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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

KALE

UPOV Code(s): BRASS_OLE_COS;
BRASS_OLE_GAM; BRASS_OLE_GAS;
BRASS_OLE_GAV; BRASS_OLE_PAL

Brassica oleracea L. var. *costata* DC.;
Brassica oleracea L. var. *medullosa* Thell.;
Brassica oleracea L. var. *sabellica* L.;
Brassica oleracea L. var. *viridis* L.;
Brassica oleracea L. var. *palmifolia* DC.

GUIDELINES**FOR THE CONDUCT OF TESTS****FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

* 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.]

Alternative names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Brassica oleracea</i> L. var. <i>costata</i> DC., <i>Brassica oleracea</i> L. var. <i>trunchuda</i> L. H. Bailey	Bedford cabbage, Braganza, Portugese cole, Portuguese kale, Seakale cabbage, Tronchuda cabbage, Tronchuda kale	Chou tronchuda, Chou à grosses côtes, Chou portuguais	Portugiesischer Kohl, Rippenkohl, Tronchudakohl	Col asa de cántaro, Col de pezón grueso, Col tronchuda
<i>Brassica oleracea</i> L. var. <i>medullosa</i> Thell.	Marrow-stem kale	Chou moëllier	Futterkohl, Markstammkohl	Col medular, Col de meollo
<i>Brassica oleracea</i> L. var. <i>sabellica</i> L., <i>Brassica oleracea</i> L. var. <i>acephala</i> auct., <i>Brassica oleracea</i> L. var. <i>selenisia</i> L.	Borecole, Curly kale, Dwarf Siberian kale, Kitchen kale, Scotch kale	Chou fris�e, Chou aigrette, Chou plume	Braunkohl, Federkohl, Gr�unkohl, Krauskohl	Berza rizada, Col crespata, Col rizada
<i>Brassica oleracea</i> L. var. <i>viridis</i> L., <i>Brassica</i> <i>oleracea</i> L. var. <i>acephala</i> DC.	Collards, Cow cabbage, Fodder kale, Galega kale, Kale, Spring-heading cabbage, Tall kale, Tree kale	Chou � vaches, Chou fourrager, Chou cavalier, Chou collard	Blattkohl, Bl�tterkohl, Futterkohl, Kuhkohl	Berza, Berza gallega, Col forrajera
<i>Brassica oleracea</i> L. var. <i>palmifolia</i> DC.	Giant Jersey kale, Jersey kale, Palm kale, Palm-tree kale, Tree kale	Chou palmier	Palmkohl, Italienischer Kohl	Col palmera

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.

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1. Subject of these Test Guidelines

- 1.1 These Test Guidelines apply to all varieties of *Brassica oleracea* L. var. *costata* DC., *Brassica oleracea* L. var. *medullosa* Thell., *Brassica oleracea* L. var. *sabellica* L., *Brassica oleracea* L. var. *viridis* L. and *Brassica oleracea* L. var. *palmifolia* DC.
- 1.2 Guidance on the use of Test Guidelines for interspecific hybrids that are not explicitly covered by Test Guidelines is provided in document TGP/13 “Guidance for New Types and Species”.

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 seeds or young plants.
- 2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

seed-propagated varieties: 20g or 5000 seeds
vegetatively propagated varieties: 30 young plants

In the case of seed, the seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.

- 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.
- 3.1.3 The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test.

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 In the case of seed-propagated varieties, each test should be designed to result in a total of at least 40 plants which should be divided between at least 2 replicates.
- 3.4.2 In the case of vegetatively propagated varieties, each test should be designed to result in a total of at least 20 plants which should be divided between at least 2 replicates.
- 3.4.3 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 *Additional Tests*

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 Number of Plants or Parts of Plants to be Examined

In the case of seed-propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 20 plants or parts taken from each of 20 plants and any other observation made on all plants in the test, disregarding any off-type plants.

In the case of vegetatively propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts taken from each of 10 plants and any other observation 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 cross-pollinated, self-pollinated (inbred line), hybrid varieties and vegetatively 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 For the assessment of uniformity of single cross hybrids and self-pollinated varieties (inbred lines), a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 40 plants, 2 off-types are allowed. In addition, for single cross hybrids, a population standard of 3% and an acceptance probability of at least 95% should be applied for inbred plants obviously resulting from the selfing of a parent line. In the case of a sample size of 40 plants, 3 inbred plants are allowed.
- 4.2.5 For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 20 plants, 1 off-type is allowed.

4.3 *Stability*

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be further examined by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

- (a) Plant: position of growing point (characteristic 3)
- (b) Leaf: color (characteristic 9)
- (c) Leaf: variegation (characteristic 11)

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 All relevant states of expression are presented in the characteristic.

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)-(d) 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. (*)	QN	MG/MS/VG	(+)	(a)				
	Plant: height	Plante : hauteur	Pflanze: Höhe	Planta: altura				
	very short	très basse	sehr niedrig	muy baja				1
	very short to short	très basse à basse	sehr niedrig bis niedrig	muy baja a baja				2
	short	basse	niedrig	baja	Lage Moskrul, Starbor			3
	short to medium	basse à moyenne	niedrig bis mittel	baja a media				4
	medium	moyenne	mittel	media	Darkibor, Marriot, Rossignol			5
	medium to tall	moyenne à haute	mittel bis hoch	media a alta				6
	tall	haute	hoch	alta	Esthe, Fizz, Nero di Toscana, Redbor			7
	tall to very tall	haute à très haute	hoch bis sehr hoch	alta a muy alta				8
	very tall	très haute	sehr hoch	muy alta	Ostfriesische Palme			9
2.	QN	MS/VG	(+)	(a)				
	Plant: diameter	Plante : diamètre	Pflanze: Durchmesser	Planta: diámetro				
	very small	très petit	sehr klein	muy pequeño				1
	very small to small	très petit à petit	sehr klein bis klein	muy pequeño a pequeño				2
	small	petit	klein	pequeño	Tintoreto			3
	small to medium	petit à moyen	klein bis mittel	pequeño a medio				4
	medium	moyen	mittel	medio	Darkibor, Dwarf Green Curled			5
	medium to large	moyen à grand	mittel bis groß	medio a grande				6
	large	grand	groß	grande	Cottagers, Esthe, Nero di Toscana			7
	large to very large	grand à très grand	groß bis sehr groß	grande a muy grande				8
	very large	très grand	sehr groß	muy grande				9
3. (*)	QN	VG	(+)	(a)				
	Plant: position of growing point	Plante : position du point végétatif	Pflanze: Position des Vegetationspunkts	Planta: posición del punto vegetativo				
	lower part	partie inférieure	im unteren Teil	parte inferior	Esthe, Fizz			1
	lower to middle part	partie inférieure à partie centrale	im unteren bis mittleren Teil	parte inferior a parte central	Halbhoher grüner krauser			2
	middle part	partie centrale	im mittleren Teil	parte central	Black Magic, Kobolt			3
	middle to upper part	partie centrale à partie supérieure	im mittleren bis oberen Teil	parte central a parte superior				4
	upper part	partie supérieure	im obereren Teil	parte superior	Dwarf Green Curled, Kadet, Westlandse Herfst			5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
4.	QN	MG/MS/VG	(+)	(a)		
	Plant: number of leaves	Plante : nombre de feuilles	Pflanze: Anzahl Blätter	Planta: número de hojas		
	few	petit	gering	bajo	Fizz, Pentland Brig	1
	few to medium	petit à moyen	gering bis mittel	bajo a medio		2
	medium	moyen	mittel	medio	Redbor, Westlandse Herfst	3
	medium to many	moyen à élevé	mittel bis hoch	medio a alto		4
	many	élevé	hoch	alto	Esthe, Winnetou	5
5.	QN	MG/MS/VG	(+)	(a)		
	Stem: length	Tige : longueur	Stiel: Länge	Tallo: longitud		
	very short	très courte	sehr kurz	muy corta		1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta		2
	short	courte	kurz	corta	Rednex	3
	short to medium	courte à moyenne	kurz bis mittel	corta a media		4
	medium	moyenne	mittel	media	Dwarf Green Curled, Fizz	5
	medium to long	moyenne à longue	mittel bis lang	media a larga		6
	long	longue	lang	larga		7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga		8
	very long	très longue	sehr lang	muy larga		9
6.	QN	MS/VG	(+)	(a), (d)		
	Stem: diameter	Tige : diamètre	Stiel: Durchmesser	Tallo: diámetro		
	very small	très petit	sehr klein	muy pequeño		1
	very small to small	très petit à petit	sehr klein bis klein	muy pequeño a pequeño		2
	small	petit	klein	pequeño	Thousand Head	3
	small to medium	petit à moyen	klein bis mittel	pequeño a medio		4
	medium	moyen	mittel	medio	Goldeneye	5
	medium to large	moyen à grand	mittel bis groß	medio a grande		6
	large	grand	groß	grande	Camaro	7
	large to very large	grand à très grand	groß bis sehr groß	grande a muy grande		8
	very large	très grand	sehr groß	muy grande		9

	English		français		deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
7.	QN	VG	(+)	(d)				
	Stem: tendency to branch	Tige : tendance à se ramifier	Stiel: Neigung zur Verzweigung	Tallo: tendencia a ramificar				
	weak	faible	gering	débil	Bombardier		1	
	weak to medium	faible à moyenne	gering bis mittel	débil a media			2	
	medium	moyenne	mittel	media	Thousand Head		3	
	medium to strong	moyenne à forte	mittel bis stark	media a fuerte			4	
	strong	forte	stark	fuerte	Anglian Gold		5	
8. (*)	QN	VG	(+)	(a), (b)				
	Leaf: attitude	Feuille : port	Blatt: Haltung	Hoja: porte				
	erect	dressé	aufrecht	erecto	Esthe, Nero di Toscana		1	
	erect to semi-erect	dressé à demi-dressé	aufrecht bis halbaufrecht	erecto a semierecto			2	
	semi-erect	demi-dressé	halbaufrecht	semierecto	Cottagers, Redbor		3	
	semi-erect to horizontal	demi-dressé à horizontal	halbaufrecht bis waagrecht	semierecto a horizontal			4	
	horizontal	horizontal	waagrecht	horizontal	Marriot		5	
9. (*)	PQ	VG		(a), (b)				
	Leaf: color	Feuille : couleur	Blatt: Farbe	Hoja: color				
	light green	vert clair	hellgrün	verde claro	Tintoreto		1	
	medium green	vert moyen	mittelgrün	verde medio	Dwarf Green Curled, Esthe		2	
	dark green	vert foncé	dunkelgrün	verde oscuro	Kapitan		3	
	grey green	vert-gris	graugrün	verde grisáceo	Fizz		4	
	blue green	vert-bleu	blaugrün	verde azulado	Black Magic, Nero di Toscana		5	
	reddish green	vert rougeâtre	rötlichgrün	verde rojizo	Redbor		6	
	purple	pourpre	purpurn	púrpura	Rednex		7	
10.	QN	VG	(+)	(a), (b)				
	Leaf: intensity of anthocyanin coloration of main vein	Feuille : intensité de la pigmentation anthocyanique de la nervure principale	Blatt: Intensität der Anthocyanfärbung der Mittelrippe	Hoja: intensidad de la pigmentación antocianica del nervio principal				
	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Darkibor, Ostfriesische Palme		1	
	weak	faible	gering	débil			2	
	medium	moyenne	mittel	media	Midnight Sun		3	
	strong	forte	stark	fuerte	Redbor, Rednex		4	
	very strong	très forte	sehr stark	muy fuerte			5	

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11. (*)	QL	VG	(a), (b), (c)			
	Leaf: variegation	Feuille : panachure	Blatt: Panaschierung	Hoja: variegación		
	absent	absente	fehlend	ausente	Esthe	1
	present	présente	vorhanden	presente	Frost Byte, Purple Varie	9
12. (*)	QN	MS/VG	(+)	(a), (b)		
	Leaf: number of lobes	Feuille : nombre de lobes	Blatt: Anzahl Lappen	Hoja: número de lóbulos		
	absent or very few	absent ou très petit	fehlend oder sehr gering	ausente o muy bajo	Esthe, Nero di Toscana	1
	few	petit	gering	bajo	Cottagers	2
	medium	moyen	mittel	medio	Pentland Brig	3
	many	élevé	hoch	alto	Darkibor	4
	very many	très élevé	sehr hoch	muy alto	Lerchenzungen	5
13.	QN	VG	(+)	(a), (d)		
	Leaf: length of petiole wing	Feuille : longueur de l'aile du pétiole	Blatt: Länge des Blattstielflügels	Hoja: longitud del ala del peciolo		
	absent or very short	absente ou très courte	fehlend oder sehr kurz	ausente o muy corta	Harrier	1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta		2
	short	courte	kurz	corta	Coleor	3
	short to medium	courte à moyenne	kurz bis mittel	corta a media		4
	medium	moyenne	mittel	media	Camaro	5
	medium to long	moyenne à longue	mittel bis lang	media a larga		6
	long	longue	lang	larga	Grüner Angeliter	7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga		8
	very long	très longue	sehr lang	muy larga	Pavla	9
14. (*)	QN	MS/VG	(+)	(a), (b), (c)		
	Leaf blade: length	Limbe : longueur	Blattspreite: Länge	Limbo: longitud		
	very short	très courte	sehr kurz	muy corta		1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta		2
	short	courte	kurz	corta	Redbor, Westlandse Herfst	3
	short to medium	courte à moyenne	kurz bis mittel	corta a media		4
	medium	moyenne	mittel	media	Esthe	5
	medium to long	moyenne à longue	mittel bis lang	media a larga		6
	long	longue	lang	larga	Nero di Toscana	7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga		8
	very long	très longue	sehr lang	muy larga		9

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15. (*)	QN	MS/VG	(+)	(a), (b), (c)				
	Leaf blade: width	Limbe : largeur	Blattspreite: Breite	Limbo: anchura				
	very narrow	très étroite	sehr schmal	muy estrecha				1
	very narrow to narrow	très étroite à étroite	sehr schmal bis schmal	muy estrecha a estrecha	Raven			2
	narrow	étroite	schmal	estrecha	Dwarf Green Curled, Redbor			3
	narrow to medium	étroite à moyenne	schmal bis mittel	estrecha a media				4
	medium	moyenne	mittel	media	Cottagers, Esthe, Fizz			5
	medium to broad	moyenne à large	mittel bis breit	media a ancha				6
	broad	large	breit	ancha	Beira			7
	broad to very broad	large à très large	breit bis sehr breit	ancha muy ancha				8
	very broad	très large	sehr breit	muy ancha				9
16. (*)	QN	MS/VG	(+)	(a), (b), (c)				
	Leaf blade: length/width ratio	Limbe : rapport longueur/largeur	Blattspreite: Verhältnis Länge/Breite	Limbo: relación longitud/anchura				
	very low	très bas	sehr klein	muy baja				1
	very low to low	très bas à bas	sehr klein bis klein	muy baja a baja	Marriot			2
	low	bas	klein	baja	Beira			3
	low to medium	bas à moyen	klein bis mittel	baja a media	Dauro			4
	medium	moyen	mittel	media	Esthe, Redbor, Tintoreto			5
	medium to high	moyen à élevé	mittel bis groß	media a alta	Fizz			6
	high	élevé	groß	alta				7
	high to very high	élevé à très élevé	groß bis sehr groß	alta a muy alta	Black Magic, Lerchenzungen			8
	very high	très élevé	sehr groß	muy alta	Nero di Toscana			9
17. (*)	QN	MS/VG	(+)	(a), (b)				
	Leaf blade: number of incisions	Limbe : nombre d'incisions	Blattspreite: Anzahl Einschnitte	Limbo: número de incisiones				
	absent or very few	absent ou très petit	fehlend oder sehr gering	ausente o muy bajo	Esthe, Nero di Toscana			1
	very few to few	très petit à petit	sehr gering bis gering	muy bajo a bajo				2
	few	petit	gering	bajo	Westlandse Herfst			3
	few to medium	petit à moyen	gering bis mittel	bajo a medio				4
	medium	moyen	mittel	medio	Fizz			5
	medium to many	moyen à élevé	mittel bis hoch	medio a alto				6
	many	élevé	hoch	alto				7
	many to very many	élevé à très élevé	hoch bis sehr hoch	alto a muy alto				8
	very many	très élevé	sehr hoch	muy alto				9

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18.	QN	VG	(+)	(a), (b)				
	Leaf blade: depth of incisions		Limbe : profondeur des incisions		Blattspreite: Tiefe der Einschnitte	Limbo: profundidad de las incisiones		
	absent or shallow		absente ou peu profonde		fehlend oder flach	ausente o poco profunda	Esthe, Nero di Toscana	1
	shallow to medium		peu profonde à moyenne		flach bis mittel	poco profunda a media		2
	medium		moyenne		mittel	media		3
	medium to deep		moyenne à profonde		mittel bis tief	media a profunda		4
	deep		profonde		tief	profunda	Fizz	5
19.	QN	VG	(+)	(a), (b), (c)				
	Leaf blade: curvature of midrib		Limbe : courbure de la nervure médiane		Blattspreite: Biegung der Mittelrippe	Limbo: curvatura del nervio central		
	incurved		incurvée		aufgebogen	incurvada		1
	straight		droite		gerade	recta	Midnight Sun	2
	slightly recurved		légèrement recourbée		leicht gebogen	ligeramente recurvada	Esthe, Kadet, Lerchenzungen	3
	moderately recurved		modérément recourbée		mäßig gebogen	moderadamente recurvada	Westlandse Winter	4
	strongly recurved		fortement recourbée		stark gebogen	fuertemente recurvada	Westlandse Herfst	5
	very strongly recurved		très fortement recourbée		sehr stark gebogen	muy fuertemente recurvada		6
20.	QN	VG	(+)	(a), (b), (c)				
	Leaf blade: blistering		Limbe : cloûre		Blattspreite: Blasigkeit	Limbo: abullonado		
	absent or very weak		absente ou très faible		fehlend oder sehr gering	ausente o muy débil		1
	very weak to weak		très faible à faible		sehr gering bis gering	muy débil a débil		2
	weak		faible		gering	débil	Esthe	3
	weak to medium		faible à moyenne		gering bis mittel	débil a medio		4
	medium		moyenne		mittel	medio	Fizz	5
	medium to strong		moyenne à forte		mittel bis stark	medio a fuerte		6
	strong		forte		stark	fuerte	Black Magic, Nero di Toscana	7
	strong to very strong		forte à très forte		stark bis sehr stark	fuerte a muy fuerte		8
	very strong		très forte		sehr stark	muy fuerte		9

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21.	QN	VG	(+)	(a), (b), (c)				
	Leaf blade: folding in cross section		Limbe : pliure en section transversale		Blattspreite: Faltung im Querschnitt	Limbo: plegado en sección transversal		
	absent or very weak		absente ou très faible		fehlend oder sehr gering	ausente o muy débil		1
	weak		faible		gering	débil	Rossignol, Tintoreto	2
	medium		moyenne		mittel	medio	Dwarf Green Curled, Redbor	3
	strong		forte		stark	fuerte	Lerchenzungen	4
	very strong		très forte		sehr stark	muy fuerte		5
22.	QN	VG	(+)	(a), (b), (c)				
	Leaf blade: twisting		Limbe : torsion		Blattspreite: Drehung	Limbo: torsión		
	absent or very weak		absente ou très faible		fehlend oder sehr gering	ausente o muy débil	Black Magic, Nero di Toscana	1
	weak		faible		gering	débil	Esthe	2
	medium		moyenne		mittel	media	Cottagers	3
	strong		forte		stark	fuerte		4
	very strong		très forte		sehr stark	muy fuerte		5
23.	QN	VG	(+)	(a), (b), (c)				
	Leaf blade: undulation of margin		Limbe : ondulation du bord		Blattspreite: Randwellung	Limbo: ondulación del margen		
	absent or very weak		absente ou très faible		fehlend oder sehr gering	ausente o muy débil	Cottagers, Esthe	1
	weak		faible		gering	débil	Pentland Brig	2
	medium		moyenne		mittel	media	Redbor	3
	strong		forte		stark	fuerte	Dwarf Green Curled	4
	very strong		très forte		sehr stark	muy fuerte	Westlandse Herfst	5
24.	QN	VG	(+)	(a), (b), (c)				
	<u>Only for varieties with Leaf blade: undulation of margin: absent or very weak to weak:</u> Leaf blade: recurvature of margin		<u>Seulement pour les variétés avec Limbe : ondulation du bord :</u> absente ou très faible : Limbe : recourbure du bord		<u>Nur für Sorten mit Blattspreite: Randwellung: fehlend oder sehr gering bis gering:</u> Blattspreite: Randbiegung	<u>Solo variedades con Limbo: ondulación del margen: ausente o muy débil a débil:</u> Limbo: curvatura del margen		
	absent or weak		absente ou faible		fehlend oder gering	ausente o débil	Esthe, Midnight Sun	1
	medium		moyenne		mittel	media	Rossignol	2
	strong		forte		stark	fuerte	Black Magic, Nero di Toscana	3

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25.	QN	MS/VG	(+)	(a), (b)				
	Petiole: length	Pétiole : longueur	Blattstiel: Länge	Peciolo: longitud				
	absent or very short	absente ou très courte	fehlend oder sehr kurz	ausente o muy corta	Nero di Toscana		1	
	short	courte	kurz	corta	Rossignol, Tintoreto		2	
	medium	moyenne	mittel	media	Halbhoher grüner krauser, Redbor		3	
	long	longue	lang	larga			4	
	very long	très longue	sehr lang	muy larga	Cottagers, Fizz		5	
26.	QN	MS/VG	(+)	(a), (b)				
	Petiole: width	Pétiole : largeur	Blattstiel: Breite	Peciolo: anchura				
	very narrow	très étroite	sehr schmal	muy estrecha			1	
	narrow	étroite	schmal	estrecha	Darkibor, Westlandse Herfst		2	
	medium	moyenne	mittel	media	Cottagers, Esthe, Halbhoher grüner krauser, Kobolt		3	
	broad	large	breit	ancha	Marriot		4	
	very broad	très large	sehr breit	muy ancha	Dauro		5	
27.	PQ	VG	(+)	(a)				
	Young leaf: color	Jeune feuille : couleur	Junges Blatt: Farbe	Hoja joven: color				
	yellow green	vert-jaune	gelbgrün	verde amarillento	Esthe, Tintoreto		1	
	green	vert	grün	verde	Dwarf Green Curled		2	
	grey green	vert-gris	graugrün	verde grisáceo	Lerchenzungen		3	
	blue green	vert-bleu	blaugrün	verde azulado	Black Magic, Nero di Toscana		4	
	red purple	pourpre-rouge	rotpurpurn	púrpura rojizo	Redbor, Rednex		5	
28.	QL	MS/VS	(+)					
	Male sterility	Stérilité mâle	Männliche Sterilität	Androesterilidad				
	absent	absente	fehlend	ausente	Esthe, Westlandse Herfst		1	
	present	présente	vorhanden	presente	Winnetou		9	

8. Explanations on the Table of Characteristics

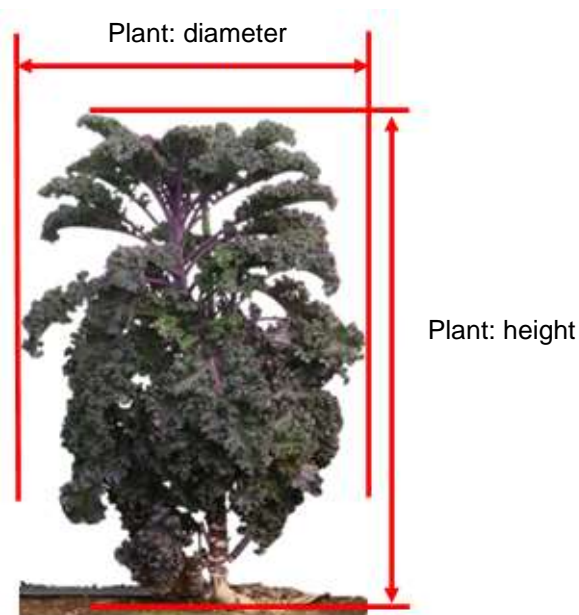
8.1 *Explanations covering several characteristics*

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

- (a) Observations should be made on plants 3 to 5 months after sowing.
- (b) Observations should be made on fully developed leaves.
- (c) The leaf blade does not include the independent lateral lobes at the lower half of the leaf.
- (d) Characteristics which should be observed on fodder types only (*Brassica oleracea* L. var. *viridis* L., *Brassica oleracea* L. var. *medullosa* Thell.).

8.2 *Explanations for individual characteristics*

Ad. 1: Plant: height

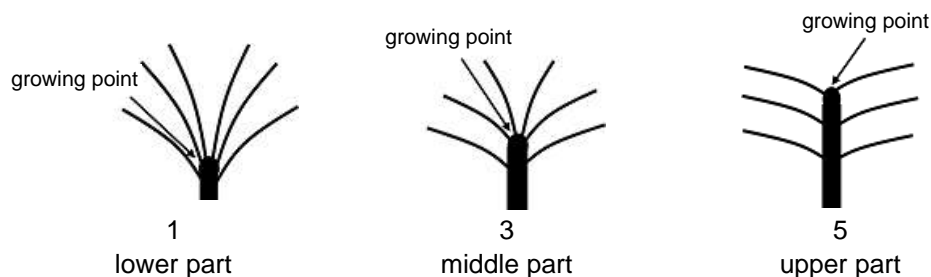


Ad. 2: Plant: diameter

See Ad. 1

Ad. 3: Plant: position of growing point

Observations of the growing point position should be made in relation to the top of the plant.

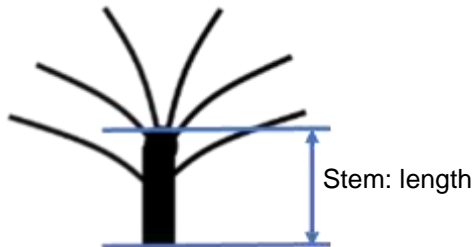


Ad. 4: Plant: number of leaves

Observations should be made on the number of leaves more than 10 cm in length.

Ad. 5: Stem: length

Observations should be made from ground level to the growing point.



Ad. 6: Stem: diameter

Observations should be made at the widest point.

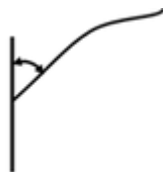
Ad. 7: Stem: tendency to branch

Observations should be made after bolting but before flowering. It should be assessed as number of branching nodes along the main stem.

Ad. 8: Leaf: attitude



1
erect



3
semi-erect



5
horizontal

Ad. 10: Leaf: intensity of anthocyanin coloration of main vein

Observations should be made on the lower side of the leaf.

Ad. 12: Leaf: number of lobes

Parts of the leaf are considered to be lobes if:

1. They have a minimum length of 1 cm and
2. When folded back to the midrib as shown in Figs 1 and 2, the folded tissue meets the midrib
3. Their length is at least equivalent to the width of the leaf petiole at their point of attachment

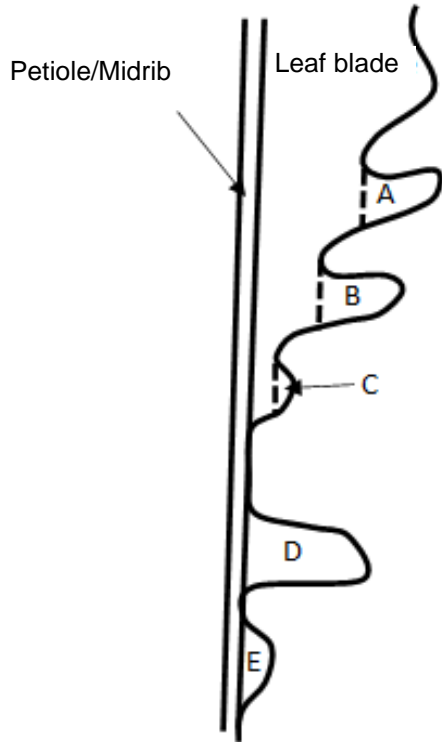


Figure 1

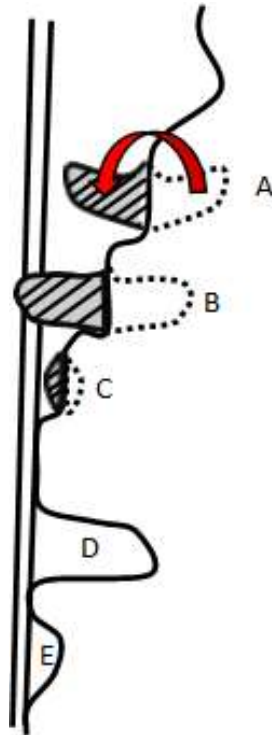


Figure 2

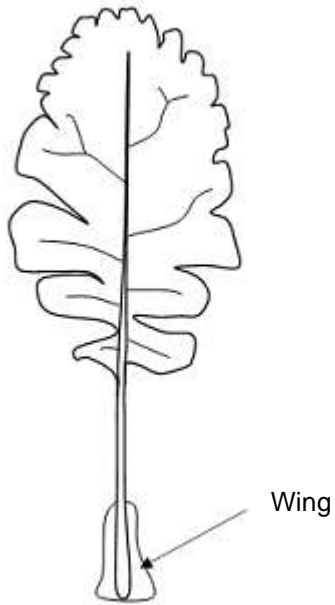
- A is not a lobe as it does not meet the midrib when folded
- B is a lobe as it meets the midrib when folded
- C is too small to be a lobe as it is less than 1 cm in length and does not meet the midrib when folded
- D is a lobe as the length is longer than the width of the leaf petiole at the point of attachment
- E is not a lobe as the length is shorter than the width of the leaf petiole at the point of attachment

Ad. 13: Leaf: length of petiole wing

Parts of the leaf are considered to be wings if:

1. They attach to the petiole at the base
2. Their length is most equivalent to the width of the petiole at the point of attachment.

Where the lamina is entire and continuous and is attached to the base of the petiole then the petiole wing is assessed as note 9.



1
absent or very
short



3
short



5
medium

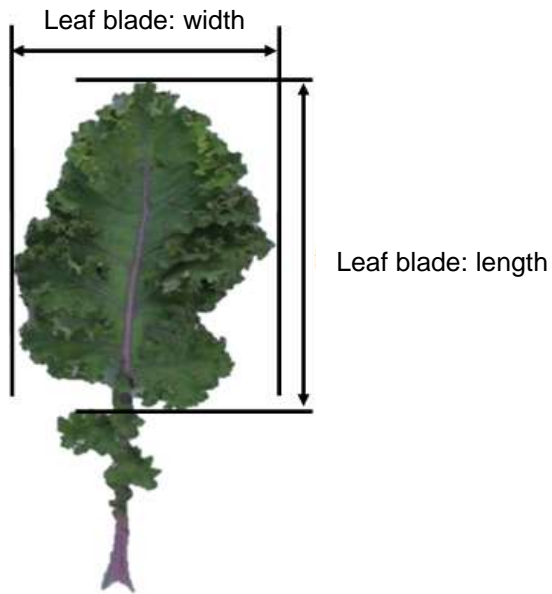


7
long



9
very long

Ad. 14: Leaf blade: length



Ad. 15: Leaf blade: width

See Ad. 14

Ad. 17: Leaf blade: number of incisions

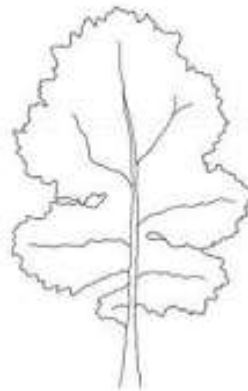
Observations should be made on the upper third of the unfolded leaf blade.



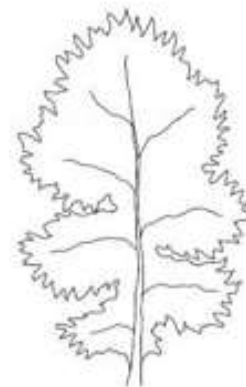
1
absent or very few



3
few



5
medium



7
many

Ad. 18: Leaf blade: depth of incisions

Observations should be made on the upper third of the unfolded leaf blade.



1
absent or shallow



3
medium



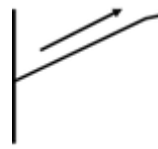
5
deep

Ad. 19: Leaf blade: curvature of midrib

Observations should be made on the overall shape, not one section of the leaf blade. For example, if almost all of the midrib is straight but the apical part of the midrib is strongly recurved then it should be assessed as straight.



1
incurved



2
straight



3
slightly recurved



4
moderately recurved



5
strongly recurved



6
very strongly recurved

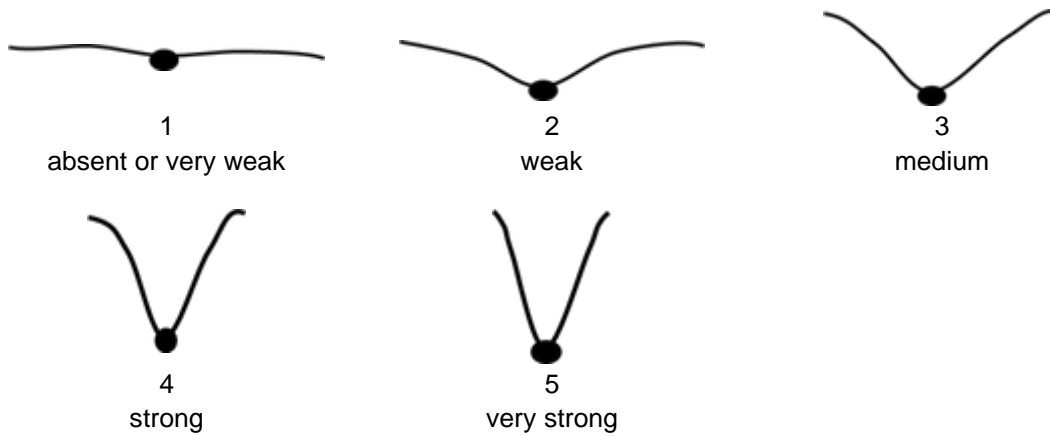
Ad. 20: Leaf blade: blistering

Blistering is the difference in height of the surface of the leaf between the veins.



Ad. 21: Leaf blade: folding in cross section

Observations should be made at the middle third of the leaf blade.



Ad. 22: Leaf blade: twisting

Observations should be made on the whole leaf.



1
absent or very weak



2
weak



3
medium



4
strong

Ad. 23: Leaf blade: undulation of margin

Observations should be made on the small undulations of the margin of the leaf blade.



1
absent or very
weak



2
weak



3
medium



4
strong



5
very strong

Ad. 24: Only for varieties with Leaf blade: undulation of margin: absent or very weak to weak: Leaf blade: recurvature of margin

Observations should be made at the middle third of the leaf blade.



1
absent or weak

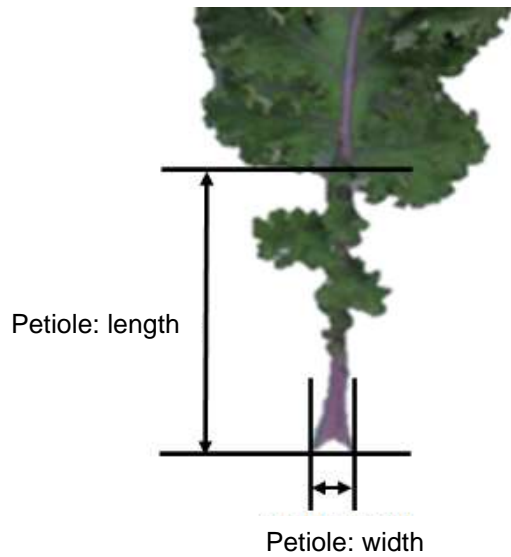


2
medium



3
strong

Ad. 25: Petiole: length



Ad. 26: Petiole: width

See Ad. 25

Observations should be made at the base of petiole.

Ad. 27: Young leaf: color

Observations should be made on immature leaves at the apex of the plant.

Ad. 28: Male sterility

To be tested in a field trial and/or in a DNA marker test¹.

In the case of a field trial, the type of observation is VS. In the case of a DNA marker test, the type of observation is MS.

Field trial:

Observations should be made on fully opened flowers. Tapping or shaking the flowering stem will release pollen, which, if present, can be observed on dark colored paper or card. The absence of pollen production is an indication of male sterility. The presence of pollen production is an indication of male fertility.



male fertile (pollen present)



male sterile (pollen absent)

DNA marker test:

If the cytoplasmic male sterility (CMS) marker is absent, the variety is expected to have male fertile flowers. If the CMS marker is present, the variety is expected to have male sterile flowers.

In cases where the DNA marker test result does not confirm the declaration in the TQ, a field trial should be performed to observe whether the variety has male fertile or male sterile flowers due to another mechanism.

¹ The description of the method to test male sterility for *Brassica* (CMS marker) is covered by a trade secret. The owner of the trade secret, Syngenta Seeds B.V., has given its consent for the use of the CMS marker solely for the purposes of examination of Distinctness, Uniformity and Stability (DUS) and for the development of variety descriptions by UPOV and authorities of UPOV members. Syngenta Seeds B.V. declares that neither UPOV, nor authorities of UPOV members that use the CMS marker for the above purposes will be held accountable for possible (mis)use of the CMS marker by third parties. Please contact Naktuinbouw, Netherlands, to obtain the method and information on the CMS marker for the purposes mentioned above.

9. Literature

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10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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	Application date: (not to be filled in by the applicant)
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TECHNICAL QUESTIONNAIRE
 to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire		
1.1.1	Botanical name	<input type="text" value="Brassica oleracea L. var. costata DC."/> []
1.1.2	Common name	<input type="text" value="Bedford cabbage, Braganza, Portugese cole, Portuguese kale, Seakale cabbage, Tronchuda cabbage, Tronchuda kale"/>
1.2.1	Botanical name	<input type="text" value="Brassica oleracea L. var. medullosa Thell."/> []
1.2.2	Common name	<input type="text" value="Marrow-stem kale"/>
1.3.1	Botanical name	<input type="text" value="Brassica oleracea L. var. sabellica L."/> []
1.3.2	Common name	<input type="text" value="Borecole, Curly kale, Dwarf Siberian kale, Kitchen kale, Scotch kale"/>
1.4.1	Botanical name	<input type="text" value="Brassica oleracea L. var. viridis L."/> []
1.4.2	Common name	<input type="text" value="Collards, Cow cabbage, Fodder kale, Galega kale, Kale, Spring-heading cabbage, Tall kale, Tree kale"/>
1.5.1	Botanical name	<input type="text" value="Brassica oleracea L. var. palmifolia DC."/> []
1.5.2	Common name	<input type="text" value="Giant Jersey kale, Jersey kale, Palm kale, Palm-tree kale, Tree kale"/>

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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2.	Applicant	
	Name	<input type="text"/>
	Address	<input type="text"/>
	Telephone No.	<input type="text"/>
	Fax No.	<input type="text"/>
	E-mail address	<input type="text"/>
	Breeder (if different from applicant)	<input type="text"/>

3.	Proposed denomination and breeder's reference	
	Proposed denomination (if available)	<input type="text"/>
	Breeder's reference	<input type="text"/>

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

(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)

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

- (a) Cross-pollination
- (i) Population
- (b) Hybrid
- (i) Single hybrid
- (c) Other (please provide details)

4.2.2 Vegetative propagation

- (a) Cuttings
- (b) Other (state method)

4.2.3 Other
(Please provide details)

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
5.1 Plant: height (1)		
very short		1 []
very short to short		2 []
short	Lage Moskrul, Starbor	3 []
short to medium		4 []
medium	Darkibor, Marriot, Rossignol	5 []
medium to tall		6 []
tall	Esthe, Fizz, Nero di Toscana, Redbor	7 []
tall to very tall		8 []
very tall	Ostfriesische Palme	9 []
5.2 Plant: position of growing point (3)		
lower part	Esthe, Fizz	1 []
lower to middle part	Halbhoher grüner krauser	2 []
middle part	Black Magic, Kobolt	3 []
middle to upper part		4 []
upper part	Dwarf Green Curled, Kadet, Westlandse Herfst	5 []
5.3 Leaf: attitude (8)		
erect	Esthe, Nero di Toscana	1 []
erect to semi-erect		2 []
semi-erect	Cottagers, Redbor	3 []
semi-erect to horizontal		4 []
horizontal	Marriot	5 []
5.4 Leaf: color (9)		
light green	Tintoreto	1 []
medium green	Dwarf Green Curled, Esthe	2 []
dark green	Kapitan	3 []
grey green	Fizz	4 []
blue green	Black Magic, Nero di Toscana	5 []
reddish green	Redbor	6 []
purple	Rednex	7 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.5 Leaf: variegation (11)		
absent	Esthe	1 []
present	Frost Byte, Purple Varie	9 []
5.6 Leaf blade: length (14)		
very short		1 []
very short to short		2 []
short	Redbor, Westlandse Herfst	3 []
short to medium		4 []
medium	Esthe	5 []
medium to long		6 []
long	Nero di Toscana	7 []
long to very long		8 []
very long		9 []
5.7 Leaf blade: width (15)		
very narrow		1 []
very narrow to narrow	Raven	2 []
narrow	Dwarf Green Curled, Redbor	3 []
narrow to medium		4 []
medium	Cottagers, Esthe, Fizz	5 []
medium to broad		6 []
broad	Beira	7 []
broad to very broad		8 []
very broad		9 []
5.8 Leaf blade: length/width ratio (16)		
very low		1 []
very low to low	Marriot	2 []
low	Beira	3 []
low to medium	Dauro	4 []
medium	Esthe, Redbor, Tintoreto	5 []
medium to high	Fizz	6 []
high		7 []
high to very high	Black Magic, Lerchenzungen	8 []
very high	Nero di Toscana	9 []

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Characteristics	Example Varieties	Note
5.9 Leaf blade: depth of incisions (18)		
absent or shallow	Esthe, Nero di Toscana	1 []
shallow to medium		2 []
medium		3 []
medium to deep		4 []
deep	Fizz	5 []
5.10 Leaf blade: undulation of margin (23)		
absent or very weak	Cottagers, Esthe	1 []
weak	Pentland Brig	2 []
medium	Redbor	3 []
strong	Dwarf Green Curled	4 []
very strong	Westlandse Herfst	5 []
5.11 Male sterility (28)		
absent	Esthe, Westlandse Herfst	1 []
present	Winnetou	9 []

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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
<i>Example</i>	<i>Stem: length</i>	<i>medium</i>	<i>short</i>

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

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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]