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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

BROWN MUSTARD*

UPOV Code(s):

BRASS_JUN

Brassica juncea (L.) Czern.

GUIDELINES

FOR THE CONDUCT OF TESTS

prepared by experts from Japana
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

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Brassica juncea (L.) Czern.	Brown mustard, Indian mustard, Oriental mustard	Moutarde brune	Sareptasenf	Mostaza de Sarepta, Mostaza india

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.

* 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.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Brassica juncea* (L.) Czern..

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:

3,000 seeds for single spaced plants
or
20,000 seeds for drilled plots.

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

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 optimum stage of development for the assessment of each characteristic is indicated by a number in the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.3.

3.4 Test Design

3.4.1 In the case of single spaced plants, each test should be designed to result in a total of at least 60 plants which should be divided between at least 2 replicates.

3.4.2 In the case of drilled plots, each test should be designed to result in a total of at least 200 plants which should be divided between at least 2 replicates.

3.5 Additional Tests

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

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

4.1.4 Number of Plants or Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 30 plants or parts of plants taken from each of 30 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

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

4.2.2 These Test Guidelines have been developed for the examination of seed-propagated varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

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

4.2.4 For the assessment of uniformity of seed-propagated varieties, a population standard of 2% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 60 plants, 3 off-types are allowed. In the case of a sample size of 200 plants for drilled plants, 7 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 further examined by testing a new seed stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

(a) Seed: color (characteristic 1)
(b) Leaf: type (characteristic 5)
(c) Only varieties with leaf: type: entire or lobed: Leaf blade: density of incisions of margin (characteristic 18)
(d) Only varieties with leaf: type: entire or lobed: Leaf blade: blistering (characteristic 19)
(e) Only varieties with leaf: type: entire: Leaf blade: width of midrib (characteristic 20)
(f) Plant: head formation (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:

State	*Note*
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	*Note*
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.5 Legend

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

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

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

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

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

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

7 Growth stage key See Explanations on the Table of Characteristics in Chapter 8.3

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	**(*)**	**QL VG**		**00**			
		Seed: color	**Graine : couleur**	**Samen: Farbe**	**Semilla: color**		
		yellow	jaune	gelb	amarillo	Kigarashina	1
		blackish brown	brun noirâtre	schwärzlich braun	marrón negruzco	Akaoba Takana, Esperance, Miike Takana, Terrafit, Terraplus	2
2.		**QN VG**		**10**			
		Hypocotyl: anthocyanin coloration	**Hypocotyle : pigmentation anthocyanique**	**Hypokotyl: Anthocyanfärbung**	**Hipocótilo: pigmentación antociánica**		
		absent or weak	nulle ou faible	fehlend oder gering	ausente o débil	Jarangi, TTK456, Zasai FM-58	1
		medium	moyenne	mittel	media	Jarami, Shinkoku Seisai	2
		strong	forte	stark	fuerte	Kigarashina	3
3.		**QN MS/VG**	**(+)**	**10**			
		Cotyledon: length	**Cotylédon : longueur**	**Keimblatt: Länge**	**Cotiledón: longitud**		
		short	court	kurz	corto	Junkei Yamashiona, Vittasso	3
		medium	moyen	mittel	medio	Katsuona, Terraplus	5
		long	long	lang	largo	Scala	7
4.		**QN MS/VG**	**(+)**	**10**			
		Cotyledon: width	**Cotylédon : largeur**	**Keimblatt: Breite**	**Cotiledón: anchura**		
		narrow	étroit	schmal	estrecho	Junkei Yamashiona, Vittasso	3
		medium	moyen	mittel	medio	Katsuona, Pacific Gold, Terraplus	5
		broad	large	breit	ancho	Minaret, Terminator	7
5.	**(*)**	**PQ VG**	**(+) (a)**	**19**			
		Leaf: type	**Feuille : type**	**Blatt: Typ**	**Hoja: tipo**		
		entire	entière	ganzranding	entera	Akaoba Takana, Kekkyu Takana, Miike Takana, Sagami Green, Shinkoku Seisai	1
		lobed	lobée	gelappt	lobulada	Hagarashina, Kigarashina, Terrafit	2
		divided	découpés	geteilt	dividida	Akariasu, Flaming Frills, Riasu Karashina, Scarlet Frills	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.		**PQ VG**	**(+) (a)**	**19**			
		Leaf: shape	**Feuille : forme**	**Blatt: Form**	**Hoja: forma**		
		ovate	ovale	eiförmig	oval	Serihon	1
		circular	circulaire	rund	circular	Kekkyu Takana	2
		elliptic	elliptique	elliptisch	elíptica	Akariasu	3
		oblong	oblongue	länglich	oblonga	Etamine, Zasai FM-58	4
		obovate	obovale	verkehrt eiförmig	oboval	Esperance, Katsuona	5
		spatulate	spatulée	spatelförmig	espatulada	Kigarashina	6
7.		**QN VG**	**(+)**	**19**			
		Leaf: attitude	**Feuille : port**	**Blatt: Haltung**	**Hoja: porte**		
		erect	dressée	aufrecht	erecta	Energy, Vittasso, Wasabina	1
		semi-erect	demi-dressée	halbaufrecht	semierecta	Esperance, Shinkoku Seisai	3
		horizontal	horizontale	waagerecht	horizontal	Etamine, Miike Takana	5
8.		**QN MS/VG**	**(+) (a)**	**19**			
		Leaf: length	**Feuille : longueur**	**Blatt: Länge**	**Hoja: longitud**		
		short	courte	kurz	corta	Chirimen Hakarashina	3
		medium	moyenne	mittel	media	Miike Takana, Terraplus	5
		long	longue	lang	larga	Akaoba Takana, Vittasso	7
9.		**QN MS/VG**	**(+) (a)**	**19**			
		Leaf: width	**Feuille : largeur**	**Blatt: Breite**	**Hoja: anchura**		
		narrow	étroite	schmal	estrecha	Chirimen Hakarashina	3
		medium	moyenne	mittel	media	Miike Takana, Terraplus	5
		broad	large	breit	ancha	Katsuona, Vittasso	7
10.	**(*)**	**QN MS/VG**	**(+) (a)**	**19**			
		Leaf: length of petiole	**Feuille : longueur du pétiole**	**Blatt: Länge des Blattstiels**	**Hoja: longitud del pecíolo**		
		absent or very short	absent ou très court	fehlend oder sehr kurz	ausente o muy corto	Serihon	1
		short	court	kurz	corta	Miike Takana	3
		medium	moyen	mittel	media	Junkei Yamashiona	5
		long	long	lang	largo		7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11.		**QN MS/VG**	**(+) (a)**	**19**			
		Leaf: width of petiole	**Feuille : largeur du pétiole**	**Blatt: Breite des Blattstiels**	**Hoja: anchura del pecíolo**		
		narrow	étroit	schmal	estrecho	Kigarashina	3
		medium	moyen	mittel	medio	Katsuona	5
		broad	large	breit	ancho	Shinkoku Seisai	7
12.		**QN VG**	**(+) (a)**	**19**			
		Only varieties with leaf: type: lobed or divided: Leaf blade: size of terminal lobe	**Seulement les variétés avec feuille : type : lobée ou découpés : Limbe : taille du lobe terminal**	**Nur Sorten mit Blatt: Typ: gelappt oder geteilt: Blattspreite: Größe des Endlappens**	**Solo variedades con Hoja: tipo: lobulada o dividida: Limbo: tamaño del lóbulo terminal**		
		small	petit	klein	pequeño	Akariasu	3
		medium	moyen	mittel	medio	Kigarashina	5
		large	large	groß	grande	Pacific Gold, Perm Green	7
13.	**(*)**	**QN VG**	**(+) (a)**	**19**			
		Leaf blade: number of lateral lobes	**Limbe : nombre de lobes latéraux**	**Blattspreite: Anzahl der Seitenlappen**	**Limbo: número de lóbulos laterales**		
		absent or very few	nul ou très petit	fehlend oder sehr wenige	ausentes o muy bajo	Akaoba Takana, Sagami Green	1
		few	petit	wenige	bajo	Minaret	3
		medium	moyen	mittel	medio	Esperance, Kigarashina	5
		many	grand	viele	alto	Akariasu, TTK456	7
14.		**QN VG**	**(a)**	**19**			
		Leaf blade: pubescence on lower side	**Limbe : pubescence sur la face inférieure**	**Blattspreite: Behaarung der Unterseite**	**Limbo: pubescencia en envés**		
		absent or weak	nulle ou faible	fehlend oder gering	ausente o débil	Miike Takana	1
		medium	moyenne	mittel	media	Oba Takana	2
		strong	forte	stark	densa	Kigarashina	3
15.	**(*)**	**QN VG**	**(+) (a)**	**19**			
		Leaf blade: anthocyanin coloration	**Limbe : pigmentation anthocyanique**	**Blattspreite: Anthocyanfärbung**	**Limbo: pigmentación antociánica**		
		absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Kekkyu Takana, Vitamine	1
		weak	faible	gering	débil		3
		medium	moyenne	mittel	media	Miike Takana	5
		strong	forte	stark	fuerte	TTK456	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16.		**QN VG**	**(a)**	**19**			
		Only varieties with anthocyanin coloration: absent or very weak: Leaf blade: intensity of green color	**Seulement les variétés avec pigmentation anthocyanique : nulle ou très faible : Limbe : intensité de la couleur verte**	**Nur Sorten mit Anthocyanfärbung: fehlend oder sehr gering: Blattspreite: Intensität der grünen Farbe**	**Solo variedades con pigmentación antociánica: ausente o muy débil: Limbo: intensidad del color verde**		
		light	claire	hell	claro	Wasabina	3
		medium	moyenne	mittel	medio	Etamine, Golden Streaks, Katsuona	5
		dark	foncée	dunkel	oscuro	Terratop	7
17.		**QN VG**	**(a)**	**19**			
		Only varieties with leaf: type: entire or lobed: Leaf blade: undulation of margin	**Seulement les variétés avec feuille : type : entière ou lobée : Limbe : ondulation du bord**	**Nur Sorten mit Blatt: Typ: ganzrandig oder gelappt: Blattspreite: Wellung des Randes**	**Solo variedades con Hoja: tipo: entera o lobulada: Limbo: ondulación del borde**		
		absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil		1
		weak	faible	gering	débil	Akaoba Takana	2
		medium	moyenne	mittel	media	Katsuona	3
		strong	forte	stark	fuerte	Chirimen Hakarashina	4
		very strong	très forte	sehr stark	muy fuerte		5
18.	**(*)**	**QN VG**	**(+) (a)**	**19**			
		Only varieties with leaf: type: entire or lobed: Leaf blade: density of incisions of margin	**Seulement les variétés avec feuille : type : entière ou lobée : Limbe : densité des incisions du bord**	**Nur Sorten mit Blatt: Typ: ganzrandig oder gelappt: Blattspreite: Dichte der Randeinschnitte**	**Solo variedades con Hoja: tipo: entera o lobulada: Limbo: densidad de las incisiones del borde**		
		absent or very sparse	nulle ou très faible	fehlend oder sehr locker	ausentes o muy laxas		1
		sparse	faible	locker	laxas	Etamine, Katsuona	3
		medium	moyenne	mittel	medias	Opaleska	5
		dense	forte	dicht	densas	Oportuna	7
19.	**(*)**	**QN VG**	**(+) (a)**	**19**			
		Only varieties with leaf: type: entire or lobed: Leaf blade: blistering	**Seulement les variétés avec feuille : type : entière ou lobée : Limbe : cloqûre**	**Nur Sorten mit Blatt: Typ: ganzrandig oder gelappt: Blattspreite: Blasigkeit**	**Solo variedades con Hoja: tipo: entera o lobulada: Limbo: ampollado**		
		absent or weak	absente ou faible	fehlend oder schwach	ausente o débil	Etamine, Kigarashina	1
		medium	moyenne	mittel	medio	Akaoba Takana	2
		strong	forte	stark	fuerte	Katsuona	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.		**QN MS/VG**	**(+) (a)**	**19**			
		<u>Only varieties with leaf: type: entire</u>: Leaf blade: width of midrib	**<u>Seulement les variétés avec feuille : type : entière</u> : Limbe : largeur de la nervure médiane**	**<u>Nur Sorten mit Blatt: Typ: ganzrandig</u>: Blattspreite: Breite der Mittelrippe**	**<u>Solo variedades con Hoja: tipo: entera</u>: Limbo: anchura del nervio central**		
		narrow	étroite	schmal	estrecho	Sagami Green	3
		medium	moyenne	mittel	medio	Katsuona	5
		broad	large	breit	ancho	Shinkoku Seisai	7
21.	**(*)**	**QL VG**	**(+)**	**19**			
		Plant: head formation	**Plante : formation d'un capitule**	**Pflanze: Kopfbildung**	**Planta: formación de repollo**		
		absent	absente	fehlend	ausente	Kigarashina	1
		present	présente	vorhanden	presente	Kekkyu Takana	9
22.		**QN MS/VG**		**19**			
		Head: height	**Capitule : hauteur**	**Kopf: Höhe**	**Repollo: altura**		
		short	bas	kurz	corto		1
		medium	moyen	mittel	medio	Kekkyu Takana, Unzen Kekkyu Takana	2
		tall	haut	hoch	alto		3
23.		**QN MS/VG**		**19**			
		Head: width	**Capitule : largeur**	**Kopf: Breite**	**Repollo: anchura**		
		narrow	étroit	schmal	estrecho		1
		medium	moyen	mittel	medio	Kekkyu Takana, Unzen Kekkyu Takana	2
		broad	large	breit	ancho		3
24.		**QN MS/VG**		**19**			
		Head: number of leaves	**Capitule : nombre de feuilles**	**Kopf: Anzahl Blätter**	**Repollo: número de hojas**		
		few	petit	wenige	bajo		3
		medium	moyen	mittel	medio	Kekkyu Takana, Unzen Kekkyu Takana	5
		many	grand	viele	alto		7
25.		**PQ VG**		**19**			
		Head: internal color	**Capitule : couleur intérieure**	**Kopf: Innenfarbe**	**Repollo: color interno**		
		yellowish white	blanc jaunâtre	gelblich weiß	blanco amarillento	Unzen Kekkyu Takana	1
		light green	vert clair	hellgrün	verde claro		2
		medium green	vert moyen	mittelgrün	verde medio	Kekkyu Takana	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
26.	**PQ VG**	**(+)**	**20-29**			
	Main stem: shape	**Tige principale : forme**	**Haupttrieb: Form**	**Tallo principal: forma**		
	narrow conical	conique étroite	schmal kegelförmig	cónico estrecho	Kigarashina	1
	rounded	arrondie	abgerundet	redondeado	Umino	2
	broad conical	conique large	breit kegelförmig	cónico ancho	Zasai FM-58	3
	branched	ramifiée	verzweigt	ramificado	FE-K226	4
27.	**QN MG**		**31**			
	Time of beginning of bolting	**Époque de début de montaison**	**Zeitpunkt des Schossbeginns**	**Época del comienzo de la floración**		
	early	précoce	früh	temprana	Junkei Yamashiona, Scala	3
	medium	moyenne	mittel	media	Terraplus	5
	late	tardive	spät	tardía	Akaoba Takana	7
28.	**QN MG/MS**		**50**			
	Time of flowering	**Époque de floraison**	**Zeitpunkt der Blüte**	**Época de floración**		
	early	précoce	früh	temprana	Terrafit	3
	medium	moyenne	mittel	media	Minaret, Terraplus	5
	late	tardive	spät	tardía	Brons	7
	very late	très tardive	sehr spät	muy tardía	Vittasso	9
29.	**QN MS/VG**	**(b)**	**70-79**			
	Plant: height	**Plante : hauteur**	**Pflanze: Höhe**	**Planta: altura**		
	short	courte	kurz	baja	Pacific Gold, Terminator	3
	medium	moyenne	mittel	media	Terraplus	5
	tall	haute	hoch	alta	Minaret	7
	very tall	très haute	sehr hoch	muy alta	Vittasso	9
30.	**QN MS/VG**	**(+) (b)**	**70-79**			
	Silique: length	**Silique : longueur**	**Schote: Länge**	**Silicua: longitud**		
	short	courte	kurz	corta	Terraplus, Vittasso	3
	medium	moyenne	mittel	media	Pacific Gold	5
	long	longue	lang	larga	Minaret	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31.	**QN MS/VG**	**(+) (b)**	**70-79**			
	Silique: length of beak	**Silique : longueur du bec**	**Schote: Länge der Spitze**	**Silicua: longitud de la punta**		
	short	court	kurz	corta	Terraplus, Vittasso	3
	medium	moyen	mittel	media	Terrafit	5
	long	long	lang	larga		7
32.	**QN MS/VG**	**(+) (b)**	**70-79**			
	Silique: width	**Silique : largeur**	**Schote: Breite**	**Silicua: anchura**		
	narrow	étroite	schmal	estrecha	Vittasso	3
	medium	moyenne	mittel	media	Energy, Terrafit	5
	broad	large	breit	ancha	Oba Takana	7
33.	**QN MS/VG**	**(+) (b)**	**70-79**			
	Silique: length of peduncle	**Silique : longueur du pédoncule**	**Schote: Länge des Stiels**	**Silicua: longitud del pedúnculo**		
	short	court	kurz	corto	Vittasso	3
	medium	moyen	mittel	medio	Energy	5
	long	long	lang	largo	Minaret	7
34.	**QN VG**	**(+)**				
	Tendency to form inflorescences	**Tendance à former des inflorescences**	**Neigung zur Bildung von Blütenständen**	**Tendencia a formar inflorescencias**		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Brons, Vittasso	1
	weak	faible	gering	débil		3
	medium	moyenne	mittel	media	Terraplus	5
	strong	forte	stark	fuerte		7
	very strong	très forte	sehr stark	muy fuerte	Energy, Minaret, Terrafit	9

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

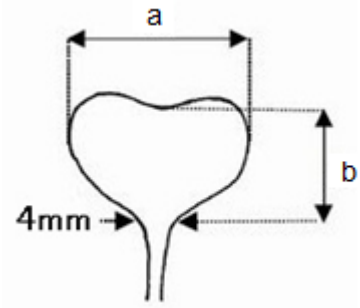
Characteristics containing the following key in the Table of Characteristics should be examined as indicated below:

(a) Observations should be made on the largest fully developed leaf.
(b) Observations should only be made on varieties without head formation.

8.2 Explanations for individual characteristics

Ad. 3: Cotyledon: length

The observations should be made on cotyledons of 30 seedlings. If the two cotyledons differ in size, the biggest one should be measured. The length is defined as distance between the inclination at top of the cotyledon and the point where the width of the petiole is about 4 mm. The width of the cotyledon should be measured at the widest point of the cotyledons.

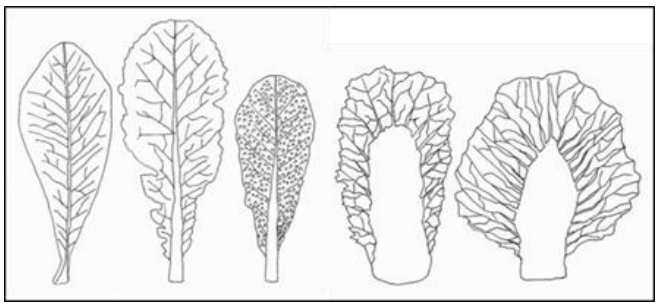


a = Cotyledon: width (characteristic 4)
b = Cotyledon: length (characteristic 3)

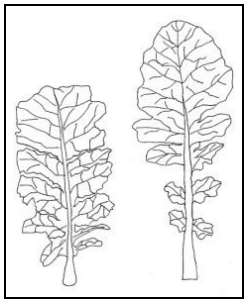
Ad. 4: Cotyledon: width

See Ad. 3

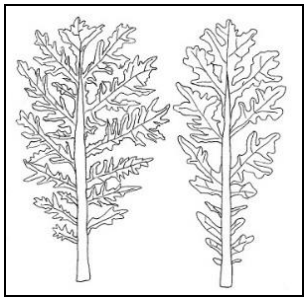
Ad. 5: Leaf: type



1
entire

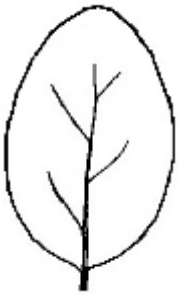
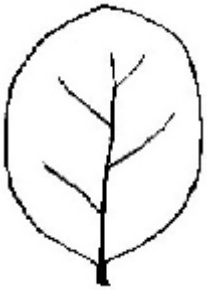
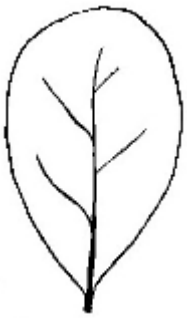
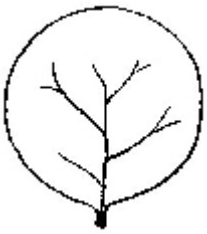


2
lobed



3
divided

Ad. 6: Leaf: shape

width	← broadest part →		
	below middle	at middle	above middle
narrow		 4 oblong	 6 spatulate
medium	 1 ovate	 3 elliptic	 5 obovate
broad		 2 circular	

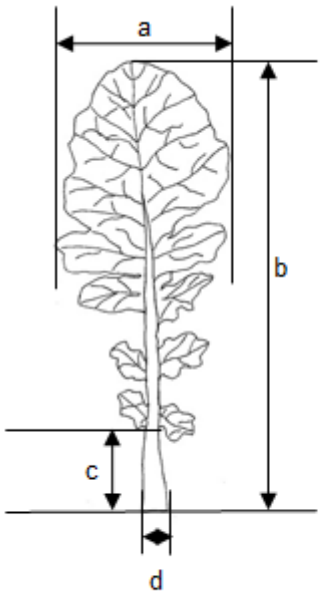
Ad. 7: Leaf: attitude

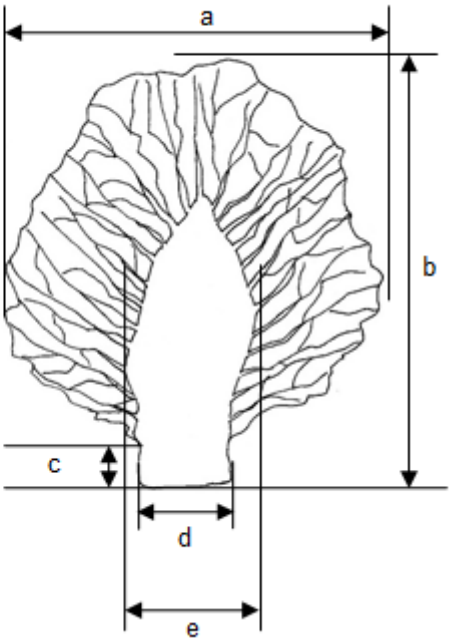

1
erect


3
semi-erect


5
horizontal

Ad. 8: Leaf: length





a = Leaf: width (characteristic 9)
b = Leaf: length (characteristic 8)
c = Petiole: length (characteristic 10)
d = Petiole: width (characteristic 11)
e = Midrib: width (characteristic 20)

Ad. 9: Leaf: width

See Ad. 8

Ad. 10: Leaf: length of petiole

See Ad. 8

Ad. 11: Leaf: width of petiole

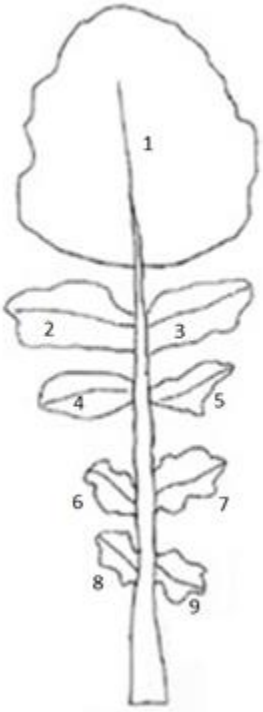
See Ad. 8

Ad. 12: Only varieties with leaf: type: lobed or divided: Leaf blade: size of terminal lobe

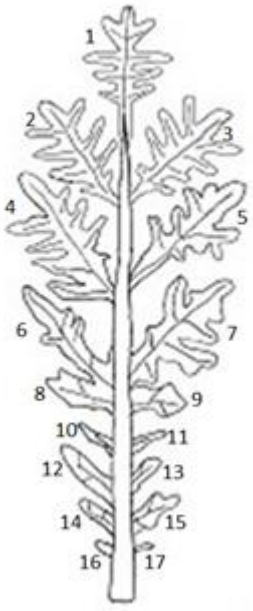
Parts of the leaf blade are considered as lobes if their length is at least equivalent to the width of the leaf petiole at their point of attachment and if the upper notch of the blade has at least half the length of the lobe itself.

The terminal lobe is the top lobe of the leaf, which is the No. 1 lobe in the following figure.

The lateral lobes are the lobes excluding the terminal lobe (numbers 2, 3, 4, etc. in the following figures)

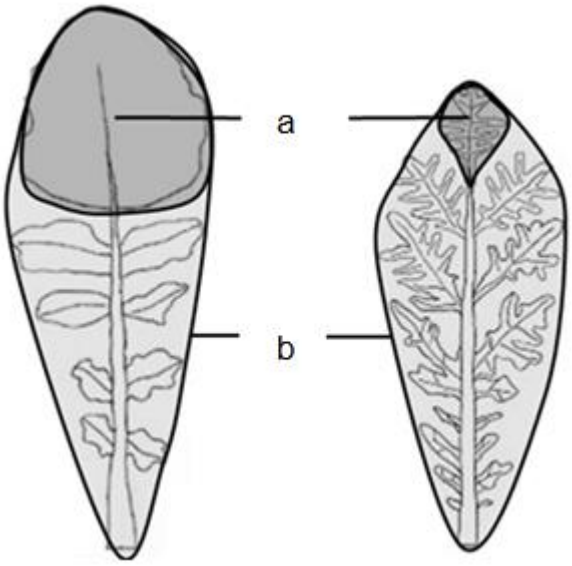


lobed



divided

The size of terminal lobe should be assessed by the ratio of the terminal lobe size/the leaf size. The terminal lobe size and the leaf size are the size of the area which was surrounded by each outline of them.



a = terminal lobe size
b = leaf size

Ad. 13: Leaf blade: number of lateral lobes

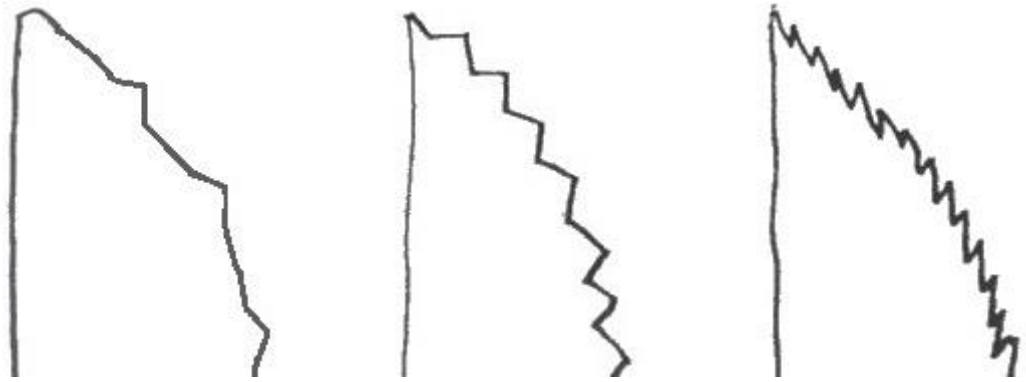
See Ad. 12

Ad. 15: Leaf blade: anthocyanin coloration

The strongest intensity of anthocyanin should be observed (not the extension).

Ad. 18: Only varieties with leaf: type: entire or lobed: Leaf blade: density of incisions of margin

Observations should be made on the distal part of the leaves.



3
sparse

5
medium

7
dense

Ad. 19: Only varieties with leaf: type: entire or lobed: Leaf blade: blistering

1
absent or weak

2
medium

3
strong

Ad. 20: Only varieties with leaf: type: entire: Leaf blade: width of midrib

See Ad. 8

The width of midrib should be measured at the widest point.

Ad. 21: Plant: head formation

1
absent

9
present

Ad. 26: Main stem: shape

Observations on the shape of the main stem should be made after removing the leaves, excluding lateral stems which are located at the base of main stem.

1
narrow conical

2
rounded

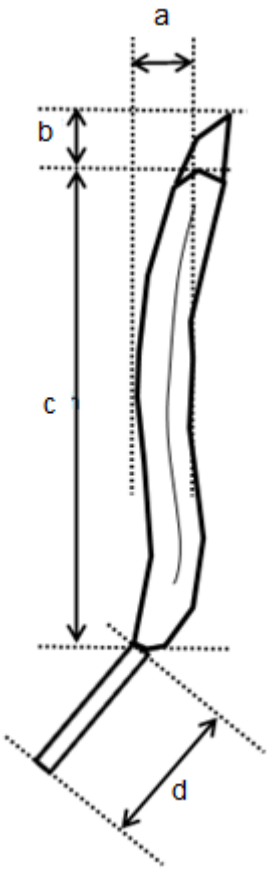
3
broad conical

4
branched

Ad. 30: Silique: length

Observations on the silique should be made on the middle third of the inflorescence of the main stem.

Observations should be made on the length of the silique from attachment of peduncle to top, excluding beak.



a = Silique: width (characteristic 32)
b = Silique: length of beak (characteristic 31)
c = Silique: length (characteristic 30)
d = Silique: length of peduncle (characteristic 33)

Ad. 31: Silique: length of beak

See Ad. 30

Ad. 32: Silique: width

See Ad. 30

Ad. 33: Silique: length of peduncle

See Ad. 30

Ad. 34: Tendency to form inflorescences

Observations should be made in the year of sowing under long day conditions.

The observation of the tendency to form inflorescence (proportion of plants below bud stage, in bud stage, in flowering stage, in stage of silique formation) should be made in autumn, when the development stagnates.

Alternatively the beginning of flowering may be observed in this trial; early flowering would mean strong tendency, late flowering would mean weak tendency.

8.3 Key for the stages of development

Key	General description
0	Principal growth stage 0:Germination
01	Beginning of seed imbibition
03	Seed imbibition complete
05	Radicle emerged from seed
07	Hypocotyl with cotyledons emerged from seed
08	Hypocotyl with cotyledons growing towards soil surface
09	Emergence: cotyledons emerge through soil surface
1	Principal growth stage 1: Leaf development
10	Cotyledons completely unfolded
11	First leaf unfolded
12	2 leaves unfolded
13	3 leaves unfolded
14	4 leaves unfolded
15	5 leaves unfolded
16	6 leaves unfolded
17	7 leaves unfolded
18	8 leaves unfolded
19	9 or more leaves unfolded
2	Principal growth stage 2: Formation of side shoots
20	No side shoots
21	First side shoot detectable
22	2 side shoots detectable
23	3 side shoots detectable
24	4 side shoots detectable
25	5 side shoots detectable
26	6 side shoots detectable
27	7 side shoots detectable
28	8 side shoots detectable
29	9 or more side shoots detectable
3	Principal growth stage 3: Stem elongation
30	no internodes(“rosette”)
31	1 visibly extended internode
32	2 visibly extended internodes
33	3 visibly extended internodes
34	4 visibly extended internodes
35	5 visibly extended internodes
36	6 visibly extended internodes
37	7 visibly extended internodes
38	8 visibly extended internodes
39	9 or more visibly extended internodes
4	Principal growth stage 4: Inflorescence emergence
40	Flower buds present, still enclosed by leaves
41	Flower buds visible from above (“green bud”)
42	Flower buds free, level with the youngest leaves
43	Flower buds raised above the youngest leaves
45	Individual flower buds (main inflorescence) visible but still closed
47	Individual flower buds (secondary inflorescence) visible but still closed
49	First petals visible, flower buds still closed by (“yellow bud”)
5	Principal growth stage 5: Opening of flowers
50	First flowers open
51	10% of flowers on main raceme open, main raceme elongating
52	20% of flowers on main raceme open
53	30% of flowers on main raceme open
54	40% of flowers on main raceme open
55	Full flowering: 50% flowers on main raceme open, older petals falling
57	Flowering declining: majority of petals fallen
59	End of flowering

6	Principal growth stage 6: Development of silique
61	10% of siliques have reached final size
62	20% of siliques have reached final size
63	30% of siliques have reached final size
64	40% of siliques have reached final size
65	50% of siliques have reached final size
66	60% of siliques have reached final size
67	70% of siliques have reached final size
68	80% of siliques have reached final size
69	Nearly all siliques have reached final size
7	Principal growth stage 7: Ripening
70	seed green, filling silique cavity
71	10% of siliques ripe, seeds dark and hard
72	20% of siliques ripe, seeds dark and hard
73	30% of siliques ripe, seeds dark and hard
74	40% of siliques ripe, seeds dark and hard
75	50% of siliques ripe, seeds dark and hard
76	60% of siliques ripe, seeds dark and hard
77	70% of siliques ripe, seeds dark and hard
78	80% of siliques ripe, seeds dark and hard
79	Fully ripe: nearly all siliques ripe, seeds dark and hard
8	Principal growth stage 8: Senescence
87	Plant dead and dry
89	Harvested product

8.4 Other names of the example varieties

TTK456(1)	Chaplin(2)
Akaoba Takana(3)	Red Giant(4)

(1) official denomination registered under the law in Japan in 2011.
(2) official denomination of TTK456 registered under the law in European Union in 2014.
(3) commercial name in Japan.
(4) commercial name of Akaoba Takana in European Union.

9. Literature

Fujishiro, T., 1996: Breeding processes and characteristics of a newly bred leaf mustard (*Brassica Juncea* Coss.). Kanagawa, JP

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Meier, U., 2001: Growth stages of mono-and dicotyledonous plants. BBCH Monograph Federal Biological Research Centre for Agriculture and Forestry

Ministry of Agriculture, Forestry & Fisheries of Japan., 1994: National Test Guideline for Karashina

Phillips, R., Rix, M., 1993: Vegetables (The Pan Garden Plants Series). pp. 44

Tsukamoto, Y., 1994: The Grand Dictionary of Horticulture Volume 1. The Shogakukan Ltd., Tokyo, JP, pp. 520 to pp. 522

Takasi A., 2004: Yasai-engei-daihyakka 17. Shadanhojin Nousan-gyoson-bunkakyokai. Tokyo, JP. pp. 169 to pp. 233

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 juncea* (L.) Czern.
1.2 Common name	Brown mustard, Indian mustard, Oriental mustard

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 [ ]
(please state parent varieties)

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

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

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

4.1.4 Other [ ]
(Please provide details)

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Cross-pollination [ ]
(b) Other (please provide details) [ ]

4.2.2 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)	**Seed: color**		
	yellow	Kigarashina	1 [ ]
	blackish brown	Akaoba Takana, Esperance, Miike Takana, Terrafit, Terraplus	2 [ ]
5.2 (5)	**Leaf: type**		
	entire	Akaoba Takana, Kekkyu Takana, Miike Takana, Sagami Green, Shinkoku Seisai	1 [ ]
	lobed	Hagarashina, Kigarashina, Terrafit	2 [ ]
	divided	Akariasu, Flaming Frills, Riasu Karashina, Scarlet Frills	3 [ ]
5.3 (6)	**Leaf: shape**		
	ovate	Serihon	1 [ ]
	circular	Kekkyu Takana	2 [ ]
	elliptic	Akariasu	3 [ ]
	oblong	Etamine, Zasai FM-58	4 [ ]
	obovate	Esperance, Katsuona	5 [ ]
	spatulate	Kigarashina	6 [ ]
5.4 (7)	**Leaf: attitude**		
	erect	Energy, Vittasso, Wasabina	1 [ ]
	erect to semi-erect		2 [ ]
	semi-erect	Esperance, Shinkoku Seisai	3 [ ]
	semi-erect to horizontal		4 [ ]
	horizontal	Etamine, Miike Takana	5 [ ]
5.5 (17)	**<u>Only varieties with leaf: type: entire or lobed</u>: Leaf blade: undulation of margin**		
	absent or very weak		1 [ ]
	weak	Akaoba Takana	2 [ ]
	medium	Katsuona	3 [ ]
	strong	Chirimen Hakarashina	4 [ ]
	very strong		5 [ ]

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

	Characteristics	Example Varieties	Note
5.6 (18)	**<u>Only varieties with leaf: type: entire or lobed</u>: Leaf blade: density of incisions of margin**		
	absent or very sparse		1 [ ]
	very sparse to sparse		2 [ ]
	sparse	Etamine, Katsuona	3 [ ]
	sparse to medium		4 [ ]
	medium	Opaleska	5 [ ]
	medium to dense		6 [ ]
	dense	Oportuna	7 [ ]
	dense to very dense		8 [ ]
	very dense		9 [ ]
5.7 (19)	**<u>Only varieties with leaf: type: entire or lobed</u>: Leaf blade: blistering**		
	absent or weak	Etamine, Kigarashina	1 [ ]
	medium	Akaoba Takana	2 [ ]
	strong	Katsuona	3 [ ]
5.8 (20)	**<u>Only varieties with leaf: type: entire</u>: Leaf blade: width of midrib**		
	very narrow		1 [ ]
	very narrow to narrow		2 [ ]
	narrow	Sagami Green	3 [ ]
	narrow to medium		4 [ ]
	medium	Katsuona	5 [ ]
	medium to broad		6 [ ]
	broad	Shinkoku Seisai	7 [ ]
	broad to very broad		8 [ ]
	very broad		9 [ ]
5.9 (21)	**Plant: head formation**		
	absent	Kigarashina	1 [ ]
	present	Kekkyu Takana	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 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	*Leaf: shape*	*ovate*	*oblong*

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

Main use:

Vegetable	[ ]
Oilseed	[ ]
Condiment	[ ]
Green manure	[ ]
other	[ ]

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]