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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 Technical Working Party for Vegetables
 at its forty fifth session, to be held in Monterey, California, United States of America,
 from July 25 to 29, 2011*

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

* 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.]

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

ASSOCIATED DOCUMENTS

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

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1. Subject of these Test Guidelines

1.1 These Test Guidelines apply to all varieties of *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)
- ~~(a) — Seedling: anthocyanin coloration of hypocotyl (characteristic 2)~~
- (b) Leaf: attitude (characteristic 5)
- (c.1) **Only for N-type varieties:** Leaf: length (characteristic 6.1)
- (c.2) **Only for S-type varieties:** Leaf: length (characteristic 6.2)
- ~~(c) — Leaf blade: lobes (characteristic 9)~~
- (d) Leaf blade: number of lobes (characteristic 10)
- (e.1) **Only for N-type varieties:** Petiole: anthocyanin coloration (characteristic 12)
- (e.2) **Only for S-type varieties:** Petiole: anthocyanin coloration (characteristic 13)
- (f.1) **Only for N-type varieties:** Radish: length (characteristics 14.1)
- (f.2) **Only for S-type varieties:** Radish: length (characteristics 14.2)
- (g.1) **Only for N-type varieties:** Radish: diameter (characteristic 15.1)
- (g.2) **Only for S-type varieties:** Radish: diameter (characteristic 15.2)
- (h) Radish: shape (characteristic 16)
- (i) Radish: number of colors of skin (excluding root) (characteristic 20)
- ~~(j) — Root: color (characteristic 22)~~
- (j) **Only varieties with Radish: Number of colors of skin: two:** Radish: extent of white from root end (characteristic 25)
- (k) 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 ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota
1. MG (*) (+)	C Only N-type varieties: Ploidy	Ploidie	Ploidie	Ploidía		
QL	diploid	diploïde	diploid	diploïde	Halblanger weißer Sommer (N)	2
	tetraploid	tétraploïde	tetraploid	tetraploïde	Rex (N)	4
2.a (*)	VG Seedling: anthocyanin coloration of hypocotyl	Plantule: pigmentation anthocyanique de l'hypocotyle	Keimpflanze: Anthocyanfärbung des Hypokotyls	Plantula: pigmentación antocianica del hipocotilo		
QL	(a) absent	absente	fehlend	ausente	Belcanto (S), Koeto (S), Minowase Summer Cross No. 3 (N)	1
	present	présente	vorhanden	presente	Cerise (S), Kaiser (N), Rex (N)	9
NL 2011 : To change the order and put this characteristic at the end of leaf char. In fact this is a S characteristic						
3.	VG Only for S-type varieties: Foliage: width of attachment	Feuillage: largeur de l'attache au collet	Nur für S-Typen: Laub: Breite des Ansatzes	Follaje: anchura de la inserción al cuello		
QN	(b) narrow	Fine	schmal	estracha	Flamino (S)	3
	medium	Moyen	mittel	medio	Apache (S), Flambo (S),	5
	wide	Large	breit	ancha	Rond écarlate (S)	7
4.	VG Only for N-type varieties: Foliage: number of fully developed leaves	Feuillage: nombre de feuille à complet développement	Nur für N-Typen: Laub: Anzahl der ausgewachsenen Blätter	Follaje: número de hojas completamente desarrolladas		
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

	English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota
5. (*) (+)	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
6.1 (*) (+)	VG/ <u>Only for N-type</u> MS <u>varieties: Leaf:</u> <u>length</u>	Feuille: longueur	Blatt: Länge	Hoja: longitud		
QN	(b) short	courte	kurz	corta	Sutong (N)	3
	medium	moyenne	mittel	media	Noir long maraîcher (N), Rex (N)	5
	long	longue	lang	larga	Noir gros rond d'hiver (N)	7
6.2 (*) (+)	VG/ <u>Only for S-type</u> MS <u>varieties: Leaf:</u> <u>length</u>	Feuille: longueur	Blatt: Länge	Hoja: longitud		
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				Red Hazera (S)	9
7. (*) (+)	VG/ <u>Only for N-type</u> MS <u>varieties: Leaf:</u> <u>width</u>	Limbe:	<u>Nur für N-Typen:</u> <u>Blattspreite: Breite</u>	Limbo:		
QN	(b) narrow		schmal			3
	medium		mittel		April Cross (N)	5
	broad		breit		Mantanghong (N), Rex (N)	7

English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota
8. VG	Leaf blade: Shape of Limbe: forme du apex	Blattspreite: Form der Spitze	Limbo: forma del ápice		
(+)					
PQ	(b) slightly pointed	leicht zugespitzt		Korund (S), Matsumoto kiriba (N), Paradiso (S)	1
	blunt	stumpf		Minowase Summer Cross No. 3 (N)	2
	rounded	abgerundet	redondeado	Everest (N), Neckarperle (S), Sora (S)	3

HU 2011: Propose to have only yellow green (note 1, Okura Cross(N)) and grey green (note 2, April Cross (N), Unicorn (N))

9. VG	Leaf blade: color	Limbe: couleur	Blattspreite: Farbe	Limbo: color	
PQ	(b) yellow green			Kiba Risou (N)	1
	light green			Cross (N), Everest (N), Miura	2
	medium green			Miyashige Green neke (N)	3
	dark green			April Cross (N), Minowase Summer Cross No. 3 (N)	4
	light grey green			Okura (N)	5
	medium grey green			Red Poppins (S), Sakurajima oonaga (N)	6
	dark grey green			Kuroba Risou (N)	7

English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota	
NL 2011: The example varieties need to be reviewed: for example Cherry Belle is strongly lobed within the small radish group, but rather weakly lobed compared to many N types.						
10. VG	Leaf blade: number of lobes	Limbe: nombre de lobes	Blattspreite: Anzahl Lappen	Limbo: numero de lobulos		
(*) (+)						
QN	(b) absent or very few		fehlend oder sehr gering	Everest (N), Ostergruß rosa 2 (N), Saxa 2 (S)	1	
		très petit		muy bajo		
	few	petit	gering	bajo	Ilka (S), Halblanger weißer Sommer (N), Nelson (S), Osaka 40 days (N)	3
	medium	moyen	mittel	medio	Cracou (S), De cinq semaines rose (N), Minowase Summer Cross No. 3 (N)	5
	many	grand	groß	alto	Cherry Belle (S), Noir long maraîcher (N), Suikomi ninengo (N)	7
	very many	très grand	sehr groß	muy alto	Mikura Cross (N)	9
11. 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		fehlend oder sehr flach	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	Falco (N), Flamino (S), Hilds blauer Herbst und Winter (N), Matsumotokiriba (N), April Cross (N)	7

English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota	
NL 2011: Propose to combine the two and make one, condensed range, 1-3 or 1-5 (as done for Char. 2, if decided to keep)						
12. VG	<u>Only for N-type varieties:</u> Petiole: anthocyanin coloration		<u>Nur für N-Typen:</u> Blattstiel: Anthocyanfärbung			
QL (b)	absent	absente	fehlend	ausente	April Cross (N), Noir gros rond d'hiver (N), Omny (N)	1
	present	présente	vorhanden	present	Rex (N), Rose d'hiver de Chine (N), Violet de Gournay (N)	9
13. VG	<u>Only for S-type varieties:</u> Petiole: anthocyanin coloration		<u>Nur für S-Typen:</u> Blattstiel: Anthocyanfärbung			
QN (b)	absent or very weak		fehlend oder sehr schwach		Fakir (S)	1
	weak		schwach		Blanche transparente (S), Flamino (S), Mirabeau (S)	3
	medium		mittel		Erfurter Riesenrot (S), Forro (S)	5
	strong		stark		Pernot (S)	7
	very strong		sehr stark			9
14.1 MS/ (*) VG	<u>Only for N-type varieties:</u> Radish: length		<u>Nur N-Typen:</u> Rube: Länge			
		Racine: longueur		Raiz: longitud		
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

English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota	
14.2 MS/ (*) VG	<u>Only for S-type</u> <u>varieties: Radish:</u> length	Racine: longueur	<u>Nur S-Typen: Rübe:</u> Länge	Raiz: longitud		
QN (b)	very short	très courte	sehr kurz	muy corta	1	
	short	courte	kurz	corta	3	
	medium	moyenne	mittel	media	5	
	long	longue	lang	larga	7	
	very long	très longue	sehr lang	muy larga	9	
15.1 MS/ VG	<u>Only for N-type</u> <u>varieties: Radish:</u> diameter	Racine:	<u>Nur N-Typen:</u> Rübe: Durchmesser	Raiz:		
QN (b)	very small		sehr klein	Ostergruß rosa 2 (N)	1	
	small	petit	klein	pequeno	Noir gros round d'hiver (N), Surato (N)	3
	medium	moyenne	mittel	media	Minowase Summer Cross No. 3 (N)	5
	large	grand	groß	grande	Koshin (N)	7
	very large		sehr groß	Sakurajima oomaru (N)	9	
15.2 MS/ VG	<u>Only for S-type</u> <u>varieties: Radish:</u> diameter	Racine:	<u>Nur S-Typen: Rübe:</u> Durchmesser	Raiz:		
QN (b)	very small			Gaudry 2 (S)	1	
	small	petit	klein	pequeno		3
	medium	moyenne	mittel	media	Rond rose à très grand bout blanc (S)	5
	large	grand	groß	grande		7
	very large					9

English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota
16. VG Radish: shape (* (+)	Racine: forme	Rübe: Form	Raiz: forma		
PQ (b) narrow triangular	triangulaire étroite	schmal dreieckig	triangular estrecha	Rex (N)	1
medium triangular				Ovale blanc de Munich (N), Suikomi ninengo (N)	2
ovate	ovale	eiförmig	oval	Lavergne (S), Fridolin weiss (N)	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), White Breakfast (N), Oshin (N)	5
narrow elliptic				Gensuke (N)	6
medium elliptic				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				Sakurajima Oomaru (N)	9
medium oblate				Fakir (S), Kuromaru (N), Rond rose à très grand bout blanc (S)	10
obovate	obovate	verkehrt eiförmig	oboval	Miura (N)	11
bell shaped		glockenförmig		Kara Nezumi (N), Nezumi (N), Roche (S)	12

	English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota
17.	VG		Nur für N-Typen:			
(+)	Only for N-type varieties: Radish: position in soil		Rübe: Sitz im Boden			
QN	(b) very shallow		sehr flach		Kuromaru (N)	1
	shallow		flach		Aonaga (N), Minowase Summer Cross No. 3 (N)	3
	medium		mittel		Miyashigenagabuto (N)	5
	deep		tief		Miura (N)	7
	very deep		sehr tief		Suikomi ninengo (N)	9
18.	VG	Racine:	Rübe: Schulterform	Raiz:		
(+)	Radish: shape of shoulder					
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	conica	Blanche transparent (S), Mantanghong (N), Pernot (S)	3

English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota	
NL 2011 Looking at the drawing this could be worded as Radish : shape of apex (excluding <u>root</u>) and would be in line with Char. 20						
19. VG	Radish: shape of apex (excluding tip)	Racine : forme de	Rübe: Form des Apex (außer Spitze)	Raiz: forma de		
(+)						
PQ	(b) narrow acute	aigue étroite	schmal spitz	aguda angosta	April Cross (N), Blanche transparente (S)	1
	acute	aigue	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	plate	eben	plana	À forcer rond écarlate (S), Jumbo Scarlet (N), Akizumari (N)	5
20. VG	Radish: Number of colors of skin (excluding root)		Rübe: Anzahl der Farben der Haut (außer Wurzel)			
(*)						
(+)						
PQ	one		eine		Cerise (S), Minowase Summer Cross No. 3 (N), Saxa 2 (S),	1
	two		zwei		Akasuji (N), Bamba (S), Flamboyant 2 (S), Murasakizukin (N)	2

English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota	
NL 2011: Prefer wording “upper part”, Furthermore brown could be deleted, probably this is the real color of “black” varieties.						
21. VG (* (+)	Radish: color of skin of stem end		Rübe: Farbe der Haut des Rübenendes			
PQ (b)	white	blanc	weiß	blanco	Minowase Summer Cross No. 3 (N), Rex (S)	1
	yellowish white				Miura (N)	2
	yellow	jaune	gelb	amarillo	Gold Star (S)	3
	brown	brun	braun	marron		4
	light green				Miyashige Nagabuto (N), Oshin (N)	5
	medium green				Nezumi (N)	6
	dark green				Aonaga (N), Kazafu karami (N)	7
	pink	rose	rosa	rosa	De cinq semaines rose 3 (S)	8
	dark pink red		dunkelrosarot		Ostergruß rosa 2 (S)	9
	red	rouge	rot	rojo	Benigeshou (N)	10
	purple	pourpre	purpurn	purpura	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 ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota
NL 2011: Do we need this Char.? It is related to flesh color. A variety like Mantanghong has a red root because of its red flesh, the red round small radishes have a white root because of the white flesh.					
HU 2011: Agree with NL					
VG Root: color			Wurzel: Farbe		
22.					
(*)					
(+) PQ					
(b) white	blanc	weiß	blanco	Minowase Summer Cross No. 3 (N);	1
yellowish white				Miura (N)	2
yellow	jaune	gelb	amarillo	Gold Star (S)	3
brown	brun	braun	marron		4
light green				Kazafukarami (N)	5
medium green					6
dark green					7
pink	rose	rosa	rosa	Koshin	8
dark pink red		dunkelrosarot			9
red	rouge	rot	rojo	Benizonochunaga (N)	10
purple	pourpre	purpur	purpura	Karaineaka (N)	11
violet	violet	violett	violeta		12
black	noir	schwarz	negro	Kuromaru (N)	13
23. VG Distribution of color of skin					
(+) (b) mainly upper part				Murasakizukin (N)	
QL mainly lower part				Koshin (N)	
striped				Akasuji (N)	
mainly upper part and striped				Itomaki (N)	

	English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota	
24. VG	<u>Only for N-type varieties: Radish:</u>						
(+)	Red color pattern of skin						
QL (b)	absent		fehlend		Minowase Summer Cross No. 3 (N)	1	
	present		vorhanden		Akasuji (N)	2	
NL 2011: Instead of 'root end' the wording could be 'lower part'							
FR 2011: agrees, but the example varieties must be reallocated, Rond rose à très grand bout blanc 2 (S) is very large and Demi-long écarlate à très petit blanc 2 (S) is very small.							
25. VG	<u>Only varieties with Radish: Number of color of skin:two: Radish: Extent of white color from root end</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	

	English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota
26. VG	<u>Only for N type varieties:</u> Radish: ridging of surface	___ Racine : annelé de la surface	<u>Nur für N-Typen:</u> Rübe: Ringelung der Oberfläche	___ Raiz: anillada de la superficie		
QN (b)	absent or very weak	absente 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		sehr stark		Aonaga (N)	5
27. VG (+)	Radish: main color of flesh		Rübe: Hauptfarbe des Fleisches			
PQ (b)	translucent white	blanc vitreux	glasigweiß	blanco traslucido	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

	English	français	deutsch	español	Example Varieties ⁽¹⁾ / Exemples ⁽¹⁾ / Beispielssorten ⁽¹⁾ / Variedades ejemplo ⁽¹⁾	Note/ Nota
28. VG (* (+)	Time of harvest maturity	Epoque de maturité de récolte	Zeitpunkt der Erntereife	Fecha de madurez de cosecha		
QN	early S-type					1
	medium S-type					2
	late S-type					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				Oshin (N), Sutong (N), Miyashige nagabuto (N)	6
	late N-type				Miura (N)	7
	very late N-type				Sakurajima oomaru (N)	8
29. VG (+)	Radish: tendency to become pithy	Racine: tendance à se creuser	Rübe: Neigung zum Pelzigwerden	Raiz: tendencia a ahuecarse		
PQ	absent or very weak expressed				Altos (S), Carnita (S), Everest (N), Ika (S), Sakurajima Oomaru (N)	1
					Miura (N)	3
	weakly expressed				Aviso (S), Miyashige nagabuto (N)	5
					Minowase Summer Cross No. 3 (N)	7
	very strong expressed				Blanche transparente (S), Cherry Belle (S), Osaka 40 days (N), Rex (N)	9

8. Explanations on the Table of Characteristics

8.1 Grouping for *Raphanus sativus* L.:

NL 2011: How to deal with sensibility to day length in this concept? Some varieties cannot be tested in both groups or in a certain season because they bolt instead of developing a radish.

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	[medium N type Char. 28]
S-type varieties	< 35 days	[medium S type Char. 28]

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.

NL 2011 Proposal to reword (b)

- (b) All observations on the leaf and the radish should be made at the time of harvest maturity ~~for S-type and for N-type varieties~~ which is 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 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 5: Leaf: attitude

For N-type varieties to 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.

NL 2011 : 30 days after sowing should not be necessary on our opinion, not all varieties become horizontal.

HU 2011: agrees with 30 days because radish of some N-type varieties was already with 10 cm above the soil 40 days after sowing.

Ad. 6.1 and 6.2: Leaf: length

Ad. 7: Only for N-type varieties: Leaf: width

All observation should be made on fully developed leaves.

Ad. 8: Leaf blade: Shape of apex

JP 2011:



1

slightly pointed

2

blunt

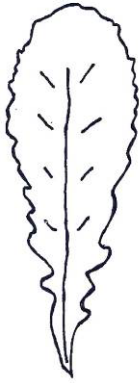
3

rounded

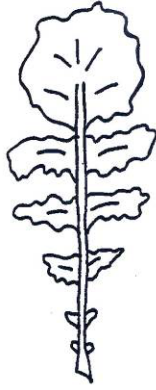
Ad. 10: Leaf blade: number of lobes

Parts of the leaf blade are considered as lobes if the cutting is the distance between the margin of the leaf and the mid-rib.

NL 2011: The explanation of what is a lobe is not clear.















1
absent or very few

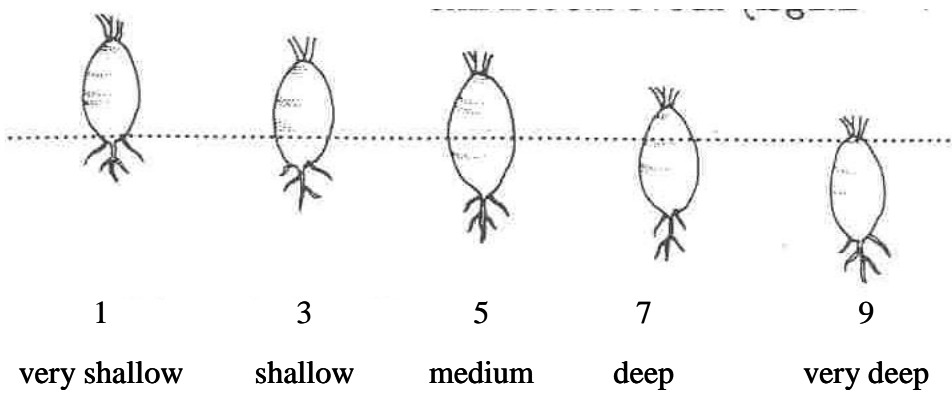


9
very many

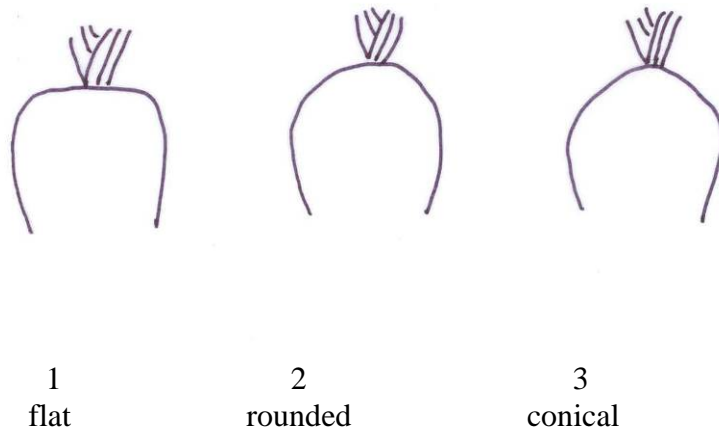
Ad. 16: Radish: shape

		towards apex	Position of broadest part	towards base	
Width: Ratio length / width	narrow		 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 oblate		
	broad		 9 narrow oblate		

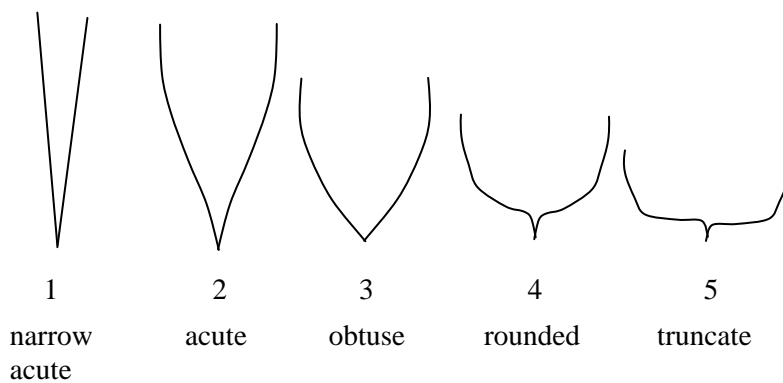
Ad. 17: Only for N-type varieties: Radish: position in soil



Ad. 18: Radish: shape of shoulder



Ad. 19: Radish: shape of apex (excluding tip)

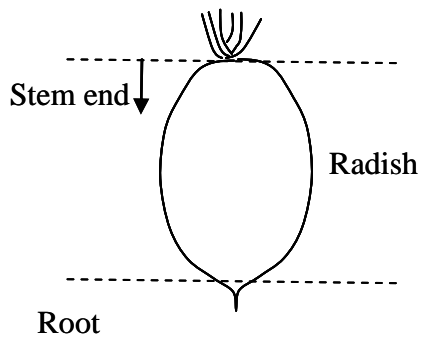


Ad 20: Radish: Number of colors of skin (excluding root)

NL 2011 to be explained, that green (of the upper part) is considered as a color

Ad 21: Radish: Color of skin of stem end

Ad 22: Root: color



Ad. 23 Distribution of color of skin



1

mainly upper part



2

mainly lower part



3

striped



4

mainly upper part
and striped

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



1

absent

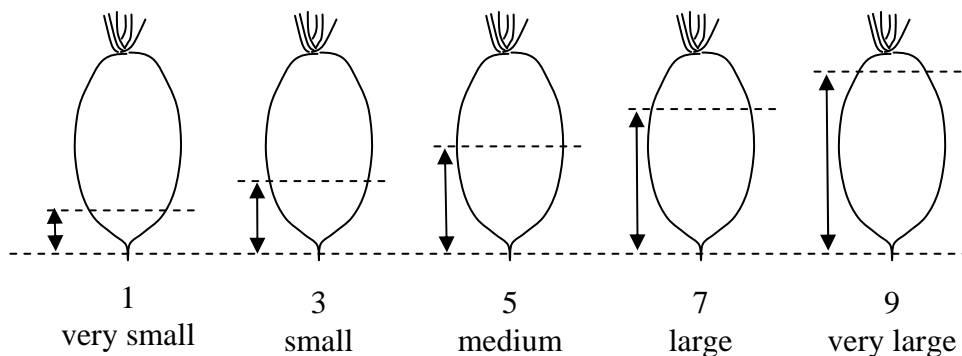


2

present

Ad. 25: Only varieties with Radish: Number of colors of skin: two: Radish: extent of white tip

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**All: to improve the explanation**

For the determination of this characteristic an additional replication should be grown. After having reached the harvest maturity radishes should be repeatedly harvested and cut in cross section to determine the tendency of becoming pithy. The date 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.

FR 2011: I am not happy with this proposition of additional replication. It's enough to have more plants in each replication. Another problem is that some varieties never become pithy and in this case the trial must be maintained for very long time. I would prefer to have a date, for example 3 weeks after harvest maturity and observe the intensity of pithiness at this stage.

HU2010: agree with this explanation but how many plants have to be cut and how many days have to be observed? May be at S-type radish has to be cut every day or every second day after harvest time 10 or 20 pieces and N-type varieties every third or fifth day 10 pieces? Length of observation can be at S-type 7-10 days and N-type varieties 10-14 days? Don't have to raise the amount of the seed quantity because of this additional replication?

8.4 Decimal code for growth stages*

Phenological growth stages and BBCH-Identification keys of 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:	Roots beginning to expand (diameter > 0,5 cm)
45:	50 % of the expected root diameter reached
48:	80 % of the expected root diameter reached
49:	Expansion complete; typical form and size of 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 (Please indicate the relevant botanical name):		
1.1.1 Botanical name	<i>Raphanus sativus</i> L. var. <i>niger</i> (Mill.) S. Kerner	[]
	<i>Raphanus sativus</i> L. var. <i>longipinnatus</i> L.H. Bailey	[]
1.1.2 Common name	Black Radish, Oriental radish	
1.2.1 Botanical name	<i>Raphanus sativus</i> L. var. <i>sativus</i>	[]
1.2.2 Common name	Radish, Garden radish, European, radish, Chinese small radish, Western radish	

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

2. Applicant

Name

Address

Telephone No.

Fax No.

E-mail address

Breeder (if different from applicant)

3. Proposed denomination and breeder's reference

Proposed denomination
(if available)

Breeder's reference

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>#4. Information on the breeding scheme and propagation of the variety</p> <p>4.1 Breeding scheme</p> <p>Variety resulting from:</p> <p>4.1.1 Inbred line []</p> <p>4.1.2 Hybrid [] (please state parent variety)</p> <p>FR 2011 Propose to have also Single hybrid / three way hybrid</p> <p><input type="text"/></p> <p>4.1.3 open pollinated variety [] (please provide details)</p> <p><input type="text"/></p> <p>4.1.4 Other [] (please provide details)"</p> <p><input type="text"/></p>		
<p>4.2 Method of propagating the variety</p> <p>(a) Self-pollination []</p> <p>(b) Cross-pollination []</p> <p style="padding-left: 20px;">(i) population []</p> <p style="padding-left: 20px;">(ii) synthetic variety []</p> <p>(c) Hybrid []</p> <p>(d) Other [] (please provide details)</p>		

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

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).			
Characteristics	Example Varieties	Note	
5.1 Time of harvest maturity (irrespective the type of variety)			
< 35 days		1 []	
35 – 60 days		2 []	
> 60 days		3 []	
Number of days to harvest maturity			
..... (please complete)			
5.2 <u>Only N-type varieties:</u> Ploidy			
(1)			
diploid	Halblanger weißer Sommer (N)	2 []	
tetraploid	Rex (N)	4 []	
5.2 Seedling: anthocyanin coloration of hypocotyl			
(2)			
5.3 Leaf:attitude			
(5)			
erect	Clipo (S), Karissima (S), Rex (N)	1 []	
erect to semi erect		2 []	
semi erect	Balkar (S), Ostergruß rosa 2 (N)	3 []	
semi erect to horizontal		4 []	
horizontal	Bel Image (S), Mikura Cross (N), Minowase Summer Cross No. 3 (N), Ronde Witte (S)	5 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.4i <u>Only for N-type varieties:</u> Leaf: length (6.1)			
very short		1 []	
very short to short		2 []	
short	Sutong (N)	3 []	
short to medium		4 []	
medium	Noir long maraîcher (N), Rex (N)	5 []	
medium to long		6 []	
long	Noir gros rond d'hiver (N)	7 []	
long to very long		8 []	
very long		9 []	
5.4ii <u>Only for S-type varieties:</u> Leaf: length (6.2)			
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
5.5 Leaf blade: number of lobes (10)		
absent or very few	Everest (N), Ostergruß rosa 2 (N), Saxa 2 (S)	1 []
very few to few		2 []
few	Ilka (S), Halblanger weißer Sommer (N), Nelson (S), Osaka 40 days (N)	3 []
few to medium		4 []
medium	Cracou (S), De cinq semaines rose (N), Minowase Summer Cross No. 3 (N)	5 []
medium to many		6 []
many	Cherry Belle (S), Noir long maraîcher (N), Suikomi ninengo (N)	7 []
many to very many		8 []
very many	Mikura Cross (N)	9 []
5.6 <u>Only for N-type varieties:</u> Petiole: anthcyanin coloration (12)		
absent	April Cross (N), Noir gros rond d'hiver (N), Omny (N)	1 []
present	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	
5.7 <u>Only for S-type varieties:</u> Petiole: anthcyanin coloration			
(13)			
absent or very weak	Fakir (S)	1 []	
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		9 []	
5.8i <u>Only for N-type varieties:</u> Radish: length			
(14.1)			
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 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.8ii <u>Only for S-type varieties:</u> Radish: length (14.2)			
very short		1 []	
very short to short		2 []	
short		3 []	
short to medium		4 []	
medium		5 []	
medium to long		6 []	
long		7 []	
long to very long		8 []	
very long		9 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.9i <u>Only for N-type varieties: Radish:diameter</u> (15.1)			
very small	Ostergroß 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 []	
5.9ii <u>Only for S-type varieties Radish:diameter</u> (15.2)			
very small		1 []	
very small to small		2 []	
small	Gaudry 2 (S)	3 []	
small to medium		4 []	
medium		5 []	
medium to large		6 []	
large	Rond rose à très grand bout blanc (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 (16)			
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 root) (20)			
one	Cerise (S), Minowase Summer Cross No. 3 (N), Saxa 2 (S)	1	[]
two	Akasuji (N), Bamba (S), Flamboyant 2 (S), Murasakizukin (N)	2	[]
5.10 Root: color (22)			
white	Rex (S), Minowase Summer Cross No. 3 (N),	1	[-]
yellowish white	Miura (N)	2	[-]
yellow	Gold Star (S)	3	[-]
brown		4	[-]
light green		5	[-]
medium green	Aonaga (N)	6	[-]
dark green		7	[-]
pink	De cinq semaines rose 3 (S)	8	[-]
dark pink red	Ostergruß rosa 2 (S)	9	[-]
red	Benigeshou (N)	10	[-]
purple	Karaineaka (N), Roche	11	[-]
violet	Hilds blauer Herbst und Winter (S), Violet de Gournay (S)	12	[-]
black	Noir gros rond d'hiver (N)	13	[-]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.12 <u>Only varieties with Radish: Number of colors of skin: two:</u> (25) Radish: extent of white from 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 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.13 Time of harvest maturity (28)			
ISF 2011: Not clear what the difference is with question 5.1 to breeder. At least explanation should be added in order for breeder to be able to fill this in			
early S-type		1 []	
medium S-type		2 []	
late S-type		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:	
<p>6. Similar varieties and differences from these varieties</p> <p><i>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.</i></p>			
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>
<p>Comments:</p>			

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>#7. Additional information which may help in the examination of the variety</p> <p>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?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.2 Are there any special conditions for growing the variety or conducting the examination?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.3 Other information</p>		
<p>8. Authorization for release</p> <p>(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?</p> <p>Yes [] No []</p> <p>(b) Has such authorization been obtained?</p> <p>Yes [] No []</p> <p>If the answer to (b) is yes, please attach a copy of the authorization.</p>		

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:												
<p>9. Information on plant material to be examined or submitted for examination.</p> <p>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.</p> <p>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:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">(a) Microorganisms (e.g. virus, bacteria, phytoplasma)</td> <td style="width: 10%;">Yes []</td> <td style="width: 20%;">No []</td> </tr> <tr> <td>(b) Chemical treatment (e.g. growth retardant, pesticide)</td> <td>Yes []</td> <td>No []</td> </tr> <tr> <td>(c) Tissue culture</td> <td>Yes []</td> <td>No []</td> </tr> <tr> <td>(d) Other factors</td> <td>Yes []</td> <td>No []</td> </tr> </table> <p>Please provide details for where you have indicated “yes”.</p> <p>.....</p>			(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 []
(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 []												
<p>10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:</p> <p>Applicant’s name <input style="width: 550px; height: 25px;" type="text"/></p> <p>Signature <input style="width: 350px; height: 25px;" type="text"/> Date <input style="width: 180px; height: 25px;" type="text"/></p>														

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