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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
 GENEVA

DRAFT**RADISH, BLACK RADISH**

UPOV Code: RAPHA_SAT_SAT ;
 RAPHA_SAT_NIG

(Raphanus sativus L. var sativus; Raphanus sativus L. var. niger (Mill.) S. Kerner

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

prepared by an expert from Germany

*to be considered by
 the Enlarged Editorial Committee at its meeting
 to be held in Geneva, on January 11 and 12, 2012*

Alternative Names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Raphanus sativus L. var. niger (Mill.) S. Kerner, = (N)</i> <i>Raphanus sativus L. var. longipinnatus L.H. Bailey</i>	Black radish, Oriental radish	Radis rave	Rettich	Rabano de invierno, Rabano negro
<i>Raphanus sativus L. var sativus = (S)</i>	Radish, Garden Radish, European Radish, Chinese Small Radish, Western Radish	Radis de tous les mois	Radieschen	Rabanito

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 *Raphanus sativus* L. var *sativus*; *Raphanus sativus* L. var. *niger* (Mill.) S. Kerner and hybrids between those 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.

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

14,000 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*

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 Each test should be designed to result in a total of at least 60 plants for varieties of the N-type varieties and 200 plants for varieties of the S-type varieties which should be divided between at least two replicates (see Chapter 5.3).

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 *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 / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 40 plants or parts taken from each of 40 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 second column of 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 Cross pollinated varieties

For the assessment of uniformity should be according to the recommendations for cross-pollinated varieties in the General Introduction. However, for the characteristics, Radish: shape (characteristic 17) and Radish: color of skin (characteristic 21), a population standard of 2% and an acceptance probability of 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, 7 off-types are allowed.

4.2.3 Hybrids and inbred lines

For the assessment of uniformity of hybrids and inbred lines, a population standard of 2 % and an acceptance probability of at least 95 % should be applied. In the case of 60 plants, 3 off-types are allowed. In the case of a sample size of 200 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) Only N-type varieties: Ploidy (characteristic 1)
- (b) Only for N-type varieties: Leaf: length (characteristic 3)
- (c) Only for S-type varieties: Leaf: length (characteristic 4)
- (d) Leaf blade: number of lobes (characteristic 8)
- (e) Only for N-type varieties: Petiole: anthocyanin coloration (characteristic 10)
- (f) Only for N-type varieties: Radish: length (characteristic 13)
- (g) Only for S-type varieties: Radish: length (characteristic 14)
- (h) Only for N-type varieties: Radish: diameter (characteristic 15)
- (i) Only for S-type varieties: Radish: diameter (characteristic 16)
- (j) Radish: shape (characteristic 17)
- (k) Radish: number of colors of skin (excluding non-thickened root) (characteristic 21)
- (l) Only varieties with Radish: Number of colors of skin: two: Radish: extent of white color from non-thickened root end (characteristic 25)
- (m) Time to harvest maturity (characteristic 28)

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*

6.4.1. 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, VS see Chapter 4.1.5

C special test

(1) Type of example variety belongs to:
(S) = S- type varieties
(N) = N- type varieties

(a), (b) 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. (*) (+)	MG C	<u>Only N-type varieties: Ploidy</u>	<u>Uniquement les variétés de type N : ploïdie</u>	<u>Nur N-Typen: Ploidie</u>	<u>Únicamente variedades tipo-N: Ploidía</u>	
QL	diploid	diploïde	diploid	diploïde	Halblanger weißer Sommer (N)	2
	tetraploid	tétraploïde	tetraploid	tetraploïde	Rex (N)	4
2. (*) (+)	VG	Leaf: attitude	Feuille : port	Blatt: Haltung	Hoja: porte	
QN	erect	dressé	aufrecht	erecto	Clipo (S), Karissima (S), Rex (N)	1
	semi erect	demi-dressé	halbaufrecht	semierecto	Balkar (S), Ostergruß rosa 2 (N)	3
	horizontal	horizontal	waagrecht	horizontal	Bel Image (S), Mikura Cross (N), Minowase Summer Cross No. 3 (N), Ronde Witte (S)	5
3. (*) (+)	VG/ MS	<u>Only for N-type varieties: Leaf: length</u>	<u>Uniquement pour les variétés de type N : Feuille : longueur</u>	<u>Nur für N-Typen: Blatt: Länge</u>	<u>Únicamente variedades tipo-N: Hoja: longitud</u>	
QN	(b) short	courte	kurz	corta	Sutong (N), Yeoreumdalang (N)	3
	medium	moyenne	mittel	media	Chungilpum (N), Noir long maraîcher (N), Rex (N)	5
	long	longue	lang	larga	Gilzo (N), Noir gros rond d'hiver (N)	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
4. (*) (+)	VG/ MS	<u>Only for S-type varieties: Leaf: length</u>	<u>Uniquement pour les variétés de type S : Feuille : longueur</u>	<u>Nur für S-Typen: Blatt: Länge</u>	<u>Únicamente variedades tipo-S: Hoja: longitud</u>	
QN	(b)	short	courte	kurz	corta	Cerise (S), Saxa 2 (S) 3
		medium	moyenne	mittel	media	Amored (S), Novo (S) 5
		long	longue	lang	larga	National 2 (S) 7
		very long	très longue	sehr lang	muy larga	Red Hazera (S) 9
5. (+)	VG/ MS	<u>Only for N-type varieties: Leaf: width</u>	<u>Uniquement pour les variétés de type N : Limbe : largeur</u>	<u>Nur für N-Typen: Blattspreite: Breite</u>	<u>Únicamente variedades tipo-N: Hoja: anchura</u>	
QN	(b)	narrow	étroite	schmal	estrecha	3
		medium	moyenne	mittel	media	April Cross (N) 5
		broad	large	breit	ancha	Mantanghong (N), Rex (N) 7
6. (+)	VG	Leaf blade: shape of apex	Limbe : forme du sommet	Blattspreite: Form der Spitze	Limbo: forma del ápice	
PQ	(b)	slightly pointed	légèrement pointu	leicht zugespitzt	ligeramente puntiagudo	Korund (S), Matsumoto kiriba (N), Paradiso (S) 1
		blunt	tronqué	stumpf	romo	Minowase Summer Cross No. 3 (N) 2
		rounded	arrondi	abgerundet	redondeado	Everest (N), Neckarperle (S), Sora (S) 3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
7.	VG	Leaf blade: color	Limbe : couleur	Blattspreite: Farbe	Limbo: color		
PQ	(b)	yellow green	jaune, vert	gelbgrün	verde amarillento	Kiba Risou (N)	1
		light green	vert clair	hellgrün	verde claro	Cross (N), Everest (N), Miura	2
		medium green	vert moyen	mittelgrün	verde medio	Miyashige Green neke (N)	3
		dark green	vert foncé	dunkelgrün	verde oscuro	April Cross (N), Minowase Summer Cross No. 3 (N)	4
		light grey green	vert-gris clair	hellgraugrün	verde grisáceo claro	Okura (N)	5
		medium grey green	vert-gris moyen	mittelgraugrün	verde grisáceo medio	Red Poppins (S), Sakurajima oonaga (N)	6
		dark grey green	vert-gris foncé	dunkelgraugrün	verde grisáceo oscuro	Kuroba Risou (N)	7
8.	VG	Leaf blade: number of lobes	Limbe : nombre de lobes	Blattspreite: Anzahl Lappen	Limbo: número de lóbulos		
QN	(b)	absent or very few	nul ou très petit	fehlend oder sehr gering	ausente o muy bajo	Everest (N), Ostergruß rosa 2 (N), Ping Pong (S)	1
		few	petit	gering	bajo	Cherry Belle (S), Halblanger weißer Sommer (N), Nelson (S), Osaka 40 days (N)	3
		medium	moyen	mittel	medio	De cinq semaines rose (N), Minowase Summer Cross No. 3 (N), Scarlet Champion (S)	5
		many	grand	groß	alto	Noir long maraîcher (N), Suikomi ninengo (N)	7
		very many	très grand	sehr groß	muy alto	Mikura Cross (N)	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
9.	VG	Leaf blade: depth of incisions of margin	Limbe : profondeur des découpures du bord	Blattspreite: Tiefe der Randeinschnitte	Limbo: profundidad de las incisiones del borde		
QN	(b)	absent or very shallow	nulles ou très peu profondes	fehlend oder sehr flach	ausentes o muy poco profundas	Everest (N), Fury (S)	1
		shallow	peu profondes	flach	poco profundas	Apolo (S), Blanche transparente (S), Neptun (N)	3
		medium	moyennes	mittel	medias	April Cross (N), Cracou (S)	5
		deep	profondes	tief	profundas	April Cross (N), Falco (N), Flamino (S), Hilds blauer Herbst und Winter (N), Matsumotokiriba (N)	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
10.	VG	<u>Only for N-type varieties:</u> Petiole: anthocyanin coloration	<u>Uniquement pour les variétés de type N :</u> Pétiole : pigmentation anthocyanique	<u>Nur für N-Typen:</u> Blattstiel: Anthocyanfärbung	<u>Únicamente variedades tipo-N:</u> Pecíolo: pigmentación antocianica		
QN	(b)	absent or very weak	nulle ou très faible	fehlend oder sehr schwach	Ausente o muy débil	April Cross (N), Fakir (S), Noir gros rond d'hiver (N), Omny (N)	1
		absent or very weak to weak	nulle ou très faible à faible	fehlend oder sehr schwach bis schwach	ausente o muy débil a débil		2
		weak	faible	schwach	débil	Blanche transparente (S), Flamino (S), Mirabeau (S)	3
		weak to medium	faible à moyenne	schwach bis mittel	débil a media		4
		medium	moyenne	mittel	media	Erfurter Riesenrot (S), Forro (S)	5
		medium to strong	moyenne à forte	mittel bis stark	media a fuerte		6
		strong	forte	stark	fuerte	Pernot (S)	7
		strong to very strong	forte à très forte	stark bis sehr stark	fuerte a muy fuerte		8
		very strong	très forte	sehr stark	muy fuerte	Rex (N), Rose d'hiver de Chine (N), Violet de Gournay (N)	9
11.	VG	<u>Only for S-type varieties:</u> Foliage: width of attachment	<u>Uniquement pour les variétés de type S :</u> Feuillage : largeur de l'attache au collet	<u>Nur für S-Typen:</u> Laub: Breite des Ansatzes	<u>Únicamente variedades tipo-S:</u> Follaje: anchura de la inserción al cuello		
QN	(b)	narrow	étroite	schmal	estrecha	Flamino (S)	3
		medium	moyenne	mittel	media	Apache (S), Flambo (S)	5
		wide	large	breit	ancha	Rond écarlate (S)	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
12.	VG	<u>Only for N-type varieties: Foliage: number of fully developed leaves</u>	<u>Uniquement pour les variétés de type N : Feuillage : nombre de feuille à complet développement</u>	<u>Nur für N-Typen: Laub: Anzahl der ausgewachsenen Blätter</u>	<u>Únicamente variedades tipo-N: Follaje: número de hojas completamente desarrolladas</u>		
QN	(b)	few	petit	gering	bajo	Ostergruß rosa 2 (N), Rex (N)	3
		medium	moyen	mittel	medio	Neptun (N)	5
		many	grand	groß	alto	April Cross (N)	7
13.	MS/ (* VG)	<u>Only for N-type varieties: Radish: length</u>	<u>Uniquement pour les variétés de type N : Racine : longueur</u>	<u>Nur N-Typen: Rübe: Länge</u>	<u>Únicamente variedades tipo-N: Rábano: longitud</u>		
QN	(b)	very short	très courte	sehr kurz	muy corta	Noir gros rond d'hiver (N)	1
		short	courte	kurz	corta	Rex (N)	3
		medium	moyenne	mittel	media	Minowase Summer Cross No. 3	5
		long	longue	lang	larga	Suikomi ninengo (N)	7
		very long	très longue	sehr lang	muy larga	Surato (N)	9
14.	MS/ (* VG)	<u>Only for S-type varieties: Radish: length</u>	<u>Uniquement pour les variétés de type S : Racine : longueur</u>	<u>Nur S-Typen: Rübe: Länge</u>	<u>Únicamente variedades tipo-S: Rábano: longitud</u>		
QN	(b)	very short	très courte	sehr kurz	muy corta	Gaudry 2 (S)	1
		short	courte	kurz	corta	Cerise (S), Saxa 2 (S)	3
		medium	moyenne	mittel	media	Bamba (S)	5
		long	longue	lang	larga	Flamboyant 2 (S)	7
		very long	très longue	sehr lang	muy larga	Flambo (S), Blanche transparente (S)	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
15.	MS/ VG	<u>Only for N-type varieties: Radish: diameter</u>	<u>Uniquement pour les variétés de type N : Racine : diamètre</u>	<u>Nur N-Typen: Rübe: Durchmesser</u>	<u>Únicamente variedades tipo-N: Rábano: diámetro</u>	
QN	(b)	very small	très petit	sehr klein	muy pequeño	Ostergruß rosa 2 (N) 1
		small	petit	klein	pequeño	Noir gros round d'hiver (N), Surato (N) 3
		medium	moyen	mittel	medio	Minowase Summer Cross No. 3 (N) 5
		large	grand	groß	grande	Koshin (N) 7
		very large	très grand	sehr groß	muy grande	Sakurajima oomaru (N) 9
16.	MS/ VG	<u>Only for S-type varieties: Radish: diameter</u>	<u>Uniquement pour les variétés de type S : Racine : diamètre</u>	<u>Nur S-Typen: Rübe: Durchmesser</u>	<u>Únicamente variedades tipo-S: Rábano: diámetro:</u>	
QN	(b)	very small	très petit	sehr klein	muy pequeño	Gaudry 2 (S) 1
		small	petit	klein	pequeño	Cerise (S), Saxa 2 (S) 3
		medium	moyen	mittel	medio	Rond rose à bout blanc 2 (S) 5
		large	grand	groß	grande	Riesen von Aspen (S) 7
		very large	très grand	sehr groß	muy grande	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17.	VG Radish: shape	Racine : forme	Rübe: Form	Rábano: forma		
(*)						
(+)						
PQ (b)	narrow triangular	étroite, triangulaire	schmal dreieckig	triangular estrecha	Rex (N)	1
	medium triangular	triangulaire moyenne	mittel dreieckig	triangular media	Ovale blanc de Munich (N), Suikomi ninengo (N)	2
	ovate	ovale	eiförmig	oval	Lavergne (S), Fridolin weiss (N)	3
	acicular	aciculaire	nadelartig	acicular	Blanche transparente (S), De cinq semaines rose 3 (N), Minowase Summer Cross No. 3 (N)	4
	oblong	oblongue	rechteckig	oblonga	Clipo (S), Fluo (S), Neptun (N), Noir long maraîcher (N), White Breakfast (N), Oshin (N)	5
	narrow elliptic	étroite, elliptique	schmal elliptisch	elíptica estrecha	Gensuke (N)	6
	medium elliptic	elliptique moyenne	mittel elliptisch	elíptica media	Murasakizukin (N), Pico (S), Sutong (N)	7
	circular	ronde	rund	circular	Cerise (S), Falco (N), Noir gros rond d'hiver (N), Oomaru Shogoin (N), Tinto (S)	8
	narrow oblate	étroite, aplatie	schmal breitrund	achatada estrecha	Sakurajima Oomaru (N)	9
	medium oblate	aplatie moyenne	mittel breitrund	achatada media	Fakir (S), Kuromaru (N), Rond rose à très grand bout blanc (S)	10
	obovate	obovale	verkehrt eiförmig	oboval	Miura (N)	11
	bell shaped	campanulée	glockenförmig	acampanada	Kara Nezumi (N), Nezumi (N), Roche (S)	12

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18.	VG	<u>Only for N-type varieties: Radish: position in soil</u>	<u>Uniquement pour les variétés de type N : Racine : position dans le sol</u>	<u>Nur für N-Typen: Rübe: Sitz im Boden</u>	<u>Únicamente variedades tipo-N: Rábano: posición en el suelo:</u>	
(+)						
QN	(b)	very shallow	très peu enterrée	sehr flach	muy superficial	Kuromaru (N) 1
		shallow	peu enterrée	flach	superficial	Aonaga (N), Minowase Summer Cross No. 3 (N) 3
		medium	moyennement enterrée	mittel	media	Miyashigenagabuto (N) 5
		deep	enterrée	tief	profunda	Miura (N) 7
		very deep	très enterrée	sehr tief	muy profunda	Suikomi ninengo (N) 9
19.	VG	Radish: shape of shoulder	Racine : forme de l'épaulement	Rübe: Schulterform	Raíz: forma del hombro	
(+)						
PQ	(b)	flat	aplatie	flach	aplanada	Bamba (S), Saxa 2 (S), Minowase Summer Cross No. 3 (N) 1
		rounded	arrondie	abgerundet	redondeada	Flamino (S), Rex (N) 2
		conical	conique	konisch	cónica	Blanche transparent (S), Mantanghong (N), Pernot (S) 3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
20.	VG Radish: shape of apex	Racine : forme du sommet	Rübe: Form der Spitze	Raíz: forma del ápice		
(+)						
PQ (b)	narrow acute	aiguë, étroite	schmal spitz	aguda angosta	April Cross (N), Blanche transparente (S)	1
	acute	aigüe	spitz	aguda	Flambo (S), Fridolin weiß (N), Oshin (N)	2
	obtuse	obtuse	stumpf	obtusa	De dix-huit jours (S), Kuroba Risou (N), Ninja (N), Tama Winter (N)	3
	rounded	arrondie	abgerundet	redondeada	Bamba (S), Callisto (S), Noir gros rond d'hiver (N), Oomura Shogoin (N)	4
	truncate	tronquée	eben	plana	À forcer rond écarlate (S), Jumbo Scarlet (N), Akizumari (N)	5
21.	VG Radish: number of colors of skin (excluding non-thickened root)	Racine : nombre de couleurs de l'épiderme (sans la racine non épaisse)	Rübe: Anzahl der Farben der Haut (außer Wurzel)	Rábano: número de colores de la piel (excluida la raíz no gruesa)		
(*)						
PQ	one	une	eine	uno	Cerise (S), Minowase Summer Cross No. 3 (N), Saxa 2 (S)	1
	two	deux	zwei	dos	Akasuji (N), Bamba (S), Flamboyant 2 (S), Murasakizukin (N)	2

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
22.	VG	Radish: color of skin	Racine : couleur de	Rübe: Farbe der	Rábano: color de la		
(*)		of stem end	l'épiderme de	Haut des	piel del extremo del		
(+)		la base	Rübenendes	tallo			
PQ	(b)	white	blanc	weiß	blanco	Minowase Summer Cross No. 3 (N), Rex (S)	1
		yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Miura (N)	2
		yellow	jaune	gelb	amarillo	Gold Star (S)	3
		brown	brun	braun	marrón		4
		light green	vert clair	hellgrün	verde claro	Miyashige Nagabuto (N), Oshin (N)	5
		medium green	vert moyen	mittelgrün	verde medio	Nezumi (N)	6
		dark green	vert foncé	dunkelgrün	verde oscuro	Aonaga (N), Kazafu karami (N)	7
		pink	rose	rosa	rosa	De cinq semaines rose 3 (S)	8
		dark pink red	rouge-rose foncé	dunkelrosarot	rojo rosado oscuro	Ostergruß rosa 2 (S)	9
		red	rouge	rot	rojo	Benigeshou (N)	10
		purple	pourpre	purpurn	púrpura	Karaineaka (N),	11
		violet	violet	violett	violeta	Hilds blauer Herbst und Winter (S), Violet de Gournay (S)	12
		black	noir	schwarz	negro	Kuromaru (N), Noir gros rond d'hiver (N)	13

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
23.	VG	Non-thickened root:	Racine non épaisse :	Wurzel: Farbe	Raíz no gruesa:		
(*)		color	couleur		color		
(+)							
PQ	(b)	white	blanc	weiß	blanco	Minowase Summer Cross No. 3 (N),	1
		yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Miura (N)	2
		yellow	jaune	gelb	amarillo	Gold Star (S)	3
		brown	brun	braun	marrón		4
		light green	vert clair	hellgrün	verde claro	Kazafukarami (N)	5
		medium green	vert moyen	mittelgrün	verde medio		6
		dark green	vert foncé	dunkelgrün	verde oscuro		7
		pink	rose	rosa	rosa	Koshin (N)	8
		dark pink red	rouge-rose foncé	dunkelrosarot	rojo rosado oscuro		9
		red	rouge	rot	rojo	Benizonochunaga (N)	10
		purple	pourpre	purpurn	púrpura	Karaineaka (N)	11
		violet	violet	violett	violeta		12
		black	noir	schwarz	negro	Kuromaru (N)	13
24.	VG	<u>Only for N-type</u>	<u>Uniquement pour</u>	<u>Nur für N-Typen:</u>	<u>Únicamente</u>		
(+)		varieties: Radish:	les variétés de	Rübe: rotes	variedades tipo-N:		
		red color pattern of	type N : Racine :	Farbmuster auf	Rábano:		
		skin	répartition de	Haut	distribución del		
			la couleur rouge de		color rojo de la piel:		
			l'épiderme				
QL	(b)	absent	absente	fehlend	ausente	Minowase Summer Cross No. 3 (N)	1
		present	présente	vorhanden	presente	Akasuji (N)	2

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
25. VG (* (+).	<u>Only varieties with Radish: Number of color of skin: two: Radish: extent of white color from non-thickened root end</u>	<u>Uniquement les variétés avec Racine : nombre de couleurs de l'épiderme : deux : Racine : étendue de la couleur blanche depuis l'extrémité non épaisse de la racine</u>	<u>Nur Sorten mit Rübe: Anzahl der Farben der Haut: zwei: Rübe: Ausdehnung der weißen Farbe vom Wurzelende aus</u>	<u>Únicamente variedades con rábano: Número de colores de la piel: dos: extensión del color blanco desde el extremo no grueso de la raíz</u>		
QN (b)	very small	très faible	sehr gering	muy pequeña	Benizonochunaga (N), Demi-long écarlate à très petit blanc 2 (S)	1
	small	faible	gering	pequeña	Benikanmi (N), Pernot clair (S)	3
	medium	moyenne	mittel	media	Aonaga (N), Fakir (S), Pépito (S)	5
	large	forte	groß	grande	Delikat (S), Flamino (S), Oshin (N)	7
	very large	très forte	sehr groß	muy grande	Murasakizukin (N), Rond rose à très grand bout blanc 2 (S)	9
26. VG	<u>Only for N type varieties: Radish: ridging of surface</u>	<u>Uniquement pour les variétés de type N : Racine : annelé de la surface</u>	<u>Nur für N-Typen: Rübe: Ringelung der Oberfläche</u>	<u>Únicamente variedades tipo-N: Raíz: anillada de la superficie</u>		
QN (b)	absent or very weak	absent ou très faible	fehlend oder sehr gering	ausente o muy débil	Minowase Summer Cross No. 3 (N), Suikomininengo (N)	1
	medium	moyen	mittel	media	Halblanger weißer Sommer (N), Miyashige Nagabuto (N)	3
	very strong	très fort	sehr stark	muy fuerte	Aonaga (N)	5

TG/63/7(proj.6) and TG/64/7(proj.5)
 Radish, Black Radish/Radis rave, Radis de tous les mois/Rettich, Radieschen/
 Rábano, Rábano negro, 2011-09-28

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	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
27.	VG	Radish: main color of flesh	Racine : couleur principale de la chair	Rübe: Hauptfarbe des Fleisches	Rábano: color principal de la pulpa		
(+)							
PQ	(b)	translucent white	blanc vitreux	glasigweiß	blanco traslúcido	De dix-huit jours (S), Rex (N)	1
		opaque white	blanc mat	mattweiß	blanco opaco	Bamba (S), Noir gros long d'hiver de Paris (N), Saxa 2 (S)	2
		green	vert	grün	verde	Green Meat (N), Kazafukarami (N)	3
		red	rouge	rot	rojo	Mantanghong (N), Roche (S), Tenankoshin (N)	4
28.	VG	Time of harvest maturity	Époque de maturité de récolte	Zeitpunkt der Erntereife	Época de madurez para cosecha		
(*)							
(+)							
QN		early S-type	précoce type S	früh S-Typ	Tipo-S temprana	Donar (S)	1
		medium S-type	moyenne type S	mittel S-Typ	Tipo-S media	Flamboyant (S)	2
		late S-type	tardive type S	spät S-Typ	Tipo-S tardía	Blanche transparente (S), Scarlet Champion (S)	3
		very early N type	très précoce type N	sehr früh N-Typ	Tipo-N muy temprana	Osaka 40 days (N), Ostergruß rosa 2 (N)	4
		early N-type	précoce type N	früh N-Typ	Tipo-N temprana	Minowase Summer Cross No. 3 (N)	5
		medium N-type	moyenne type N	mittel N-Typ	Tipo-N media	Oshin (N), Sutong (N), Miyashige nagabuto (N)	6
		late N-type	tardive type N	spät N-Typ	Tipo-N tardía	Miura (N)	7
		very late N-type	très tardive type N	sehr spät N-Typ	Tipo-N muy tardía	Sakurajima oomaru (N)	8

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29.	VG	Radish: tendency to	Racine : tendance à	Rübe: Neigung zum	Raíz: tendencia a	
(+)	C	become pithy	se creuser	Pelzigwerden	ahuecarse	
QN	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Alttox (S), Clipo (S), Savour (S)	1
	weak	faible	gering	débil	Bamba (S), Polka (S)	3
	moderate	modérée	mittel	moderada	Flamboyant 2 (S)	5
	strong	forte	stark	fuerte	Cherry Belle (S), De Sezanne (S)	7
	very strong	très forte	sehr stark	muy fuerte	Blanche transparente (S), De dix-huit jours (S)	9

8. Explanations on the Table of Characteristics

8.1 *Grouping for Raphanus sativus L.:*

Grouping for varieties to S-type and N-type varieties is based on the time of harvest maturity:

	Harvest maturity	Example variety
N-type varieties	> 60 days	Oshin (N), Sutong (N), Miyashige nagabuto (N)
S-type varieties	< 35 days	Flamboyant 2 (S)

Those varieties of which the harvest maturity falls between 35 and 60 days should be classified in a next step taking into account length and diameter of the radish as follows:

	Length of radish (for elongated varieties)	Diameter of radish (for rounded varieties)
N-type varieties	>15 cm	>3.5 cm
S-type varieties	<10 cm	<2.5 cm

Varieties which fall still between N-type varieties and S-type varieties should be tested in both groups.

8.2 *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) All observations on the seedling and the cotyledon should be made when the first true leaf is expanded.
- (b) All observations on the leaf and the radish should be made at the time of harvest maturity depending on the type.

8.3 *Explanations for individual characteristics*

Ad. 1: Only N-type varieties: ploidy

The ploidy status of the plant can be checked by different methods as determination of the number

- of chromosomes of the non-thickened root meristem
- and length of stoma on the lower side of the cotyledon (tetraploid varieties have a longer stoma than diploid varieties)
- of chloroplasts of the guard cells on the lower side of the cotyledon (the guard cells of tetraploid varieties are bigger and contain more chloroplasts (> 20) than those of diploid varieties (> 10).

Another efficient method to determine the ploidy status is the flow cytometry.

Ad. 2: Leaf: attitude

N-type varieties should be observed 30 days after sowing, because the characteristic might be at a later stage influenced by the position of the radish in the soil.

Ad. 3: Only for N-type varieties: Leaf: length

Ad. 4: Only for S-type varieties: Leaf: length

Ad. 5: Only for N-type varieties: Leaf: width

All observations should be made on fully developed leaves.

Ad. 6: Leaf blade: shape of apex



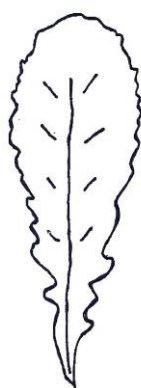
1
slightly pointed

2
blunt

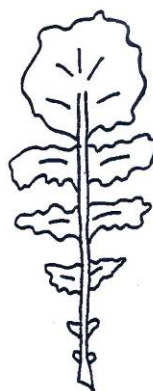
3
rounded

Ad. 8: Leaf blade: number of lobes

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 both notches of the blade have at least half the length of the lobe itself.















1
absent or very few

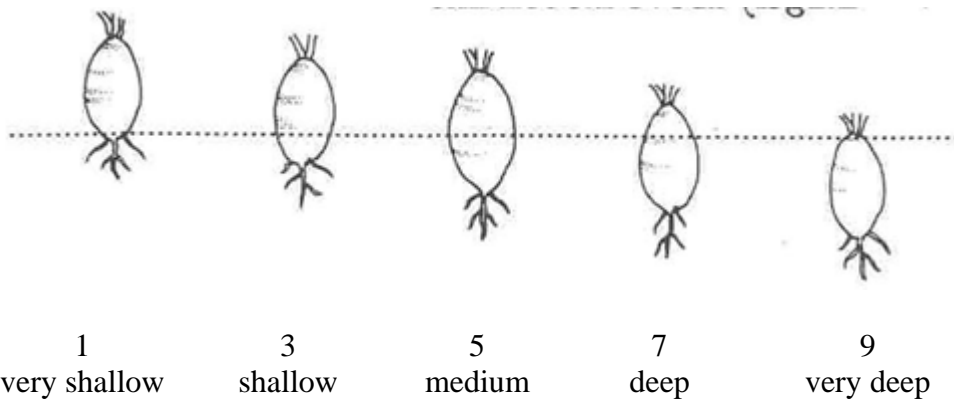


9
very many

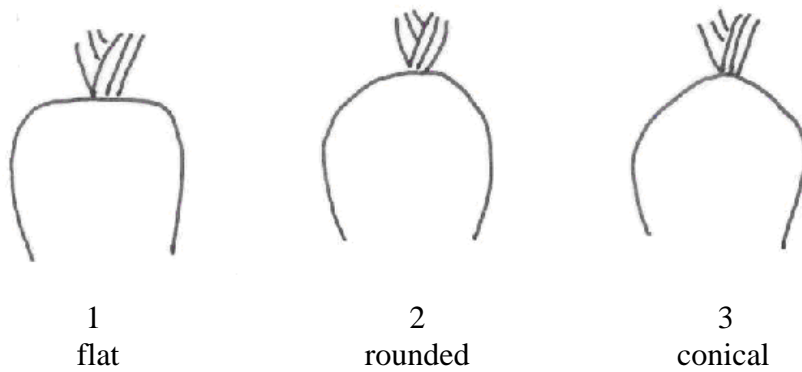
Ad. 17: Radish: shape

		← broadest part →				
		(below middle)	at middle	(above middle)		
narrow (elongated) → width (ratio length/width) ← broad (compressed)			 4 acicular			
			 5 oblong			
			 6 narrow elliptic	 1 narrow triangular		
		 12 bell shaped	 11 obovate	 7 medium elliptic	 3 ovate	 2 medium triangular
			 8 circular			
			 10 medium			
			 9 narrow oblate			

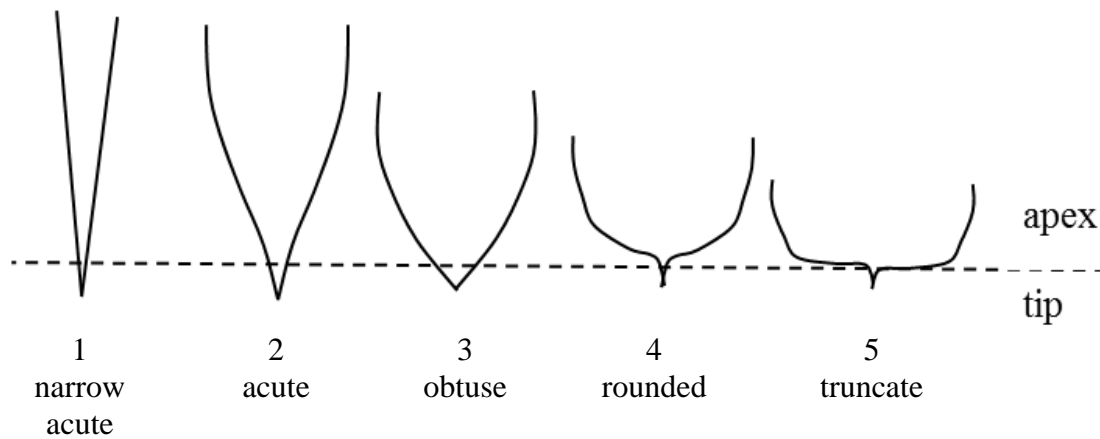
Ad. 18: Only for N-type varieties: Radish: position in soil



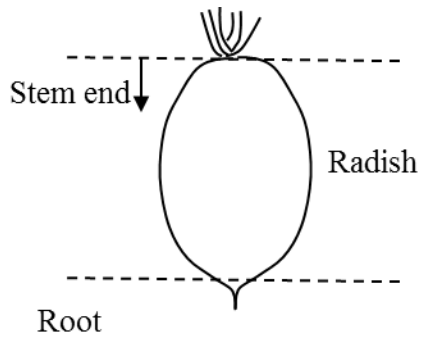
Ad. 19: Radish: shape of shoulder



Ad. 20: Radish: shape of apex



Ad. 22: Radish: color of skin of stem end



Ad. 24: Only N-type varieties: Radish: red color pattern of skin



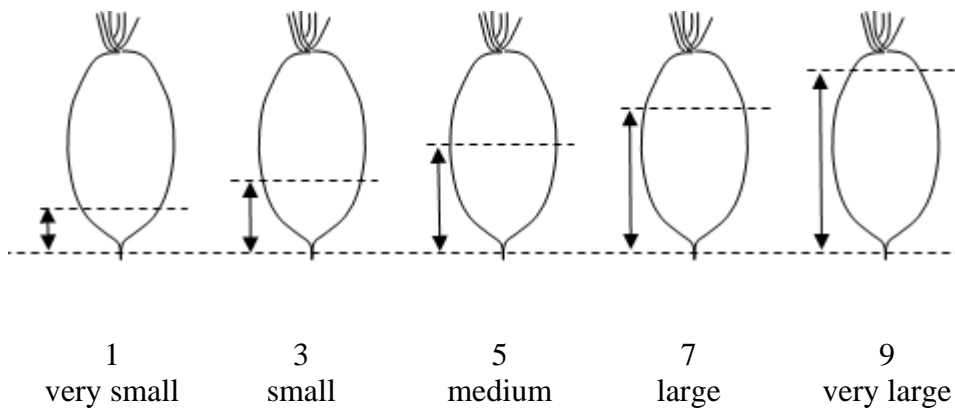
1
absent



2
present

Ad. 25: Only varieties with Radish: Number of color of skin: two: Radish: extent of white color from non-thickened root end

The extent of white tip should be observed in relation to the total length of the radish.



Ad. 27: Radish: main color of flesh

The main color is the color with largest surface area

Ad. 28: Time of harvest maturity

Time of harvest maturity should be observed at growth stage 48 (see Chapter 8.4).

Ad. 29: Radish: tendency to become pithy

After having reached the harvest maturity radishes may be repeatedly harvested and cut in cross section to determine the tendency of becoming pithy. In this case, the number of days after sowing is to be recorded when 50% of the plants show this characteristic. Varieties which are very early pithy correspond to the expression very strong, varieties becoming pithy very late correspond to the expression absent or very weak.

8.4 *Decimal code for growth stages*

Phenological growth stages and BBCH-Identification keys of non-thickened root and stem vegetables (radish = *Raphanus sativus* L. ssp.) Feller et al., 1995 a

Code	Description
Principal growth stage 0: Germination	
09:	Emergence: cotyledons break through soil surface
Principal growth stage 1: Leaf development (Main shoot)	
10:	Cotyledons completely unfolded; growing point or true leaf initial visible
19:	9 or more true leaves unfolded
Principal growth stage 4: Development of harvestable vegetative plant parts	
41:	Non-thickened roots beginning to expand (diameter > 0,5 cm)
45:	50 % of the expected non-thickened root diameter reached
48:	80 % of the expected non-thickened root diameter reached
49:	Expansion complete; typical form and size of non-thickened roots reached

9. Literature

Vogel, G., 1996: Handbuch des speziellen Gemüsebaues, Verlag Eugen Ulmer, Stuttgart, DE.

Wonneberger, C., Keller, F., Bahn Müller, H., 2004: Gemüsebau. Verlag Eugen Ulmer, Stuttgart, DE.

Uwe Meyer (Ed.) 1997: Growth stages of mono- and dicotyledonous plants: BBCH Monograph, Biologische Bundesanstalt für Land- und Forstwirtschaft (ed.). Wien: Blackwell Wiss.-Verlag, pp. 100 – 105.

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	<input type="text" value="Raphanus sativus L. var. niger (Mill.) S. Kerner"/> <input type="text" value="Raphanus sativus L. var. longipinnatus L.H. Bailey"/>	[] []
1.1.2 Common name	<input type="text" value="Black Radish, Oriental radish"/>	
1.2.1 Botanical name	<input type="text" value="Raphanus sativus L. var. sativus"/>	[]
1.2.2 Common name	<input type="text" value="Radish, Garden Radish, European Radish, Chinese Small Radish, Western Radish"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

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

#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing []

4.1.2 Mutation []
(please state parent variety)

4.1.3 Discovery and development []

(please state where and when discovered and 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

- (a) Self-pollination []
- (b) Cross-pollination
- (i) population []
- (ii) synthetic variety []
- (c) Hybrid
- (i) single hybrid []
- (ii) three-way hybrid []
- (d) 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 <u>Only N-type varieties:</u> Ploidy			
(1)			
diploid	Halblanger weißer Sommer (N)	2 []	
tetraploid	Rex (N)	4 []	
5.2 <u>Only for N-type varieties:</u> Leaf: length			
(3)			
very short		1 []	
very short to short		2 []	
short	Sutong (N), Yeoreumdalang	3 []	
short to medium		4 []	
medium	Chungilpum, Noir long maraîcher (N), Rex (N)	5 []	
medium to long		6 []	
long	Gilzo, Noir gros rond d'hiver (N)	7 []	
long to very long		8 []	
very long		9 []	
5.3 <u>Only for S-type varieties:</u> Leaf: length			
(4)			
very short		1 []	
very short to short		2 []	
short	Cerise (S), Saxa 2 (S),	3 []	
short to medium		4 []	
medium	Amored (S), Novo (S),	5 []	
medium to long		6 []	
long	National 2 (S),	7 []	
long to very long		8 []	
very long	Red Hazera (S)	9 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
Characteristics	Example Varieties	Note
5.4 Leaf blade: number of lobes (8)		
absent or very few	Everest (N), Ostergruß rosa 2 (N), Ping Pong (S)	1 []
very few to few		2 []
few	Cherry Belle (S), Halblanger weißer Sommer (N), Nelson (S), Osaka 40 days (N)	3 []
few to medium		4 []
medium	De cinq semaines rose (N), Minowase Summer Cross No. 3 (N), Scarlet Champion (S)	5 []
medium to many		6 []
many	Noir long maraîcher (N), Suikomi ninengo (N)	7 []
many to very many		8 []
very many	Mikura Cross (N)	9 []
5.5 <u>Only for N-type varieties:</u> Petiole: anthocyanin coloration (10)		
absent or very weak	April Cross (N), Fakir (S) Noir gros rond d'hiver (N), Omny (N)	1 []
absent or very weak to weak		2 []
weak	Blanche transparente (S), Flamino (S), Mirabeau (S)	3 []
weak to medium		4 []
medium	Erfurter Riesenrot (S), Forro (S)	5 []
medium to strong		6 []
strong	Pernot (S)	7 []
strong to very strong		8 []
very strong	Rex (N), Rose d'hiver de Chine (N), Violet de Gournay (N)	9 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.6 <u>Only for N-type varieties:</u> Radish: length (13)			
very short	Noir gros rond d'hiver (N)	1 []	
very short to short		2 []	
short	Rex (N)	3 []	
short to medium		4 []	
medium	Minowase Summer Cross No. 3	5 []	
medium to long		6 []	
long	Suikomi ninengo (N)	7 []	
long to very long		8 []	
very long	Surato (N)	9 []	
5.7 <u>Only for S-type varieties:</u> Radish: length (14)			
very short	Gaudry 2 (S)	1 []	
very short to short		2 []	
short	Cerise (S), Saxa 2 (S)	3 []	
short to medium		4 []	
medium	Bamba (S)	5 []	
medium to long		6 []	
long	Flamboyant 2 (S)	7 []	
long to very long		8 []	
very long	Flambo (S), Blanche transparente (S)	9 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
Characteristics	Example Varieties	Note
5.8 <u>Only for N-type varieties:</u> Radish: diameter (15)		
very small	Ostergruß rosa 2 (N)	1 []
very small to small		2 []
small	Noir gros round d'hiver (N), Surato (N)	3 []
small to medium		4 []
medium	Minowase Summer Cross No. 3 (N)	5 []
medium to large		6 []
large	Koshin (N)	7 []
large to very large		8 []
very large	Sakurajima oomaru (N)	9 []
5.9 <u>Only for S-type varieties:</u> Radish: diameter (16)		
very small	Gaudry 2 (S)	1 []
very small to small		2 []
small	Cerise (S), Saxa 2 (S)	3 []
small to medium		4 []
medium	Rond rose à bout blanc 2 (S)	5 []
medium to large		6 []
large	Riesen von Aspen (S)	7 []
large to very large		8 []
very large		9 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.10 Radish: shape (17)			
narrow triangular	Rex (N)	1 []	
medium triangular	Ovale blanc de Munich (N), Suikomi ninengo (N)	2 []	
ovate	Fridolin weiss (N), Lavergne (S)	3 []	
acicular	Blanche transparente (S), De cinq semaines rose 3 (N), Minowase Summer Cross No. 3 (N)	4 []	
oblong	Clipo (S), Fluo (S), Neptun (N), Noir long maraîcher (N), Oshin (N), White Breakfast (N)	5 []	
narrow elliptic	Gensuke (N)	6 []	
medium elliptic	Murasakizukin (N), Pico (S), Sutong (N)	7 []	
circular	Cerise (S), Falco (N), Noir gros rond d'hiver (N), Oomaru Shogoin (N), Tinto (S)	8 []	
narrow oblate	Sakurajima Oomaru (N)	9 []	
medium oblate	Fakir (S), Kuromaru (N), Rond rose à très grand bout blanc (S)	10 []	
obovate	Miura (N)	11 []	
bell shaped	Kara Nezumi (N), Nezumi (N), Roche (S)	12 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.11 Radish: number of colors of skin (excluding non-thickened root) (21)			
one	Cerise (S), Minowase Summer Cross No. 3 (N), Saxa 2 (S)	1 []	
two	Akasuji (N), Bamba (S), Flamboyant 2 (S), Murasakizukin (N)	2 []	
5.12 Non-thickened root: color (23)			
white	Minowase Summer Cross No. 3 (N),	1 []	
yellowish white	Miura (N)	2 []	
yellow	Gold Star (S)	3 []	
brown		4 []	
light green	Kazafukarami (N)	5 []	
medium green		6 []	
dark green		7 []	
pink	Koshin (N)	8 []	
dark pink red		9 []	
red	Benizonochunaga (N)	10 []	
purple	Karaineaka (N)	11 []	
violet		12 []	
black	Kuromaru (N)	13 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.13 Only varieties with Radish: Number of colors of skin: two: (25) Radish: extent of white from non-thickened root end			
very small	Benizonochunaga (N), Demi-long écarlate à très petit blanc 2 (S)	1 []	
very small to small		2 []	
small	Benikanmi (N), Pernot clair (S)	3 []	
small to medium		4 []	
medium	Aonaga (N), Fakir (S), Pépito (S)	5 []	
medium to large		6 []	
large	Delikat (S), Flamino (S), Oshin (N)	7 []	
large to very large		8 []	
very large	Murasakizukin (N), Rond rose à très grand bout blanc 2 (S)	9 []	
5.14 Time of harvest maturity (28)			
early S-type	Donar (S)	1 []	
medium S-type	Flamboyant (S)	2 []	
late S-type	Blanche transparente (S), Scarlet Champion (S)	3 []	
very early N type	Osaka 40 days (N), Ostergruß rosa 2 (N)	4 []	
early N-type	Minowase Summer Cross No. 3 (N)	5 []	
medium N-type	Miyashige nagabuto (N)	6 []	
late N-type	Miura (N)	7 []	
very late N-type	Sakurajima oomaru (N)	8 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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6. Similar varieties and differences from these varieties

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

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the similar variety(ies)	Describe the expression of the characteristic(s) for your candidate variety
<i>Example</i>	<i>Radish: color of skin</i>	<i>white</i>	<i>yellow</i>

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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 non-thickened 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”.

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10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant's name			
Signature		Date	

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