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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

CALABRESE, SPROUTING BROCCOLI *

UPOV Code: BRASS_OLE_GBC

Brassica oleracea L. convar. *botrytis* (L.) Alef. var. *cymosa* Duch.
(including *Brassica oleracea* L. convar. *botrytis* (L.) Alef. var. *italica*)

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Brassica oleracea L. convar. *botrytis* (L.) Alef. var. *cymosa* Duch., *Brassica oleracea* L. convar. *botrytis* (L.) Alef. var. *italica*, *Brassica olerracea* L. var. *italica* Planck.	Calabrese, Sprouting Broccoli, Winter broccoli	Broccoli, Chou brocoli	Brokkoli	Brócoli, Bróculi, Brécol

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

Other associated UPOV documents: TG/45 (Cauliflower)

* 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.]

TABLE OF CONTENTS PAGE

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Brassica oleracea* L. convar. *botrytis* (L.) Alef. var. *cymosa* Duch, including *Brassica oleracea* L. convar. *botrytis* (L.) Alef. var. *italica*.

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.

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

20 g or 5,000 seeds.

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

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

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

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

3.3.1 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.

3.3.2 The recommended method of observing the characteristic is indicated by the following key in the second column of the Table 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

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 60 plants, which should be divided between two or more replicates.

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

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, all observations should be made on 40 plants or parts taken from each of 40 plants.

3.6 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.

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

4.2.3 For the assessment of uniformity of hybrid 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 60 plants, 2 off-types are 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 tested, either by growing a further generation, or by testing a new seed stock to ensure that it exhibits the same characteristics as those shown by the previous 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: number of stems (characteristic 1)
(b) Head: color (characteristic 18)
(c) Time of harvest maturity (50% of plants) (characteristic 30)
(d) Male sterility (characteristic 32)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

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

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.

6.3 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

(*) Asterisked characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3
QN: Quantitative characteristic – see Chapter 6.3
PQ: Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG: See Chapter 3.3.1

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

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

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. (*) (+)	**(a)**	**Plant: number of stems**	**Plante: nombre de tiges**	**Pflanze: Anzahl Stengel**	**Planta: número de tallos**		
QL	**VG**	one	une	einer	uno	Ramoso Calabrese, Shogun	1
		more than one	plus d'une	mehr als einer	más de uno	A Getti di Napoli	2
2. (*)		**Plant: height (at harvest maturity)**	**Plante: hauteur (à la maturité de récolte)**	**Pflanze: Höhe (bei Erntereife)**	**Planta: altura (madurez para la cosecha)**		
QN	**MS**	very short	très basse	sehr niedrig	muy baja	New Light	1
		short	basse	niedrig	baja	Packman, Primor	3
		medium	moyenne	mittel	media	Coaster	5
		tall	haute	hoch	alta	Citation	7
		very tall	très haute	sehr hoch	muy alta	Colibri, Pollux	9
3. (*) (+)		**Leaf: attitude (at beginning of head formation)**	**Feuille: port (au commencement de la formation de la pomme)**	**Blatt: Haltung (bei Beginn der Kopfbildung)**	**Hoja: porte (al comenzar a formarse la cabeza)**		
QN	**VG**	semi-erect	demi-dressé	halbaufrecht	semierecto	Arcadia, Asti, Civet, Claudia	3
		horizontal	horizontal	waagerecht	horizontal	Bishop, Colonel, New Light	5
		semi-pendulous	demi-retombant	halbhängend	semicolgante	A Getti di Napoli	7
4. (*)	**(a) (b)**	**Leaf: length (including petiole)**	**Feuille: longueur (y compris pétiole)**	**Blatt: Länge (einschließlich Stiel)**	**Hoja: longitud (incluido el peciolo)**		
QN	**MS**	short	courte	kurz	corta	Dandy Early, Emperor	3
		medium	moyenne	mittel	media	Brigadeer, Sumosun	5
		long	longue	lang	larga	Green Duke, Laser	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	**(a) (b)**	**Leaf: width**	**Feuille: largeur**	**Blatt: Breite**	**Hoja: anchura**		
QN	**MS**	narrow	étroite	schmal	estrecha	Arcadia, Brigadeer	3
		medium	moyenne	mittel	media	Buccaneer, Green Belt	5
		broad	large	breit	ancha	Claudia, Esquire, New Prince	7
6. (*)	**(a) (b)**	**Leaf: number of lobes**	**Feuille: nombre de lobes**	**Blatt: Anzahl Lappen**	**Hoja: número de lóbulos**		
QN	**VG**	absent or very few	nul ou très petit	fehlend oder sehr gering	ausente o escaso	Viola, Violet Queen	1
		few	petit	gering	bajo	Early White Sprouting	3
		medium	moyen	mittel	medio	Coaster, Topper	5
		many	grand	groß	alto	Prisma, Shogun	7
		very many	très grand	sehr groß	muy alto	Medium Late 145	9
7. (*)	**(a) (b)**	**Leaf blade: color**	**Limbe: couleur**	**Blattspreite: Farbe**	**Limbo: color**		
PQ	**VG**	green	vert	grün	verde	Claudia, Verflor	1
		grey green	vert gris	graugrün	verde grisáceo	Bishop	2
		blue green	vert bleu	blaugrün	verde azulado	Citation, Esquire, Symphony	3
8.	**(a) (b)**	**Leaf blade: intensity of color**	**Limbe: intensité de la couleur**	**Blattspreite: Intensität der Farbe**	**Limbo: intensidad de color**		
QN	**VG**	light	claire	hell	claro		3
		medium	moyenne	mittel	medio		5
		dark	foncée	dunkel	oscuro		7
9.	**(a) (b)**	**Leaf blade: anthocyanin coloration**	**Limbe: pigmentation anthocyanique**	**Blattspreite: Anthocyanfärbung**	**Limbo: pigmentación antociánica**		
QL	**VG**	absent	absente	fehlend	ausente	Claudia, Embassy	1
		present	présente	vorhanden	presente	Buccaneer, Pascal	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
10.	**(a) (b)**	**Leaf blade: undulation of margin**	**Limbe: ondulation du bord**	**Blattspreite: Wellung des Randes**	**Limbo: ondulación del borde**		
QN	**VG**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
		weak	faible	gering	débil	Beaufort, Early Pack, Laser, Paladin	3
		medium	moyenne	mittel	media	Citation	5
		strong	forte	stark	fuerte	Aikido, Marathon, Samurai	7
		very strong	très forte	sehr stark	muy fuerte	Di Albenga précoce	9
11.	**(a) (b)**	**Leaf blade: dentation of margin**	**Limbe: dentelure du bord**	**Blattspreite: Zähnung des Randes**	**Limbo: dentado del borde**		
QN	**VG**	weak	faible	gering	débil	Galaxy	3
		medium	moyenne	mittel	medio	Buccaneer	5
		strong	forte	stark	fuerte	Admiral	7
12.	**(a) (b)**	**Leaf blade: blistering**	**Limbe: cloqûre**	**Blattspreite: Blasigkeit**	**Limbo: abullonado**		
QN	**VG**	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Buccaneer, Colibri	1
		weak	faible	gering	débil	Coaster, Gem	3
		medium	moyenne	mittel	medio	Medium Late 145, Skiff	5
		strong	forte	stark	fuerte		7
		very strong	très forte	sehr stark	muy fuerte		9
13.	**(a) (b)**	**Petiole: anthocyanin coloration**	**Pétiole: pigmentation anthocyanique**	**Blattstiel: Anthocyanfärbung**	**Peciolo: pigmentación antociánica**		
QL	**VG**	absent	absente	fehlend	ausente	Claudia, Embassy	1
		present	présente	vorhanden	presente	Early Purple Sprouting	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
14.	**(a) (b)**	**Petiole: length**	**Pétiole: longueur**	**Blattstiel: Länge**	**Peciolo: longitud**		
QN	**VG**	very short	très court	sehr kurz	muy corta	Violet Queen	1
		short	court	kurz	corta	High Sierra, Padovano	3
		medium	moyen	mittel	media	Emperor, Ramoso Calabrese	5
		long	long	lang	larga	Groene Calabrese, Premium Crop	7
		very long	très long	sehr lang	muy larga		9
15. **(+)**	**(c)**	**Head: length of branching at base (excluding stem)**	**Pomme: longueur des ramifications à la base (excluant la tige)**	**Kopf: Länge der Verzweigungen an der Basis (ohne Stengel)**	**Cabeza: longitud de ramificación en la base (excluido el tallo)**		
QN	**MS**	very short	très courtes	sehr kurz	muy corta	Viola	1
		short	courtes	kurz	corta	Brigadeer, Buccaneer, Emperor	3
		medium	moyennes	mittel	media	Capitol, Green Duke, Perseus	5
		long	longues	lang	larga	Laser, Kayak	7
		very long	très longues	sehr lang	muy larga	A Getti di Napoli	9
16.	**(c)**	**Head: size**	**Pomme: taille**	**Kopf: Größe**	**Cabeza: tamaño**		
QN	**VG**	very small	très petite	sehr klein	muy pequeño	Early Purple Sprouting	1
		small	petite	klein	pequeño	Orbit, Scorpio	3
		medium	moyenne	mittel	medio	Dundee, Early Man	5
		large	grande	groß	grande	Caravel, Mercedes, Packman	7
		very large	très grande	sehr groß	muy grande	Viola, Violet Queen	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17. (*) (+)	**(c)**	**Head: shape in longitudinal section**	**Pomme: forme en section longitudinale**	**Kopf: Form in Längsschnitt**	**Cabeza: forma en sección longitudinal**		
QN	**VG**	circular	ciculaire	rund	circular	Esquire	1
		transverse broad elliptic	elliptique transverse large	quer breit elliptisch	elíptica transversal ancha	Admiral, Corvet	2
		transverse medium elliptic	elliptique transverse moyenne	quer mittel elliptisch	elíptica transversal media	Buccaneer, Futura	3
		transverse narrow elliptic	elliptique transverse étroite	quer schmal elliptisch	elíptica transversal estrecha	Citation, Scorpio, Zeus	4
18. (*)	**(c)**	**Head: color**	**Pomme: couleur**	**Kopf: Farbe**	**Cabeza: color**		
PQ	**VG**	cream	crème	cremefarben	crema	Early White Sprouting	1
		green	verte	grün	verde	Idol, Verflor	2
		grey green	vert gris	graugrün	verde grisáceo	Brigadeer, Galaxy	3
		blue green	vert bleu	blaugrün	verde azulado	Buccaneer	4
		violet	violacée	violett	violeta	Viola	5
19.	**(c)**	**Head: intensity of color**	**Pomme: intensité de la couleur**	**Kopf: Intensität der Farbe**	**Cabeza: intensidad del color**		
QN	**VG**	light	claire	hell	clara		3
		medium	moyenne	mittel	media		5
		dark	foncée	dunkel	oscura		7
20.	**(c)**	**Head: anthocyanin coloration**	**Pomme: pigmentation anthocyanique**	**Kopf: Anthocyan-färbung**	**Cabeza: pigmentación antociánica**		
QL	**VG**	absent	absente	fehlend	ausente	Early White Sprouting	1
		present	présente	vorhanden	presente	Brigadeer, Shogun, Viola	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21.	**(c)**	**Head: intensity of anthocyanin coloration**	**Pomme: intensité de la pigmentation anthocyanique**	**Kopf: Intensität der Anthocyanfärbung**	**Cabeza: intensidad de pigmentación antociánica**		
QN	**VG**	very weak	très faible	sehr gering	muy débil		1
		weak	faible	gering	débil	Brigadeer	3
		medium	moyenne	mittel	media	Shogun	5
		strong	forte	stark	fuerte		7
		very strong	très forte	sehr stark	muy fuerte	Viola	9
22.	**(c)**	**Head: knobbling**	**Pomme: protubérance**	**Kopf: Höckerbildung**	**Cabeza: protuberación**		
QN	**VG**	fine	faible	fein	débil	Apollo, Brigadeer	3
		medium	moyen	mittel	medio	Southern Comet	5
		coarse	fort	stark	fuerte	Perseus, Regilio	7
23.	**(c)**	**Head: texture**	**Pomme: granulation**	**Kopf: Körnung**	**Cabeza: textura**		
QN	**VG**	very fine	très fine	sehr fein	muy fina	Viola	1
		fine	fine	fein	fina	Auriga, Bishop, Green Top	3
		medium	moyenne	mittel	media	Clipper, Coaster	5
		coarse	grossière	grob	gruesa	Citation	7
		very coarse	très grossière	sehr grob	muy gruesa	Earlyman	9
24.	**(c)**	**Head: firmness**	**Pomme: fermeté**	**Kopf: Festigkeit**	**Cabeza: firmeza**		
QN	**VG**	loose	lâche	locker	laxa	Caravel	3
		medium	moyenne	mittel	media	Late Corona	5
		firm	ferme	fest	densa	Captain	7
25.	**(c)**	**Head: bracts**	**Pomme: bractées**	**Kopf: Brakteen**	**Cabeza: brácteas**		
QL	**VG**	absent	absentes	fehlend	ausentes	Gem, Orion	1
		present	présentes	vorhanden	presentes	Ramoso Calabrese	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
26.		**Plant: secondary heads (at harvest maturity)**	**Plante: pommes secondaires (à maturité de récolte)**	**Pflanze: sekundäre Köpfe (bei Erntereife)**	**Planta: cabezas secundarias (madurez para la cosecha)**		
QL	**VG**	absent	absentes	fehlend	ausentes	Scorpio, Zeus	1
		present	présentes	vorhanden	presentes	Marathon, Tribute, Late Purple Sprouting	9
27.		**Plant: prominence of secondary heads (as for 26)**	**Plante: proéminence des pommes secondaires (comme pour 26)**	**Pflanze: Ausbildung von sekundären Köpfen (wie für 26)**	**Planta: prominencia de cabezas secundarias (para 26)**		
QN	**VG**	weak	faible	gering	débil		3
		medium	moyenne	mittel	media	Citation	5
		strong	forte	stark	fuerte	Marathon, Tribute	7
28.		**Flower: color**	**Fleur: couleur**	**Blüte: Farbe**	**Flor: color**		
QL	**VG**	white	blanche	weiß	blanco	A Getti de Napoli	1
		yellow	jaune	gelb	amarillo	Brigadeer, Orion	2
29.		**Flower: intensity of yellow color**	**Fleur: intensité de la couleur jaune**	**Blüte: Intensität der Gelbfärbung**	**Flor: intensidad del color amarillo**		
QN	**VG**	light	claire	hell	clara	Brigadeer	3
		medium	moyenne	mittel	media	Capitol, Corvet	5
		dark	foncée	dunkel	oscura	Gem, Orion	7
30. (*)		**Time of harvest maturity (50% of plants)**	**Époque de maturité de récolte (50% des plantes)**	**Zeitpunkt der Erntereife (50 % der Pflanzen)**	**Época de madurez para la cosecha (50% de las plantas)**		
QN	**MG**	very early	très précoce	sehr früh	muy precoz	Earlyman, Primor	1
		early	précoce	früh	precoz	Galaxy, Packman, Scorpio	3
		medium	moyenne	mittel	media	Sumosun	5
		late	tardive	spät	tardía	Colibri, Ginga, Pollux	7
		very late	très tardive	sehr spät	muy tardía	Late Purple Sprouting	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
31.		**Time of beginning of flowering (50% of plants with at least 10% flowers)**	**Époque de début de floraison (50% des plantes avec au moins 10% de fleurs)**	**Zeitpunkt des Blühbeginns (50 % der Pflanzen mit mindestens 10 % Blüten)**	**Época de comienzo de la floración (50% de las plantas con 10% de flores como mínimo)**		
QN	**MG**	early	précoce	früh	precoz	Clipper, Southern Comet	3
		medium	moyenne	mittel	media	Coaster, Cruiser	5
		late	tardive	spät	tardía	Shogun, Viola	7
32. (*) (+)		**Male sterility**	**Stérilité mâle**	**Männliche Sterilität**	**Androesterilidad**		
QL	**VG/ MS**	absent	absente	fehlend	ausente	Marathon	1
		present	présente	vorhanden	presente	Chevalier	9

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) Plant, leaf, leaf blade: observations on the plant, the leaf and the leaf blade which should be made on fully developed plants just before harvest maturity.

(b) Leaf, leaf blade, petiole: observations on the leaf, the leaf blade and the petiole, which should be made on the largest leaf.

(c) Head: observations on the head which should be made at harvest maturity and should relate to the primary spear.

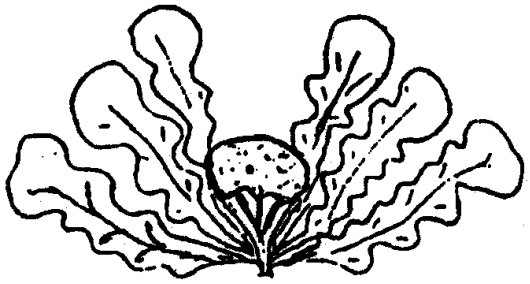
8.2 Explanations for individual characteristics

Ad. 1: Plant: number of stems

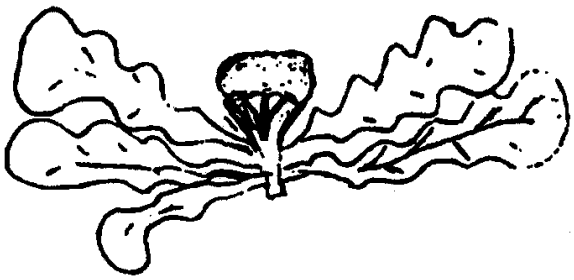
1
one

2
more than one

Ad. 3: Leaf: attitude (at beginning of head formation)



3
semi-erect



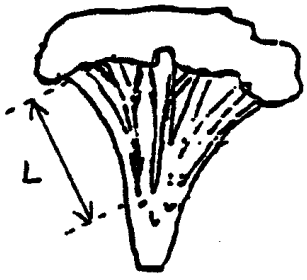
5
horizontal

7
semi-pendulous

Ad. 15: Head: length of branching at base (excluding stem)

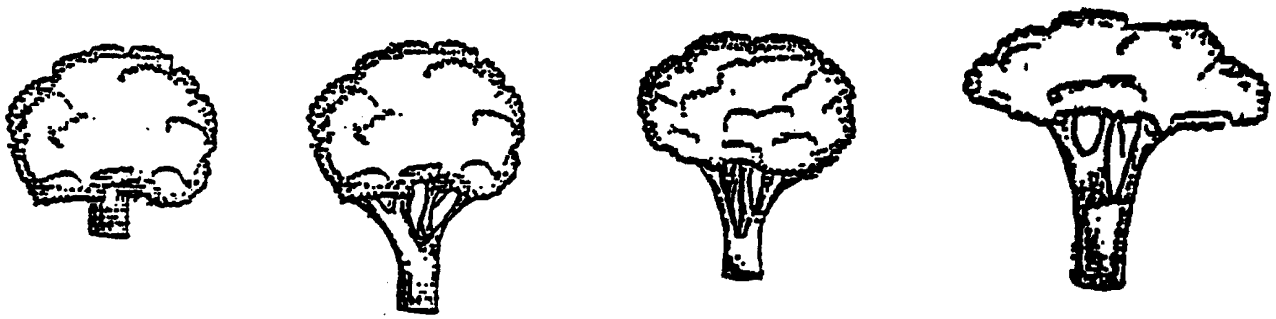
3
short

5
medium



7
long

Ad. 17: Head: shape in longitudinal section



1	2	3	4
circular	transverse broad elliptic	transverse medium elliptic	transverse narrow elliptic

Ad. 32: 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[1]. 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.

[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

Gray, 1982: Taxonomy and Evolution of Broccoli (*Brassica oleracea* var. *italica*). Economic Botany 36, pp. 397-410

Gray, 1989: Taxonomy and Evolution of Broccoli and Cauliflower. Baileya 23(1), pp. 28-46.

Helm, J., 1960: Brokkoli und Spargelkohl. Der Züchter 30, pp. 223-241

Marshall, B., Thompson, R., 1987: A Model of the Influence of Air Temperature and Solar Radiation on the Time of Maturity of Calabrese Brassica oleracea var. italica. Annals of Botany 60, pp. 513-519

Miller, C.H., Konster, T.R., and Lamont, W.J., 1985: Cold Stress Influence on Premature Flowering of Broccoli. HortScience 20(2), pp. 193-195

Wiebe, H.J., 1975: The morphological development of cauliflower and broccoli cultivars depending on temperature. Sci. Hort. 3, pp. 95-101

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 Botanical name	*Brassica oleracea* L. convar. (L.) Alef. var. *cymosa* Duch. (including *Brassica oleracea* L. convar. *botrytis* (L.) Alef. var. *italica)*
1.2 Common name	Calabrese, Sprouting Broccoli

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

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]

(b) Cross-pollination
(i) population [ ]
(ii) synthetic variety [ ]

(c) Hybrid [ ]

(d) Other [ ]
(please provide details)

4.2.2 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:

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: number of stems**		
	one	Ramoso Calabrese, Shogun	1[ ]
	more than one	A Getti di Napoli	2[ ]
5.2 (2)	**Plant: height (at harvest maturity)**		
	very short	New Light	1[ ]
	short	Packman, Primor	3[ ]
	medium	Coaster	5[ ]
	tall	Citation	7[ ]
	very tall	Colibri. Pollux	9[ ]
5.3 (18)	**Head: color**		
	cream	Early White Sprouting	1[ ]
	green	Idol, Verflor	2[ ]
	grey green	Brigadeer, Galaxy	3[ ]
	blue green	Buccaneer	4[ ]
	violet	Viola	5[ ]
5.4 (30)	**Time of harvest maturity (50% of plants)**		
	very early	Earlyman, Primor	1[ ]
	early	Galaxy, Packman, Scorpio	3[ ]
	medium	Sumosun	5[ ]
	late	Colibri, Ginga, Pollux	7[ ]
	very late	Late Purple Sprouting	9[ ]

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

	Characteristics	Example Varieties	Note
5.5 (32)	Male sterility		
	absent	Marathon	1[ ]
	present	Chevalier, Montop	9[ ]

6. Similar varieties and differences from these varieties

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

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

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)

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.

[#] 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:

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]