity)**	**Fruit: intensité de la couleur verte du collet (comme pour 34)**	**Frucht: Intensität der Grünfärbung der Flammung (wie unter 34)**	**Fruto: intensidad del color verde del hombro (como para 34)**		
QN	**(c)**	light	claire	hell	claro		3
		medium	moyenne	mittel	medio	RS 01648542	5
		dark	foncée	dunkel	oscuro	He-man	7
18. (*)	**VG**	**Fruit: color at maturity**	**Fruit: couleur à maturité**	**Frucht: Farbe bei der Reife**	**Fruto: color en la madurez**		
PQ	**(b)**	green	verte	grün	verde	Big Force	1
		yellowish	jaunâtre	gelblich	amarillento	Vigomax	2
		orangish	orangé	orangerot	anaranjado	Titron	3
19. (+)	**VG**	**Sensitivity to silvering**	**Sensibilité à l'argenture**	**Empfindlichkeit gegen Silberblatt**	**Sensibilidad al plateado**		
QL		sensitive	sensible	vorhanden	sensible	Big Power	1
		insensitive	insensible	fehlend	insensible	Multifort	9
20. (*) (+)	**VG**	**Sensitivity to autonecrosis**	**Sensibilité à autonécrose**	**Empfindlichkeit gegen**	**Sensibilidad al**		
QL		sensitive	sensible	vorhanden	sensible	Body	1
		insensitive	insensible	fehlend	insensible	Maxifort	9
21. (*) (+)	**VG**	**Resistance to *Meloidogyne incognita***	**Résistance au *Meloidogyne incognita***	**Resistenz gegen *Meloidogyne incognita***	**Resistencia a *Meloidogyne incognita***		
QL		absent	absente	fehlend	ausente	Bruce	1
		present	présente	vorhanden	presente	Emperador	9
22. (*) (+)	**VG**	**Resistance to *Verticillium dahliae* – Race 0**	**Résistance au *Verticillium dahliae* – Pathotype 0**	**Resistenz gegen *Verticillium dahliae* – Pathotyp 0**	**Resistencia a *Verticillium dahliae* – Raza 0**		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Big Power	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23. **(+)**		**Resistance to *Fusarium oxysporum* f. sp. *lycopersici***	**Résistance au *Fusarium oxysporum* f. sp. *lycopersici***	**Resistenz gegen *Fusarium oxysporum* f. sp. *lycopersici***	**Resistencia a *Fusarium oxysporum* f. sp. *lycopersici***		
23.1 **(*)**	**VG**	**– Race 0 (ex 1)**	**– Pathotype 0 (ex 1)**	**– Pathotyp 0 (ex 1)**	**– Raza 0 (ex 1)**		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Emperador	9
23.2 **(*)**	**VG**	**– Race 1 (ex 2)**	**– Pathotype 1 (ex 2)**	**– Pathotyp 1 (ex 2)**	**– Raza 1 (ex 2)**		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Emperador	9
23.3 **(*)**	**VG**	**– Race 2 (ex 3)**	**– Pathotype 2 (ex 3)**	**– Pathotyp 2 (ex 3)**	**– Raza 2 (ex 3)**		
QL		absent	absente	fehlend	ausente	Emperador	1
		present	présente	vorhanden	presente	Colosus	9
24. **(*)** **(+)**	**VG**	**Resistance to *Fusarium oxysporum* f. sp. *radicis lycopersici***	**Résistance au *Fusarium oxysporum* f. sp. *radicis lycopersici***	**Resistenz gegen *Fusarium oxysporum* f. sp. *radicis lycopersici***	**Resistencia a *Fusarium oxysporum* f. sp. *radicis lycopersici***		
QL		absent	absente	fehlend	ausente	Kemerit	1
		present	présente	vorhanden	presente	Emperador	9
25. **(+)**		Resistance to *Fulvia fulva* (Ff) (ex *Cladosporium fulvum*)	**Résistance au *Fulvia fulva* (Ff) (ex *Cladosporium fulvum)***	**Resistenz gegen *Fulvia fulva* (Ff) (ex *Cladosporium fulvum)***	**Resistencia a *Fulvia fulva* (Ff) (ex *Cladosporium fulvum)***		
25.1	**VG**	**– Race 0**	**– Pathotype 0**	**– Pathotyp 0**	**– Raza 0**		
QL		absent	absente	fehlend	ausente	King Kong	1
		present	présente	vorhanden	presente	Bruce	9
25.2	**VG**	**– Group A**	**– Groupe A**	**– Gruppe A**	**– Grupo A**		
QL		absent	absente	fehlend	ausente	King Kong	1
		present	présente	vorhanden	presente	Big Power	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25.3	**VG**	**– Group B**	**– Groupe B**	**– Gruppe B**	**– Grupo B**		
QL		absent	absente	fehlend	ausente	King Kong	1
		present	présente	vorhanden	presente	Bruce	9
25.4	**VG**	**– Group C**	**– Groupe C**	**– Gruppe C**	**– Grupo C**		
QL		absent	absente	fehlend	ausente	King Kong, Bruce	1
		present	présente	vorhanden	presente	Big Power	9
25.5	**VG**	**– Group D**	**– Groupe D**	**– Gruppe D**	**– Grupo D**		
QL		absent	absente	fehlend	ausente	King Kong	1
		present	présente	vorhanden	presente	Bruce	9
25.6	**VG**	**– Group E**	**– Groupe E**	**– Gruppe E**	**– Grupo E**		
QL		absent	absente	fehlend	ausente	King Kong, Bruce	1
		present	présente	vorhanden	presente	Big Power	9
26. **(+)**		**Resistance to Tomato Mosaic Virus**	**Résistance au virus de la mosaïque de la tomate**	**Resistenz gegen das Tomatenmosaikvirus**	**Resistencia al virus del mosaico del tomate**		
26.1 **(*)**	**VG**	**– Strain 0**	**– Souche 0**	**– Pathotyp 0**	**– Cepa 0**		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Emperador	9
27. **(+)**	**VG**	**Resistance to *Pyrenochaeta lycopersici***	**Résistance au *Pyrenochaeta lycopersici***	**Resistenz gegen *Pyrenochaeta lycopersici***	**Resistencia a *Pyrenochaeta lycopersici***		
QL		absent	absente	fehlend	ausente	Zaralto	1
		present	présente	vorhanden	presente	Emperador	9
28. **(+)**	**VG**	**Resistance to *Stemphylium***	**Résistance au *Stemphylium* spp.**	**Resistenz gegen *Stemphylium* spp.**	**Resistencia a *Stemphylium* spp.**		
QL		absent	absente	fehlend	ausente	Big Power	1
		present	présente	vorhanden	presente	Body	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29. **(+)**	**VG**	**Resistance to Tomato Yellow Leaf Curl Virus**	**Résistance au *Tomato Yellow Leaf Curl Virus***	**Resistenz gegen gelbes Tomatenblattrollvirus**	**Resistencia a virus de la hoja en cuchara**		
QL		absent	absente	fehlend	ausente	Big Power	1
		present	présente	vorhanden	presente		9
30. **(+)**	**VG**	**Resistance to Tomato Spotted Wilt Virus**	**Résistance au *Tomato Spotted Wilt Virus***	**Resistenz gegen das gefleckte Tomaten-welkevirus**	**Resistencia a *Tomato Spotted Wilt Virus***		
QL		absent	absente	fehlend	ausente	Big Power	1
		present	présente	vorhanden	presente	Enpower	9
31. **(+)**	**VG**	**Resistance to *Oidium neolycopersici***	**Résistance au *Oidium neolycopersici***	**Resistenz gegen *Oidium neolycopersici***	**Resistencia a *Oidium neolycopersici***		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Multifort	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) All observations on the plant, stem and leaves should be done after a fruit set on at least five trusses and before ripening of the second truss. Observations should be done before deterioration of the leaves.
(b) All observations on the fruit should be made on mature fruits from the second or higher truss.
(c) All observations on the green shoulder of the fruit should be made on the plant before maturity.

8.2 Explanations for individual characteristics

Ad. 1: Seedling: anthocyanin coloration of hypocotyl

Ad. 2: Plant: height

To be observed after a fruit set on 5 nodes

Ad. 3: Stem: anthocyanin coloration of upper third

Most of the varieties are classed 1 to 5. Expression of anthocyanin is influenced by day temperature. Under greenhouse conditions, the variation is rather low, except for varieties with Tm2 allele which is linked to anthocyanin of the stem (especially at the internode).

3	5	7
weak	medium	strong

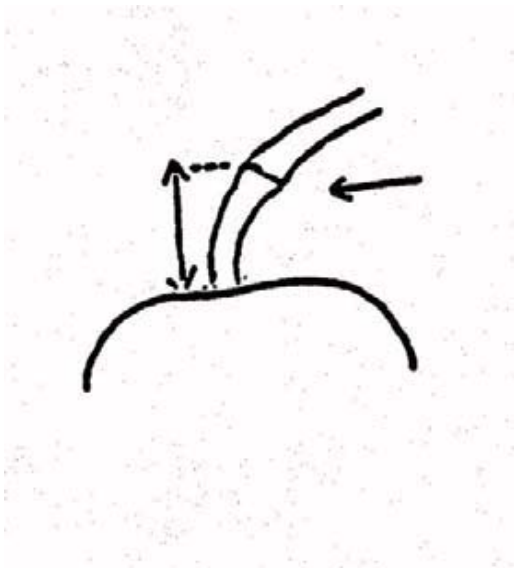
Ad. 4: Stem: length of internode (between 1st and 4th inflorescence)

The length of the internode should be observed/measured at one time for the whole trial, e.g after a fruit set on approximately 5 nodes. The total length of the stem should be observed/measured between the 1st and 4th trusses. When this observation/measure is divided by the number of internodes in between, an indication of the length of the internode is given.

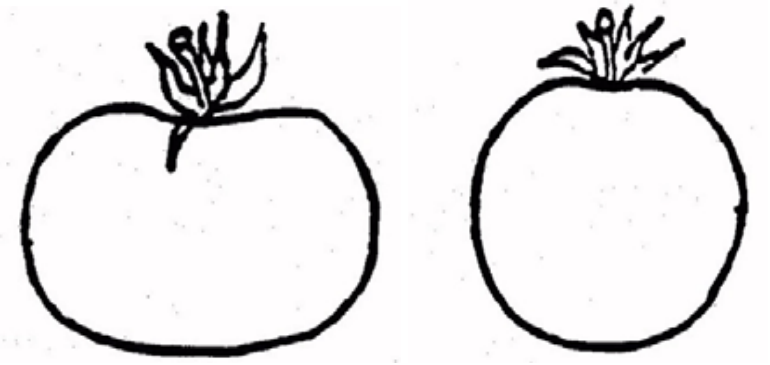
Ad. 7: Leaf: size of leaflets (in middle of leaf)

The size of the leaflet should be observed in the middle of the leave.

Ad. 11: Pedicel: length (from abscission layer to calyx)



Ad. 13: Fruit: shape in longitudinal section



1	2
slightly flattened	circular

Ad. 19: Sensitivity to silvering

Method:

Evaluation: Evaluation is done on fully-grown plants

Execution of test: 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 in an artificial medium in the greenhouse

Temperature: day temperature maximum 18°C

Light: normal daylight

Growing method: no special method necessary

Duration of test: 4 - 5 months

Number of plants tested: minimum of 20

Observation of the expression: A visual survey has to be made on the presence of leaves that show signs of silvering

Standard varieties: it concerns tomato varieties (*Solanum lycopersicum* L.)
expression absent: Marathon, Sano
expression present: Sonatine

It is to be noted that this characteristic may not be observable under “sunny” climates

Ad. 20: Sensitivity to autonecrosis

Method:

Evaluation:	evaluation is done on fully-grown plants
Execution of test:	autonecrosis can be observed under normal growing conditions.
Sowing:	normal trial conditions
Temperature:	normal trial temperatures
Light:	normal daylight
Growing method:	no special method necessary
Duration of test:	4 - 5 months
Number of plants tested:	minimum of 20

Observation of the expression: A visual survey has to be made on the presence of leaves that show signs of autonecrosis

Standard varieties:	expression absent: MAXIFORT expression present: BODY

Ad. 21: Resistance to *Meloidogyne incognita (*Mi)

Method

Maintenance of strain

Type of medium:	on roots of susceptible varieties
Special conditions:	avoid rotting of roots

Execution of test:

Temperature:	not over 28° C
Growing method:	preferably in the greenhouse
Method of inoculation:	plants are sown in infested soil
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

Notation: number of root knots and root deformation

Standard varieties: susceptible: BRUCE
resistant: EMPERADOR

Ad. 22: Resistance to *Verticillium dahliae* sp.(Va and Vd)

Method

Maintenance of strains: Race 0 represented by strain Toreilles 4-1-4-1 is used. Race 0 is the common race defined by its ability to infect plants with the Ve gene. Long term storage of strains: conidia suspended in glycerol solution at -80°C. Strain can be subcultured on PDA or S of Messiaen media.

Execution of test:

Growth stage of plants: Plants are grown in greenhouse or growth chamber. Inoculation can be done from the cotyledon stage (first leaves emerging) to 2 expanded leaves stage. The following varieties can be used as controls. As a minimum, there should be one resistant and one susceptible control in the test. The heterozygous variety will help interpretation of results in case of aggressive test. Clarion could be interesting to add to susceptible controls as it is less susceptible and could also help to check the inoculation pressure of the test. These 2 varieties are optional.

Standard variety	Vd:0

it concerns tomato varieties (*Solanum lycopersicum* L.)

Marmande verte, Flix	S
Clarion	s
Monalbo x Marmande verte	RH
Monalbo, Elias	R

R	resistance present; no symptoms
RH	resistance present; sometimes very weak symptoms
s	resistance absent; weak symptoms
S	resistance absent; clear symptoms

Temperature: Test performed under controlled conditions at 20 to 22°C.

Inoculum: *Verticillium* sp. is grown on liquid Czapek Dox Broth or S of Messiaen media for 3 to 7 days in the dark, at 20 to 25°C with aeration. Spores are harvested and adjusted to 10_6sp/ml.

Method of inoculation: Plantlets are harvested, roots are cut and soaked for 5 to 15 min in the inoculum suspension. Plantlets are then transplanted in soil.

Duration of test: At least 33 days from sowing to notation.

Number of plants tested: At least 20 plants.

Notation: 25-30 days after inoculation.

Notation scale and interpretation of results:

R: no symptoms

S: chlorosis in the lower leaves, growth reduced and brown vessels or growth not reduced and brown vessels. Analysis of results should be calibrated with results on R and S controls.

Ad. 23.1 + 23.2 + 23.3: Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) -Race 0 (ex 1), Race 1 (ex 2) and Race 2 (ex 3)

Method

Maintenance of strains: Long term storage of strains: at -80°C in 20% glycerol. Race 0 (ex 1) represented by strains Orange 71 or PRI 20698 or Fol 071 and race 1 represented by strains 4152 (more aggressive) or PRI40698 or RAF 70 (less aggressive) are used. Strains can be multiplied on PDA or S of Messiaen media.

Execution of test:

Growth stage of plants:

Plants are grown in greenhouse or growth chamber for 10 to 18 days (cotyledons to first leaf stages).

The following varieties are used as controls. Each line will be represented by at least one variety which can be chosen in the varieties indicated; the resistance phenotype to the two pathotypes of Fol is indicated. The heterozygous variety has a resistance phenotype usually weaker than in homozygous lines. This weak resistance can be used to calibrate the borderline between resistance and susceptibility. The heterozygous control for Fol:1 is optional.

Controls for Fol:0 resistance test: concerns tomato varieties (*Solanum lycopersicum* L.)

	Fol:0	Fol:1*
Marmande, Marmande verte, Resal	S	S
Marporum x Marmande verte (heterozygous)	R	S
Marporum, Larissa	R	S
Motelle, Gourmet, Mohawk	R	R

** For information*

Controls for Fol:1 resistance test: it concerns tomato varieties (*Solanum lycopersicum* L.)

	Fol:0*	Fol:1
Cherry Belle, Roma, Marmande verte	S	S
Ranco**, Marporum	R	S
Motelle x Marmande verte	R	R
Tradiro, Odisea	R	R

** For information*

*** For Ranco: weak resistance to Fol0 with many escapes*
R = resistance present
S = resistance absent

Temperature: Test performed in climatic chambers or greenhouse at 24-28°C. In case of aggressive test, temperature can be decreased to 20-24°C.

Inoculum: *Fusarium oxysporum* f. sp. *lycopersici* is grown on PDA or S of Messiaen media or in aerated Czapek-Dox liquid cultures for 7 to 10 days. Spores are harvested and adjusted to 10_6sp/ml for strains grown on media. In case of very aggressive isolate, inoculum concentration can be decreased.

Method of inoculation: Soaking of roots (cutting of roots optional) and of hypocotyls axis for 5 to 15 min in the inoculum suspension and transplantation of inoculated plantlets in soil.

Duration of test: At least 28 days from sowing to notation.

Number of plants tested: At least 20 plants.

Notation: At least 21 days after inoculation.

Notation scale: 4 qualitative classes:

- 0: no symptoms,
- 1: external healthy aspect of plant (without growth reduction) with brown vessels (sometimes extending above cotyledons, generally remaining below cotyledons),
- 2: growth reduction and brown vessels above cotyledons,
- 3: dead plant.

Interpretation of scale: Generally 0 and 1 are considered resistant, 2 and 3 are susceptible but analysis of results should be calibrated with results of R and S controls.

Ad. 24: Resistance to *Fusarium oxysporum* f. sp. *radicis lycopersici* (For)

Method

Maintenance of race: Type of medium: on PDA or 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: climate room or glasshouse

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

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 pathogenicity

Standard varieties:
- susceptible: - EMPERADOR
- resistant: - COLOSUS

Ad. 25.1 – 25.6 Resistance to *Fulvia fulva* (Ff) (ex *Cladosporium fulvum)*

Method

Maintenance of races

Type of medium: PDA or synthetic medium

Special conditions: subculturing of isolates

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 (daminazoide), or in glasshouse with high humidity, for example under a polyethylene cover.

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: 20 plants

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

Standard varieties: concerns tomato varieties (*Solanum lycopersicum* L.)

- 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. 26.1 : Resistance to Tomato mosaic virus (ToMV)- Strains 0, 1 and 2

Method

Maintenance of strains

Strains are long term stored as desiccated leaves below 10°C. Race 0 represented by isolate INRA Avignon 6-5-1-1 (aucuba mosaic strain) is used. Virus should be multiplied on the susceptible control before being used for inoculation of the test.

Execution of test

Growth stage of plants

Plants are grown in greenhouse or growth chamber until cotyledons (first leaves emerging) to two expanded leaves have appeared. Within each test at least one resistant and one susceptible standard variety is included.

The following varieties are used as controls. Each line will be represented by at least one resistance phenotype which can be chosen from the varieties indicated; the resistance phenotype to the 3 pathotypes of ToMV is indicated. Mobaci and Moperou will allow checking the pathotype identity of the virus. Monalbo x Momor will help the interpretation of the distinct resistance phenotype with necrosis.

Controls for ToMV:0, these varieties were not validated as standard varieties for ToMV:1 and ToMV:2:

Variety	Resistance phenotype		
	ToMV:0	ToMV:1	ToMV:2
concerns tomato varieties (*Solanum lycopersicum* L.)			
Marmande, Monalbo	S	S	S
Mobaci	R	S	R
Moperou	R	R	S
Monalbo x Momor	RN	RN	RN
Momor, Gourmet	R	R	R

R = resistance present; no symptoms
RN = resistance present; a variable proportion of plants showing some or extensive necrosis; all other plants have no symptoms.
S = resistance absent; mosaic symptoms

Temperature: Test performed in climatic chambers or greenhouse at 24 to 26°C. At higher temperatures, resistance can break down.

Inoculum and method of inoculation

Mechanical inoculation by rubbing cotyledons (first leaves emerging) or two expanded leaves with an inoculum solution consisting of symptomatic leaves grinded in a buffer with carborundum added. Leaves can be rinsed after inoculation. Light is important for symptom expression.

Duration of test: 24 to 42 days from sowing to notation.

Number of plants tested: At least 20 plants.

Notation: 12-21 days after inoculation when symptoms are well developed on susceptible control.

Notation scale and interpretation results: R: without symptoms or with necrosis (necrosis can be observed on plants heterozygous for resistance gene, these plants are noted resistant)
S: mosaic symptoms.

Ad. 27: Resistance to *Pyrenochaeta lycopersici* (Pl)

Method

Maintenance of race:	Method 1:	on roots obtained from plants grown in the greenhouse on naturally contaminated soil (or with enforced natural contamination);
	Method 2:	inoculum grown on sand or mould, mixed with oatmeal 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 as a 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: ZARALTO
resistant: EMPERADOR

Ad. 28: Resistance to *Stemphylium*.

Method

Maintenance of isolate

Type of medium:	on PDA or 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:	glasshouse or climate 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: BIG POWER resistant: BODY

Ad. 29: Resistance to Tomato Yellow Leaf Curl virus (TYLCV)

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 *S. pimpinellifolium* and from *S. peruvianum*

Ad. 30: Resistance to Tomato Spotted Wilt virus (TSWV) - Race 0

Method

Maintenance of races

Type of medium: on tomato plants or frozen at –70° C

Special conditions:

Execution of test

Growth stage of plants: one or two leaves expanded

Temperature: day: 20°C, night: 20°C

Light: extra light in winter

Growing method: glasshouse

Method of inoculation: mechanical, rubbing with carborundum on cotyledons, inoculum suspension < 10° C

Duration of test

- from sowing to inoculation: 20 days
- from inoculation to reading: 14 to 20 days

Number of plants tested: 15 to 30 plants

Remarks: be aware of thrips

Standard varieties: - susceptible: BIG POWER
- resistant: ENPOWER

Ad. 31: Resistance to *Oidium neolycopersici* (On) (ex *Oidium lycopersicum (*Ol)

Method

Maintenance of races

Type of medium:	on tomato plants
Special conditions:	climatic room

Execution of test

Growth stage of plants:	3 weeks
Temperature:	24°C during the day; 18°C during the night
Light:	12 hours
Method of innoculation:	- by spraying (10_4 conidia/ml) on leaves - by dredging (uncontrolled inoculum) on leaves

Execution of test

Duration of test

- from sowing to inoculation: 18 - 20 days
- from inoculation to reading: 15 – 18 days

Number of plants tested: 20 plants

Remarks:

Scale of notes:	- no sporulation	}
	- sporulation without extension (necrotic points)	}Resistant }
	- moderate sporulation	}
	- abundant sporulation	}Susceptible

Standard varieties:	it concerns tomato varieties (*Solanum lycopersicum* L.) - susceptible: Momor (*Solanum lycopersicum* L) - resistant: (*Solanum habrochaites* S. Knapp & D.M. Spooner) PI-247087 (accession), Romiror

9. Literature

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10. Technical Questionnaire

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

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

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

1. Subject of the Technical Questionnaire

1.1 Botanical name	*Solanum lycopersicum* L. x *Solanum habroichaites* S. Knapp & D.M. Spooner
1.2 Common name	Tomato rootstocks

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)

(……..……..…)	x	(……..……..…)
female parent		male parent

(b) partially known cross [ ]
(please state known parent variety(ies))

(……..……..…)	x	(……..……..…)
female parent		male parent

(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)

[#] 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:

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

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

4.2.1 Vegetative propagation

(a) cuttings [ ]

(b) *in vitro* propagation [ ]

(c) other (state method) [ ]

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 (13)	**Fruit: shape in longitudinal section**		
	slightly flattened	He-Wolf	1[ ]
	circular	Maxifort	2[ ]
5.2 (14)	**Fruit: number of locules**		
	only two	Maxifort	1[ ]
	two or three	RS 01648542	2[ ]
5.3 (15)	**Fruit: green shoulder (before maturity)**		
	absent		1[ ]
	present	Maxifort	9[ ]
5.4 (18)	**Fruit: color at maturity**		
	green		1[ ]
	yellowish	Vigomax	2[ ]
	orangish	Titron	3[ ]
5.5 (21)	**Resistance to *Meloidogyne incognita***		
	absent	Bruce	1[ ]
	present	Big Power	9[ ]
5.6 (22)	**Resistance to *Verticillium dahliae* sp.Race 0**		
	absent		1[ ]
	present	Big Power	9[ ]

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

	Characteristics	Example Varieties	Note
5.7 (23)	**Resistance to *Fusarium oxysporum* f.sp. *lycopersici***		
5.8 (23.1)	**Race 0(ex 1)**		
	absent		1[ ]
	present	Emperador	9[ ]
5.9 (23.2)	**Race 1(ex 2)**		
	absent		1[ ]
	present	Emperador	9[ ]
5.10 (23.3)	**Race 2(ex 3)**		
	absent	Emperador	1[ ]
	present	Colosus	9[ ]
5.11 (24)	**Resistance to *Fusarium oxysporum* f.sp.*radicis lycopersici***		
	absent	Kemerit	1[ ]
	present	Emperador	9[ ]

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
He-Wolf	Fruit: shape in longitudinal section	slightly flattened	circular

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

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.

[#] 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:

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

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

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

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

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

……

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

[Notes from ISF follow]

Tomato Rootstock

General remarks received from ISF that were not taken over in the second draft:

1. Page 1: should be applicable to all tomato rootstock – see report TWV44 for a list of rootstocks
Reaction: Other types of rootstocks currently in use are suited to be described according to the tomato guideline. That should be added to the chapter ‘subject of these guidelines of the Tomato Guideline

2. Page 4 Material required:
Rootstock seed is generally primed, a process to improve seed quality (e.g. germination quality and speed). Raw untreated rootstock seed material is generally of lower quality because of its inter-specific genetic makeup. Therefore, we propose in the document, to be somewhat more specific when describing a seed "treatment". The generic "treatment" term can be interpreted in many different ways, and could raise questions everytime the questionnaire will be completed for a new variety.
Reaction: This approach is not in line with the general UPOV principles to accept only non treated seeds.

3. page 10 char 1:

To add: Seed-propagated varieties only:

Reaction: as this is self explanatory, not taken over

4. page 10 and up;
The example variety Big Power will be replaced soon
Reaction: as no alternatives are given and the number of available alternatives is limited, kept for the time being when no substitute is indicated.

5. page 10 and up;
The example variety Big force is deleted
Reaction: as no alternatives are given and the number of available alternatives is limited, kept for the time being when no substitute is indicated.

6. page 13 and 14 chars 14, 15, 16, 17 and 18
See tomato protocol
Reaction: as this protocol is limited to *Solanum lycopersicum* L x *S. habroichaites* a large number of states do not exist and therefore was deleted from the characteristics.

7. page 13 char 15
In tomato guideline char 15 & 16 come after char 11
Reaction: it seems more logical to keep it here.

8. page 16
The example variety Kemerit will be replaced.
Reaction: as no alternatives are given and the number of available alternatives is limited, kept for the time being when no substitute is indicated.

9. page 17 char 26
Tomato Mosaic Virus should be Tomato Mosaic Tobamovirus (ToMV)
Reaction: sofar the names of diseases used follow the state of affairs as given by the International Committee for Taxonomy of Viruses (ICTV) as also used by ISF itself on its website.

10. page 18 char 30
Tomato Spotted Wilt Virus should be Tomato Spotted Wilt Tospovirus (TSWV)
Reaction: sofar the names of diseases used follow the state of affairs as given by the International Committee for Taxonomy of Viruses (ICTV) as also used by ISF itself on its website.

11. page 21 and up; Disease resistances:
General remark for standard varieties in disease characteristics: now sometimes tomato varieties are mentioned. Better to conform to example varieties included in Table of characteristics or use other rootstock varieties.
Reaction: when logical and possible the rootstock example varieties are given. However as in many cases the test will be the same and the tomato example varieties help to explain the genetic background, these were kept. When tomato (non-rootstock examples are given this is indicated in the text.

11. Furthermore, we received following remark from Harris Moran (j.schoenecker@clause.com). Unfortunately I did not have the opportunity yet to contact him, but I did not want to miss the deadline and also wanted to inform you:

The questionnaire for a rootstock variety does not seem much different than that for a tomato variety (fresh or processing type). That is, the evaluation is on the F1 seed per se. Because this tomato rootstock questionnaire is solely for Solanum lycopersicum L. x Solanum habroichaites, the female parent will undoubtedly bring traits that will allow two F1 rootstocks to be distinguished. However, I think the evaluation could be done also on the rootstock per se. Such traits to evaluate could be as follow:

Seed Quality (via X-ray)
> seed filling (i.e. proportion of the different seed organs)
> homogeneity

Germination Quality (on primed seeds)
> speed to germination
> homogeneity

Plantlets Quality
> homogeneity of the plantlets in a specific timeframe
> proportion of usable plantlets (for grafting)

Grafting Quality
> grafting ability
> homogeneity

Root Vigor (of the rootstock)

> measured by its volume
> measured by its mass

Resistances Package
For example...
HMCL FUNDATOR = HR: ToMV, V, Fol 1,2 ,For ,M / IR: Pl (Pyrenochaeta lycopersici)
HMCL CLXTPG04 = HR: ToMV, V, Fol 1,2,3, For ,M / IR: Pl (Pyrenochaeta lycopersici)
DRS BEAUFORT = HR: ToMV, V, Fol 1,2 ,For ,M / IR: Pl (Pyrenochaeta lycopersici)

Most rootstocks will have the complete resistance package for soil-borne pathogens. Hence, it may not be the most disciminative trait.

Reaction: these remarks need further discussion to see if they can be brought into the UPOV terminology.

[End of Notes and of document]