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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

LEAF BEET, SWISS CHARD *

UPOV Code(s):

BETAA_VUL_GVF

Beta vulgaris L. ssp. *vulgaris* var. *flavescens* DC.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from France
to be considered by the
Technical Committee
at its fifty-fifth session, to be held in Geneva,
from 2019-10-28 to 2019-10-29

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Beta vulgaris L. ssp. *vulgaris* var. *flavescens* DC.	Leaf Beet, Mangel, Spinach Beet, Swiss Chard	Blette, Bette à côtes, Bette commune, Poirée	Mangold, Stielmangold	Acelga, Acelga cardo

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.

Other associated UPOV documents: TG/60

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Beta vulgaris* L. ssp. *vulgaris* var. *flavescens* DC..

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 clusters.

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

100g or 6,000 seed clusters at least.

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

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

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

3.1.2 The two independent growing cycles should be in the form of two separate plantings.

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 60 plants, which should be divided between at least 2 replicates.

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

3.5 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 or Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 40 plants or parts of plants taken from each of 40 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 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 These Test Guidelines have been developed for the examination of seed-propagated varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

4.2.3 The assessment of uniformity for cross-pollinated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction.

4.2.4 The uniformity of a variety may be determined on the basis of off-types for some characteristics and standard deviations for other characteristics.

4.2.5 For the characteristics "Leaf blade: color" (characteristic 6), "Petiole: color" (characteristic 16), a population standard of 2% and an acceptance probability of 95% should be applied. In the case of a sample size of 60 plants, 3 off-types are allowed.

4.2.6 For the assessment of uniformity of hybrids and inbred lines, a population standard of 2% and an acceptance probability of at least 95% should be applied. In the case of 60 plants, 3 off-types are allowed.

4.2.7 An additional tolerance (population standard of 2%, acceptance probability of at least 95%) of off-types can be accepted for clear cases of plants obviously resulting from the selfing of a parent line of a single-cross hybrid.

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 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) Leaf blade: color (characteristic 6)
(b) Only varieties with Leaf blade: color: green: Leaf blade: intensity of green color (characteristic 7)
(c) Only varieties with Leaf blade: color: purple: Leaf blade: intensity of purple color (characteristic 9)
(d) Petiole: width (characteristic 14)
(e) Petiole: color (characteristic 16)

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 2	**3 4**	**5 6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

5 (+) See Explanations on the Table of Characteristics in Chapter 8.2

6 (a)-(b) See Explanations on the Table of Characteristics in Chapter 8.1

7 Not applicable

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.		**PQ VG**	**(+)**				
		Seedling: hypocotyl color	**Plantule : couleur de l'hypocotyle**	**Keimpflanze: Farbe des Hypokotyls**	**Plántula: color del hipocótilo**		
		white	blanche	weiß	blanco	Verte à carde blanche	1
		green	verte	grün	verde	Groene Gewone, Lisca verde da taglio	2
		yellow	jaune	gelb	amarillo	Pirol	3
		reddish	rougeâtre	rötlich	rojizo	Fantasy, Ruby Red	4
2.	**(*)**	**QN MS/VG**	**(+)**	**(a)**			
		Leaf: length	**Feuille : longueur**	**Blatt: Länge**	**Hoja: longitud**		
		short	courte	kurz	corta	Groene Gewone, Verde de penca blanca ancha	3
		medium	moyenne	mittel	media	Blonde à carde blanche	5
		long	longue	lang	larga	Paros, Verte à carde blanche	7
3.	**(*)**	**QN VG**		**(a)**			
		Leaf: attitude	**Feuille : port**	**Blatt: Haltung**	**Hoja: porte**		
		erect	dressé	aufrecht	erecta	Paros	1
		semi-erect	demi-dressé	halbaufrecht	semierecta	Blonde à carde blanche	3
		prostrate	étalé	liegend	postrada	Groene Gewone	5
4.	**(*)**	**QN MS/VG**	**(+)**	**(a)**			
		Leaf blade: length	**Limbe : longueur**	**Blattspreite: Länge**	**Limbo: longitud**		
		short	court	kurz	corto	Amarilla de Lyon, Groene Gewone	3
		medium	moyen	mittel	medio	Verde de Niza	5
		long	long	lang	largo	Blonde à carde blanche, Paros	7
5.	**(*)**	**QN MS/VG**	**(+)**	**(a)**			
		Leaf blade: width	**Limbe : largeur**	**Blattspreite: Breite**	**Limbo: anchura**		
		narrow	étroit	schmal	estrecho	Groene Gewone	3
		medium	moyen	mittel	medio	Paros	5
		broad	large	breit	ancho	Verte à carde blanche	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	**(*)**	**QL** **VG**	**(a), (b)**				
		Leaf blade: color	**Limbe : couleur**	**Blattspreite: Farbe**	**Limbo: color**		
		green	vert	grün	verde	Groene Gewone, Rhubarb Chard	1
		purple	pourpre	purpurn	púrpura	Firebird, Mangenta	2
7.	**(*)**	**QN** **VG**	**(a), (b)**				
		<u>Only varieties with Leaf blade: color: green:</u> Leaf blade: intensity of green color	**<u>Seules les variétés présentant un limbe : couleur : vert :</u> Limbe : intensité de la couleur verte**	**<u>Nur Sorten mit Blattspreite: Farbe: grün:</u> Blattspreite: Intensität der grünen Farbe**	**<u>Solo variedades con Limbo: color: verde:</u> Limbo: intensidad del color verde**		
		very light	très claire	sehr hell	muy claro	Amarilla de Lyon	1
		light	claire	hell	claro	Blonde à carde blanche	3
		medium	moyenne	mittel	medio	Groene Gewone, Verde de Niza	5
		dark	foncée	dunkel	oscuro	Verde de penca blanca ancha	7
		very dark	très foncée	sehr dunkel	muy oscuro	Verde de penca blanca larga	9
8.		**QN** **VG**	**(+)** **(a), (b)**				
		<u>Only varieties with Leaf blade: color: green:</u> intensity of purple over color	**<u>Seules les variétés présentant un limbe : couleur : vert :</u> Intensité du lavis pourpre**	**<u>Nur Sorten mit Blattspreite: Farbe: grün:</u> Intensität der purpurnen Deckfarbe**	**<u>Solo variedades con Limbo: color: verde:</u> intensidad del color superficial púrpura**		
		absent or light	nulle ou claire	fehlend oder hell	ausente o claro	Blonde à carde blanche	1
		medium	moyenne	mittel	medio	Rhubarb Chard	3
		dark	foncée	dunkel	oscuro	Charlie	5
9.	**(*)**	**QN** **VG**	**(a), (b)**				
		<u>Only varieties with Leaf blade: color: purple:</u> Leaf blade: intensity of purple color	**<u>Seules les variétés présentant un limbe : couleur : pourpre :</u> Limbe : intensité de la couleur pourpre**	**<u>Nur Sorten mit Blattspreite: Farbe: purpurn:</u> Blattspreite: Intensität der purpurnen Farbe**	**<u>Solo variedades con Limbo: color: púrpura:</u> Limbo: intensidad del color púrpura**		
		light	claire	hell	claro		1
		medium	moyenne	mittel	medio	Mangenta	3
		dark	foncée	dunkel	oscuro	Firebird	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10.		**QN VG**	**(+) (a)**				
		Leaf blade: reflexing of the margin	**Limbe : enroulement du bord**	**Blattspreite: Biegung des Randes**	**Limbo: curvatura del borde**		
		absent or very weak	nul ou très faible	fehlend oder sehr gering	nula o muy leve	Groene Gewone	1
		weak	faible	gering	leve	Blonde à carde blanche	3
		medium	moyen	mittel	media		5
		strong	fort	stark	marcada	Lucullus	7
11.		**QN VG**		**(a)**			
		Leaf blade: glossiness	**Limbe : brillance**	**Blattspreite: Glanz**	**Limbo: brillo**		
		weak	faible	gering	leve	Groene Gewone	3
		medium	moyenne	mittel	medio		5
		strong	forte	stark	intenso	Blonde à carde blanche	7
12.	**(*)**	**QN VG**		**(a)**			
		Leaf blade: blistering	**Limbe : cloqûre**	**Blattspreite: Blasigkeit**	**Limbo: abullonado**		
		weak	faible	gering	leve	Groene Gewone	3
		medium	moyenne	mittel	medio	Blonde à carde blanche, Paros	5
		strong	forte	stark	intenso	Lucullus	7
13.		**QN MS/VG**	**(+)**	**(a)**			
		Petiole: length	**Pétiole : longueur**	**Blattstiel: Länge**	**Pecíolo: longitud**		
		very short	très court	sehr kurz	muy corto		1
		short	court	kurz	corto	Lucullus	3
		medium	moyen	mittel	medio	Paros	5
		long	long	lang	largo	Blonde à carde blanche, Verde de penca blanca larga	7
		very long	très long	sehr lang	muy largo	Groene Gewone	9
14.	**(*)**	**QN MS/VG**	**(+)**	**(a)**			
		Petiole: width	**Pétiole : largeur**	**Blattstiel: Breite**	**Pecíolo: anchura**		
		very narrow	très étroit	sehr schmal	muy estrecho	Groene Gewone	1
		narrow	étroit	schmal	estrecho	Rhubarb Chard, Verde de Niza	3
		medium	moyen	mittel	medio	Lucullus, Verde de penca blanca larga	5
		broad	large	breit	ancho	Amarilla de Lyon	7
		very broad	très large	sehr breit	muy ancho	Paros, Verde de penca blanca ancha	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15.	**QN VG**	**(+) (a)**				
	Petiole: curvature of upper side in cross section	**Pétiole : courbure de la face externe de la section transversale**	**Blattstiel: Krümmung an der Oberseite im Querschnitt**	**Pecíolo: curvatura de la cara superior en sección transversal**		
	absent or weak	nulle ou faible	fehlend oder gering	nula o leve	Groene Gewone	1
	medium	moyenne	mittel	media	Lucullus	3
	strong	forte	stark	marcada	Blonde à carde blanche	5
16. **(*)**	**PQ VG**		**(b)**			
	Petiole: color	**Pétiole : couleur**	**Blattstiel: Farbe**	**Pecíolo: color**		
	white	blanc	weiß	blanco	Blonde à carde blanche	1
	green	vert	grün	verde	Groene Gewone	2
	yellow	jaune	gelb	amarillo	Bright Yellow	3
	red	rouge	rot	rojo	Rhubarb Chard, Ruby Red	4
	purple	pourpre	purpurn	púrpura	Fantasy, Mangenta, Pink Passion	5
17. **(*)**	**QN VG**	**(+) (b)**				
	Petiole: intensity of color	**Pétiole : intensité de la couleur**	**Blattstiel: Intensität der Farbe**	**Pecíolo: intensidad del color**		
	light	claire	hell	claro		3
	medium	moyenne	mittel	medio		5
	dark	foncée	dunkel	oscuro		7
18.	**QN VG**	**(+)**				
	Bolting tendency	**Tendance à la montaison**	**Neigung zum Schossen**	**Tendencia a la subida a flor**		
	absent or weak	nulle ou faible	fehlend oder gering	nula o leve	Paros, Verde de Niza	1
	medium	moyenne	mittel	media	Verde de penca blanca ancha	2
	strong	forte	stark	marcada	Amarilla de Lyon	3

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

Characteristics containing the following key in the Table of Characteristics should be examined as indicated below:

(a) Observations should be made when the foliage is fully developed.

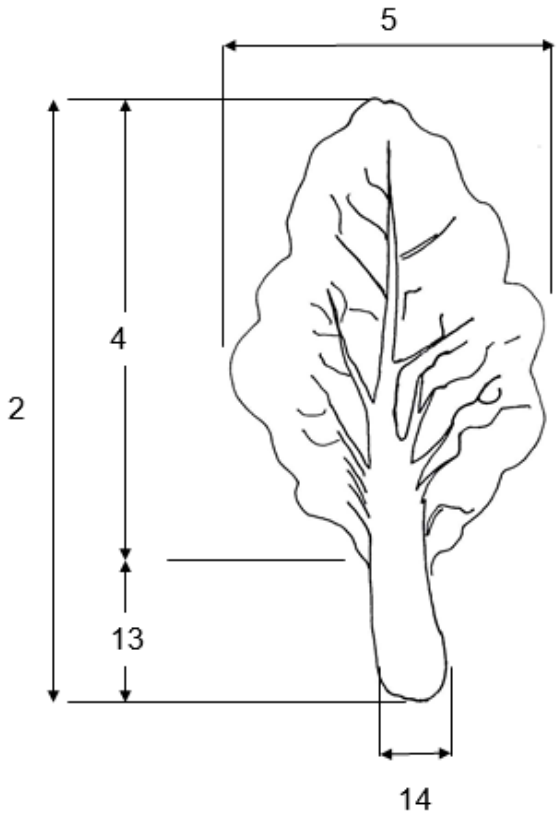
(b) Observations should be made on the upper side.

8.2 Explanations for individual characteristics

Ad. 1: Seedling: hypocotyl color

Observations on the seedling should be made after the appearance of the second true leaf.

Ad. 2: Leaf: length



Char. 2: Leaf: length
Char. 4: Leaf blade: length
Char. 5: Leaf blade: width
Char. 13: Petiole: length
Char. 14: Petiole: width

Ad. 4: Leaf blade: length

See Ad. 2

Ad. 5: Leaf blade: width

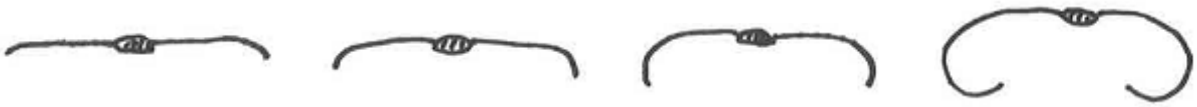
See Ad. 2

Ad. 8: Only varieties with Leaf blade: color: green: intensity of purple over color

In the case of a plant part which has a ground color upon which a second color such as a flush develops over time, the flush is considered the over color. The over color is not always the color occupying the smallest surface area of the plant part concerned.

In the case of a green leaf blade, the back ground color is green, more or less dark, with potentially an additional purple over color, more or less expressed.

Ad. 10: Leaf blade: reflexing of the margin



1	3	5	7
absent or very weak	weak	medium	strong

Ad. 13: Petiole: length

See Ad. 2

Ad. 14: Petiole: width

See Ad. 2

Observation should be made at the broadest part of the petiole.

Ad. 15: Petiole: curvature of upper side in cross section

1	3	5
absent or weak	medium	strong

Ad. 17: Petiole: intensity of color

Excluding varieties with white petioles.

Ad. 18: Bolting tendency

Method of cold treatment

Seed is laid out on a filter paper, which should be kept moist for germination. The minimum germination temperature is 18°C. With emergence of the root the seedlings should be transplanted into modules and subjected to cold treatment in cold storage for four weeks at 3°C without artificial lighting.

After the cold treatment the seedlings should be cultivated under normal conditions, preferably in the greenhouse (2°C minimum temperature, ventilation at 7°C and above).

Multigerm varieties with several seedlings emerging from one cluster should not usually be singled. After the development of two true leaves, the young plants should be transplanted into the open field.

The number of bolted plants (with shoot axis elongated by more than 5 cm) should be counted at least once a week.

It is recommended to conduct this test as early as possible in the growing season, because bolting is influenced by the climatic conditions after cold treatment.

Swiss chard is very sensitive to devernalization at temperatures above 18°C.

9. Literature

Sakuta, M., 2013: Diversity in plant red pigments: anthocyanins and betacyanins. Plant Biotechnol Rep, JP, 8, pp. 37-48.

Stafford, H.A., 1994 : Anthocyanines et bethalaines: évolution des voies mutuellement exclusives. Science végétale, FR, 101(2), pp. 91-98.

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	*Beta vulgaris* L. ssp. *vulgaris* var. *flavescens* DC.
1.2 Common name	Leaf Beet, Mangel, Spinach Beet, Swiss Chard

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 [ ]

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

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

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

4.1.4 Other [ ]
(Please provide details)

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)	Cross-pollination	[ ]
(i)	Population	[ ]
(b)	Hybrid	[ ]
(i)	Single hybrid	[ ]
(ii)	Three-way hybrid	[ ]
(c)	Inbred line	[ ]
(d)	Other (please provide details)	[ ]

4.2.2 Other [ ]
(Please provide details)

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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
5.1 (2)	**Leaf: length**		
	very short		1 [ ]
	very short to short		2 [ ]
	short	Groene Gewone, Verde de penca blanca ancha	3 [ ]
	short to medium		4 [ ]
	medium	Blonde à carde blanche	5 [ ]
	medium to long		6 [ ]
	long	Paros, Verte à carde blanche	7 [ ]
	long to very long		8 [ ]
	very long		9 [ ]
5.2 (3)	**Leaf: attitude**		
	erect	Paros	1 [ ]
	erect to semi-erect		2 [ ]
	semi-erect	Blonde à carde blanche	3 [ ]
	semi-erect to prostrate		4 [ ]
	prostrate	Groene Gewone	5 [ ]
5.3 (4)	**Leaf blade: length**		
	very short		1 [ ]
	very short to short		2 [ ]
	short	Amarilla de Lyon, Groene Gewone	3 [ ]
	short to medium		4 [ ]
	medium	Verde de Niza	5 [ ]
	medium to long		6 [ ]
	long	Blonde à carde blanche, Paros	7 [ ]
	long to very long		8 [ ]
	very long		9 [ ]

	Characteristics	Example Varieties	Note
5.4 (5)	**Leaf blade: width**		
	very narrow		1 [ ]
	very narrow to narrow		2 [ ]
	narrow	Groene Gewone	3 [ ]
	narrow to medium		4 [ ]
	medium	Paros	5 [ ]
	medium to broad		6 [ ]
	broad	Verte à carde blanche	7 [ ]
	broad to very broad		8 [ ]
	very broad		9 [ ]
5.5 (6)	**Leaf blade: color**		
	green	Groene Gewone, Rhubarb Chard	1 [ ]
	purple	Firebird, Mangenta	2 [ ]
5.6 (7)	**Only varieties with Leaf blade: color: green: Leaf blade: intensity of green color**		
	very light	Amarilla de Lyon	1 [ ]
	very light to light		2 [ ]
	light	Blonde à carde blanche	3 [ ]
	light to medium		4 [ ]
	medium	Groene Gewone, Verde de Niza	5 [ ]
	medium to dark		6 [ ]
	dark	Verde de penca blanca ancha	7 [ ]
	dark to very dark		8 [ ]
	very dark	Verde de penca blanca larga	9 [ ]
5.7 (9)	**Only varieties with Leaf blade: color: purple: Leaf blade: intensity of purple color**		
	light		1 [ ]
	light to medium		2 [ ]
	medium	Mangenta	3 [ ]
	medium to dark		4 [ ]
	dark	Firebird	5 [ ]

	Characteristics	Example Varieties	Note
5.8 (14)	**Petiole: width**		
	very narrow	Groene Gewone	1 [ ]
	very narrow to narrow		2 [ ]
	narrow	Rhubarb Chard, Verde de Niza	3 [ ]
	narrow to medium		4 [ ]
	medium	Lucullus, Verde de penca blanca larga	5 [ ]
	medium to broad		6 [ ]
	broad	Amarilla de Lyon	7 [ ]
	broad to very broad		8 [ ]
	very broad	Paros, Verde de penca blanca ancha	9 [ ]
5.9 (16)	**Petiole: color**		
	white	Blonde à carde blanche	1 [ ]
	green	Groene Gewone	2 [ ]
	yellow	Bright Yellow	3 [ ]
	red	Rhubarb Chard, Ruby Red	4 [ ]
	purple	Fantasy, Mangenta, Pink Passion	5 [ ]

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6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Petiole: color*	*red*	*purple*

Comments:

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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.

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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.

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:

Applicant’s name

Signature Date

[End of document]