

Technical Working Party for Vegetables

TWV/55/13

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PARTIAL REVISION OF THE TEST GUIDELINES FOR TOMATO ROOTSTOCKS

Document prepared by an expert from the Netherlands

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1. The purpose of this document is to present a proposal for a partial revision of the Test Guidelines for Tomato Rootstocks (document TG/294/1 Corr. Rev. 3).

2. The Technical Working Party for Vegetables (TWV), at its fifty-fourth session hosted by Brazil and organized by electronic means, from May 11 to 15, 2020, agreed that the Test Guidelines for Tomato Rootstocks (document TG/294/1 Corr. Rev. 3) be partially revised for the deletion of *S. cheesmaniae* from the coverage of the Test Guidelines and Characteristics and explanations 22 “Resistance to *Meloidogyne incognita* (Mi)”, 23 “Resistance to *Verticillium* sp. (Va and Vd) – Race 0”, 24 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol)”, 26 “Resistance to *Fulvia fulva* (Ff) (ex *Cladosporium fulvum*)” (see document TWV/54/9 “Report”, Annex III).

3. The following changes are proposed:

- (a) Deletion of *Solanum lycopersicum* L. x *Solanum cheesmaniae* (L. Ridley) Fosberg (UPOV code SOLAN_LCH) from the coverage of the Test Guidelines:
 - (i) Deletion from the cover page
 - (ii) Chapter 1 “Subject of these Test Guidelines”: Deletion from Chapter 1.1 and addition to Chapter 1.2
 - (iii) Deletion from Technical Questionnaire, Section 1 “Subject of the Technical Questionnaire”
- (b) Changes to notes and method of observation of characteristic 22 “Resistance to *Meloidogyne incognita* (Mi)” and explanation Ad. 22
- (c) Changes to Characteristics 23 “Resistance to *Verticillium* sp. (Va and Vd)”, 24.1 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 0EU/1US” and characteristic 24.2 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 1EU/2US”:
 - (i) Deletion of asterisks
 - (ii) Deletion from grouping characteristics in Chapter 5.3.
- (d) Changes to the explanation Ad. 24 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol)”
- (e) Correction of title of characteristic 26 “Resistance to *Fulvia fulva* (Ff) (ex *Cladosporium fulvum*)” and changes to explanation Ad. 26
- (f) Chapter 10: Technical Questionnaire:
 - (i) Section 5: Deletion of Characteristics 23 “Resistance to *Verticillium* sp. (Va and Vd)”, 24.1 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 0EU/1US” and characteristic 24.2 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 1EU/2US”
 - (ii) Section 7: Addition of Characteristics 23 “Resistance to *Verticillium* sp. (Va and Vd)”, 24.1 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 0EU/1US” and characteristic 24.2 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 1EU/2US” and other non-asterisked disease resistance characteristics to Section 7.3 “Other Information” of the Technical Questionnaire with an option ‘not tested’

4. The proposed changes to are presented below in highlight and underline (insertion) and ~~strike through~~ (deletion).

Proposed deletion of *Solanum lycopersicum* L. x *Solanum cheesmaniae* (L. Ridley) Fosberg (UPOV code SOLAN_LCH) from the coverage of the Test Guidelines

Deletion from the cover page

Current wording

TOMATO ROOTSTOCKS
UPOV Code: SOLAN_HAB; SOLAN_LHA; SOLAN_LPE; SOLAN_LCH; SOLAN_PHA
<i>Solanum habrochaites</i> S. Knapp & D.M. Spooner; <i>Solanum lycopersicum</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner; <i>Solanum lycopersicum</i> L. x <i>Solanum peruvianum</i> (L.) Mill.; <i>Solanum lycopersicum</i> L. x <i>Solanum cheesmaniae</i> (L. Ridley) Fosberg; <i>Solanum pimpinellifolium</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner

Alternative Names:

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Solanum habrochaites</i> S. Knapp & D.M. Spooner, <i>Lycopersicon agrimoniifolium</i> Dunal, <i>Lycopersicon hirsutum</i> Dunal, <i>Lycopersicon hirsutum</i> f. <i>glabratum</i> C. H. Müll.				
<i>Solanum lycopersicum</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner				
<i>Solanum lycopersicum</i> L. x <i>Solanum peruvianum</i> (L.) Mill.				
<i>Solanum lycopersicum</i> L. x <i>Solanum cheesmaniae</i> (L. Ridley) Fosberg				
<i>Solanum pimpinellifolium</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner				

* 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.]

Proposed new wording

TOMATO ROOTSTOCKS
UPOV Code: SOLAN_HAB; SOLAN_LHA; SOLAN_LPE; SOLAN_LCH ; SOLAN_PHA
<i>Solanum habrochaites</i> S. Knapp & D.M. Spooner; <i>Solanum lycopersicum</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner; <i>Solanum lycopersicum</i> L. x <i>Solanum peruvianum</i> (L.) Mill.;; <i>Solanum lycopersicum</i> L. x <i>Solanum cheesmaniae</i> (L. Ridley) Fosberg; <i>Solanum pimpinellifolium</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner

Alternative Names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Solanum habrochaites</i> S. Knapp & D.M. Spooner, <i>Lycopersicon agrimoniifolium</i> Dunal, <i>Lycopersicon hirsutum</i> Dunal, <i>Lycopersicon hirsutum</i> f. <i>glabratum</i> C. H. Müll.				
<i>Solanum lycopersicum</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner				
<i>Solanum lycopersicum</i> L. x <i>Solanum peruvianum</i> (L.) Mill.				
<i>Solanum lycopersicum</i> L. x <i>Solanum cheesmaniae</i> (L. Ridley) Fosberg				
<i>Solanum pimpinellifolium</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner				

* 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.]

Chapter 1 “Subject of these Test Guidelines”: Deletion from Chapter 1.1 and addition to Chapter 1.2

Current wording

Subject of these Test Guidelines

1.1 These Test Guidelines apply to all varieties of *Solanum habrochaites* S. Knapp & D.M. Spooner; *Solanum lycopersicum* L. x *Solanum habrochaites* S. Knapp & D.M. Spooner, *Solanum lycopersicum* L. x *Solanum peruvianum* L. (Mill.), *Solanum lycopersicum* L. x *Solanum cheesmaniae* (L. Ridley) Fosberg and *Solanum pimpinellifolium* L. x *Solanum habrochaites* S. Knapp & D.M. Spooner. Such varieties are generally used as rootstocks for tomato varieties (varieties of *Solanum lycopersicum* L. (*Lycopersicum esculentum* L. (Mill.)).

1.2 Rootstocks belonging to *Solanum lycopersicum* L. (*Lycopersicum esculentum* Mill.) or to *Solanum lycopersicum* L. x *Solanum pimpinellifolium* L. (*Lycopersicum esculentum* Mill. x *Lycopersicum pimpinellifolium* Mill.) should be covered by UPOV Test Guidelines TG/44.

Proposed new wording

Subject of these Test Guidelines

1.1 These Test Guidelines apply to all varieties of *Solanum habrochaites* S. Knapp & D.M. Spooner; *Solanum lycopersicum* L. x *Solanum habrochaites* S. Knapp & D.M. Spooner, *Solanum lycopersicum* L. x *Solanum peruvianum* L. (Mill.), ~~*Solanum lycopersicum* L. x *Solanum cheesmaniae* (L. Ridley) Fosberg~~ and *Solanum pimpinellifolium* L. x *Solanum habrochaites* S. Knapp & D.M. Spooner. Such varieties are generally used as rootstocks for tomato varieties (varieties of *Solanum lycopersicum* L. (*Lycopersicum esculentum* L. (Mill.)).

1.2 Rootstocks belonging to *Solanum lycopersicum* L. (*Lycopersicum esculentum* Mill.), to *Solanum lycopersicum* L. x *Solanum cheesmaniae* (L. Ridley) Fosberg or to *Solanum lycopersicum* L. x *Solanum pimpinellifolium* L. (*Lycopersicum esculentum* Mill. x *Lycopersicum pimpinellifolium* Mill.) should be covered by UPOV Test Guidelines TG/44.

Deletion from Technical Questionnaire, Section 1 "Subject of the Technical Questionnaire"

Current wording

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 Tomato Rootstocks belonging to:		
1.1	Botanical name	<i>Solanum habrochaites</i> S. Knapp & D.M. Spooner [...]
1.2	Botanical name	<i>Solanum lycopersicum</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner [...]
1.3	Botanical name	<i>Solanum lycopersicum</i> L. x <i>Solanum peruvianum</i> (L.) Mill. [...]
1.4	Botanical name	<i>Solanum lycopersicum</i> L. x <i>Solanum cheesmaniae</i> (L. Ridley) Fosberg [...]
1.5	Botanical name	<i>Solanum pimpinellifolium</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner [...]

Proposed new wording

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 Tomato Rootstocks belonging to:		
1.1	Botanical name	<i>Solanum habrochaites</i> S. Knapp & D.M. Spooner [...]
1.2	Botanical name	<i>Solanum lycopersicum</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner [...]
1.3	Botanical name	<i>Solanum lycopersicum</i> L. x <i>Solanum peruvianum</i> (L.) Mill. [...]
1.4	Botanical name	<i>Solanum lycopersicum</i> L. x <i>Solanum cheesmaniae</i> (L. Ridley) Fosberg [...]
1.5	Botanical name	<i>Solanum pimpinellifolium</i> L. x <i>Solanum habrochaites</i> S. Knapp & D.M. Spooner [...]

Proposed changes to notes and method of observation of characteristic 22 “Resistance to *Meloidogyne incognita* (Mi)” and explanation Ad. 22

Current wording

22. (* (+)	VG Resistance to <i>Meloidogyne incognita</i> (Mi)	Résistance à <i>Meloidogyne incognita</i> (Mi)	Resistenz gegen <i>Meloidogyne incognita</i> (Mi)	Resistencia a <i>Meloidogyne incognita</i> (Mi)		
QN	susceptible	sensible	anfällig	susceptible	Bruce	1
	moderately resistant	moyennement résistant	mäßig resistant	moderadamente resistente		2
	highly resistant	hautement résistant	hoch resistant	muy resistente	Emperador	3

proposed new wording

22. (* (+)	VG <u>VS</u> Resistance to <i>Meloidogyne incognita</i> (Mi)	Résistance à <i>Meloidogyne incognita</i> (Mi)	Resistenz gegen <i>Meloidogyne incognita</i> (Mi)	Resistencia a <i>Meloidogyne incognita</i> (Mi)		
QN	susceptible	sensible	anfällig	susceptible	Bruce	1
	<u>susceptible to intermediate resistant</u>					<u>2</u>
	<u>intermediate moderately resistant</u>	moyennement résistant	mäßig resistant	moderadamente resistente		<u>2 3</u>
	<u>intermediate to highly resistant</u>					<u>4</u>
	highly resistant	hautement résistant	hoch resistant	muy resistente	Emperador	<u>3 5</u>

*Current wording*Ad. 22: Resistance to *Meloidogyne incognita* (Mi)

1. Pathogen *Meloidogyne incognita*
3. Host species *Solanum lycopersicum*
4. Source of inoculum Naktuinbouw (NL¹) or GEVES² (FR)
5. Isolate non-resistance breaking
6. Establishment isolate identity use rootstock or tomato standards
7. Establishment pathogenicity use susceptible rootstock or tomato standard
8. Multiplication inoculum
 - 8.1 Multiplication medium living plant
 - 8.2 Multiplication variety preferably resistant to powdery mildew
 - 8.3 Plant stage at inoculation see 10.3
 - 8.5 Inoculation method see 10.4
 - 8.6 Harvest of inoculum root systems are cut with scissors into pieces
of about 1 cm length
 - 8.7 Check of harvested inoculum visual check for presence of root knots
 - 8.8 Shelf life/viability inoculum 1 day
9. Format of the test
 - 9.1 Number of plants per genotype 20 plants
 - 9.2 Number of replicates 1 replicate
 - 9.3 Control varieties
 - Susceptible: Bruce and (*Solanum lycopersicum*) Clairvil, Casaque Rouge
 - Moderately resistant : (*Solanum lycopersicum*) Madyta, Campeon, Madyta, Vinchy
 - Highly resistant: Emperador and (*Solanum lycopersicum*) "Anahu x Casaque Rouge",
Anahu, Anabel
 - 9.4 Test design include standard varieties
 - 9.5 Test facility greenhouse or climate room
 - 9.6 Temperature not over 28° C
 - 9.7 Light at least 12 h per day
10. Inoculation
 - 10.1 Preparation inoculum small pieces of diseased root mixed with soil
mix soil and infested root pieces
 - 10.2 Quantification inoculum soil: root ratio = 8:1, or depending on experience
 - 10.3 Plant stage at inoculation seed, or cotyledons
 - 10.4 Inoculation method plants are sown in infested soil or contamination of soil after sowing
when plantlets are at cotyledon stage
 - 10.7 Final observations 28 to 45 days after inoculation
11. Observations
 - 11.1 Method root inspection
 - 11.2 Observation scale Symptoms:
Galling, root malformation,
growth reduction, plant death
 - 11.3 Validation of test evaluation of variety resistance should be calibrated with results of
resistant and susceptible controls on standards
12. Interpretation of test results in comparison with control varieties
To consider that resistant varieties may have a few plants with falls. These are not considered as off-types.

absent (susceptible)..... [1]	growth strongly reduced, high gall count
intermediate (moderately resistant)..... [2]	medium growth reduction, medium gall count
present (highly resistant)..... [3]	no growth reduction, no galls
13. Critical control points:
Avoid rotting of roots; high temperature causes breakdown of resistance






¹ Naktuinbouw: resistentie@naktuinbouw.nl

² Geves: matref@geves.fr

*Proposed new wording*Ad. 22: Resistance to *Meloidogyne incognita* (Mi)

1.	Pathogen	<i>Meloidogyne incognita</i>
2.	Quarantine status	-
3.	Host species	Tomato - <i>Solanum lycopersicum</i>
4.	Source of inoculum	GEVES ³ (FR) or INIA (ES) ⁴ or Naktuinbouw (NL ⁵)
5.	Isolate	non-resistance breaking
6.	Establishment isolate identity	use tomato standards
7.	Establishment pathogenicity	use susceptible rootstock or tomato standard
8.	Multiplication inoculum	
8.1	Multiplication medium	living plant
8.2	Multiplication variety	susceptible variety, preferably resistant to powdery mildew
8.3	Plant stage at inoculation	see 10.3 2 leaves stage
8.5	Inoculation method	see 10.4 deposit of piece of contaminated roots in soil (around 5-10g per plant, to adapt depending of the population aggressivity)
8.6	Harvest of inoculum	6 to 10 weeks after inoculation, root systems are cut with scissors into pieces of about 1 cm length
8.7	Check of harvested inoculum	visual check for presence of root knots and ripe egg masses
8.8	Shelf life/viability inoculum	1 day
9.	Format of the test	
9.1	Number of plants per genotype	20 plants 30 plants, plus at least 10 non-inoculated plants to observe if a possible lack of germination is due to nematode or not
9.2	Number of replicates	1 replicate at least 2, preferably 3 to allow statistical analysis
9.3	Control varieties	Susceptible: Bruce and (<i>Solanum lycopersicum</i>) Clairvil , Casaque Rouge Moderately Intermediate resistant: (<i>Solanum lycopersicum</i>) Madyta, Campeon, Madyta, Vinchy, Tyonie Highly resistant: Emperador and (<i>Solanum lycopersicum</i>) "Anahu x Casaque Rouge", Anahu, Anabel
9.4	Test design	include standard varieties 3 replicates of 10 plants in different trays by variety, non-inoculated plants in a separate tray
9.5	Test facility	greenhouse or climate room
9.6	Temperature	not over 28° C 20-26°C, the temperature may be adapted, depending on the aggressivity of the test, to obtain the expected response of the controls, but should not exceed 26°C. Higher temperatures will cause breakdown of resistance.
9.7	Light	at least 12 h per day
10	Inoculation	
10.1	Preparation inoculum	small pieces of diseased roots mixed with soil mix soil and infested root pieces
10.2	Quantification inoculum	soil: root ratio = 8:1, or depending on experience the ratio is depending of aggressiveness of test and lab's conditions (e.g. between 30g to 60g of infested roots, for 100 plants in a tray of 45*30 cm containing approximately 5.5 kg of substrate), galls should be homogeneously mixed with soil.
10.3	Plant stage at inoculation	seed, or cotyledons

³ GEVES; matref@geves.fr⁴ INIA; resistencias@inia.es⁵ Naktuinbouw; resistentie@naktuinbouw.nl

10.4	Inoculation method	plants are sown in infested soil or contamination of soil after sowing when plantlets are at cotyledon stage plants sown in soil contaminated with galls			
10.7	End of test	28 to 45 days after inoculation depending on test conditions (temperature, season)			
11.	Observations				
11.1	Method	root inspection per plant			
11.2	Observation scale				
	<p>Class 0: healthy plant, no galls</p> 	<p>Class 1: few and little galls which are difficult to find (for example less than 5)</p> 	<p>Class 2: few galls, easy to observe but on few roots, still a lot of roots without galls</p> 	<p>Class 3: many individual galls on most but not all roots</p> 	<p>Class 4: many galls on all roots, sometimes in chains, can lead to dead plants and /or may suppress emergence</p> 
<p>The germination percentage of non-inoculated plants of the same seed lot in the same experiment should be used to calculate the number of seeds that did not produce a plant, and add these to plants in class 4.</p>					
11.3	Validation of test	evaluation of variety resistance should be calibrated with results of resistant and susceptible controls on standards Validation on controls. Expected reactions of controls: Susceptible control: most plants at classes 3 and 4. Highly resistant: most plants at classes 0 and 1. Intermediate resistant: clearly different from other controls with majority of plants around class 2.			
11.4	Off-types	resistant varieties may have a few plants with a few galls			
12.	Interpretation of test results in comparison with control varieties data in terms of UPOV characteristic states	[1] Susceptible: variety very similar to susceptible control [3] Intermediate resistant: variety very similar to intermediate resistant control [5] Highly resistant: variety very similar to highly resistant control If results are not clear, statistical analysis is advised. If significantly different from the controls, a retest is advised to check if the result is stable.			
<p>To consider that resistant varieties may have a few plants with falls. These are not considered as off-types:</p> <p>absent (susceptible)..... [1] growth strongly reduced, high gall count</p> <p>intermediate (moderately resistant)..... [2] medium growth reduction, medium gall count</p> <p>present (highly resistant)..... [3] no growth reduction, no galls</p>					
13.	Critical control points	Avoid rotting of roots; high temperature causes breakdown of resistance Avoid overwatering. This may result in rotting of roots. In case of aggressive test, put seeds in a layer of non-contaminated soil or decrease the quantity of inoculum.			

Proposed changes to Characteristics 23 “Resistance to *Verticillium* sp. (Va and Vd)”, 24.1 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 0EU/1US” and characteristic 24.2 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 1EU/2US”

Deletion of asterisks

Current wording

23. (*) (+)	VG	Resistance to <i>Verticillium</i> sp. (Va and Vd) – Race 0	Résistance à <i>Verticillium</i> sp. (Va et Vd) – Pathotype 0	Resistenz gegen <i>Verticillium</i> sp. (Va und Vd) – Pathotyp 0	Resistencia a <i>Verticillium</i> sp. (Va y Vd) – Raza 0		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Big Power	9
24. (+)		Resistance to <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)	Résistance à <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)	Resistenz gegen <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)	Resistencia a <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)		
24.1 (*)	VG	– Race 0EU/1US	– Race 0EU/1US	– Pathotyp 0EU/1US	– Raza 0EU/1US		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Emperador	9
24.2 (*)	VG	– Race 1EU/2US	– Race 1EU/2US	– Pathotyp 1EU/2US	– Raza 1EU/2US		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Emperador	9
24.3 (*)	VG	– Race 2EU/3US	– Race 2EU/3US	– Pathotyp 2EU/3US	– Raza 2EU/3US		
QL		absent	absente	fehlend	ausente	Emperador	1
		present	présente	vorhanden	presente	Colosus	9

Proposed new wording

23. (*) (+)	VG	Resistance to <i>Verticillium</i> sp. (Va and Vd) – Race 0	Résistance à <i>Verticillium</i> sp. (Va et Vd) – Pathotype 0	Resistenz gegen <i>Verticillium</i> sp. (Va und Vd) – Pathotyp 0	Resistencia a <i>Verticillium</i> sp. (Va y Vd) – Raza 0		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Big Power	9
24. (+)		Resistance to <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)	Résistance à <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)	Resistenz gegen <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)	Resistencia a <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)		
24.1 (*)	VG	– Race 0EU/1US	– Race 0EU/1US	– Pathotyp 0EU/1US	– Raza 0EU/1US		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Emperador	9
24.2 (*)	VG	– Race 1EU/2US	– Race 1EU/2US	– Pathotyp 1EU/2US	– Raza 1EU/2US		
QL		absent	absente	fehlend	ausente		1
		present	présente	vorhanden	presente	Emperador	9
24.3 (*)	VG	– Race 2EU/3US	– Race 2EU/3US	– Pathotyp 2EU/3US	– Raza 2EU/3US		
QL		absent	absente	fehlend	ausente	Emperador	1
		present	présente	vorhanden	presente	Colosus	9

Deletion from grouping characteristics in Chapter 5.3.

Current wording

5.3 The following have been agreed as useful grouping characteristics:

- (a) Fruit: green shoulder (characteristic 11)
- (b) Autonecrosis (characteristic 21)
- (c) Resistance to *Meloidogyne incognita* (characteristic 22)
- (d) Resistance to *Verticillium* sp. – Race 0 (characteristic 23)
- (e) Resistance to *Fusarium oxysporum* f. sp. *lycopersici* – Race 0EU/1US (characteristic 24.1)
- (f) Resistance to *Fusarium oxysporum* f. sp. *lycopersici* – Race 1EU/2US (characteristic 24.2)
- (g) Resistance to *Fusarium oxysporum* f. sp. *lycopersici* – Race 2EU/3US (characteristic 24.3)

Proposed new wording

5.3 The following have been agreed as useful grouping characteristics:

- (a) Fruit: green shoulder (characteristic 11)
- (b) Autonecrosis (characteristic 21)
- (c) Resistance to *Meloidogyne incognita* (characteristic 22)
- ~~(d) Resistance to *Verticillium* sp. – Race 0 (characteristic 23)~~
- ~~(e) Resistance to *Fusarium oxysporum* f. sp. *lycopersici* – Race 0EU/1US (characteristic 24.1)~~
- ~~(f) Resistance to *Fusarium oxysporum* f. sp. *lycopersici* – Race 1EU/2US (characteristic 24.2)~~
- ~~(g) (d) Resistance to *Fusarium oxysporum* f. sp. *lycopersici* – Race 2EU/3US (characteristic 24.3)~~

Proposed changes to the explanation Ad. 24 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol)”

Current wording

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

1.	Pathogen	<i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i>
3.	Host species	<i>Solanum lycopersicum</i>
4.	Source of inoculum	Naktuinbouw ⁶ (NL), GEVES ⁷ (FR) or INIA ⁸ (ES)
5.	Isolate	race 0EU/1US (e.g. strains Orange 71 or PRI 20698 or Fol 071) race 1EU/2US (e.g. strains 4152 or PRI40698 or RAF 70) race 2EU/3US (e.g. strain Fol029)
6.	Establishment isolate identity	use differential varieties (see ISF website: http://www.worldseed.org)
7.	Establishment pathogenicity	on susceptible tomato varieties
8.	Multiplication inoculum	
8.1	Multiplication medium	Potato Dextrose Agar, Medium “S” of Messiaen
8.4	Inoculation medium	water for scraping agar plates or Czapek-Dox culture medium (7 d-old aerated culture)
8.6	Harvest of inoculum	filter through double muslin cloth
8.7	Check of harvested inoculum	spore count; adjust to 10 ⁶ per ml
8.8	Shelflife/viability inoculum	4-8 h, keep cool to prevent spore germination
9.	Format of the test	
9.1	Number of plants per genotype	at least 20 plants
9.2	Number of replicates	1 replicate
9.3.1	Control varieties for the test with race 0EU/1US	
	Susceptible	(<i>Solanum lycopersicum</i>) Marmande, Marmande verte, Resal
	Resistant	Emperador, Colosus and (<i>Solanum lycopersicum</i>) “Marporum x Marmande verte”, Motelle, Gourmet, Mohawk, Ranco, Tradiro
9.3.2	Control varieties for the test with race 1EU/2US	
	Susceptible	(<i>Solanum lycopersicum</i>) Marmande verte, Cherry Belle, Roma, Marporum, Ranco
	Resistant	Emperador, Colosus and (<i>Solanum lycopersicum</i>) Tradiro, Odisea, “Motelle x Marmande verte”
9.3.3	Control varieties for the test with race 2EU/3US	
	Susceptible	Emperador and (<i>Solanum lycopersicum</i>) Marmande verte, Motelle, Marporum
	Resistant	Colosus and (<i>Solanum lycopersicum</i>) Tributes, Murdoch, “Marmande verte x Florida”
9.4	Test design	>20 plants; e.g. 35 seeds for 24 plants, including 2 blanks
9.5	Test facility	glasshouse or climate room
9.6	Temperature	24-28°C (severe test, with mild isolate) 20-24°C (mild test, with severe isolate)
9.7	Light	12 hours per day or longer
9.8	Season	all seasons
9.9	Special measures	slightly acidic peat soil is optimal; keep soil humid but avoid water stress

⁶ Naktuinbouw: resistentie@naktuinbouw.nl

⁷ GEVES: matref@geves.fr

⁸ INIA: resistencias@inia.es

10.	Inoculation	
10.1	Preparation inoculum	aerated Messiaen or PDA or Agar Medium S of Messiaen or Czapek Dox culture or scraping of plates
10.2	Quantification inoculum	spore count, adjust to 10 ⁶ spores per ml, lower concentration for a very aggressive isolate
10.3	Plant stage at inoculation	10-18 d, cotyledon to first leaf
10.4	Inoculation method	roots and hypocotyls are immersed in spore suspension for 5-15 min; trimming of roots is an option
10.7	Final observations	14-21 days after inoculation
11.	Observations	
11.1	Method	visual
11.2	Observation scale	symptoms: growth retardation, wilting, yellowing, vessel browning extending above cotyledon
11.3	Validation of test	evaluation of variety resistance should be calibrated with results of resistant and susceptible controls.
12.	Interpretation of test results in comparison with control varieties	
	absent [1]	severe symptoms
	present [9]	mild or no symptoms
13.	Critical control points	Test results may vary slightly in inoculum pressure due to differences in isolate, spore concentration, soil humidity and temperature.

Proposed new wording

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

1.	Pathogen	<i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i>
3.	Host species	<i>Solanum lycopersicum</i>
4.	Source of inoculum	Naktuinbouw ⁹ (NL), GEVES ¹⁰ (FR) or INIA ¹¹ (ES)
5.	Isolate	race 0EU/1US (e.g. strains Orange 71 or PRI 20698 or Fol 071) race 1EU/2US (e.g. strains 4152 or PRI40698 or RAF 70) race 2EU/3US (e.g. strain Fol029)
6.	Establishment isolate identity	use differential varieties (see ISF website: http://www.worldseed.org)
7.	Establishment pathogenicity	on susceptible tomato varieties
8.	Multiplication inoculum	
8.1	Multiplication medium	Potato Dextrose Agar, Medium "S" of Messiaen
8.4	Inoculation medium	water for scraping agar plates or Czapek-Dox culture medium (7 d-old aerated culture)
8.6	Harvest of inoculum	filter through double muslin cloth
8.7	Check of harvested inoculum	spore count; adjust to 10 ⁶ per ml
8.8	Shelflife/viability inoculum	4-8 h, keep cool to prevent spore germination
9.	Format of the test	
9.1	Number of plants per genotype	at least 20 plants
9.2	Number of replicates	1 replicate
9.3.1	Control varieties for the test with race 0EU/1US	
	Susceptible	(<i>Solanum lycopersicum</i>) Marmande, Marmande verte, Resal
	Resistant	Emperador, Colosus and (<i>Solanum lycopersicum</i>) "Marporum x Marmande verte", Motelle, Gourmet, Mohawk, Ranco, Tradiro
9.3.2	Control varieties for the test with race 1EU/2US	
	Susceptible	(<i>Solanum lycopersicum</i>) Marmande verte, Cherry Belle, Roma, Marporum, Ranco
	Resistant	Emperador, Colosus and (<i>Solanum lycopersicum</i>) Tradiro, Odisea, "Motelle x Marmande verte"
9.3.3	Control varieties for the test with race 2EU/3US	
	Susceptible	Emperador and (<i>Solanum lycopersicum</i>) Marmande verte, Motelle, Marporum. <u>Susceptible rootstocks are generally less susceptible than susceptible <i>Solanum lycopersicum</i> varieties. The susceptible rootstock variety Emperador must be included as control.</u>
	Resistant	Colosus and (<i>Solanum lycopersicum</i>) Tributes, Murdoch, "Marmande verte x Florida"
9.4	Test design	>20 plants; e.g. 35 seeds for 24 plants, including 2 blanks
9.5	Test facility	glasshouse or climate room
9.6	Temperature	24-28°C (severe test, with mild isolate) 20-24°C (mild test, with severe isolate)
9.7	Light	12 hours per day or longer
9.8	Season	all seasons
9.9	Special measures	slightly acidic peat soil is optimal; keep soil humid but avoid water stress

⁹ Naktuinbouw: resistentie@naktuinbouw.nl

¹⁰ GEVES: matref@geves.fr

¹¹ INIA: resistencias@inia.es

10.	Inoculation	
10.1	Preparation inoculum	aerated Messiaen or PDA or Agar Medium S of Messiaen or Czapek Dox culture or scraping of plates
10.2	Quantification inoculum	spore count, adjust to 10 ⁶ spores per ml, lower concentration for a very aggressive isolate
10.3	Plant stage at inoculation	10-18 d, cotyledon to first leaf
10.4	Inoculation method	roots and hypocotyls are immersed in spore suspension for 5-15 min; trimming of roots is an option
10.7	Final observations	14-21 days after inoculation
11.	Observations	
11.1	Method	visual
11.2	Observation scale	symptoms: growth retardation, wilting, yellowing, vessel browning extending above cotyledon
11.3	Validation of test	evaluation of variety resistance should be calibrated with results of resistant and susceptible controls.
12.	Interpretation of test results in comparison with control varieties data in terms of UPOV characteristic states	
	absent [1]	severe symptoms
	present [9]	mild or no symptoms
13.	Critical control points	Test results may vary slightly in inoculum pressure due to differences in isolate, spore concentration, soil humidity and temperature.

Correction of title of characteristic 26 “Resistance to *Fulvia fulva* (Ff) (ex *Cladosporium fulvum*)” and changes to explanation Ad. 26

Current wording

26. (+)	Resistance to <i>Fulvia fulva</i> (Ff) (ex <i>Cladosporium fulvum</i>)	Résistance à <i>Fulvia fulva</i> (Ff) (ex <i>Cladosporium fulvum</i>)	Resistenz gegen <i>Fulvia fulva</i> (Ff) (ex <i>Cladosporium fulvum</i>)	Resistencia a <i>Fulvia fulva</i> (Ff) (ex <i>Cladosporium fulvum</i>)		
26.1	VG – Race 0	– Pathotype 0	– Pathotyp 0	– Raza 0		
QL	absent	absente	fehlend	ausente	King Kong	1
	present	présente	vorhanden	presente	Bruce	9
26.2	VG – Group A	– Groupe A	– Gruppe A	– Grupo A		
QL	absent	absente	fehlend	ausente	King Kong	1
	present	présente	vorhanden	presente	Big Power	9
26.3	VG – Group B	– Groupe B	– Gruppe B	– Grupo B		
QL	absent	absente	fehlend	ausente	King Kong	1
	present	présente	vorhanden	presente	Bruce	9
26.4	VG – Group C	– Groupe C	– Gruppe C	– Grupo C		
QL	absent	absente	fehlend	ausente		1
	present	présente	vorhanden	presente	Big Power	9
26.5	VG – Group D	– Groupe D	– Gruppe D	– Grupo D		
QL	absent	absente	fehlend	ausente	King Kong	1
	present	présente	vorhanden	presente	Bruce	9
26.6	VG – Group E	– Groupe E	– Gruppe E	– Grupo E		
QL	absent	absente	fehlend	ausente	Bruce, King Kong	1
	present	présente	vorhanden	presente	Big Power	9

Proposed new wording

26. (+)	<u>Resistance to <i>Fulvia Passalora fulva</i> (Ff Pf) (ex <i>Cladosporium fulvum</i>) (ex <i>Fulvia fulva</i>)</u>	<u>Résistance à <i>Fulvia Passalora fulva</i> (Ff Pf) (ex <i>Cladosporium fulvum</i>) (ex <i>Fulvia fulva</i>)</u>	<u>Resistenz gegen <i>Fulvia Passalora fulva</i> (Ff Pf) (ex <i>Cladosporium fulvum</i>) (ex <i>Fulvia fulva</i>)</u>	<u>Resistencia a <i>Fulvia Passalora fulva</i> (Ff Pf) (ex <i>Cladosporium fulvum</i>) (ex <i>Fulvia fulva</i>)</u>		
26.1	VG – Race 0	– Pathotype 0	– Pathotyp 0	– Raza 0		
QL	absent	absente	fehlend	ausente	King Kong	1
	present	présente	vorhanden	presente	Bruce	9
26.2	VG – Group A	– Groupe A	– Gruppe A	– Grupo A		
QL	absent	absente	fehlend	ausente	King Kong	1
	present	présente	vorhanden	presente	Big Power	9
26.3	VG – Group B	– Groupe B	– Gruppe B	– Grupo B		
QL	absent	absente	fehlend	ausente	King Kong	1
	present	présente	vorhanden	presente	Bruce	9
26.4	VG – Group C	– Groupe C	– Gruppe C	– Grupo C		
QL	absent	absente	fehlend	ausente		1
	present	présente	vorhanden	presente	Big Power	9
26.5	VG – Group D	– Groupe D	– Gruppe D	– Grupo D		
QL	absent	absente	fehlend	ausente	King Kong	1
	present	présente	vorhanden	presente	Bruce	9
26.6	VG – Group E	– Groupe E	– Gruppe E	– Grupo E		
QL	absent	absente	fehlend	ausente	Bruce, King Kong	1
	present	présente	vorhanden	presente	Big Power	9

Current wording

Ad. 26: Resistance to *Fulvia fulva* (Ff) (ex *Cladosporium fulvum*)

1. Pathogen..... *Fulvia fulva* (ex *Cladosporium fulvum*)
 3. Host species *Solanum lycopersicum*
 4. Source of inoculum Naktuinbouw¹² (NL) or GEVES¹³ (FR)
 5. Isolate Race group 0, A, B, C, D, and E
 6. Establishment isolate identity..... with genetically defined differentials from GEVES (FR)
A breaks Cf-2, B Cf-4, C Cf-2&4, D Cf-5, E Cf-2&4&5
 7. Establishment pathogenicity symptoms on susceptible tomato
 8. Multiplication inoculum.....
 - 8.1 Multiplication medium Potato Dextrose Agar or Malt Agar or a synthetic medium
 - 8.8 Shelf life/viability inoculum 4 hours, keep cool
 9. Format of the test
 - 9.1 Number of plants per genotype..... more than 20 plants
 - 9.2 Number of replicates..... 1 replicate
 - 9.3 Control varieties
 - Susceptible: King Kong and (*Solanum lycopersicum*) Monalbo, Moneymaker
 - Resistant for race 0:..... Bruce and (*Solanum lycopersicum*) Angela, Estrella, Sonatine, Sonato, Vemone, Vagabond, IVT 1149, Vagabond x IVT 1149, IVT 1154
 - Resistant for race group A: Big Power and (*Solanum lycopersicum*) Angela, Estrella, Sonatine, Sonato
 - Resistant for race group B: Bruce and (*Solanum lycopersicum*) Angela, Estrella, Sonatine, Sonato, Vemone
 - Resistant for race group C: Big Power and (*Solanum lycopersicum*) Angela, Estrella, Sonatine
 - Resistant for race group D: Bruce and (*Solanum lycopersicum*) Estrella, Sonatine, Vemone
 - Resistant for race group E: Big Power and (*Solanum lycopersicum*) Sonatine, Jadviga, Rhianna, IVT 1154
 - 9.5 Test facility glasshouse or climate room
 - 9.6 Temperature day: 22° C, night: 20° or day: 25°C, night 20°C
 - 9.7 Light 12 hours or longer
 - 9.9 Special measures depending on facility and weather, there may be a need to raise the humidity
e.g. humidity tent closed 3-4 days after inoculation
and after this, 66% until 80% closed during day, until end
 10. Inoculation.....
 - 10.1 Preparation inoculum prepare evenly colonized plates, e.g. 1 for 36 plants;
remove spores from plate by scraping with water with Tween20;
filter through double muslin cloth
 - 10.2 Quantification inoculum..... count spores; adjust to 10⁵ spores per ml or more
 - 10.3 Plant stage at inoculation..... 19-20 d (incl. 12 d at 24°), 2-3 leaves
 - 10.4 Inoculation method..... spray on dry leaves
 - 10.7 Final observations..... 14 days after inoculation
 11. Observations
 - 11.1 Method visual inspection of abaxial side of inoculated leaves
 - 11.2 Observation scale Symptom: velvety, white spots
 - 11.3 Validation of test evaluation of variety resistance should be calibrated with results of resistant and susceptible controls
 12. Interpretation of test results in comparison with control varieties
 - absent [1] symptoms
 - present [9] no symptoms
- Excessively high humidity may cause rugged brown spots on all leaves. These are not to be considered as off-types.
13. Critical control points:
Ff spores have a variable size and morphology. Small spores are also viable.
Fungal plates will gradually become sterile after 6-10 weeks. Store good culture at -80°C.
For practical purposes, it is not possible to keep plants longer than 14 days inside a tent.

Proposed new wording

¹² Naktuinbouw: resistentie@naktuinbouw.nl

¹³ Geves: matref@geves.fr

Ad. 26: Resistance to *Fulvia Passalora fulva* (Ff Pf) (~~ex Cladosporium fulvum~~) (ex *Fulvia fulva*)

1. Pathogen.....*Fulvia Passalora fulva* (~~ex Cladosporium fulvum~~)
3. Host species.....*Solanum lycopersicum*
4. Source of inoculum.....Naktuinbouw¹⁴ (NL) or GEVES¹⁵ (FR)
5. Isolate.....Race group 0, A, B, C, D, and E
6. Establishment isolate identitywith genetically defined differentials from GEVES (FR)
A breaks Cf-2, B Cf-4, C Cf-2&4, D Cf-5, E Cf-2&4&5
7. Establishment pathogenicity.....symptoms on susceptible tomato
8. Multiplication inoculum
- 8.1 Multiplication medium.....Potato Dextrose Agar or Malt Agar or a synthetic medium
- 8.8 Shelf life/viability inoculum4 hours, keep cool
9. Format of the test
- 9.1 Number of plants per genotypemore than 20 plants
- 9.2 Number of replicates.....1 replicate
- 9.3 Control varieties
- Susceptible:King Kong, ~~and~~ (*Solanum lycopersicum*) Monalbo, Moneymaker
- Resistant for race 0:Bruce, ~~and~~ (*Solanum lycopersicum*) ~~Angela, Estrella, Sonatine, Sonato, Vemone, Vagabond, IVT 1149, Vagabond x IVT 1149, IVT 1154, Purdue, Antique, Pink Treat, Sprigel, Triallon~~
- Resistant for race group A:~~Big Power, Vitalfort, and~~ (*Solanum lycopersicum*) ~~Angela, Estrella, Sonatine, Sonato Purdue, IVT1154, IVT1149, Antique, Pink Treat, Sprigel, Triallon~~
- Resistant for race group B:Bruce, ~~and~~ (*Solanum lycopersicum*) ~~Angela, Estrella, Sonatine, Sonato, Vemone Vétomold, IVT1154, IVT1149, Antique, Retinto, Sprigel, Triallon~~
- Resistant for race group C:~~Big Power, Vitalfort, and~~ (*Solanum lycopersicum*) ~~Angela, Estrella, Sonatine, IVT1154, IVT1149, Antique, Sprigel, Triallon~~
- Resistant for race group D:Bruce, ~~and~~ (*Solanum lycopersicum*) ~~Estrella, Sonatine, Vemone Vétomold, IVT1154, Antique, Pink Treat, Retinto, Sprigel~~
- Resistant for race group E:~~Big Power, Vitalfort, and~~ (*Solanum lycopersicum*) ~~Sonatine, Jadviga, Rhianna, IVT 1154, Antique, Sprigel~~
- 9.5 Test facilityglasshouse or climate room
- 9.6 Temperature.....day: 22° C, night: 20° or day: 25°C, night 20°C
- 9.7 Light12 hours or longer
- 9.9 Special measures.....depending on facility and weather, there may be a need to raise the humidity
e.g. humidity tent fully closed 3-4 days after inoculation
and after that partly closed (66% until 80%, 24h per day), until end
10. Inoculation.....
- 10.1 Preparation inoculumprepare evenly colonized plates, e.g. 1 for 36 plants;
remove spores from plate by scraping with water with Tween20;
filter through double muslin cloth
- 10.2 Quantification inoculumcount spores; adjust to 10⁵ spores per ml or more
- 10.3 Plant stage at inoculation19-20 d (incl. 12 d at 24°), 2-3 leaves
- 10.4 Inoculation method.....spray on dry leaves
- 10.7 Final observations14 days after inoculation; when susceptible control does not show clear symptoms the test may be prolonged until for example 18 days after inoculation
11. Observations
- 11.1 Methodvisual inspection of abaxial side of inoculated leaves
- 11.2 Observation scale.....Symptom: velvety, white spots
- 11.3 Validation of test..... evaluation of variety resistance should be calibrated with results of resistant and susceptible controls
12. Interpretation of ~~test results in comparison with control varieties~~ data in terms of UPOV characteristic states
- [1] absent symptoms
- [9] present no symptoms
13. Critical control points:
- ~~Ff Pf~~ spores have a variable size and morphology. Small spores are also viable.
- Fungal plates will gradually become sterile after 6-10 weeks and repeated subculturing. Do not subculture more often than strictly necessary for multiplication. Store good culture at -80°C.
- ~~For practical purposes, it is not possible to keep plants longer than 14 days inside a tent.~~ Excessively high humidity may cause rugged brown spots on all leaves. These are not to be considered as off-types.

¹⁴ Naktuinbouw: resistentie@naktuinbouw.nl¹⁵ Geves: matref@geves.fr

Chapter 10: Technical Questionnaire:

Section 5: Deletion of Characteristics 23 “Resistance to *Verticillium* sp. (Va and Vd)”, 24.1 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 0EU/1US” and characteristic 24.2 “Resistance to *Fusarium oxysporum* f. sp. *lycopersici* (Fol) Race 1EU/2US”

Current wording

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

Characteristics	Example Varieties	Note
[...]		
5.6 Resistance to <i>Verticillium</i> sp. (Va and Vd) - Race 0 (23)		
absent		1[]
present	Big Power	9[]
5.7 Resistance to <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol) (24)		
5.8 Race 0EU/1US (24.1)		
absent		1[]
present	Emperador	9[]
5.9 Race 1EU/2US (24.2)		
absent		1[]
present	Emperador	9[]
5.10 Race 2EU/3US (24.3)		
absent	Emperador	1[]
present	Colosus	9[]
5.11 Resistance to <i>Fusarium oxysporum</i> f. sp. <i>radicis-lycopersici</i> (Forl) (25)		
absent	Kemerit	1[]
present	Emperador	9[]

Proposed new wording

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

Characteristics	Example Varieties	Note
[...]		
5.6 (23) Resistance to <i>Verticillium</i> sp. (Va and Vd) - Race 0		
absent		1[]
present	Big Power	9[]
5.7 (24) Resistance to <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)		
5.8 (24.1) Race 0EU/1US		
absent		1[]
present	Emperador	9[]
5.9 (24.2) Race 1EU/2US		
absent		1[]
present	Emperador	9[]
5.10 (24.3) Resistance to <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol) - Race 2EU/3US		
absent	Emperador	1[]
present	Colosus	9[]
5.11 (25) Resistance to <i>Fusarium oxysporum</i> f. sp. <i>radicis-lycopersici</i> (Forl)		
absent	Kemerit	1[]
present	Emperador	9[]

Section 7: Addition of Characteristics 23 “Resistance to Verticillium sp. (Va and Vd)”, 24.1 “Resistance to Fusarium oxysporum f. sp. lycopersici (Fol) Race 0EU/1US” and characteristic 24.2 “Resistance to Fusarium oxysporum f. sp. lycopersici (Fol) Race 1EU/2US” and other non-asterisked disease resistance characteristics to Section 7.3 “Other Information” of the Technical Questionnaire with an option ‘not tested’

Current wording

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

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

Proposed new wording

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#7. Additional information which may help in the examination of the variety

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

Yes [] No []

(If yes, please provide details)

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

Yes [] No []

(If yes, please provide details)

7.3 Other information

7.3.1 Resistance to

	<u>absent</u>	<u>present</u>	<u>not tested</u>
<u>(a) <i>Verticillium</i> sp. (Va and Vd) - Race 0 (char. 23)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(b) <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> (Fol)</u>			
<u>(i) Race 0EU/1US (char. 24.1)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(ii) Race 1EU/2US (char. 24.2)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(c) <i>Passalora fulva</i> (Pf)</u>			
<u>(i) Race 0 (char. 26.1)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(ii) Group A (char. 26.2)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(iii) Group B (char. 26.3)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(iv) Group C (char. 26.4)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(v) Group D (char. 26.5)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(vi) Group E (char. 26.6)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(d) Tomato mosaic virus (ToMV)</u>			
<u>(i) Strain 0 (char. 27.1)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(ii) Strain 1 (char. 27.2)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(ii) Strain 2 (char. 27.3)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(e) <i>Pyrenochaeta lycopersici</i> (PI) (char. 28)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(f) <i>Stemphylium</i> spp. (Ss) (char. 29)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(g) Tomato yellow leaf curl virus (TYLCV) (char. 30)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(h) Tomato spotted wild virus (TSWV) Strain 0 (char. 31)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(i) <i>Oidium neolycopersici</i> (On) (char. 32)</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>(j) Others (please specify, including races and strains)</u>			

[End of document]