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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-fourth session, to be held in Brasilia, Brazil,
from 2020-05-11 to 2020-05-15

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:*

Botanical name	*English*	*French*	*German*	*Spanish*
Brassica oleracea L. var. *costata* DC.	Bedford cabbage, Braganza, Portugese cole, Portuguese kale, Seakale cabbage, Tronchuda cabbage, Tronchuda kale			
Brassica oleracea L. var. *medullosa* Thell.	Marrow-stem kale			
Brassica oleracea L. var. *sabellica* L.	Curly kale, Borecole, Dwarf Siberian kale, Kitchen kale, Scotch kale			
Brassica oleracea L. var. *viridis* L.	Collards, Cow cabbage, Fodder kale, Kale, Spring-heading cabbage, Tall kale, Tree kale			
Brassica oleracea L. var. *palmifolia* 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 Guidance on the use of Test Guidelines for interspecific or inter-variant] 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 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.

3.1.3 The testing of a variety may be conducted 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 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.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.

4.2.6 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: color (characteristic 9)
(c) Leaf: distribution of anthocyanin coloration (characteristic 10)
(d) Leaf blade: variegation (characteristic 19)

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)-(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					
		short				Dwarf Green Curled, Tintoretto	3
		medium				Black Magic, Cottagers, Esthe	5
		tall				Fizz, Nero di Toscana	7
2.		**QN MS/VG**	**(+) (a)**				
		Plant: diameter					
		small				Rossignol, Tintoretto	3
		medium				Darkibor, Dwarf Green Curled	5
		large				Cottagers, Esthe, Nero di Toscana	7
3.	**(*)**	**PQ VG**	**(+) (a)**				
		Plant: shape					
		inverted pyramid				Esthe, Fizz	1
		flat				Lav opretvoksende	2
		dome				Kadet, Westlandse Winter	3
		pyramid				Moosbor	4
		column					5
4.	**(*)**	**QN VG**	**(+) (a)**				
		Plant: position of growing point					
		lower part				Esthe, Fizz	1
		middle part				Black Magic, Tintoretto	2
		upper part				Dwarf Green Curled, Kadet, Westlandse Herfst	3
5.		**QN MS/VG**	**(+) (a)**				
		Plant: number of leaves					
		few				Pentland Brig, Rednex	3
		medium				Redbor, Tintoretto	5
		many				Esthe, Winnetou	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.		**QN MS/VG**	**(a)**				
		Stem: length					
		short				Darkibor, Tintoretto	3
		medium				Dwarf Green Curled, Fizz	5
		long				Cottagers	7
7.		**PQ VG**	**(a)**				
		Young Leaf: color					
		yellow green				Esthe, Tintoretto	1
		green				Dwarf Green Curled	2
		grey green				Lerchenzungen	3
		blue green				Black Magic, Nero di Toscana	4
		red purple				Redbor, Rednex	5
8.	**(*)**	**QN VG**	**(+) (a), (b)**				
		Leaf: attitude					
		erect				Esthe, Nero di Toscana	1
		semi-erect				Cottagers, Redbor	3
		horizontal				Kobolt, Starmaker	5
9.	**(*)**	**PQ VG**	**(a), (b)**				
		Leaf: color					
		yellow green				Tintoretto	1
		light green				Westlandse Winter	2
		green				Dwarf Green Curled, Esthe	3
		dark green					4
		grey green				Fizz	5
		blue green				Black Magic, Nero di Toscana	6
		reddish green				Redbor, Rednex	7
10.	**(*)**	**QN VG**	**(+) (a), (b)**				
		Leaf: distribution of anthocyanin coloration					
		absent				Esthe, Lerchenzungen, Pentland Brig	1
		partially present				Cottagers, Starmaker	2
		entirely present				Redbor, Rednex	3

	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					
	very weak					1
	weak				Ragged Jack	2
	medium				Midnight Sun, Starmaker	3
	strong				Redbor, Rednex	4
	very stong					5
12.	**QN VG**	**(+) (b)**				
	Leaf: intensity of anthocyanin coloration in winter					
	absent od very weak				Esthe	1
	weak				Cottagers, Ragged Jack	2
	medium				Starmaker	3
	strong				Midnight Sun, Redbor, Rednex	4
	very strong					5
13.	**QN MS/VG**	**(+) (a), (b)**				
	Leaf: number of lobes					
	absent or very few				Esthe, Nero di Toscana	1
	few				Cottagers	2
	medium				Rednex	3
	many				Dwarf Green Curled	4
	very many				Lerchenzungen	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
14.	**(*)**	**PQ VG**	**(+) (a), (b), (c)**				
		Leaf blade: shape					
		very narrow elliptic				Nero di Toscana	1
		very narrow elliptic to narrow elliptic				Black Magic, Lerchenzungen	2
		narrow elliptic				Winnetou	3
		narrow elliptic to elliptic					4
		elliptic				Esthe, Fizz, Redbor, Tintoretto	5
		broad elliptic				Dauro, Westlandse Herfst	6
		circular				Beria, Halbhoher grüner krauser	7
		transverse elliptic				Starmaker, Tronchusa Marriot	8
15.	**(*)**	**QN MS/VG**	**(+) (a), (b), (c)**				
		Leaf blade: length					
		short				Dwarf Green Curled, Westlandse Herfst	3
		medium				Esthe, Fizz, Lerchenzungen	5
		long				Nero di Toscana	7
16.	**(*)**	**QN MS/VG**	**(+) (a), (b), (c)**				
		Leaf blade: width					
		narrow				Dwarf Green Curled, Redbor	3
		medium				Cottagers, Esthe, Fizz	5
		broad				Beria, Tronchusa Marriot	7
17.		**QN VG**	**(+) (a), (b), (c)**				
		Leaf blade: curvature of midrib					
		incurved				Starmaker	1
		straight				Midnight Sun	2
		slightly recurved				Esthe, Kadet, Lerchenzungen, Winnetou	3
		moderately recurved				Westlandse Winter	4
		strongly recurved				Westlandse Herfst	5
		very strongly recurved				Arsis	6

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18.		**QN VG**	**(+) (a), (b), (c)**				
		Leaf blade: blistering					
		absent or very weak				Starmaker	1
		weak				Cottagers, Esthe	3
		medium				Fizz	5
		strong				Black Magic, Nero di Toscana	7
19.	**(*)**	**QL VG**	**(+) (a), (b), (c)**				
		Leaf blade: variegation					
		absent				Esthe	1
		present				Purple Varie	9
20.		**QN VG**	**(a), (b), (c)**				
		<u>Only number of lobe: absent or very few or few:</u> Leaf blade: undulation of margin					
		absent or very weak				Black Magic, Nero di Toscana	1
		weak				Esthe, Starmaker	3
		medium				Cottagers, Midnight Sun	5
		strong					7
21.		**QN VG**	**(+) (a), (b), (c)**				
		Leaf blade: recurvature of margin					
		absent or weak				Esthe, Midnight Sun	1
		medium				Rossignol	2
		strong				Black Magic, Nero di Toscana	3
22.		**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				Nero di Toscana, Starmaker	1
		weak				Esthe, Tintoretto	2
		medium	faible	gering	débil	Dwarf Green Curled	3
		strong				Lerchenzungen	4
		very strong	moyenne		medio		5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23.	**QN VG**	**(a), (b), (c)**				
	Lobe: density of undulation of margin					
	absent or very sparse				Cottagers, Esthe	1
	sparse				Pentland Brig	2
	medium				Redbor	3
	dense				Dwarf Green Curled	4
	very dense				Kobolt, Westlandse Herfst	5
24.	**(*) QN VG**	**(a), (b), (c)**				
	Lobe: depth of incision of margin					
	absent or shallow				Esthe, Redbor	1
	medium					2
	deep				Fizz, Ragged Jack	3
25.	**QN MS/VG**	**(+) (a), (b)**				
	Petiole: length					
	absent or very short				Lerchenzungen, Nero di Toscana, Starmaker	1
	short				Kobolt, Westlandse Herfst	2
	medium				Esthe, Halbhoher grüner krauser	3
	long				Ragged Jack	4
	very long				Cottagers, Fizz	5
26.	**QN MS/VG**	**(+) (a), (b)**				
	Petiole: width					
	very narrow					1
	narrow				Darkibor, Starmaker, Westlandse Herfst	2
	medium				Cottagers, Esthe, Halbhoher grüner krauser, Kobolt	3
	broad				Fizz, Tronchusa Marriot	4
	very broad					5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27.	**QL** **VG**					
	Head					
	absent				Esthe, Redbor	1
	present				Starmaker, Tronchusa Marriot	9
28.	**QL** **MS/VG**	**(+)**				
	Male sterility					
	absent				Westlandse Herfst	1
	present				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:

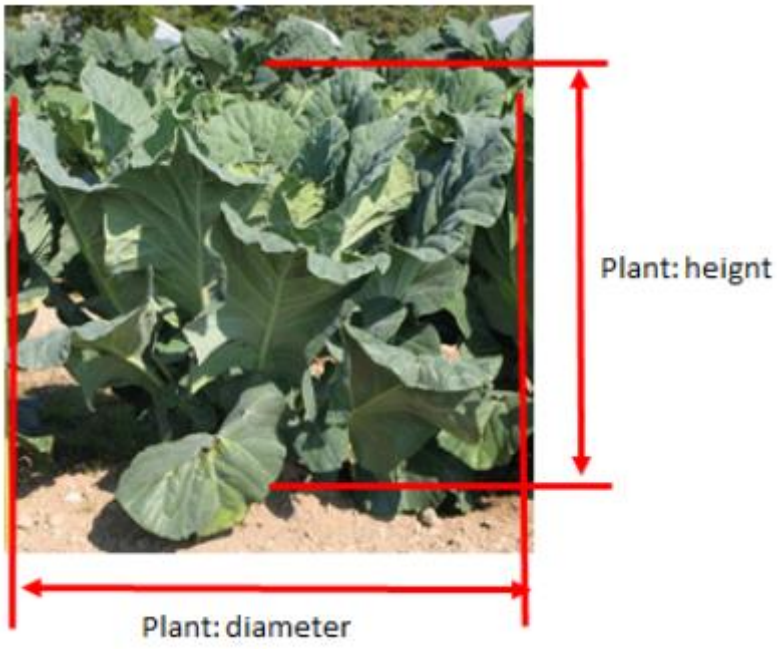
(a) Observation should be made on the plants which grew for 3 to 5 months after sowing and when the lowest temperature is above 10 degrees Celsius.

(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

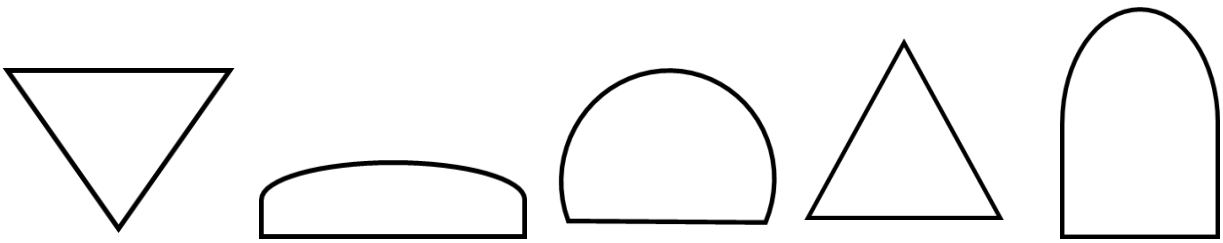
Ad. 1: Plant: height



Ad. 2: Plant: diameter

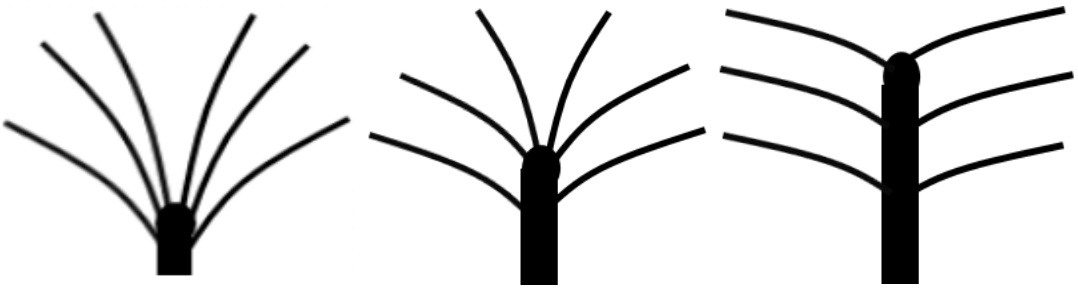
See Ad.1

Ad. 3: Plant: shape



1	2	3	4	5
inverted pyramid	flat	dome	pyramid	column

Ad. 4: Plant: position of growing point



1
lower part

2
middle part

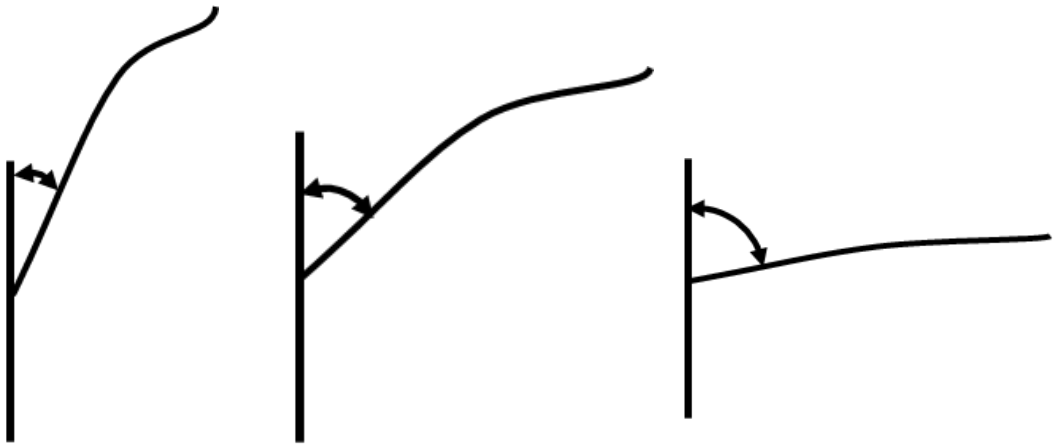
3
upper part

Ad. 5: Plant: number of leaves

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

Ad. 8: Leaf: attitude

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



1
erect

3
semi-erect

5
horizontal

Ad. 10: Leaf: distribution of anthocyanin coloration

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

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

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

Ad. 12: 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. 13: Leaf: number of lobes

Parts of the leaf blade 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

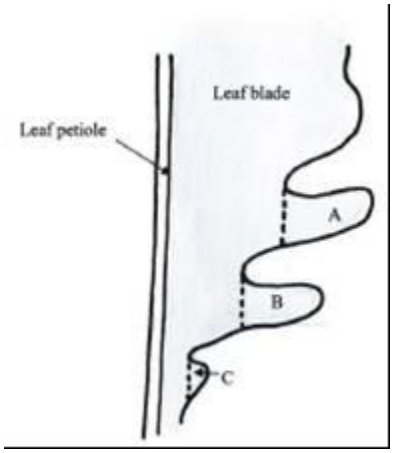


Figure 1

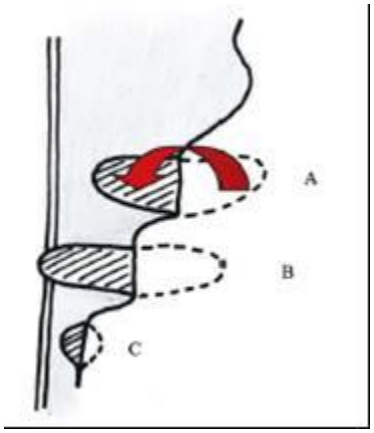
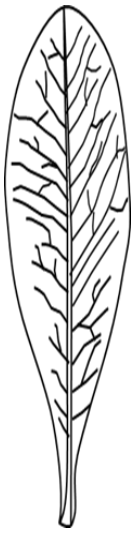


Figure 2

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

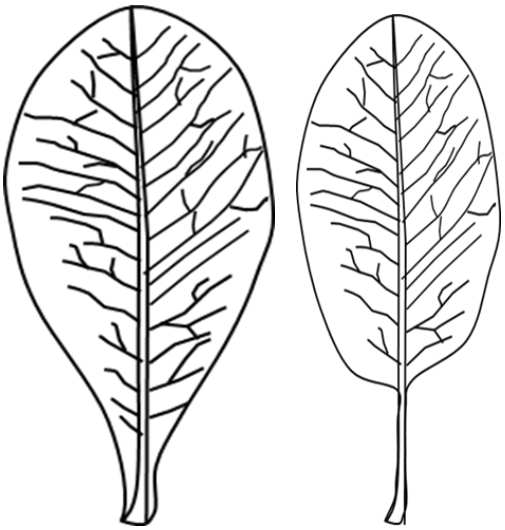
Ad. 14: Leaf blade: shape

1
very narrow elliptic

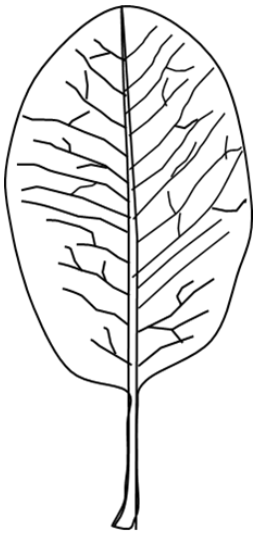


2
very narrow elliptic to narrow elliptic

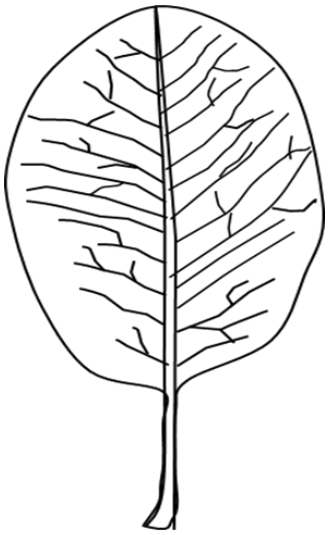
3
narrow elliptic



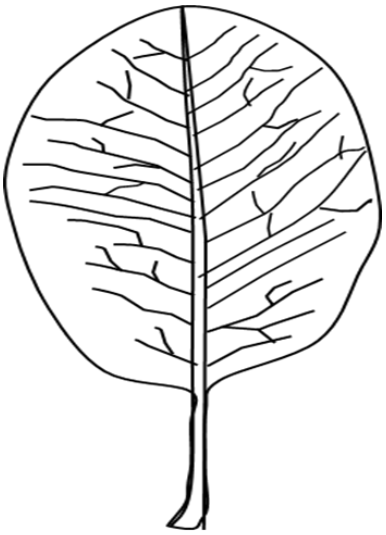
4
narrow elliptic to elliptic



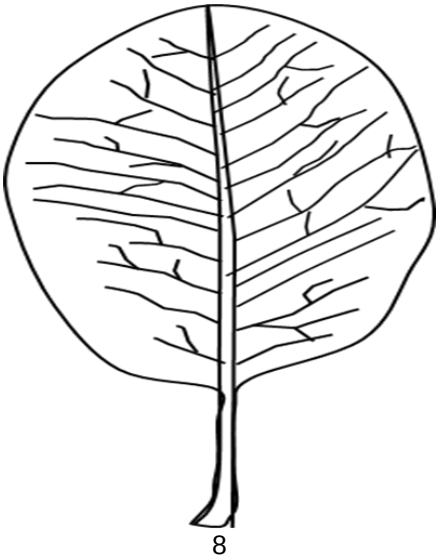
5
elliptic



6
broad elliptic

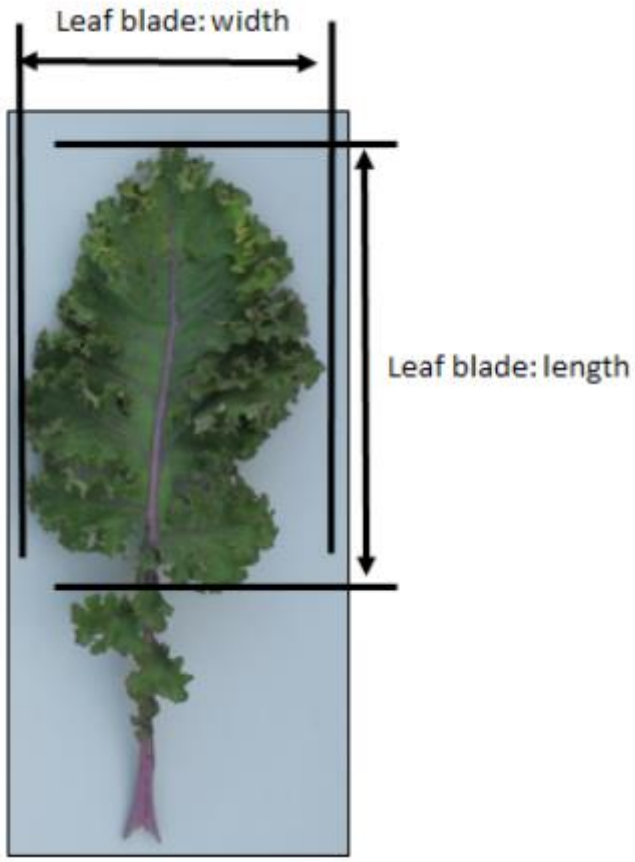


7
circular



8
transverse elliptic

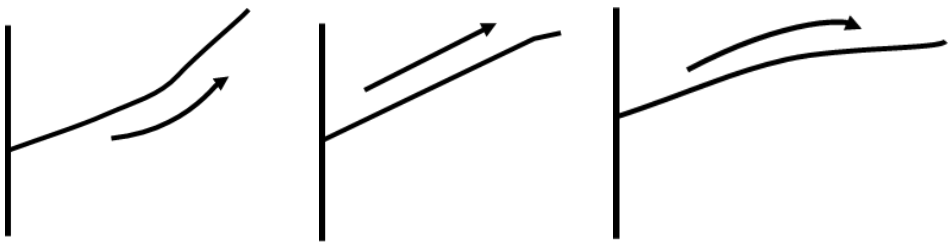
Ad. 15: Leaf blade: length



Ad. 16: Leaf blade: width

See Ad.15

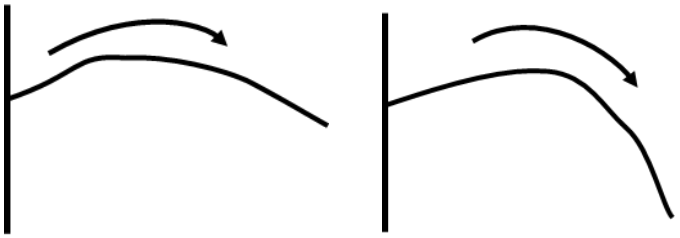
Ad. 17: Leaf blade: curvature of midrib



1
incurved

2
straight

3
slightly recurved



4
moderately recurved

5
strongly recurved

Ad. 18: Leaf blade: blistering

1	3	5	7
absent or very weak	weak	medium	strong

Ad. 19: Leaf blade: variegation

1	9
absent	present

Ad. 21: Leaf blade: recurvature of margin

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

1
absent or weak

2
medium

3
strong

Ad. 22: Leaf blade: folding in cross section

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

1
absent or very weak

2
weak

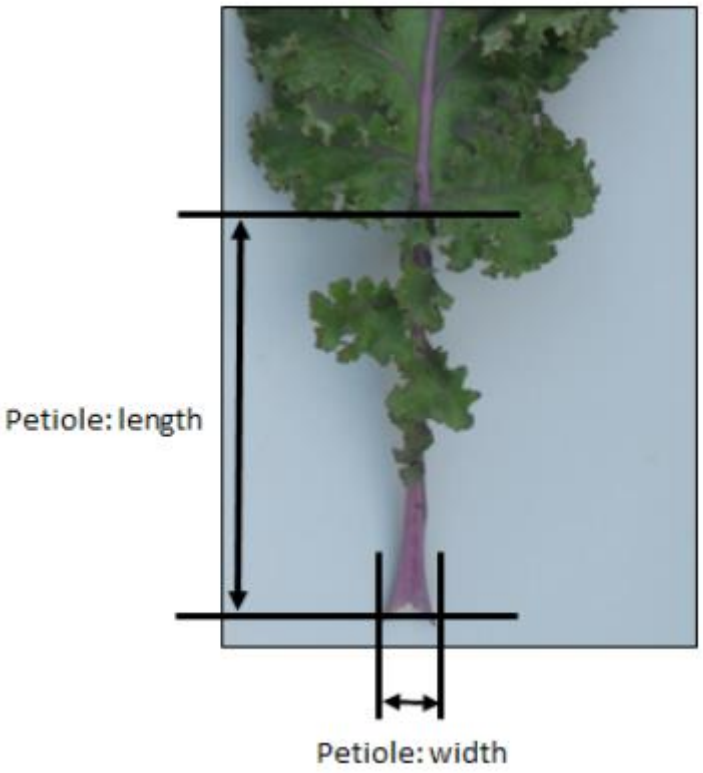
3
medium

4
strong

5
very strong

Ad. 25: Petiole: length

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



Ad. 26: Petiole: width

See Ad. 25

Ad. 28: 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 test[i]. 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

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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

1.1.1	Botanical name	*Brassica oleracea* L. var. *costata* DC.	[ ]
1.1.2	Common name	Bedford cabbage, Braganza, Portugese cole, Portuguese kale, Seakale cabbage, Tronchuda cabbage, Tronchuda kale	
1.2.1	Botanical name	*Brassica oleracea* L. var. *medullosa* Thell.	[ ]
1.2.2	Common name	Marrow-stem kale	
1.3.1	Botanical name	*Brassica oleracea* L. var. *sabellica* L.	[ ]
1.3.2	Common name	Curly kale, Borecole, Dwarf Siberian kale, Kitchen kale, Scotch kale	
1.4.1	Botanical name	*Brassica oleracea* L. var. *viridis* L.	[ ]
1.4.2	Common name	Collards, Cow cabbage, Fodder kale, Kale, Spring-heading cabbage, Tall kale, Tree kale	
1.5.1	Botanical name	*Brassica oleracea* L. var. *palmifolia* DC.	[ ]
1.5.2	Common name	Giant Jersey kale, Jersey kale, Palm kale, Palm-tree kale, Tree kale	

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

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 [ ]

(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 [ ]
(i) Single hybrid [ ]
(b) 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:

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 (1)	**Plant: height**		
	short	Dwarf Green Curled, Tintoretto	3 [ ]
	medium	Black Magic, Cottagers, Esthe	5 [ ]
	tall	Fizz, Nero di Toscana	7 [ ]
5.2 (3)	**Plant: shape**		
	inverted pyramid	Esthe, Fizz	1 [ ]
	flat	Lav opretvoksende	2 [ ]
	dome	Kadet, Westlandse Winter	3 [ ]
	pyramid	Moosbor	4 [ ]
	column		5 [ ]
5.3 (4)	**Plant: position of growing point**		
	lower part	Esthe, Fizz	1 [ ]
	middle part	Black Magic, Tintoretto	2 [ ]
	upper part	Dwarf Green Curled, Kadet, Westlandse Herfst	3 [ ]
5.4 (8)	**Leaf: attitude**		
	erect	Esthe, Nero di Toscana	1 [ ]
	semi-erect	Cottagers, Redbor	3 [ ]
	horizontal	Kobolt, Starmaker	5 [ ]
5.5 (9)	**Leaf: color**		
	yellow green	Tintoretto	1 [ ]
	light green	Westlandse Winter	2 [ ]
	green	Dwarf Green Curled, Esthe	3 [ ]
	dark green		4 [ ]
	grey green	Fizz	5 [ ]
	blue green	Black Magic, Nero di Toscana	6 [ ]
	reddish green	Redbor, Rednex	7 [ ]

	Characteristics	Example Varieties	Note
5.6 (10)	**Leaf: distribution of anthocyanin coloration**		
	absent	Esthe, Lerchenzungen	1 [ ]
	partially present	Cottagers, Starmaker	2 [ ]
	entirely present	Redbor, Rednex	3 [ ]
5.7 (14)	**Leaf blade: shape**		
	very narrow elliptic	Nero di Toscana	1 [ ]
	very narrow elliptic to narrow elliptic	Black Magic, Lerchenzungen	2 [ ]
	narrow elliptic	Winnetou	3 [ ]
	narrow elliptic to elliptic		4 [ ]
	elliptic	Esthe, Fizz, Redbor, Tintoretto	5 [ ]
	broad elliptic	Dauro, Westlandse Herfst	6 [ ]
	circular	Beria, Halbhoher grüner krauser	7 [ ]
	transverse elliptic	Starmaker, Tronchusa Marriot	8 [ ]
5.8 (15)	**Leaf blade: length**		
	short	Dwarf Green Curled, Westlandse Herfst	3 [ ]
	medium	Esthe, Fizz, Lerchenzungen	5 [ ]
	long	Nero di Toscana	7 [ ]
5.9 (16)	**Leaf blade: width**		
	narrow	Dwarf Green Curled, Redbor	3 [ ]
	medium	Cottagers, Esthe, Fizz	5 [ ]
	broad	Beria, Tronchusa Marriot	7 [ ]
5.10 (19)	**Leaf blade: variegation**		
	absent	Esthe	1 [ ]
	present	Purple Varie	9 [ ]

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

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	Characteristic(s) in which your candidate variety differs	Describe the expression of the characteristic(s) for the	Describe the expression of the characteristic(s) for **your**
Example			

Comments:

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

[#]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.

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

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]