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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT**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**

*prepared by experts from Japan
to be considered by the
Technical Working Party for Vegetables
at its fifty-third session, to be held in Seoul, Republic of Korea,
from 2019-05-20 to 2019-05-24*

Disclaimer: this document does not represent UPOV policies or guidance

* 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.	Bedford cabbage, Braganza, Portugese cole, Portuguese kale, Seakale cabbage, Tronchuda cabbage, Tronchuda kale			
<i>Brassica oleracea</i> L. var. <i>medullosa</i> Thell.	Marrow-stem kale			
<i>Brassica oleracea</i> L. var. <i>sabellica</i> L.	Curly kale, Borecole, Dwarf Siberian kale, Kitchen kale, Scotch kale			
<i>Brassica oleracea</i> L. var. <i>viridis</i> L.	Collards, Cow cabbage, Fodder kale, Kale, Spring-heading cabbage, Tall kale, Tree kale			
<i>Brassica oleracea</i> L. var. <i>palmifolia</i> DC.	Giant Jersey kale, Jersey kale, Palm kale, Palm-tree kale, Tree kale			

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 These Test Guidelines apply to all varieties of interspecific hybrid between all species of 1.1.

2. Material Required

- 2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.
- 2.2 The material is to be supplied in the form of seed or seedling.
- 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: 50 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.

3.2 *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 recommendation 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 should be according to the recommendations for cross-pollinated varieties in the General Introduction.
- 4.2.4 The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction.
- 4.2.5 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-type(s) is/are allowed.
- 4.2.6 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 4)
 - (b) Leaf: distribution of anthocyanin coloration (characteristic 8)
 - (c) Leaf: color (characteristic 9)
 - (d) Leaf blade: variegation (characteristic 21)
- 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:

<i>State</i>	<i>Note</i>
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)-(c) 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	MS/VG	(+)	(a)			
		Plant: height	Plante : hauteur	Pflanze: Höhe	Planta: altura			
		short	basse	niedrig	baja	Kobolt		3
		medium	moyenne	mittel	media	Black Magic, Dwarf Green Curled, Esthe		5
		tall	haute	hoch	alta	Nero di Toscana, Redbor		7
2.		QN	MS/VG	(+)	(a)			
		Plant: diameter	Plante : diamètre	Pflanze: Durchmesser	Planta: diámetro			
		small	petit	klein	pequeño	Rossignol		3
		medium	moyen	mittel	medio	Darkibor, Esthe		5
		large	grand	groß	grande	Maribor, Nero di Toscana		7
3.	(*)	PQ	VG	(+)	(a)			
		Plant: shape						
		inverted pyramid				Esthe, Lerchenzungen		1
		flat				Kobolt, Maribor		2
		dome				Kadet, Westlandse Winter		3
		pyramid				Moosbor		4
		column				Arsis, Westlandse Herfst		5
4.	(*)	QN	VG	(+)	(a)			
		Plant: position of growing point						
		lower part				Esthe, Moosbor		1
		middle part				Spurt		2
		upper part				Lav opretvoksende, Pentland Brig		3
5.		QN	MS/VG		(a)			
		Stem: length						
		short						3
		medium						5
		long						7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	(*)	QN	VG	(+)	(a), (b)	
	Leaf: attitude					
	erect				Esthe, Nero di Toscana	1
	semi-erect				Westlandse Herfst	3
	horizontal				Kobolt, Starmaker	5
7.	PQ	VG	(a)			
	Leaf: color of young leaf					
	yellow green				Esthe	1
	green				Dwarf Green Curled	2
	grey green				Lerchenzungen	3
	blue green				Nero di Toscana	4
	red purple					5
8.	(*)	QN	VG	(+)	(a), (b)	
	Leaf: distribution of anthocyanin coloration	Feuille : distribution de la pigmentation anthocyanique	Blatt: Verteilung der Anthocyanfärbung	Hoja: distribución de la pigmentación autociánica		
	absent				Esthe, Lerchenzungen, Pentland Brig	1
	partially present				Cottagers, Starmaker	2
	entirely present					3
9.	(*)	PQ	VG	(a), (b)		
	Leaf: color					
	yellow green				Tintoretto	1
	green				Dwarf Green Curled, Esthe	2
	grey green				Lerchenzungen	3
	blue green				Nero di Toscana	4
	red purple					5
10.	QN	VG	(+)	(a), (b)		
	Leaf: intensity of green color					
	light					3
	medium					5
	dark					7

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11.	QN	VG	(+)	(a), (b)				
	Leaf: intensity of anthocyanin coloration of main vein							
	absent or very light						Esthe	1
	light							3
	medium						Starmaker	5
	dark						Midnight Sun, Redbor	7
12.	QN	VG	(+)	(b)				
	Leaf: distribution of anthocyanin coloration in winter							
	absent						Esthe	
	entirely							
	partialy							
13.	QN	VG	(+)	(b)				
	Leaf: intensity of anthocyanin coloration in winter							
	light							3
	medium							5
	dark							7
14.	PQ	VG	(+)	(b)				
	Leaf: color in winter							
	yellow green							1
	green							2
	grey green							3
	blue green							4
	red purple							5
15.	QN	MS/VG	(+)	(a)				
	Leaf: number of leaves							
	few							3
	medium						Esthe	5
	many							7

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16. (*)	PQ	VG	(+)	(a), (b), (c)				
	Leaf blade: shape	Limbe : forme	Blattspreite: Form	Limbo: forma				
	very narrow elliptic	elliptique très étroit	sehr schmal elliptisch	elíptica muy estrecha	Lerchenzungen, Nero di Toscana		1	
	very narrow elliptic to narrow elliptic	elliptique très étroit à elliptique étroit	sehr schmal elliptisch bis schmal elliptisch	elíptica muy estrecha a elíptica estrecha	Kobolt		2	
	narrow elliptic	elliptique étroit	schmal elliptisch	elíptica estrecha	Rednex		3	
	narrow elliptic to elliptic	elliptique étroit à elliptique	schmal elliptisch bis elliptisch	elíptica estrecha a elíptica	Halbhoher grüner krauser		4	
	elliptic	elliptique	elliptisch	elíptica	Esthe, Westlandse Herfst		5	
	broad elliptic						6	
	circular				Asa de Cantaro		7	
	transverse elliptic						8	
17. (*)	QN	MS/VG	(+)	(a), (b), (c)				
	Leaf blade: length	Limbe : longueur	Blattspreite: Länge	Limbo: longitud				
	short	court	kurz	corto	Westlandse Herfst		3	
	medium	moyen	mittel	medio	Esthe		5	
	long	long	lang	largo	Lerchenzungen		7	
18. (*)	QN	MS/VG	(+)	(a), (b), (c)				
	Leaf blade: width	Limbe : largeur	Blattspreite: Breite	Limbo: anchura				
	narrow	étroit	schmal	estrecho	Lerchenzungen, Nero di Toscana		3	
	medium	moyen	mittel	medio	Esthe		5	
	broad	large	breit	ancho	Westlandse Herfst		7	
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						1	
	straight						2	
	slightly recurved				Esthe, Lerchenzungen		3	
	moderately recurved				Westlandse Winter		4	
	strongly recurved				Westlandse Herfst		5	

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.	QN	VG	(+)	(a), (b), (c)				
	Leaf blade: blistering							
	absent or very weak						Esthe	1
	weak							3
	medium							5
	strong						Nero di Toscana	7
21. (*)	QL	VG	(+)	(a), (b), (c)				
	Leaf blade: variegation							
	absent						Esthe	1
	present							9
22. (*)	QN	VG	(+)	(a), (b), (c)				
	Leaf blade: depth of incisions							
	absent or very shallow						Asa de Cantaro, Nero di Toscana	1
	shallow							2
	medium							3
	deep						Starmaker	4
	very deep						Fizz	5
23. (*)	QN	VG	(+)	(a), (b), (c)				
	Leaf blade: density of "curling"							
	absent or very sparse						Cottagers, Esthe	1
	sparse						Maribor, Pentland Brig	3
	medium						Dwarf Green Curled, Redbor	5
	dense						Kobolt, Westlandse Herfst	7
24.	QN	VG	(+)	(a), (b), (c)				
	Only density of "curling": absent or very weak: Leaf blade: undulation on margin							
	absent or very weak						Esthe	1
	weak							3
	medium							5
	strong							7

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25.	QN	VG	(+)	(a), (b), (c)				
	Leaf blade: recurvature of margin							
	absent or weak						Esthe, Midnight Sun	1
	medium						Ragged Jack, Rossignol	2
	strong						Kobolt, Nero di Toscana	3
26.	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						Midnight Sun	1
	weak						Esthe, Pentland Brig	2
	medium		faible	gering	débil		Dwarf Green Curled	3
	strong						Leuchenzungen	4
	very strong		moyenne	mittel	medio			5
27.	QN	MS/VG	(+)	(a), (b)				
	Petiole: length							
	absent or very short						Nero di Toscana	1
	short						Westlandse Herfst	3
	medium						Esthe	5
	long						Halbhoher grüner krauser	7
28.	QN	MS/VG	(+)	(a), (b)				
	Only petiole: present: Petiole: width							
	narrow						Darkibor	3
	medium						Esthe, Halbhoher grüner krauser	5
	broad						Kobolt	7
29.	QL	MS/VG	(+)					
	Male sterility		Stérilité mâle	Männliche Sterilität	Androesterilidad			
	absent		absente	fehlend	ausente		Westlandse Herfst	1
	present		présente	vorhanden	presente		Redbor, Winnetou	9

8. Explanations on the Table of Characteristics

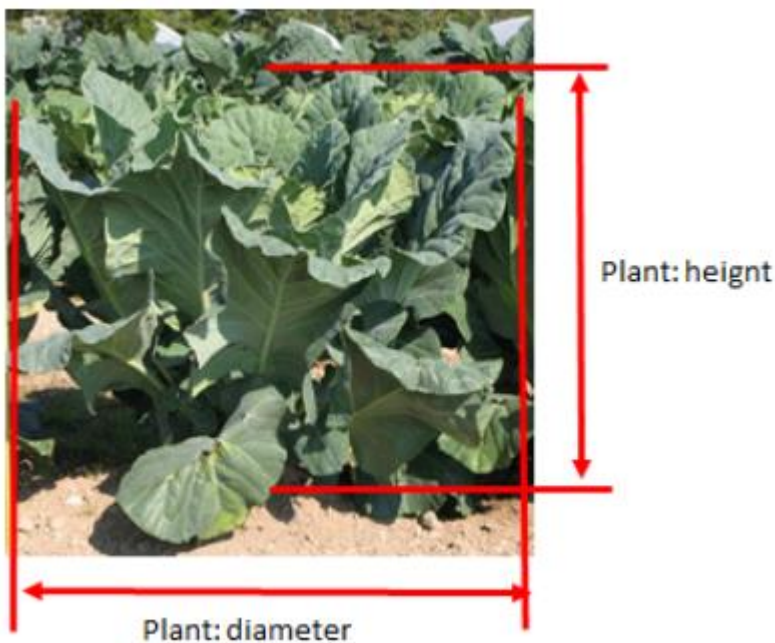
8.1 *Explanations covering several characteristics*

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

- (a) Observation should be made on the plants which grew for 3 to 5 months after sowing and when the lowest temperature is above 10 degrees Celsius.
- (b) Observation should be made on the fully developed leaves.
- (c) Leaf blade does not include the independent lateral lobes at the lower half of the leaf.

8.2 *Explanations for individual characteristics*

Ad. 1: Plant: height



Ad. 2: Plant: diameter

See Ad.1

Ad. 3: Plant: shape



1
inverted pyramid

2
flat

3
dome

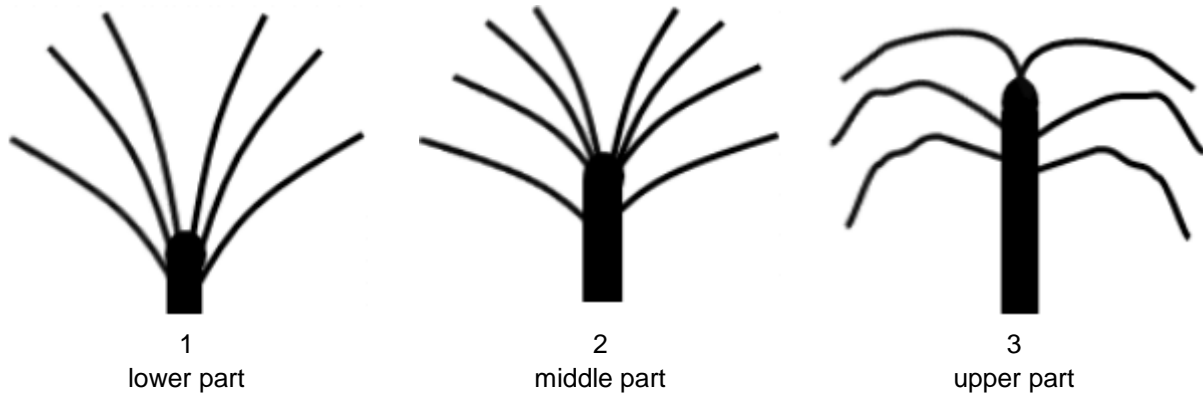


4
pyramid



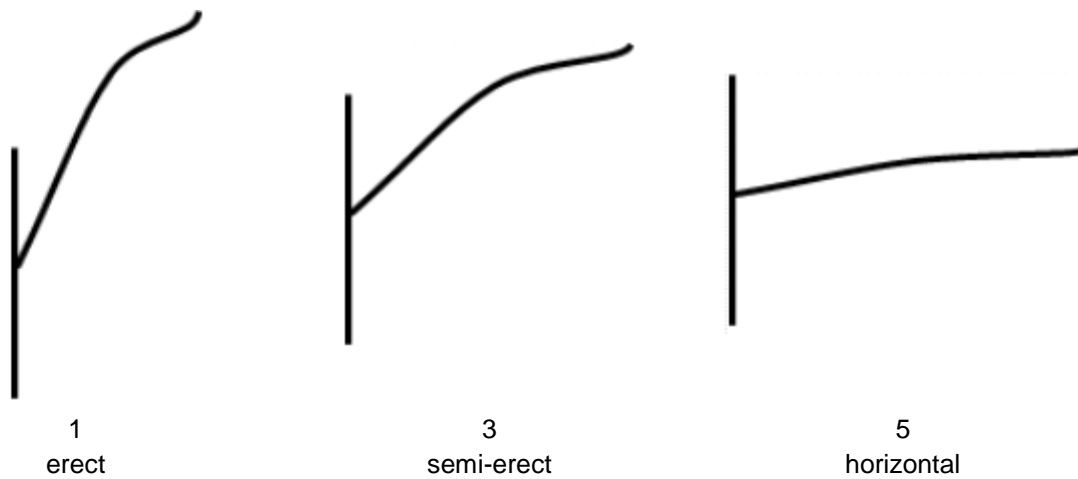
5
column

Ad. 4: Plant: position of growing point



Ad. 6: Leaf: attitude

Observation should be made on the angle of base of petiole against stem.



Ad. 8: Leaf: distribution of anthocyanin coloration

Observation should be made on upper side of the leaf including vein and petiol.

Ad. 10: Leaf: intensity of green color

Observation should be made only for green varieties. Observation should be made on the upper side of leaf without wax.

intensity of green color of leaf (Char.10)	color of leaf (Char.9)			
	1 yellow green	2 green	3 grey green	4 blue green
3 light				
5 medium				
7 dark				

Ad. 11: Leaf: intensity of anthocyanin coloration of main vein

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

Ad. 12: Leaf: distribution of anthocyanin coloration in winter

Observation in winter should be made when the lowest temperature is under 5 degrees Celsius.

Ad. 13: Leaf: intensity of anthocyanin coloration in winter

Observation in winter should be made when the lowest temperature is under 5 degrees Celsius.
Observation should be made only for varieties which anthocyanin coloration of leaf in winter is present.

Ad. 14: Leaf: color in winter

Observation in winter should be made when the lowest temperature is under 5 degrees Celsius.

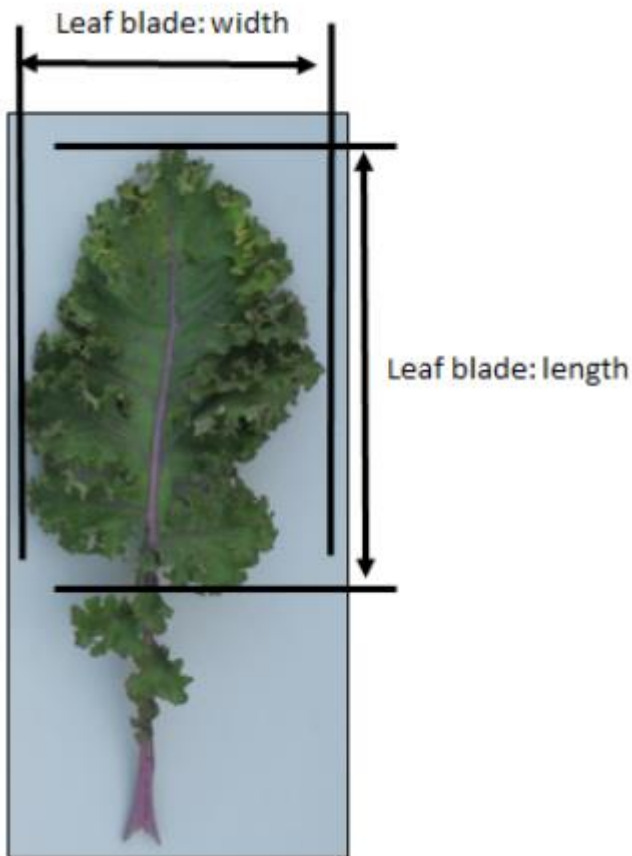
Ad. 15: Leaf: number of leaves

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

Ad. 16: Leaf blade: shape



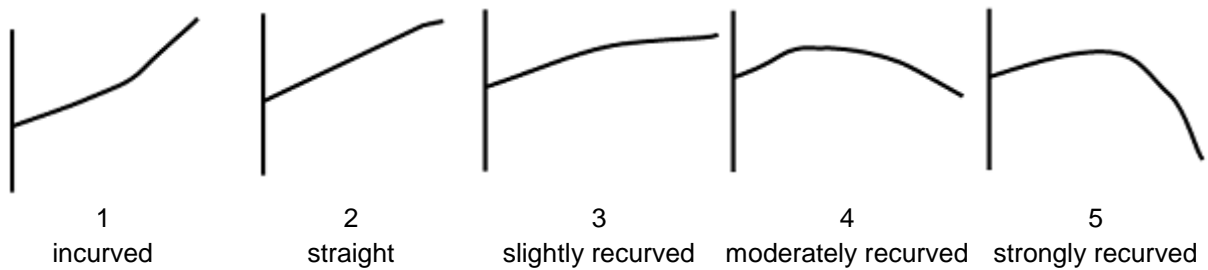
Ad. 17: Leaf blade: length



Ad. 18: Leaf blade: width

See Ad.17

Ad. 19: Leaf blade: curvature of midrib



Ad. 20: Leaf blade: blistering



1
absent or very weak



3
weak



5
medium



7
strong

Ad. 21: Leaf blade: variegation



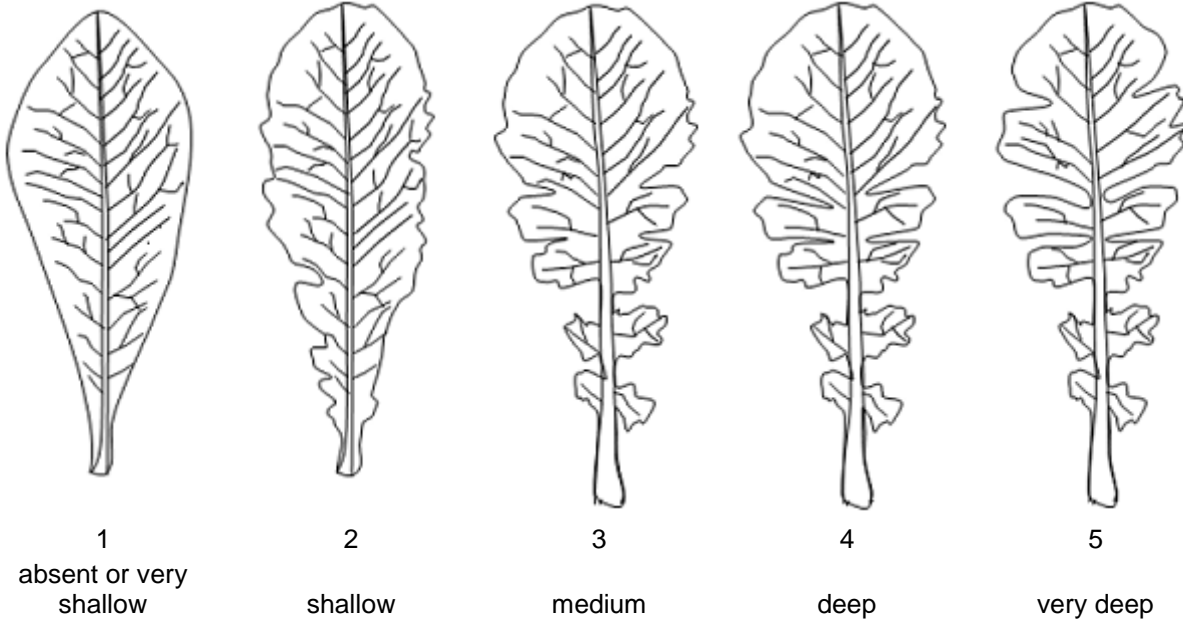
1
absent



9
present

Ad. 22: Leaf blade: depth of incisions

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

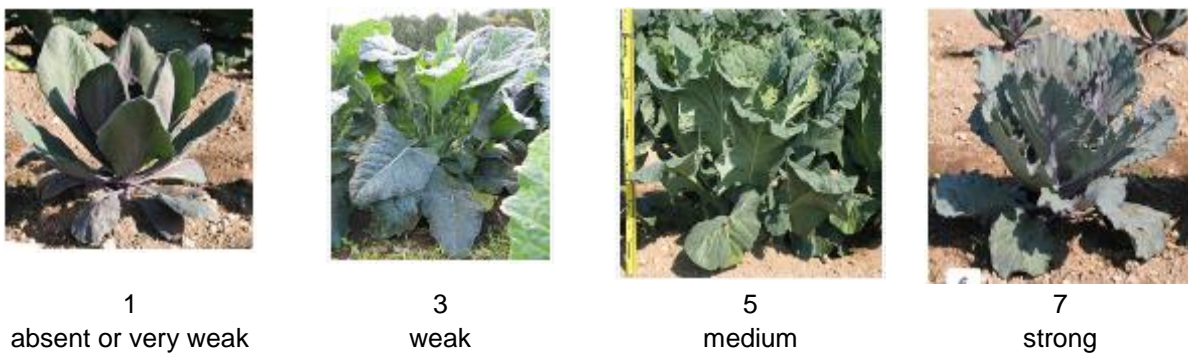


Ad. 23: Leaf blade: density of "curling"



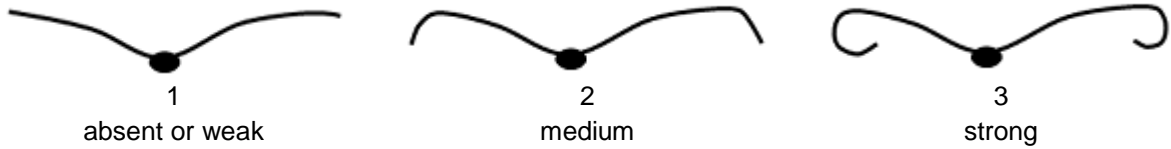
Ad. 24: Only density of "curling": absent or very weak: Leaf blade: undulation on margin

These photo will be changed in next proj.



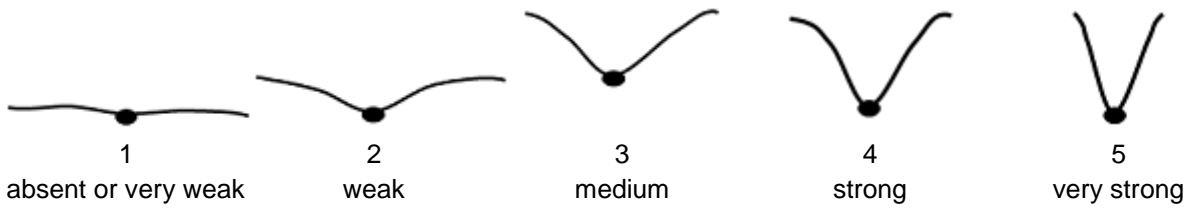
Ad. 25: Leaf blade: recurvature of margin

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



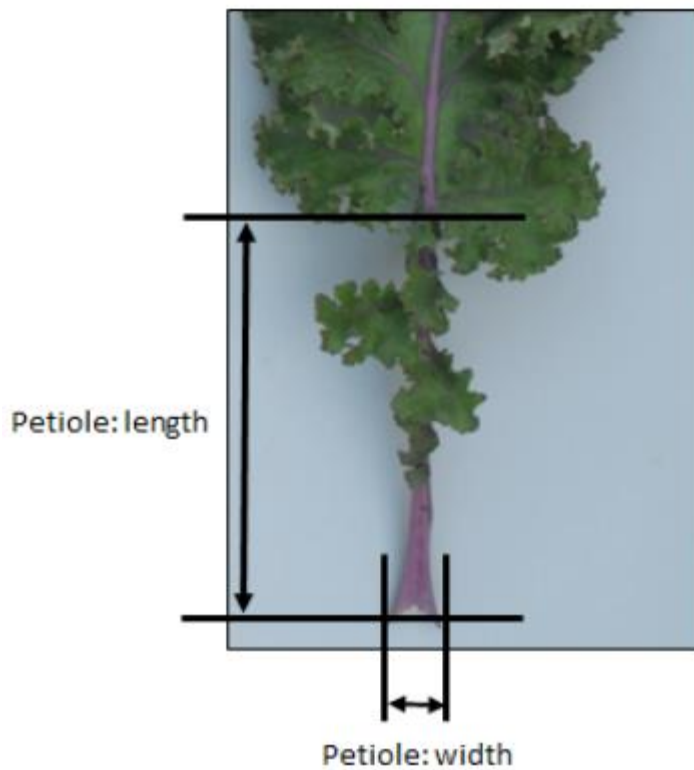
Ad. 26: Leaf blade: folding in cross section

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



Ad. 27: Petiole: length

Observation for 'Petiole: width' should be made at the base of petiole.



Ad. 28: Only petiole: present: Petiole: width

See Ad. 27

Ad. 29: Male sterility

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

Field trial:

Check presence of pollen on stamen: if pollen on stamen is present then male sterility is absent; if pollen on stamen is absent then male sterility is present.

DNA marker test and/or field trial:

All varieties declared male sterile in the TQ can be examined in a field trial or in a DNA marker testⁱ. In the case of a DNA marker test, if the CMS marker appears to be not present, a field trial should be performed to observe whether the variety is male sterile (on another mechanism) or fertile. All varieties declared fertile are to be tested in a field trial.

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

i 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

- Akihiro Y., 2004: *Yasai-engei-daihyakka 20. Shadanhojin Nousan-gyoson-bunkakyokai. Tokyo, JP. pp. 97 to pp. 101*
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- Langer, R.H.M., and Hill, G.D., 1982: "Agricultural Plants 8, Cruciferae", 165-183, Cambridge University Press, Cambridge.
- Lustinec, J., 1988: "III. 11 Kale (*Brassica oleracea* L. var. *acephala*, *medullosa*, *ramosa*, *sabellica*)", 530-547, in: *Biotechnology in Agriculture and Forestry 6*. Ed: Y.P.S. Bajaj, Springer-Verlag Berlin.
- Nieuwhof, M., 1969: "Cole Crops: Botany, Cultivation and Utilisation", Leonard Hill, London.
- Tsukamoto, Y., 1994: *The Grand Dictionary of Horticulture Volume 1*. The Shogakukan Ltd., Tokyo, JP, pp. 829 to pp. 830
- Tsunoda, S., Hinata, K. and Gomez-Campo, C., 1980: "Brassica Crops and Wild Allies", Biology and Breeding, Japan Scientific Press, Tokyo.

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="Curly kale, Borecole, 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, 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
(please state known parent variety(ies))

(c) unknown cross

(d)

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

4.1.5 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:
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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)	[]
	<input type="text"/>	

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)		
short	Kobolt	3 []
medium	Black Magic, Dwarf Green Curled, Esthe	5 []
tall	Nero di Toscana, Redbor	7 []
5.2 Plant: shape (3)		
inverted pyramid	Esthe, Lerchenzungen	1 []
flat	Kobolt, Maribor	2 []
dome	Kadet, Westlandse Winter	3 []
pyramid	Moosbor	4 []
column	Arsis, Westlandse Herfst	5 []
5.3 Plant: position of growing point (4)		
lower part	Esthe, Moosbor	1 []
middle part	Spurt	2 []
upper part	Lav opretvoksende, Pentland Brig	3 []
5.4 Leaf: attitude (6)		
erect	Esthe, Nero di Toscana	1 []
semi-erect	Westlandse Herfst	3 []
horizontal	Kobolt, Starmaker	5 []
5.5 Leaf: distribution of anthocyanin coloration (8)		
absent	Esthe, Lerchenzungen, Pentland Brig	1 []
partially present	Cottagers, Starmaker	2 []
entirely present		3 []
5.6 Leaf: color (9)		
yellow green	Tintoretto	1 []
green	Dwarf Green Curled, Esthe	2 []
grey green	Lerchenzungen	3 []
blue green	Nero di Toscana	4 []
red purple		5 []

Characteristics	Example Varieties	Note
5.7 Leaf blade: shape (16)		
very narrow elliptic	Lerchenzungen, Nero di Toscana	1 []
very narrow elliptic to narrow elliptic	Kobolt	2 []
narrow elliptic	Rednex	3 []
narrow elliptic to elliptic	Halbhoher grüner krauser	4 []
elliptic	Esthe, Westlandse Herfst	5 []
broad elliptic		6 []
circular	Asa de Cantaro	7 []
transverse elliptic		8 []
5.8 Leaf blade: length (17)		
short	Westlandse Herfst	3 []
medium	Esthe	5 []
long	Lerchenzungen	7 []
5.9 Leaf blade: width (18)		
narrow	Lerchenzungen, Nero di Toscana	3 []
medium	Esthe	5 []
broad	Westlandse Herfst	7 []
5.10 Leaf blade: variegation (21)		
absent	Esthe	1 []
present		9 []
5.11 Leaf blade: density of "curling" (23)		
absent or very sparse	Cottagers, Esthe	1 []
sparse	Maribor, Pentland Brig	3 []
medium	Dwarf Green Curled, Redbor	5 []
dense	Kobolt, Westlandse Herfst	7 []

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

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