

Technical Working Party for Vegetables

TWV/58/7

Fifty-Eighth Session
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PARTIAL REVISION OF THE TEST GUIDELINES FOR LETTUCE

Document prepared by an expert from France

Disclaimer: this document does not represent UPOV policies or guidance

1. The purpose of this document is to present a proposal for a partial revision of the Test Guidelines for Lettuce (document TG/13/11 Rev. 2).
2. The Technical Working Party for Vegetables (TWV), at its fifty-seventh session¹, agreed that the Test Guidelines for Lettuce (*Lactuca sativa* L.) be partially revised (see document TWV/57/26 Corr. "Report", Annex II).
3. The following changes are proposed:
 - (a) Revision of the grouping characteristics in chapter 5.3
 - (b) Deletion of characteristics 38 to 47 "Resistance to *Bremia lactucae* (Bl) Isolates Bl:16EU to BL:27EU"
 - (c) Revision of characteristic and explanation Ad. 55 "Resistance to *Fusarium oxysporum* f.sp. *lactucae* (Fol) Race 1"
 - (d) Addition of new characteristic "Resistance to *Fusarium oxysporum* f.sp. *lactucae* (Fol) Race 4" at the end of the table of characteristics
 - (e) Changes to the Technical Questionnaire
4. The proposed changes are presented below in highlight and underline (insertion) and ~~striketrough~~ (deletion).

¹ held in Antalya, Türkiye, from May 1 to 5, 2023, in hybrid format

Revision of the grouping characteristics in chapter 5.3

Current wording:

5.3 The following have been agreed as useful grouping characteristics:

- (a) Seed: color (characteristic 1)
- (b) Leaf: anthocyanin coloration (characteristic 11)
- (c) Time of beginning of bolting (characteristic 35)
- (d) Resistance to *Bremia lactucae* (BI) Isolate BI: 16EU (characteristic 38)

[...]

Proposed new wording:

5.3 The following have been agreed as useful grouping characteristics:

- (a) Seed: color (characteristic 1)
- (b) Leaf: anthocyanin coloration (characteristic 11)
- (c) Time of beginning of bolting (characteristic 35)
- (d) Resistance to *Bremia lactucae* (BI) Isolate BI: ~~16~~ 29EU (characteristic ~~38~~ 49)

[...]

Proposed deletion of characteristics 38 to 47 “Resistance to *Bremia lactucae* (BI) Isolates BI:16EU to BL: 27EU”

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
38.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (BI) Isolate BI: 16EU	Résistance à <i>Bremia lactucae</i> (BI) Isolat BI: 16EU	Resistenz gegen <i>Bremia lactucae</i> (BI) Isolat BI: 16EU	Resistencia a <i>Bremia lactucae</i> (BI) Aislado BI: 16EU		
	absent	absente	fehlend	ausente	Green Towers	4
	present	présente	vorhanden	presente	Argelès	9
39.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (BI) Isolate BI: 17EU	Résistance à <i>Bremia lactucae</i> (BI) Isolat BI: 17EU	Resistenz gegen <i>Bremia lactucae</i> (BI) Isolat BI: 17EU	Resistencia a <i>Bremia lactucae</i> (BI) Aislado BI: 17EU		
	absent	absente	fehlend	ausente	Green Towers	4
	present	présente	vorhanden	presente	Argelès	9
40.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (BI) Isolate BI: 20EU	Résistance à <i>Bremia lactucae</i> (BI) Isolat BI: 20EU	Resistenz gegen <i>Bremia lactucae</i> (BI) Isolat BI: 20EU	Resistencia a <i>Bremia lactucae</i> (BI) Aislado BI: 20EU		
	absent	absente	fehlend	ausente	Green Towers	4
	present	présente	vorhanden	presente	FrRsal-1	9
41.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (BI) Isolate BI: 21EU	Résistance à <i>Bremia lactucae</i> (BI) Isolat BI: 21EU	Resistenz gegen <i>Bremia lactucae</i> (BI) Isolat BI: 21EU	Resistencia a <i>Bremia lactucae</i> (BI) Aislado BI: 21EU		
	absent	absente	fehlend	ausente	Green Towers	4
	present	présente	vorhanden	presente	Argelès, Colorado	9

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
42.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (Bl) Isolate BI: 22EU	Résistance à <i>Bremia lactucae</i> (Bl) Isolat BI: 22EU	Resistenz gegen <i>Bremia lactucae</i> (Bl) Isolat BI: 22EU	Resistencia a <i>Bremia lactucae</i> (Bl) Aislado BI: 22EU		
	absent	absente	fehlend	ausente	Green Towers	4
	present	présente	vorhanden	presente	FrRsal-1	9
43.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (Bl) Isolate BI: 23EU	Résistance à <i>Bremia lactucae</i> (Bl) Isolat BI: 23EU	Resistenz gegen <i>Bremia lactucae</i> (Bl) Isolat BI: 23EU	Resistencia a <i>Bremia lactucae</i> (Bl) Aislado BI: 23EU		
	absent	absente	fehlend	ausente	Green Towers	4
	present	présente	vorhanden	presente	Colorado	9
44.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (Bl) Isolate BI: 24EU	Résistance à <i>Bremia lactucae</i> (Bl) Isolat BI: 24EU	Resistenz gegen <i>Bremia lactucae</i> (Bl) Isolat BI: 24EU	Resistencia a <i>Bremia lactucae</i> (Bl) Aislado BI: 24EU		
	absent	absente	fehlend	ausente	Argelès, Colorado	4
	present	présente	vorhanden	presente	Dandie, NunDm15, UCDm14	9
45.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (Bl) Isolate BI: 25EU	Résistance à <i>Bremia lactucae</i> (Bl) Isolat BI: 25EU	Resistenz gegen <i>Bremia lactucae</i> (Bl) Isolat BI: 25EU	Resistencia a <i>Bremia lactucae</i> (Bl) Aislado BI: 25EU		
	absent	absente	fehlend	ausente	Colorado	4
	present	présente	vorhanden	presente	Argelès	9
46.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (Bl) Isolate BI: 26EU	Résistance à <i>Bremia lactucae</i> (Bl) Isolat BI: 26EU	Resistenz gegen <i>Bremia lactucae</i> (Bl) Isolat BI: 26EU	Resistencia a <i>Bremia lactucae</i> (Bl) Aislado BI: 26EU		
	absent	absente	fehlend	ausente	Colorado	4
	present	présente	vorhanden	presente	Balesta, Bedford	9
47.	QL VG	(+)				
	Resistance to <i>Bremia lactucae</i> (Bl) Isolate BI: 27EU	Résistance à <i>Bremia lactucae</i> (Bl) Isolat BI: 27EU	Resistenz gegen <i>Bremia lactucae</i> (Bl) Isolat BI: 27EU	Resistencia a <i>Bremia lactucae</i> (Bl) Aislado BI: 27EU		
	absent	absente	fehlend	ausente	Balesta, Colorado	4
	present	présente	vorhanden	presente	FrRsal-1	9

Current wording:

Ad. 38 to 52: Resistance to *Bremia lactucae* (BI), several isolates

1.	Pathogen	<i>Bremia lactucae</i>
2.	Quarantine status	no
3.	Host species	lettuce - <i>Lactuca sativa</i> L.
4.	Source of inoculum	GEVES ² (FR) or Naktuinbouw ³ (NL)
5.	Isolate	BI: 16EU,17EU, 20-27EU, 29-31EU, 33EU, 35EU

[...]

For reference: The International Bremia Evaluation Board (IBEB) produces regular updates of the host differential reaction table. The most recent table is available through ISF at <http://www.worldseed.org/our-work/plant-health/other-initiatives/ibeb/>. Pictures for the observation scale are also provided.

Isolates	Differentials	Green Towers	Dandie	R4T57D	UC Dm14	NunDm15	CGDm16	Colorado	FrRsal-1	Argelès	RYZ 2164	RYZ910457	Bedford	Balesta	Bartoli	Design	Kibrille
BI: 16EU	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-
BI: 17EU	+	+	-	+	+	-	+	+	-	-	-	(+)	-	-	-	-	-
BI: 20EU	+	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-
BI: 21EU	+	+	+	-	+	+	-	+	-	-	-	-	-	-	-	-	-
BI: 22EU	+	-	+	+	+	-	+	-	-	-	-	-	+	-	-	-	-
BI: 23EU	+	+	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-
BI: 24EU	+	-	+	-	-	+	+	-	+	-	-	-	-	-	-	(-)	-
BI: 25EU	+	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-
BI: 26EU	+	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-
BI: 27EU	+	+	+	+	+	-	+	-	+	+	-	(-)	+	-	-	-	-
BI: 29EU	+	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
BI: 30EU	+	-	+	+	+	-	+	-	+	+	-	-	-	-	+	-	-
BI: 31EU	+	+	+	+	-	-	+	-	-	+	+	-	-	-	+	-	-
BI: 33EU	+	-	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+
BI: 35EU	+	-	+	+	+	+	+	+	+	+	+	-	-	-	+	+	+

² matref@geves.fr

³ resistentie@naktuinbouw.nl

Proposed new wording:

Ad. 38 to 52: Resistance to *Bremia lactucae* (BI), several isolates

1.	Pathogen	<i>Bremia lactucae</i>
2.	Quarantine status	no
3.	Host species	lettuce - <i>Lactuca sativa</i> L.
4.	Source of inoculum	GEVES ⁴ (FR) or Naktuinbouw ⁵ (NL)
5.	Isolate	BI: 16EU, 17EU, 20-27EU, 29-31EU, 33EU, 35EU

[...]

For reference: The International Bremia Evaluation Board (IBEB) produces regular updates of the host differential reaction table. The most recent table is available through ISF at <http://www.worldseed.org/our-work/plant-health/other-initiatives/ibeb/>. Pictures for the observation scale are also provided.

Isolates	Differentials	Green Towers	Dandie	R4T57D	UC Dm14	NunDm15	CGDm16	Colorado	FrRsal-1	Argelès	RYZ 2164	RYZ910457	Bedford	Balesta	Bartoli	Design	Kibrille
BI: 16EU	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-
BI: 17EU	+	+	-	+	+	-	+	+	-	-	-	(+)	-	-	-	-	-
BI: 20EU	+	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-
BI: 21EU	+	+	+	-	+	+	-	+	-	-	-	-	-	-	-	-	-
BI: 22EU	+	-	+	+	+	-	+	-	-	-	-	-	+	-	-	-	-
BI: 23EU	+	+	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-
BI: 24EU	+	-	+	-	-	+	-	+	-	-	-	-	-	-	-	(-)	-
BI: 25EU	+	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-
BI: 26EU	+	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-
BI: 27EU	+	+	+	+	+	-	+	-	+	+	-	(-)	+	-	-	-	-
BI: 29EU	+	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
BI: 30EU	+	-	+	+	+	-	+	-	+	+	-	-	-	-	-	+	-
BI: 31EU	+	+	+	+	-	-	+	-	-	+	+	-	-	-	-	+	-
BI: 33EU	+	-	+	+	+	+	+	+	+	+	-	-	-	-	-	+	+
BI: 35EU	+	-	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+

Isolates	Differentials	Green Towers	Dandie	R4T57D	UC Dm14	NunDm15	CGDm16	Colorado	FrRsal-1	Argelès	RYZ 2164	RYZ910457	Bedford	Balesta	Bartoli	Design	Kibrille
BI: 29EU	+	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
BI: 30EU	+	-	+	+	+	-	+	-	+	+	-	-	-	-	+	-	-
BI: 31EU	+	+	+	+	-	-	+	-	-	+	+	-	-	-	+	-	-
BI: 33EU	+	-	+	+	+	+	+	+	+	+	-	-	-	-	+	+	-
BI: 35EU	+	-	+	+	+	+	+	+	+	+	+	-	-	-	+	+	-

Legend: (+) indicates slightly reduced sporulation, (-) indicates no sporulation with necrosis or very weak sporulation, as defined in the harmonized scale given in Fig. 1. on <https://worldseed.org/our-work/disease-resistance/other-initiatives/ibeb/>

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⁵ resistentie@naktuinbouw.nl

Revision of characteristic 55 “Resistance to *Fusarium oxysporum* f.sp. *lactucae* (Fol) Race 1”

Current wording:

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
55.	QN MS/VG	(+)				
	Resistance to <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Race 1	Résistance à <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Race 1	Resistenz gegen <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Pathotyp 1	Resistencia a <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Raza 1		
	susceptible	sensible	anfällig	susceptible	Cobham Green, Patriot	1
	moderately resistant	modérément résistante	mäßig resistent	moderadamente resistente	Affic, Fuzila, Natexis	2
	highly resistant	hautement résistante	hochresistent	muy resistente	Costa Rica No. 4, Romasol	3

Proposed new wording:

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
55.	QN MS/VG	(+)				
	Resistance to <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Race 1	Résistance à <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Race 1	Resistenz gegen <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Pathotyp 1	Resistencia a <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Raza 1		
	<u>susceptible</u> absent or low	<u>sensible</u> absente ou faible	<u>anfällig</u> fehlend oder gering	<u>susceptible</u> ausente o baja	Cobham Green, Patriot	1
	<u>moderately resistant</u> medium	<u>modérément résistante</u> moyenne	<u>mäßig resistent</u> mittel	<u>moderadamente resistente</u> media	Affic, Fuzila, Natexis	2
	<u>highly resistant</u> high	<u>hautement résistante</u> élevée	<u>hochresistent</u> hoch	<u>muy resistente</u> alta	Costa Rica No. 4, Romasol	3

Addition of new characteristic “Resistance to *Fusarium oxysporum* f.sp. *lactucae* (Fol) Race 4” at the end of the table of characteristics

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
NEW	QN	MS/VG	(+)			
	Resistance to <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Race 4	Résistance à <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Race 4	Resistenz gegen <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Pathotyp 4	Resistencia a <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> (Fol) Raza 4		
	absent or low	absent ou faible	fehlend oder gering	ausente o baja	Costa Rica No. 4, Gisela	1
	medium	Moyenne	mittel	media	Ballerina, Patriot	2
	high	élevée	hoch	alta	Lomeria, Palmos	3

Ad. NEW: Resistance to *Fusarium oxysporum* f.sp. *lactucae* (Fol) Race 4

1. Pathogen	<i>Fusarium oxysporum</i> f.sp. <i>lactucae</i>
2. Quarantine status	NO : EPPO alert list
3. Host species	lettuce - <i>Lactuca sativa</i> L.
4. Source of inoculum	e.g. GEVES ⁶ (FR)
5. Isolate	Fol: 4, e.g. isolate 04750888 reference strain validated in an interlaboratory test ⁷
6. Establishment isolate identity	The most recent table of differential set is available through ISF at https://worldseed.org/our-work/disease-resistance/differential-hosts/
7. Establishment pathogenicity	use lettuce susceptible standard
8. Multiplication inoculum	
8.1 Multiplication medium	on liquid medium (e.g. Potatoes Dextrose Broth)
8.6 Harvest of inoculum	15 days
9. Format of the test	
9.1 Number of plants per genotype	at least 30, in case of doubt 60
9.2 Number of replicates	at least 2
9.3 Control varieties	susceptible: Gisela moderately resistant: Ballerina and Patriot (Ballerina is the lowest level of moderate resistance) resistant: Lomeria, Palmos
9.4 Test design	include control varieties
9.5 Test facility	greenhouse or climate room
9.6 Temperature	23-26°C
9.7 Light	under natural day length
10. Inoculation	
10.1 Preparation inoculum	spores are harvested
10.2 Quantification inoculum	adjust to 10 ⁶ sp/ml
10.3 Plant stage at inoculation	cotyledons to 2 or 3 leaves appearing
10.4 Inoculation method	soaking roots and hypocotyl for 5 to 15 min in the inoculum suspension
10.5 First observation	-
10.6 Second observation	-
10.7 Final observations	20-25 days post inoculation

⁶ matref@geves.fr






⁷ See ISF EG DRT Fol: 4 resistance in lettuce <https://worldseed.org/document/isf-final-report-fol-race-4-lettuce/>

11. Observations

11.1 Method

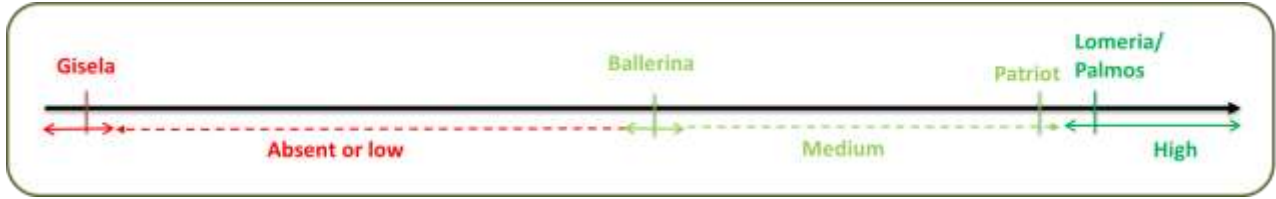
visual and/or counting number of plants with symptom.

11.2 Observation scale

inoculation by soaking seedlings	
0: plant without symptoms and healthy vessels	 A photograph of a healthy green seedling with a dark brown root system, showing no signs of disease.
1: plant with brown vessels only below the cotyledon without yellowing and wilting	 A photograph of a seedling with a stem showing brown vascular streaks below the cotyledon. A red double-headed arrow points to these brown vessels.
2: plant with brown vessels above the cotyledon, without yellowing and wilting	 A photograph of a seedling with brown vascular streaks extending above the cotyledon.
3: plant yellowing and wilting, brown vessels	 A photograph of a seedling that is yellowed and wilted, with brown vascular streaks visible on the stem.
4: dead plant	 A photograph of a dead, brown plant lying on dark soil.

11.3 Validation of test

results should be compared with results of controls and are depending of the aggressiveness of the test and the distribution of the plants over the categories.



12. Interpretation of data in terms of UPOV characteristic states

compare the distribution over the categories with the result of the controls.

Changes to the Technical Questionnaire

Current wording:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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7.3 Other information

[...]

Resistances:

- (38) Resistance to *Bremia lactucae* (BI) Isolate BI: 16EU
not tested 0 [] absent 1 [] present 9 []
- (39) Resistance to *Bremia lactucae* (BI) Isolate BI: 17EU
not tested 0 [] absent 1 [] present 9 []
- (40) Resistance to *Bremia lactucae* (BI) Isolate BI: 20EU
not tested 0 [] absent 1 [] present 9 []
- (41) Resistance to *Bremia lactucae* (BI) Isolate BI: 21EU
not tested 0 [] absent 1 [] present 9 []
- (42) Resistance to *Bremia lactucae* (BI) Isolate BI: 22EU
not tested 0 [] absent 1 [] present 9 []
- (43) Resistance to *Bremia lactucae* (BI) Isolate BI: 23EU
not tested 0 [] absent 1 [] present 9 []
- (44) Resistance to *Bremia lactucae* (BI) Isolate BI: 24EU
not tested 0 [] absent 1 [] present 9 []
- (45) Resistance to *Bremia lactucae* (BI) Isolate BI: 25EU
not tested 0 [] absent 1 [] present 9 []
- (46) Resistance to *Bremia lactucae* (BI) Isolate BI: 26EU
not tested 0 [] absent 1 [] present 9 []
- (47) Resistance to *Bremia lactucae* (BI) Isolate BI: 27EU
not tested 0 [] absent 1 [] present 9 []
- (48) Resistance to *Bremia lactucae* (BI) Isolate BI: 29EU
not tested 0 [] absent 1 [] present 9 []
- (49) Resistance to *Bremia lactucae* (BI) Isolate BI: 30EU
not tested 0 [] absent 1 [] present 9 []
- (50) Resistance to *Bremia lactucae* (BI) Isolate BI: 31EU
not tested 0 [] absent 1 [] present 9 []
- (51) Resistance to *Bremia lactucae* (BI) Isolate BI: 33EU
not tested 0 [] absent 1 [] present 9 []
- (52) Resistance to *Bremia lactucae* (BI) Isolate BI: 35EU
not tested 0 [] absent 1 [] present 9 []
- (53) Resistance to *Lettuce mosaic virus* (LMV) Pathotype II
not tested 0 [] absent 1 [] present 9 []
- (54) Resistance to *Nasonovia ribisnigri* (Nr) Biotype Nr: 0
not tested 0 [] absent 1 [] present 9 []
- (55) Resistance to *Fusarium oxysporum* f. sp. *lactucae* (Fol) Race 1
not tested 0 [] susceptible 1 [] moderately resistant 2 [] highly resistant 3 []

Proposed new wording:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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7.3 Other information

[...]

Resistances:

- ~~(38) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 16EU
not tested 0 [] absent 1 [] present 9 []~~
- ~~(39) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 17EU
not tested 0 [] absent 1 [] present 9 []~~
- ~~(40) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 20EU
not tested 0 [] absent 1 [] present 9 []~~
- ~~(41) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 21EU
not tested 0 [] absent 1 [] present 9 []~~
- ~~(42) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 22EU
not tested 0 [] absent 1 [] present 9 []~~
- ~~(43) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 23EU
not tested 0 [] absent 1 [] present 9 []~~
- ~~(44) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 24EU
not tested 0 [] absent 1 [] present 9 []~~
- ~~(45) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 25EU
not tested 0 [] absent 1 [] present 9 []~~
- ~~(46) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 26EU
not tested 0 [] absent 1 [] present 9 []~~
- ~~(47) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 27EU
not tested 0 [] absent 1 [] present 9 []~~
- (48) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 29EU
not tested 0 [] absent 1 [] present 9 []
- (49) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 30EU
not tested 0 [] absent 1 [] present 9 []
- (50) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 31EU
not tested 0 [] absent 1 [] present 9 []
- (51) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 33EU
not tested 0 [] absent 1 [] present 9 []
- (52) Resistance to *Bremia lactucae* (Bl) Isolate Bl: 35EU
not tested 0 [] absent 1 [] present 9 []
- (53) Resistance to *Lettuce mosaic virus* (LMV) Pathotype II
not tested 0 [] absent 1 [] present 9 []
- (54) Resistance to *Nasonovia ribisnigri* (Nr) Biotype Nr: 0
not tested 0 [] absent 1 [] present 9 []
- (55) Resistance to *Fusarium oxysporum* f. sp. *lactucae* (Fol) Race 1
not tested 0 [] susceptible 1 [] moderately resistant 2 [] highly resistant 3 []
not tested 0 [] absent or low 1 [] medium 2 [] high 3 []
- (NEW) Resistance to *Fusarium oxysporum* f.sp. *lactucae* (Fol) Race 4
not tested 0 [] absent or low 1 [] medium 2 [] high 3 []

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