



TG/64/6

INTERNATIONAL UNION
FOR THE PROTECTION
OF NEW VARIETIES OF
PLANTS

UNION INTERNATIONALE
POUR LA PROTECTION
DES OBTENTIONS
VÉGÉTALES

INTERNATIONALER
VERBAND ZUM SCHUTZ
VON PFLANZEN-
ZÜCHTUNGEN

UNIÓN INTERNACIONAL
PARA LA PROTECCIÓN
DE LAS OBTENCIONES
VEGETALES

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

RADISH

*(Raphanus sativus L.
var. sativus Pers.)*

GENEVA
1999

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DATE : 1999-03-23

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These Guidelines should be read in conjunction with document TG/1/2, which contains explanatory notes on the general principles on which the Guidelines have been established.

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I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Raphanus sativus* L. var. *sativus* Pers.

II. Material Required

1. The competent authorities decide when, where and in what quantity and quality the seed required for testing the variety is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must make sure that all customs formalities are complied with. The minimum quantity of seed to be supplied by the applicant in one or several samples should be:

100 g.

The seed should at least meet the minimum requirements for germination capacity, moisture content and purity for marketing seed in the country in which the application is made. The germination capacity should be as high as possible.

2. The plant material must not have undergone any treatment unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

III. Conduct of Tests

1. The minimum duration of tests should normally be two similar growing periods.

2. The tests should normally be conducted at one place. If any important characteristics of the variety cannot be seen at that place, the variety may be tested at an additional place.

3. The tests should be carried out under conditions ensuring normal growth. The size of the plots should be such that plants or parts of plants may be removed for measurement and counting without prejudice to the observations which must be made up to the end of the growing period. Each test should include a total of 200 plants which should be divided between two or more replicates. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions.

4. Additional tests for special purposes may be established.

IV. Methods and Observations

1. Unless otherwise indicated, all observations determined by measurement, weighting or counting should be made on 40 plants or parts taken from each of 40 plants.

2. For the assessment of uniformity of open-pollinated and hybrid varieties relative uniformity standards should be applied.

3. All observations on the cotyledon should be made when the first two leaves are fully developed.
4. All observations on the leaf should be made on fully developed leaves at harvest maturity.
5. All observations on the radish should be made at start of hollowness.

V. Grouping of Varieties

1. The collection of varieties to be grown should be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety. Their various states of expression should be fairly evenly distributed throughout the collection.
2. It is recommended that the competent authorities use the following characteristics for grouping varieties:
 - (a) Ploidy (characteristic 1)
 - (b) Radish: shape of base (characteristic 21)
 - (c) Radish: coloration of skin (characteristic 22)
 - (d) Bi-colored radishes only: Radish: extent of white tip (characteristic 25)

VI. Characteristics and Symbols

1. To assess distinctness, uniformity and stability, the characteristics and their states as given in the Table of Characteristics should be used.
2. Notes (numbers), for the purposes of electronic data processing, are given opposite the states of the different characteristics.
3. Legend:
 - (*) Characteristics that should be used on all varieties in every growing period over which the examinations are made and always be included in the variety descriptions, except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible.
 - (+) See Explanations on the Table of Characteristics in Chapter VIII.

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

English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
1. Ploidy (*)	Ploïdie	Ploidie	Ploidía		
diploid	diploïde	diploid	diploide	Amored, Arista	2
tetraploid	tétraploïde	tetraploid	tetraploide	Boy, Simox	4
2. Seedling: antho- cyanin coloration of hypocotyl (*)	Plantule: pigmen- tation anthocyani- que de l'hypocotyle	Keimpflanze: Anthocyanfärbung des Hypokotyls	Plántula: pigmen- tación antociánica del hipocotilo		
absent	absente	fehlend	ausente		1
present	présente	vorhanden	presente	Cerise	9
3. Cotyledon: size	Cotylédon: taille	Keimblatt: Größe	Cotiledón: tamaño		
small	petit	klein	pequeño	Cerise, Saxa 2	3
medium	moyen	mittel	mediano	Korund, Rota	5
large	grand	groß	grande	Boy, Fanal	7
4. Foliage: width of attachment	Feuillage: largeur de l'attache au collet	Laub: Breite des Ansatzes	Follaje: anchura de la inserción al cuello		
narrow	fine	schmal	estrecha	Flamino	3
medium	moyenne	mittel	media	Amored	5
wide	large	breit	ancha	Rond écarlate	7
5. Leaf: attitude (*)	Feuille: port	Blatt: Haltung	Hoja: porte		
erect	dressé	aufrecht	erecto	Clipo, Karissima, Salto	1
semi-erect	demi-dressé	halbaufrecht	semierecto	Balkar, Balored	3
horizontal	horizontal	waagrecht	horizontal	Bel Image, Ronde Witte	5
6. Leaf: length (*)	Feuille: longueur	Blatt: Länge	Hoja: longitud		
short	courte	kurz	corta	Cerise, Saxa 2	3
medium	moyenne	mittel	media	Amored, Novo	5
long	longue	lang	larga	National 2	7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7. Leaf blade: shape	Limbe: forme	Blattspreite: Form	Limbo: forma		
narrow-obovate	obovale étroit	schmal verkehrt eiförmig	oboval estrecho		1
obovate	obovale	verkehrt eiförmig	oboval	Content, Cyros	3
broad-obovate	obovale large	breit verkehrt eiförmig	oboval ancho	Balkar	5
8. Leaf blade: shape of apex	Limbe: forme du sommet	Blattspreite: Form der Spitze	Limbo: forma del ápice		
pointed	pointu	spitz	puntiagudo		1
rounded	arrondi	abgerundet	redondeado	Neckarperle, Sora	2
9. Leaf blade: hue of green color	Limbe: teinte de la couleur verte	Blattspreite: Ton der Grünfarbe	Limbo: tonalidad del color verde		
absent	absente	fehlend	ausente	Saxa 2	1
yellowish	jaunâtre	gelblich	amarillento	Atlas, Serrida, Scarlet Globe	2
greyish	grisâtre	gräulich	grisáceo	Balored, Flair, Polka	3
10. Leaf blade: intensity of green color	Limbe: intensité de la couleur verte	Blattspreite: Intensität der Grünfärbung	Limbo: intensidad del color verde		
light	faible	hell	claro	Flamino, Gaudio	3
medium	moyenne	mittel	medio	Furabella, Helro	5
dark	forte	dunkel	oscuro	Foxyred	7
11. Leaf blade: number (*) of lobes	Limbe: nombre de lobes	Blattspreite: Anzahl Lappen	Limbo: número de lóbulos		
very few	très petit	sehr gering	muy bajo	Saxa 2	1
few	petit	gering	bajo	Frühwunder, Ilka, Nelson	3
medium	moyen	mittel	medio	Cracou, Salto	5
many	grand	groß	alto		7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
12. Leaf blade: incisions of margin	Limbe: découpures du bord	Blattspreite: Randeinschnitte	Limbo: incisiones del margen		
absent	absentes	fehlend	ausente		1
present	présentes	vorhanden	presente		9
13. Leaf blade: depth of incisions of margin	Limbe: profondeur des découpures du bord	Blattspreite: Tiefe der Randeinschnitte	Limbo: profundidad de las incisiones del margen		
shallow	faible	flach	superficiales	Apolo, Callisto	3
medium	moyenne	mittel	medias	Cracou	5
deep	forte	tief	profundas		7
14. Leaf blade: pubescence	Limbe: pubescence	Blattspreite: Behaarung	Limbo: pubescencia		
weak	faible	gering	débil	Disco, Flamboyant 2	3
medium	moyenne	mittel	media		5
strong	forte	stark	fuerte	Delongpont, Rond écarlate	7
15. Petiole: anthocyanin coloration (*)	Pétiole: pigmentation anthocyanique	Blattstiel: Anthocyanfärbung	Peciolo: pigmentación antociánica		
absent	absente	fehlend	ausente	Fakir	1
present	présente	vorhanden	presente	Flamboyant 2	9
16. Petiole: intensity of anthocyanin coloration	Pétiole: intensité de la pigmentation anthocyanique	Blattstiel: Stärke der Anthocyanfärbung	Peciolo: intensidad de la pigmentación antociánica		
weak	faible	gering	débil	Flamino, Mirabeau	3
medium	moyenne	mittel	media	Forro	5
strong	forte	stark	fuerte	Pernot	7
17. Radish: thickness	Racine: grosseur	Knolle: Dicke	Rabanito: grosor		
thin	fine	dünn	delgado	Gaudry 2	3
medium	moyenne	mittel	medio		5
thick	grosse	dick	grueso	Rond rose à très grand bout blanc	7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18. Radish: width of root	Racine: grosseur du pivot	Knolle: Dicke der Wurzel	Rabanito: grosor de la raíz		
thin	fin	dünn	delgada	Clipo	3
medium	moyen	mittel	media	Apolo, Cerise, Flamboyant 2	5
thick	gros	dick	gruesa		7
19. Radish: shape (* (+)	Racine: forme	Knolle: Form	Rabanito: forma		
transverse elliptic	elliptique transverse	quer elliptisch	elíptica transversal	Fakir, Rond rose à très grand bout blanc	1
circular	circulaire	rund	circular	Cerise, Tinto	2
elliptic	elliptique	elliptisch	elíptica		3
obovate	obovale	verkehrt eiförmig	oboval		4
broad rectangular	rectangulaire large	breit rechteckig	rectangular ancha	Delongpont, De Pontoïse, Pernot	5
rectangular	rectangulaire	rechteckig	rectangular	Clipo, Fluo, Salto	6
narrow rectangular	rectangulaire étroite	schmal rechteckig	rectangular estrecha	Albion, Apolo	7
narrow obtriangular	obtriangulaire étroite	schmal verkehrt dreieckig	obtriangular estrecha		8
iciclical	en glaçon	eiszapfenförmig	en estalactita	Blanche transparente	9
20. Radish: shape of crown	Racine: forme de la partie supérieure	Knolle: Kopfform	Rabanito: forma de la corona		
concave	concave	konkav	cóncava		1
plane	plane	flach	plana	Ascari, Amored	2
convex	convexe	konvex	convexa	Arista	3

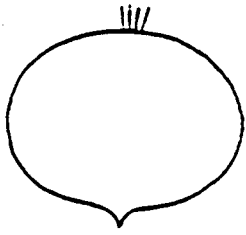
English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21. Radish: shape of base (* (+)	Racine: forme de la base	Knolle: Form der Basis	Rabanito: forma de la base		
narrow acute	pointue étroite	schmal spitz	puntiaguda estrecha	Blanche transparente	1
acute	pointue	spitz	puntiaguda	Flambo	2
obtuse	obtuse	stumpf	obtusa		3
rounded	arrondie	abgerundet	redondeada	Bamba, Callisto	4
flat	aplatie	flach	plana	À forcer rond écarlate	5
22. Radish: coloration of skin (*	Racine: couleur de l'épiderme	Knolle: Farbe der Haut	Rabanito: color de la epidermis		
one colored	unicolore	einfarbig	monocolor	Balored, Cerise	1
bi-colored	bicolore	zweifarbig	bicolor	Flamboyant 2	2
23. Radish: color of upper part (*	Racine: couleur de la partie supérieure	Knolle: Farbe des oberen Teils	Rabanito: color de la parte superior		
white	blanche	weiß	blanco	Blanche transparente	1
pink	rose	rosa	rosa		2
red	rouge	rot	rojo		3
violet	violette	violett	violeta		4
24. Radish: expression of red color of upper part (*	Racine: expression de la couleur rouge de la partie supérieure	Knolle: Ausprägung der roten Farbe des oberen Teils	Rabanito: expresión del color rojo en la parte superior		
vermilion	vermillon	zinnober	bermellón	Flamino	1
scarlet	écarlate	scharlach	escarlata	Fakir, Rota	2
carmine	carmin	karmin	carmín	Parat	3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25. <u>Bi-colored radishes</u> (* <u>only: Radish: extent of white tip</u>)	<u>Radis bicolores</u> <u>seulement: Racine: extension du bout blanc</u>	<u>Nur zweifarbige Radieschen: Knolle: Ausdehnung des Weißanteils</u>	<u>Sólo raíces bicolor: Rabanito: extensión del extremo blanco</u>		
very small	très faible	sehr gering	muy pequeña	Demi-long écarlate à très petit bout blanc 2	1
small	faible	gering	pequeña	Delikat, Flamino	3
medium	moyenne	mittel	media	Fakir, Pépito	5
large	forte	groß	grande	Séraphin	7
very large	très forte	sehr groß	muy grande	Rond rose à très grand bout blanc 2	9
26. <u>Radish: thickness of cortex</u>	<u>Racine: épaisseur du cortex</u>	<u>Knolle: Dicke der Rinde</u>	<u>Rabanito: grosor de la corteza</u>		
thin	fin	dünn	delgada	Karissima	3
medium	moyen	mittel	media	Boy, Fanal, Korund	5
thick	épais	dick	gruesa	Ilka	7
27. <u>Radish: color of flesh</u>	<u>Racine: couleur de la chair</u>	<u>Knolle: Fleischfarbe</u>	<u>Rabanito: color de la pulpa</u>		
translucent	blanc vitreux	glasigweiß	traslúcido	Albion	1
opaque	blanc mat	mattweiß	opaco	Hilmar	2
28. <u>Time of harvest maturity</u> (* <u>maturity</u>)	<u>Époque de maturité de récolte</u>	<u>Zeitpunkt der Erntereife</u>	<u>Época de madurez para cosecha</u>		
very early	très précoce	sehr früh	muy temprana		1
early	précoce	früh	temprana	Apolo, Rota	3
medium	moyenne	mittel	media	Cerise	5
late	tardive	spät	tardía	Flamboyant 2	7
very late	très tardive	sehr spät	muy tardía		9

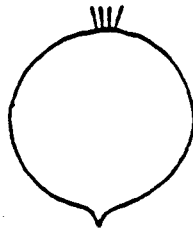
English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29. Radish: tendency to (*) become pithy	Racine: tendance à se creuser	Knolle: Neigung zum Pelzigwerden	Rabanito: tendencia a ahuecarse		
absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Alttox, Carnita	1
weak	faible	gering	débil	Apolo, Flambo,Parat	3
medium	moyenne	mittel	media	Aviso	5
strong	forte	stark	fuerte	Boy, Cherry Belle	7
very strong	très forte	sehr stark	muy fuerte		9

VIII. Explanations on the Table of Characteristics

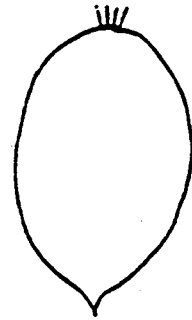
Ad. 19: Radish: shape



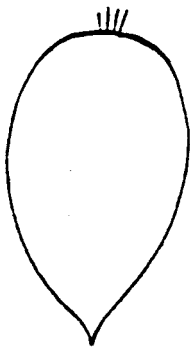
1
transverse elliptic



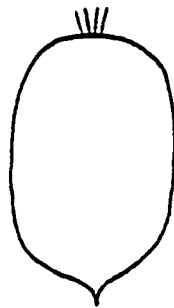
2
circular



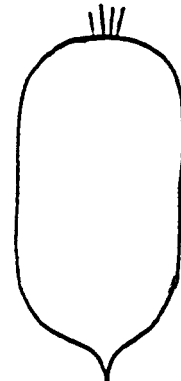
3
elliptic



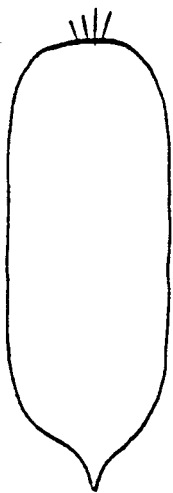
4
obovate



5
broad rectangular



6
rectangular



7
narrow rectangular



8
narrow obtriangular



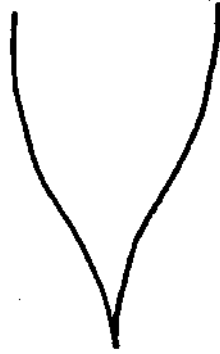
9
iciclical

Ad. 11: Leaf blade: number of lobes: Parts of the leaf blade are considered as lobes if the cutting is at least half the distance between the margin of the leaf and the mid-rib.

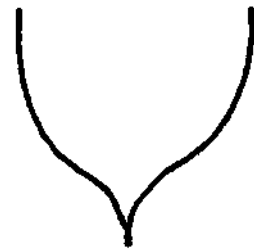
Ad. 21: Radish: shape of base



1
narrow acute



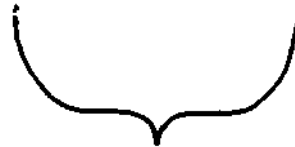
2
acute



3
obtuse



4
rounded



5
flat

IX. Literature

No specific literature.

X. Technical Questionnaire

	<p>Reference Number (not to be filled in by the applicant)</p>
<p style="text-align: center;">TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p>	
1. Species	<p style="text-align: center;"><i>Raphanus sativus</i> L. var. <i>sativus</i> Pers. RADISH</p>
2. Applicant (Name and address)	
3. Proposed denomination or breeder's reference	

4. Information on origin, maintenance and reproduction of the variety

4.1 Origin and breeding method

- | | |
|-----------------------------|-----|
| (a) Open-pollinated variety | [] |
| (b) Single hybrid | [] |
| (c) Three-way hybrid | [] |
| (d) Other (indicate type) | [] |

.....

4.2 Other information

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

Characteristics	Example Varieties	Note
5.1 Ploidy (1)		
diploid	Amored, Arista	2[]
tetraploid	Boy, Simox	4[]
5.2 Radish: shape (19)		
transverse elliptic	Fakir, Rond rose à très grand bout blanc	1[]
circular	Cerise, Tinto	2[]
elliptic		3[]
obovate		4[]
broad rectangular	Delongpont, De Pontoïse, Pernot	5[]
rectangular	Clipo, Fluo, Salto	6[]
narrow rectangular	Albion, Apolo	7[]
narrow obtriangular		8[]
iciclical	Blanche transparente	9[]
5.3 Radish: coloration of skin (22)		
one colored	Cerise, Balored	1[]
bi-colored	Flamboyant 2	2[]
5.4 Radish: color of upper part (23)		
white	Blanche transparente	1[]
pink		2[]
red		3[]
violet		4[]

Characteristics	Example Varieties	Note	
5.5 Bi-colored radishes only: (25) Radish: extent of white tip			
very small	Demi-long écarlate à très petit bout long 2	1[]	
small	Delikat, Flamino	3[]	
medium	Fakir, Pépito	5[]	
large	Séraphin	7[]	
very large	Rond rose à très grand bout blanc 2	9[]	
5.6 Time of harvest maturity (28)			
very early		1[]	
early	Apolo, Rota	3[]	
medium	Cerise	5[]	
late	Flamboyant 2	7[]	
very late		9[]	
6. Similar varieties and differences between these varieties			
Denomination of similar variety	Characteristic in which the similar variety is different ^{o)}	State of expression of similar variety	State of expression of candidate variety
^{o)} In the case of identical states of expressions of both varieties, please indicate the size of the difference.			

7. Additional information which may help to distinguish the variety

7.1 Resistance to pests and diseases

7.2 Special conditions for the examination of the variety

7.2.1 Use:

- in glasshouse
- in the open: spring
- summer
- autumn
- winter

7.2.2 Other conditions

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 that question is yes, please attach a copy of such an authorization.

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