TG/63/7(proj.2)
ORIGINAL: English
DATE: 2008-05-21

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

(NO COMMON NAME) *

UPOV Code: RAPHA_SAT_NIG

(to be clarified)

(*Raphanus sativus* L. var. *niger* (Mill.) S. Kerner; *Raphanus sativus* L. var. *longipinnatus* L.H. Bailey)

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-second session to be held in Cracow, Poland, from June 23 to 27, 2008

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Raphanus sativus L. var. *niger* (Mill.) S. Kerner, *Raphanus sativus* L. var. *longipinnatus* L.H. Bailey	Black Radish	Radis d'été, d'automne et d'hiver	Rettich	Rabano de invierno, Rabano negro

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.]

TABLE OF CONTENTS PAGE

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Raphanus sativus* L. var. *niger* (Mill.) S. Kerner and *Raphanus sativus* L. var. *longipinnatus* L.H. Bailey.

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:

100 g or 10, 000 seeds.

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

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

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

3. Method of Examination

3.1 Number of Growing Cycles

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

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 Conditions for Conducting the Examination

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.3.2 Type of observation

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

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

3.4 Test Design

3.4.1 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.

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

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, 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.

3.6 Additional Tests

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

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

recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.2 Uniformity

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:

4.2.1 Cross-pollinated varieties

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

4.2.2 Single cross hybrids and inbred lines

For the assessment of uniformity of single cross 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.

4.2.3 Hybrid varieties

The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction. In the case of single cross hybrids, the uniformity standards are set out in Section 4.2.2.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be tested, either by growing a further generation, or by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

(a) Ploidy (characteristic 1)
(b) Leaf blade: lobes (division to midrib) (characteristic 10)
(c) Radish: shape (characteristic 17)
(d) Radish: color of skin (characteristic 21)

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

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.3 Types of Expression

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

6.4 Example Varieties

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

6.5 Legend

(*) Asterisked characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3

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

MG, MS, VG, VS: See Chapter 3.3.2

C: special test

(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**	**Ploidy**	**Ploïdie**	**Ploidie**	**Ploidía**		
QL		diploid	diploïde	diploid	diploide	Halblanger weißer Sommer	2
		tetraploid	tétraploïde	tetraploid	tetraploide	Rex	4
2. (*)	**VG**	**Seedling: anthocyanin coloration of hypocotyl**	**Plantule: pigmentation anthocyanique de l'hypocotyle**	**Keimpflanze: Anthocyanfärbung des Hypokotyls**	**Plantula: pigmentacion antocianica del hipocotilo**		
QL	**(a)**	absent	absente	fehlend	ausente	Minowase Summer Cross Nr. 3	1
		present	présente	vorhanden	presente	Kaiser, Rex	9
3.	**VG**	**Cotyledon: size**	**Cotyledon: taille**	**Keimblatt: Größe**	**Cotiledon: tamano**		
QN	**(a)**	small	petit	klein	pequeno	Neptun	3
		medium	moyen	mittel	medio	Servatius	5
		large	grand	groß	grande	~~Martina~~ (*DE: del., withdrawn in 2007*) Mikura Cross (*DE: add.)*	7
4.	**VG**	**Foliage: number of fully developed leaves**	**Feuillage: nombre de feuille à complet développement**	**Laub: Anzahl der ausgewachsenen Blätter**	**Follaje: numero de hojas completamente desarrolladas**		
QN	**(b)**	few	petit	gering	bajo	Rex, Ostergruß rosa 2	3
		medium	moyen	mittel	medio	Neptun	5
		many	grand	groß	alto	April Cross	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5. (*)	**VG**	**Leaf: attitude**	**Feuille: port**	**Blatt: Haltung**	**Hoja: porte**		
QN	**(b)**	erect	dressé	aufrecht	erecto	Rex	1
		semi erect	demi-dressé	halbaufrecht	semierecto	Ostergruß rosa 2	3
		horizontal	horizontal	~~waagerecht~~ liegend	horizontal	Mikura Cross, Minowase Summer Cross Nr. 3	5
		Mikura Cross is in DE= 3 instead of note 5, Proposal for note 5 = Unicorn					
		NL: Unicorn is more erect than Mikura Cross					
6. (*)	**MS**	**Leaf: length**	**Feuille: longueur**	**Blatt: Länge**	**Hoja: longitud**		
QN	**(b)**	short	courte	kurz	corta	Runder weißer, Sutong	3
		medium	moyenne	mittel	media	Noir long maraîcher, Rex	5
		long	longue	lang	largal	Noir gros rond d'hiver	7
7. (+)	**VG**	~~**Leaf blade: shape**~~ *NL:* **Leaf : width**	**Limbe: forme**	**Blattspreite: Form**	**Limbo: forma**		
QN	**(b)**	~~narrow obovate~~ narrow				Florian	~~1~~ 3
		~~medium obovate~~ medium				April Cross	~~2~~ 5
		~~broad obovate~~ broad				Mantanghong, Rex	~~3~~ 7
		TWV 2007: To check wether all varieties have obovate shaped leaves					
		DE agrees to NL proposal					
8. (+)	**VG**	**Leaf blade: color**	**Limbe: couleur**	**Blattspreite: Farbe**	**Limbo: color**		
PQ	**(b)**	green	vert	grün	verde	Minowase Summer Cross Nr. 3	1
		yellowish green	jaunâtre	gelblich grün	amarillento	Rex	2
		greyish green	grisâtre	gräulich grün	grisáceo	Unicorn	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. **(+)**	**VG**	**Leaf blade: intensity of color**	**Limbe: intensité de la couleur**	**Blattspreite: Intensität der Färbung**	**Limbo: intensidad del color**		
QN	**(b)**	light	claire	hell	claro	Mikura Cross	3
		medium	moyenne	mittel	medio	Mino early, Omny	5
		dark	foncée	dunkel	oscuro	Houseking	7
10. **(*)** **(+)**	**VG**	**Leaf blade: lobes (division to midrib)**	**Limbe: lobes (division atteignant la nervure principale**)	**Blattspreite: Lappung (Teilung bis zur Mittelrippe)**	**Limbo: lobulos (division hasta al nervio principal)**		
QL	**(b)**	absent	absents	fehlend	ausente	Rex, Servatius	1
		present	présents	vorhanden	presente	Halblanger weißer Sommer	9
11. **(*)**	**VG**	**<u>Varieties with lobes diveded to midrib only:</u> Leaf blade: number of lobes (as for 10)**	**<u>Variétés….</u> : Limbe: nombre de lobes (comme pour 10)**	**<u>Nur für Sorten mit Teilung bis zur Mittelrippe:</u> Blattspreite: Anzahl Lappen (wie unter 10)**	**<u>Solo variedades de....</u>: Limbo: numero de lobulos (como para 10)**		
QN	**(b)**	very few	très petit	sehr gering	muy bajo	Ostergruß rosa 2	1
		few	petit	gering	bajo	Halblanger weißer Sommer	3
		medium	moyen	mittel	medio	De cinq semaines rose	5
		many	grand	groß	alto	Minowase Summer Cross Nr. 3, Noir long maraîcher	7
		very many	très grand	sehr groß	muy alto	Mikura Cross	9
Notes in DE: Minowase Summer Cross No. 3 = 9 (instead 7) and Mikura Cross = 8 (instead 9), propose to search for other example varities?							
12.	**VG**	**Leaf blade: size of terminal lobe**	**Limbe: taille du lobe terminal**	**Blattspreite: Größe des Endlappens**	**Limbo: tamano del lobula terminal**		
QN	**(b)**	small	petit	klein	pequeno	Omny	3
		medium	moyenne	mittel	medio	Hilds blauer Herbst und Winter, Rose d'hiver de Chine	5
		large	grand	groß	grande	Sutong	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13.	**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)**	shallow	peu profondes	flach	poco profundas	Neptun	3
		medium	moyennes	mittel	medias	April Cross	5
		deep	profondes	tief	profundas	Hilds blauer Herbst und Winter	7
14.	**VG**	**Petiole: anthocyanin coloration**	**Pétiole: pigmentation anthocyanique**	**Blattstiel: Anthocyanfärbung**	**Peciolo: pigmentacion antocianica**		
QL	**(b)**	absent	absente	fehlend	ausente	April Cross, Noir gros rond d'hiver, Omny,	1
		present	présente	vorhanden	presente	Rose d'hiver de Chine, Violet de Gournay, Rex	9
15. (*)	**MS/ VG**	**Radish: length**	**Racine: longueur**	**Rübe: Länge**	**Raiz: longitud**		
QN	**(b)**	very short	très courte	sehr kurz	muy corta	Runder weißer	1
		short	courte	kurz	corta	Noir gros ~~long~~ rond d'hiver	3
		medium	moyenne	mittel	media	Gentoku, Neptun,	5
		long	longue	lang	larga	Ninja, Servatius	7
		very long	très longue	sehr lang	muy larga	April Cross, Martina	9
16.	**MS/ VG**	**Radish: diameter**	**Racine:**	**Rübe: Durchmesser**	**Raiz:**		
QN	**(b)**	small	petit	klein	pequeno	Ostergruß rosa 2	3
		medium	moyenne	mittel	media	Rex	5
		large	grand	groß	grande	Noir gros rond d'hiver	7

Please check: Is note 3 = 'Noir gros long d'hiver' correct or should it be 'Noir gros rond hiver?

NL: synomym of "Nero tondo d'inverno", therefore it should be "Noir gros rond d'hiver".

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
			TWV: Check whether there is a botanical term for "radish"				
			NL proposes "root" , the lower (swollen) part of the radish				
17. (*) (+)	**VG**	**Radish: shape**	**Racine: forme**	**Rübe: Form**	**Raiz: forma**		
PQ	**(b)**	transverse elliptic	elliptique transverse	quer elliptisch	eliptica transversal	~~Jumbo Scarlet~~ *DE: new example?*	1
		NL: transverse broad elliptic				Jumbo Scarlet	?
		circular	ronde	rund	circular	Noir gros rond d'hiver	2
		elliptic	elliptique	elliptisch	eliptica	Sutong	3
		narrow elliptic	elliptique étroite	schmal elliptisch	eliptica estrecha		4
		obovate	obovale	verkehrt eiförmig	oboval	~~Münchner Bier~~ *(DE: withdrawn)*, Fridolin weiss *(add.DE)*	5
		rectangular	rectangulaire	rechteckig	rectangular	Neptun, Noir long maraîcher	6
		obtriangular	obtriangulaire	verkehrt dreieckig	obtriangular	Ovale blanc de Munich	7
		narrow obtriangular	obtriangulaire étroite	schmal verkehrt dreieckig	obtriangular estrecha	Rex	8
		iciclical	en glaçon	eiszapfenförmig	en estalagmita	De cinq semaines rose 3, Minowase Summer Cross Nr. 3	9
		ovate		eiförmig			10
		~~pearshaped~~		~~birnenförmig~~			11
		NL: bell shaped		glockenförmig			
new 17a. **(+)**	**VG**	**Radish: postion of maximum diameter**		**Rübe: Position des größten Durchmessers**	*Instead of 17. Radish: Shape* *NL: No replacement of 17*		
PQ	**(b)**	towards apex		zur Spitze hin		Rex *(add. DE)*	3
		at middle		in der Mitte		Runder weißer, Sutong *(add. DE)*	5
		towards base		zur Basis hin			7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
new 17b.		**Radish: length in relation to diameter**		**Rübe: Länge im Verhältnis zu Durchmesser**	*Instead of 17. Radish: Shape*		
(+)		*NL:* **Ratio length/diameter**			*NL: In addition to 17*		
PQ	**(b)**	very small		sehr klein			1
		small		klein		Runder weißer	3
		medium		mittel		Noir gros rond d'hiver	5
		large		groß		Sutong	7
		very large		sehr groß		Unicorn	9
new 18.	**VG**	**Radish: position in soil**		**Rübe: Sitz im Boden**			
(+)							
QN	**(b)**	very shallow		sehr flach			1
		shallow		flach		Minowase Summer Cross Nr. 3	3
		medium		mittel		Runder weißer	5
		deep		tief			7
		very deep		sehr tief			9
		DE : Please see for comparison Beetroot Guideline					
		NL: Agrees to add char.					
19.	**VG**	**Radish: shape of crown**	**Racine : forme de la partie supérieure**	**Rübe: Kopfform**	**Raiz: forma de la parte superior**		
(+)							
PQ	**(b)**	flat	aplatie	flach	aplanada	Minowase Summer Cross Nr. 3	1
		rounded	arrondie	abgerundet	redondeada	Rex	2
		conical	conique	~~kegelförmig~~ konisch	conica	Mantanghong *(DE: add.)*	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
20. (+)	**VG**	**Radish: shape of base**	**Racine : forme de la base**	**Rübe: Form der Basis**	**Raiz: forma de la base**		
PQ	**(b)**	narrow acute	aigue étroite	schmal spitz	aguda angosta	Minowase Summer Cross Nr. 3	1
		acute	aigue	spitz	aguda	~~Münchner Bier~~ *(DE: withdrawn)*, Fridolin weiß *(DE: add.)*	2
		obtuse	obtuse	stumpf	obtusa	Ninja, Tama Winter	3
		rounded	arrondie	abgerundet	redondeada	Noir gros rond d'hiver	4
		flat	plate	eben	plana	Jumbo Scarlet	5
21. (*)	**VG**	**Radish: color of skin**	**Racine : couleur de l'épiderme**	**Rübe: Farbe der Haut**	**Raiz: color de la epidermis**		
PQ	**(b)**	white	blanc	weiß	blanco	Rex	1
		yellow	jaune	gelb	amarillo		2
		brown	brun	braun	marron		3
		pink	rose	rosa	rosa	De cinq semaines rose 3	4
		red	rouge	rot	rojo		5
		~~carmine~~ dark pink red		dunkelrosarot		Ostergruß rosa 2	6
		purple	pourpre	purpurn	purpura		7
		violet	violet	violett	violeta	Hilds blauer Herbst und Winter, Violet de Gournay	8
		black	noir	schwarz	negro	Noir gros rond d'hiver	9
		NL: ~~green~~	~~vert~~	~~grün~~		~~Green Meat~~	~~10~~

DE: to add green = Note 10 ; Example variety "Green Meat"
All: to give example varities for note 2, 3 and 7

NL: Green Meat is an example of a white color of skin with a very large and strong green shoulder (char. 22) DE agrees
Furthermore it must be made very clear what the difference is between "pink", "dark pink red", "purple" and "violet"
DE : For discrimintion of reddish colors please refer to TGP 14/1 draft 3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
22.	**VG**	**White Radish only: Radish: green color of shoulder**	**Variétés à racine blanche seulement: Racine: couleur verte du collet**	**Nur Sorten mit weißen Rüben: Rübe: Grünfärbung des Kopfes**	**Solo variedades de raiz blanca: Raiz: color verde del cuello**		
QN	**(b)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Minowase Summer Cross Nr. 3	1
		weak	faible	gering	débil	Omny	3
		medium	moyenne	mittel	medio	Halblanger weißer Sommer	5
		strong	forte	stark	fuerte	~~Münchner Bier~~ *(withdrawn in DE)*	7
		very strong	très fort	sehr stark	muy fuerte	*NL:* Green Meat	9
23.	**VG**	**White radish varieties only: Radish: anthocyanin coloration**	**Variétés à racine blanche seulement : Racine : pigmentation anthocyanique**	**Nur weiße Rettichsorten: Rübe: Anthocyan-färbung**	**Solo variedades de raiz blanca: Raiz: pigmentacion antociana**		
QL	**(b)**	absent	absente	fehlend	ausente	Rex	1
		present	présente	vorhanden	presente	Neckarruhm weiß	9
24.	**VG**	**Radish: ridging of surface**	**Racine : annelé de la surface**	**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 Nr. 3	1
		weak	faible	gering	débil		3
		medium	moyen	mittel	media	Halblanger weißer Sommer	5
		strong	fort	stark	fuerte	~~Münchner Bier~~ *(Withdrawn in DE)*	7
		very strong	très fort	sehr stark	muy fuerte		9
25.	**VG**	**Radish: color of the flesh**	**Racine : couleur de la chair**	**Rübe: Farbe des Fleisches**	**Raiz: color de la pulpa**		
PQ	**(b)**	translucent white	blanc vitreux	glasigweiß	blanco traslucido	Rex	1
		opaque white	blanc mat	mattweiß	blanco opaco	Noir gros long d'hiver de Paris	2
		green	vert	grün	verde	Green Meat	3
		red	rouge	rot	rojo	Mantanghong	4

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
26. (*) (+)	**VG**	**Time of harvest maturity**	**Epoque de maturité de récolte**	**Zeitpunkt der Erntereife**	**Fecha de madurez de cosecha**	*NL: to delete char . 26*	
QN		early	précoce	früh	temprana	Ostergruß rosa 2	3
		medium	moyenne	mittel	media	Rex	5
		late	tardive	spät	tardia	Noir gros rond d'hiver	7
27. (+)	**VG C**	**Radish: tendency to become pithy**	**Racine : tendance à se creuser**	**Rübe: Neigung zum Pelzigwerden**	**Raiz: tendencia a ahuecarse**		
PQ	**(b)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil		1
		medium	moyenne	mittel	media		2
		strong	forte	stark	fuerte	Rex	3

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) 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 when the radish is fully developed (see ad. 26).

8.2 Explanations for individual characteristics

Ad. 1: 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. 7: Leaf blade: shape

Explanation of how to consider shape of lobes

DE: Any proposals for clarification? Is clarification needed?
NL: see above. We do not need a char. for shape of the leaves

Ad. 8: Leaf blade: color

TWV 2007: Photos to be provided

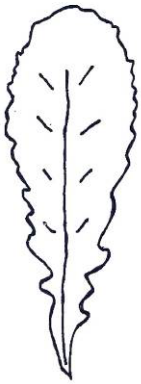
DE: All are invited to provide appropriate photos. We try to produce some although usefulness might be questionable in general.
NL: No use to have photos

Ad. 9: Leaf blade: intensity of color

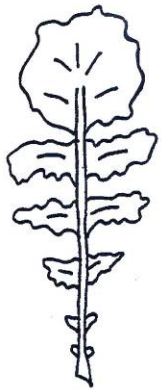
TWV 2007: Photos to be provided.

DE: All are invited to provide appropriate photos. We try to produce some although usefulness might be questionable in general.
NL: No need to have photos

Ad. 10: Leaf blade: lobes (division to midrib)

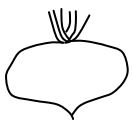


1
absent

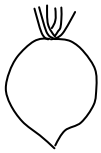


9
present

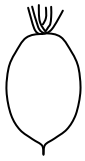
Ad. 17: Radish: shape



1
transverse elliptic



2
circular



3
elliptic

4
narrow elliptic

5
obovate

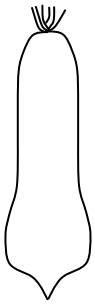
6
rectangular

7
obtriangular

8
narrow obtriangular

9
iciclical

10
ovate

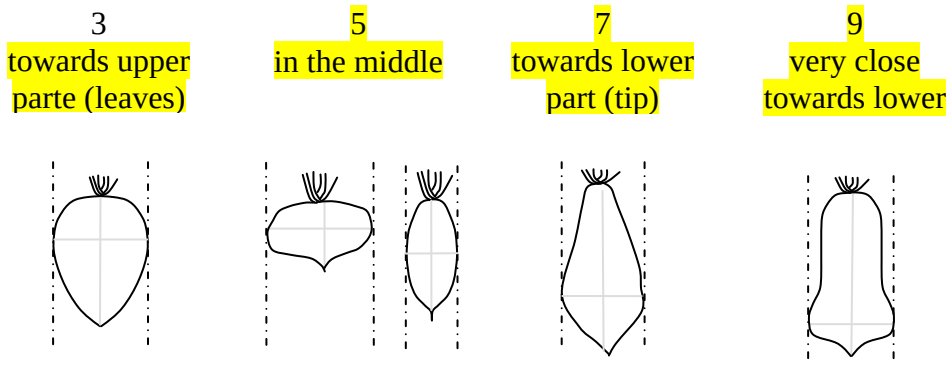


11
~~pear-shaped~~

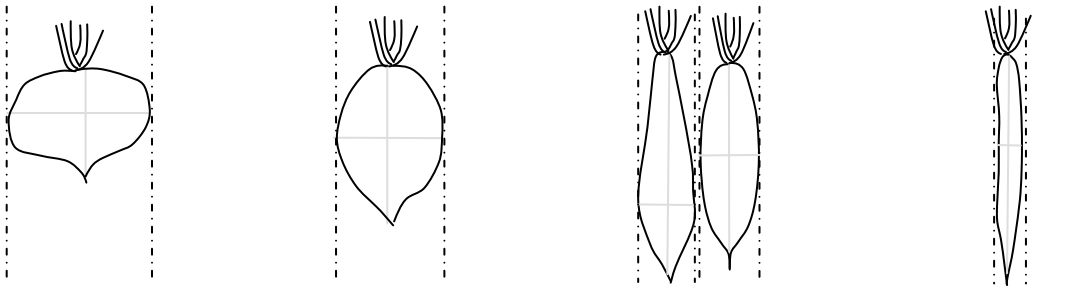
DE: all are invited to propose a better wording for note 11

NL: to add "transverse broad elliptic" between "transverse elliptic" and "circular", Note 11: "bellshaped" instead of "pearshaped"

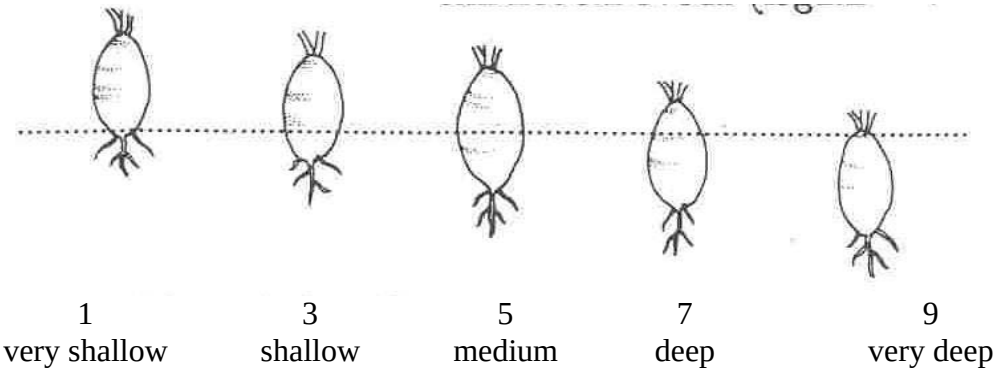
Ad. 17a (new): Radish: position of maximum diameter



Ad 17b. (new) Radish: length in relation to diameter



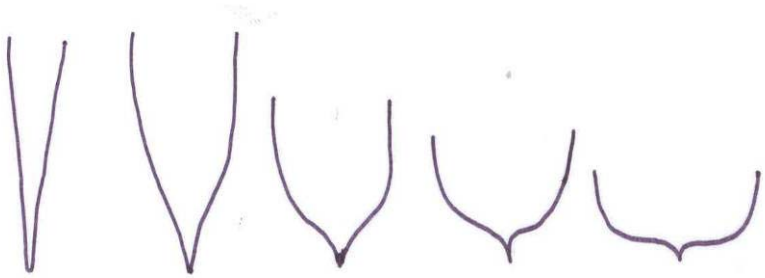
Ad. 18(new): Radish: position in soil



Ad. 19: Radish: shape of crown

1	2	3
flat	rounded	conical

Ad. 20: Radish: shape of base



1	2	3	4	5
narrow acute	acute	obtuse	rounded	flat

Ad. 26: Time of harvest maturity

Due to the different types of black radish it is difficult to fix this characteristic appropriately for all types. (We harvest the plants when the crown is about 6 cm for big radishes and 3 cm for small bunching types).
DE: We appreciate very much your comments concerning this point.
TWV 2007: Explanation to be improved or characteristic to be deleted
NL: Agree to delete

Ad. 27: Radish: Tendency to become pithy

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 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.
DE: We appreciate very much your comments concerning this point.

9. Literature

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

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

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

In the case of hybrid varieties which are the subject of an application for plant breeders' rights, and where the parent lines are to be submitted as a part of the examination of the hybrid variety, this Technical Questionnaire should be completed for each of the parent lines, in addition to being completed for the hybrid variety.

1. Subject of the Technical Questionnaire

1.1.1 Botanical name	*Raphanus sativus* L. var. *niger* (Mill.) S. Kerner
1.1.2 Common name	Black Radish
1.2.1 Botanical name	*Raphanus sativus* L. var. *longipinnatus* L.H. Bailey
1.2.2 Common name	

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)
(b) partially known cross [ ]
(please state known parent variety(ies))
(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

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

4.1.4 Other [ ]
(please provide details)

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]

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

(c) Hybrid [ ]

(d) Other [ ]
(please provide details)

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

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

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (1)	**Ploidy**		
	diploid	Halblanger weißer Sommer	2 [ ]
	tetraploid	Rex	4 [ ]
5.2 (2)	**Seedling: anthocyanin coloration of hypotcotyl**		
	absent	Minowase Summer Cross Nr. 3	1 [ ]
	present	Kaiser, Rex	9 [ ]
5.3 (15)	**Radish: length**		
	very short	Runder weißer	1 [ ]
	short	Noir gros ~~long~~ rond d'hiver	3 [ ]
	medium	Gentoku, Neptun,	5 [ ]
	long	Ninja, Servatius,	7 [ ]
	very long	April Cross, Martina	9 [ ]

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

	Characteristics	Example Varieties	Note
5.4 (17)	**Radish: shape**		
	transverse elliptic	~~Jumbo Scarlet~~	1 [ ]
	NL: transverse broad elliptic	Jumbo Scarlet	
	circular	Noir gros rond d'hiver	2 [ ]
	elliptic	Sutong	3 [ ]
	narrow elliptic		
	obovate	~~Münchner Bier~~ (*withdrawn*) Fridolin weiss	5 [ ]
	rectangular	Neptun, Noir long maraîcher,	6 [ ]
	obtriangular	Oval blanc de Munich	7 [ ]
	narrow obtriangular	Rex	8 [ ]
	iciclical	De cinq semaines rose 3, Minowase Summer Cross Nr. 3	9 [ ]
	ovate		10 [ ]
	pearshaped or bellshaped		11 [ ]
5.5 (21)	**Radish: color of skin**		
	white	Rex	1 [ ]
	yellow		2 [ ]
	brown		3 [ ]
	pink	De cinq semaines rose 3	4 [ ]
	red		5 [ ]
	dark pink red	Ostergruß rosa 2	6 [ ]
	purple		7 [ ]
	violet	Hilds blauer Herbst und Winter, Violet de Gournay,	8 [ ]
	black	Noir gros rond d'hiver	9 [ ]
	~~green~~	~~Green Meat~~	~~10~~ [ ]

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

6. Similar varieties and differences from these varieties

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

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

Comments:

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

[#]7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

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

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

9. Information on plant material to be examined or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details for where you have indicated “yes”.

……

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

Applicant’s name

Signature Date

[End of document]