



These Test Guidelines have been superseded by a later version. The latest adopted version of Test Guidelines can be found at http://www.upov.int/test_guidelines/en/list.jsp

Ces principes directeurs d'examen ont été remplacés par une version ultérieure. La version adoptée la plus récente des principes directeurs d'examen figure à l'adresse suivante : http://www.upov.int/test_guidelines/fr/list.jsp

Diese Prüfungsrichtlinien wurden durch eine neuere Fassung ersetzt. Die neueste angenommene Fassung von Prüfungsrichtlinien ist unter http://www.upov.int/test_guidelines/de/list.jsp zu finden.

Las presentes directrices de examen han sido reemplazadas por una versión posterior. La versión de las directrices de examen de más reciente aprobación está disponible en http://www.upov.int/test_guidelines/es/list.jsp.



TG/37/10

INTERNATIONAL UNION
FOR THE PROTECTION
OF NEW VARIETIES OF
PLANTS

UNION INTERNATIONALE
POUR LA PROTECTION
DES OBTENTIONS
VÉGÉTALES

INTERNATIONALER
VERBANDZUMSCHUTZ
VON PFLANZEN -
ZÜCHTUNGEN

UNIÓN INTERNACIONAL
PARA LA PROTECCIÓN
DE LAS OBTENCIONES
VEGETALES

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

TURNIP

*(Brassicarapa L.
var. rapa L.)*

GENEVA
2001

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GUIDELINES

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FOR DISTINCTNESS, UNIFORMITY AND STABILITY

TURNIP

**(*Brassica rapa* L.
var. *rapa* L.)**

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 *Brassica rapa* L. var. *rapa* L. with swollen roots.

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:

50g.

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 independent growing cycles.
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. As a minimum, each test should include a total of 60 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, weighing 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. Unless otherwise indicated, all observations on the foliage should be made on fully developed leaves which show no signs of senescence.

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) Leaf: type (characteristic 5)
- (c) Root: color of skin above soil (characteristic 18)
- (d) Root: color of flesh (characteristic 21)
- (e) Root: shape in longitudinal section (characteristic 24).

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 cycle 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.

1) The optimum stage of development (growth key) for the assessment of each characteristic is indicated by a number in the second column. The stages of development (growth key) denoted by each number are described at the end of Chapter VIII.

VII. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tablades caracteres

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades e ejemplo	Note/ Nota
1. 00 (*)	Ploidy	Ploidie	Ploidie	Ploidía		
	diploid	diploïde	diploid	diploide	Milan White	2
	tetraploid	tétraploïde	tetraploid	tetraploide	Taronda	4
2. 100-130	Leaf: attitude	Feuille: port	Blatt: Stellung	Hoja: porte		
	erect	dressé	aufrecht	erecto	Samson	1
	semi-erect	demi-dressé	halbaufrecht	semierecto	Agressa	3
	horizontal	horizontal	waagrecht	horizontal	Teltower Kleine	5
3. 100-130 (+)	Leaf: reflexing of top	Feuille: enroulement du sommet	Blatt: Umbiegen der Spitze	Hoja: curvatura del ápice		
	absent or very weak	nul ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil	Tigra	3
	medium	moyen	mittel	media		5
	strong	fort	stark	fuerte	Noir long	7
	very strong	très fort	sehr stark	muy fuerte		9
4. 100-130 (*)	Leaf: greencolor	Feuille: couleur verte	Blatt: Grünfärbung	Hoja: color verde		
	very light	très claire	sehr hell	muy claro		1
	light	claire	hell	claro	Leielander	3
	medium	moyenne	mittel	medio	Bency	5
	dark	foncée	dunkel	oscuro	Frisia	7
	very dark	très foncée	sehr dunkel	muy oscuro	Aberdeen Green Top Yellow	9
5. 100-130 (*) (+)	Leaf: type	Feuille: type	Blatt: Lappung	Hoja: tipo		
	entire	entière	fehlend	entera	Polybra	1
	lobed	lobée	vorhanden	lobulada	Samson	2

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedadesejemplo	Note/ Nota
6. 100-130 (+)	<u>Lobed-leaf varieties only</u> : Leaf: number of lobes	<u>Uniquement variétés à feuilles lobées</u>: Feuille: nombre de lobes	<u>Nur beigelappten Sorten</u>: Blatt: Anzahl Lappen	<u>Sólo para variedades de hoja lobulada</u>: Hoja: número de lóbulos		
	few	petit	gering	bajo	TokyoTop	3
	medium	moyen	mittel	medio	DeMontesson	5
	many	grand	groß	alto	AberdeenGreenTop Yellow	7
7. 100-130 (+)	<u>Entire-leaf varieties only</u> : Leaf: depth of incision of blade base	<u>Uniquement variétés à feuilles entières</u>: Feuille: profondeur des incisions à la base du limbe	<u>Nur beinicht gelappten Sorten</u> : Blatt: Tiefeder Einschnitt der Blattspaltenbasis	<u>Sólo para variedades de hoja entera</u>: Hoja: profundidad de las incisiones en la base del limbo		
	very shallow	très peu profondes	sehr gering	muy poco profundas	Alander	1
	shallow	peu profondes	gering	poco profundas	MilanWhite	3
	medium	moyennes	mittel	medias	Teutonengold	5
	deep	profondes	tief	profundas	TokyoMarket	7
	very deep	très profondes	sehr tief	muy profundas	Polybra	9
8. 100-130 (+)	Leaf: undulation of margin	Feuille: ondulation du bord	Blatt: Wellung des Randes	Hoja: ondulación del borde		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	TokyoCross	1
	weak	faible	gering	débil	TokyoTop	3
	medium	moyenne	mittel	media	Frisia	5
	strong	forte	stark	fuerte	Cylon	7
	very strong	très forte	sehr stark	muy fuerte	ImperialGreenGlobe	9
9. 100-130 (+)	Leaf: dentation of margin	Feuille: denture du bord	Blatt: Zähnung des Randes	Hoja: dentado del borde		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil	MilanWhite	3
	medium	moyenne	mittel	medio	Polybra	5
	strong	forte	stark	fuerte	Taronda	7
	very strong	très forte	sehr stark	muy fuerte	Appin	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades de ejemplo	Note/ Nota
10. 100-130 (* (+)	Leaf: length	Feuille: longueur	Blatt: Länge	Hoja: longitud		
	short	courte	kurz	corta	Milan White Forcing	3
	medium	moyenne	mittel	media	Tokyo Cross	5
	long	longue	lang	larga	Tyfon	7
11. 100-130 (+)	Leaf: width	Feuille: largeur	Blatt: Breite	Hoja: anchura		
	narrow	étroite	schmal	estrecha	De Milan rouge extra hâtif achassis	3
	medium	moyenne	mittel	media	Maschinella	5
	broad	large	breit	ancha	Tyfon	7
12. 100-130	<u>Lobed-leaf varieties only</u> : Leaf: length of terminal lobe	<u>Uniquement variétés à feuilles lobées</u>: Feuille: longueur du lobe terminal	<u>Nur beigelappten Sorten</u>: Blatt: Länge des Endlappens	<u>Sólo para variedades de hoja lobulada</u>: Hoja: longitud del lóbulo terminal		
	short	court	kurz	pequeña	Platte Witte Mei	3
	medium	moyen	mittel	media	Snowball	5
	long	long	lang	grande	Tyfon	7
13. 100-130	<u>Lobed-leaf varieties only</u> : Leaf: width of terminal lobe	<u>Uniquement variétés à feuilles lobées</u>: Feuille: largeur du lobe terminal	<u>Nur beigelappten Sorten</u>: Blatt: Breite des Endlappens	<u>Sólo para variedades de hoja lobulada</u>: Hoja: anchura del lóbulo terminal		
	narrow	étroit	schmal	estrecha	Platte Witte Mei	3
	medium	moyen	mittel	media	Civasto R	5
	broad	large	breit	ancha	Massif	7

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedadesejemplo	Note/ Nota
14. 100-130	Leaf:hairinessof upper side	Feuille:pilositéde laface supérieure	Blatt:Behaarung derOberseite	Hoja:vellosidad del haz		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Appin	1
	weak	faible	gering	débil	Teutongold, Tokyo Market	3
	medium	moyenne	mittel	media	De Milan rouge extra hâtif achassis	5
	strong	forte	stark	fuerte	Blanc dur d'hiver, Blanc plathâtif a feuille entière	7
	very strong	très forte	sehr stark	muy fuerte	Hampshire Hardy, Green Round	9
15. 100-130	Leaf:anthocyanin coloration	Feuille: pigmentation anthocyanique	Blatt: Anthocyanfärbung	Hoja: pigmentación antociánica		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Leielander	1
	weak	faible	gering	débil	Bency	3
	medium	moyenne	mittel	media	The B ruce	5
	strong	forte	stark	fuerte	Scarlet Ball	7
	very strong	très forte	sehr stark	muy fuerte	Tsutsui	9
16. 260-290 (* (+)	Root:positionin soil	Racine:position dans le sol	Rübe:Sitzim Boden	Raíz:posición dentrodelsuelo		
	very shallow	très peu profonde	sehr flach	muy poco profunda	Milan White Forcing	1
	shallow	peu profonde	flach	poco profunda	Oasis	3
	medium	moyenne	mittel	media	Agressa	5
	deep	profonde	tief	profunda	Noir long	7
	very deep	très profonde	sehr tief	muy profunda	Teltower Kleine	9
17. 280 (*	Root:thickcork layer around skin	Racine:couche subéreuse sur l'épiderme	Rübe:Dicke Korkschicht auf der Haut	Raíz:capa suberosa sobre la piel		
	absent	absente	fehlend	ausente	Bency	1
	present	présente	vorhanden	presente	Noir long	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18. 240-260 (*)	Root:color of skin above soil	Racine:couleur de l'épiderme de la partie hors du sol	Rübe:Farbe der Haut oberhalb des Bodens	Raíz:color de la epidermis fuera del suelo		
	white	blanc	weiß	blanco	Tokyo Cross	1
	green	vert	grün	verde	Leielander	2
	yellow	jaune	gelb	amarillo	Topaz	3
	orange	orange	orange	naranja	Golden Ball	4
	bronze	bronze	bronze	bronce	Grandessa	5
	scarlet	écarlate	scharlachrot	escarlata	Scarlet Ball	6
	reddish purple	pourpre rougeâtre	rötlichviolett	púrpura rojizo	Bency	7
	bluish purple	pourpre bleuâtre	bläulichviolett	púrpura azulado	The Bruce	8
19. 240-260	Root:intensity of coloration of skin above soil	Racine:intensité de la couleur de l'épiderme de la partie hors du sol	Rübe:In tensität der Farbe der Haut oberhalb des Bodens	Raíz:intensidad del color de la piel fuera del suelo		
	light	claire	hell	claro		3
	medium	moyenne	mittel	medio		5
	dark	foncée	dunkel	oscuro		7
20. 240-260	Root:colour of skin below ground	Racine:couleur de l'épiderme de la partie enterrée	Rübe:Farbe der Haut in der Erde	Raíz:color de la epidermis dentro del suelo		
	white	blanc	weiß	blanco	Taronda	1
	yellow	jaune	gelb	amarillo	Teutonengold	2
	red	rouge	rot	rojo	Scarlet Ball	3
	purple	pourpre	purpur	púrpura	Tsutsui	4
21. 240-280 (*)	Root:color of flesh	Racine:couleur de la chair	Rübe:Farbe des Fleisches	Raíz:color de la pulpa		
	white	blanche	weiß	blanco	Agressa	1
	yellow	jaune	gelb	amarillo	Teutonengold	2

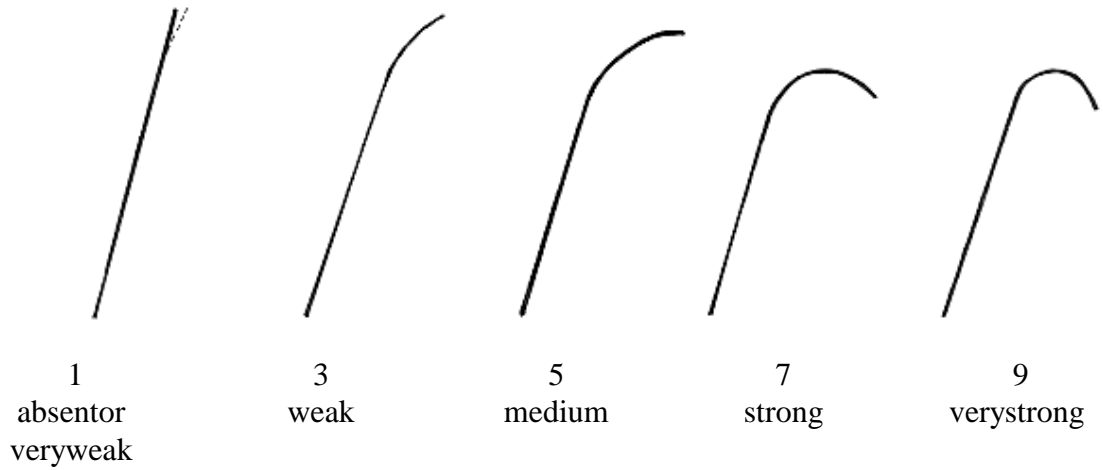
Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22. 240-280	Root: intensity of yellow color of flesh	Racine: intensité de la couleur jaunie de la chair	Rübe: Intensität der Gelbfärbung des Fleisches	Raíz: intensidad del color amarillo de la pulpa		
	light	claire	hell	claro	Findlay	3
	medium	moyenne	mittel	medio	Teutonengold	5
	dark	foncée	dunkel	oscuro	Petrowski	7
23. 240-280	Root: anthocyanin coloration of flesh	Racine: pigmentation anthocyannique de la chair	Rübe: Anthocyan - färbung des Fleisches	Raíz: pigmentación antocianica de la pulpa		
	absent	absente	fehlend	ausente	Marteau	1
	present	présente	vorhanden	presente	ScarletBall, Tsutsui	9
24. 260-280 (* (+)	Root: shape in longitudinal section	Racine: forme en section longitudinale	Rübe: Form im Längsschnitt	Raíz: forma en sección longitudinal		
	transverse narrow elliptic	elliptique transversale étroite	querschmal elliptisch	elíptica estrecha transversal	Platte Witte Mei	1
	transverse elliptic	elliptique transversale	quer elliptisch	elíptica transversal	Milan White	2
	circular	circulaire	rund	circular	Rondo	3
	obovate	obovale	verkehrteiförmig	oboval	Alwi	4
	square	droite	quadratisch	cuadrada	Champion Green Top, Yellow	5
	broad oblong	oblongue large	breit rechteckig	oblonga ancha	Rekord	6
	narrow oblong	oblongue étroite	schmal rechteckig	oblonga estrecha	Longd'Alsace	7
obtriangular	obtriangulaire	verkehrt dreieckig	obtriangular	Sirius	8	
25. 260-280 (*	Root: length	Racine: longueur	Rübe: Länge	Raíz: longitud		
	very short	très courte	sehr kurz	muycorta	Milan White	1
	short	courte	kurz	corta	The Wallace	3
	medium	moyenne	mittel	media	Dynamo	5
	long	longue	lang	larga	Taronda	7
very long	très longue	sehr lang	muylarga	Alander	9	

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
26. 260-280 (* (*)	Root: diameter (at widest point)	Racine: diamètre (de la partie la plus large)	Rübe: Durchmesser (an der breitesten Stelle)	Raíz: diámetro (en la parte más ancha)		
	small	étroit	klein	pequeña	Hakutaka	3
	medium	moyen	mittel	media	Rondo	5
	large	large	groß	grande	Massif	7
27. 260-280 (* (+)	Root: position of widest point	Racine: position relative de la partie la plus large	Rübe: Position der breitesten Stelle	Raíz: posición de la parte más ancha		
	above middle	au-dessus du milieu	oberhalb der Mitte	encima de la mitad	Marteau	1
	at middle	au centre	in der Mitte	en la mitad	Taronda	2
	below middle	dans la partie basse	unterhalb der Mitte	debajo de la mitad	Blanc dur d'hiver	3
28. 260-280 (* (+)	Root: curvature of main axis	Racine: courbure de l'axe principal	Rübe: Biegung der Hauptachse	Raíz: curvatura del eje principal		
	absent	absente	fehlend	ausente	Taronda	1
	present	présente	vorhanden	presente	DeCroissy	9
29. 260-280 (* (+)	Root: shape of top	Racine: forme du collet	Rübe: Form des Kopfes	Raíz: forma del cuello		
	strongly indented	fortement déprimé	stark eingesenkt	muy hundido		1
	indented	déprimé	ingesenkt	hundido	Milan White Forcing	3
	flat	plat	eben	plano	Milan White	5
	raised	protubérant	vorgewölbt	prominente	Taronda	7
	strongly raised	fortement protubérant	stark vorgewölbt	muy prominente	Agressa	9
30. 260-280 (* (+)	Root: shape of base	Racine: forme de la base	Rübe: Form der Basis	Raíz: forma de la base		
	indented	déprimée	ingesenkt	hundida	Milan White Forcing	1
	truncate	tronquée	gerade	truncada	Milan White	3
	rounded	arrondie	abgerundet	redondeada	Frisia	5
	obtuse	obtuse	stumpf	obtusa	Sirius	7
	pointed	pointue	spitz	puntiaguda	Noir long	9

Stage ¹⁾ Stade ¹⁾ Stadium ¹⁾ Estadio ¹⁾	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31. 220-260	Root: time of harvest maturity	Racine: époque de maturité de la récolte	Rübe: Zeitpunkt der Erntereife	Raíz: época de madurez para la cosecha		
	early	précoce	früh	precoz	Oasis	3
	medium	moyenne	mittel	media	Jaune Tankard	5
	late	tardive	spät	tardía	Aberdeen Green Top Yellow	7

VIII. ExplanationsontheTableofCharacteristics

Ad.3:Leaf:reflexingoftop



Ad.5:Leaf:type



1 entire 2 lobed

Assessment of leaf lobing should be undertaken on several leaves of the plant.

Plants with absent lobes have usually obovate and spatulate shaped leaves. These have continuous laminar tissue to the base of the leaf, no terminal lobe and may be strongly incised.

Ad.6:Lobed -leafvarietiesonly:Leaf:numberoflobes

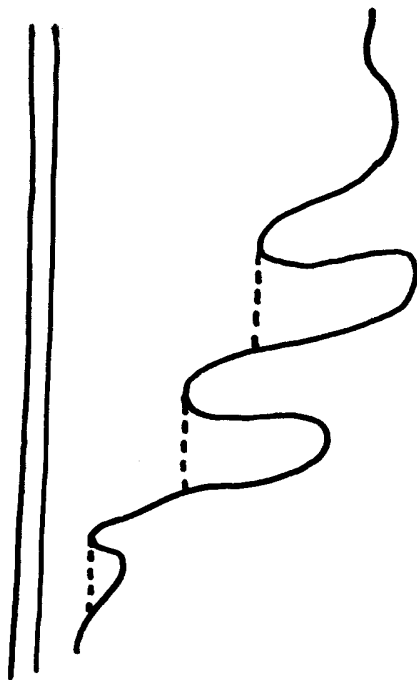


Figure1

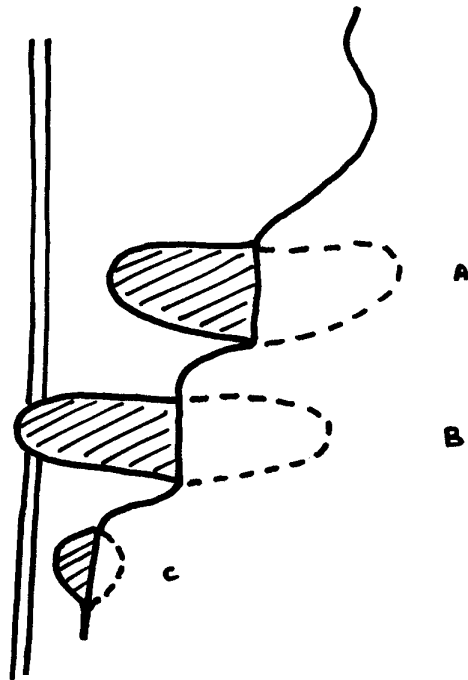


Figure2

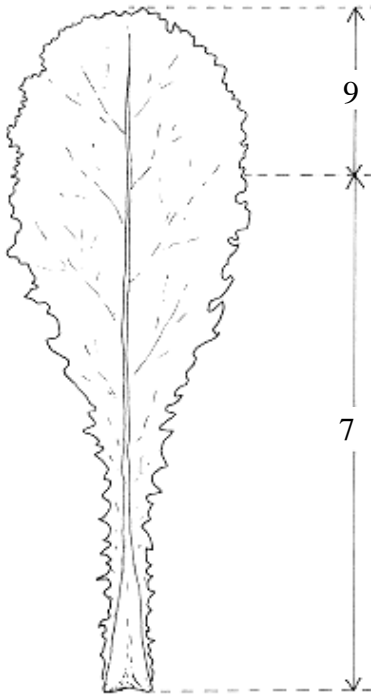
To determine whether part of the leaf is a lobe, fold that part along a line parallel to the midrib as indicated by the dotted line in figure 1. The fold starts at the base of the shorter side.

If the folded tissue meets the midrib, it is a lobe (figure 2). A lobe must have a minimum length of 1 cm.

- A is not a lobe as it does not meet the midrib when folded
- B is a lobe as it meets the midrib when folded
- C is too small to be a lobe as it is less than 1 cm in length and does not meet the midrib when folded.

Ad.7:Entire -leafvarietiesonly:Leaf:depthofincisionsofbladebase

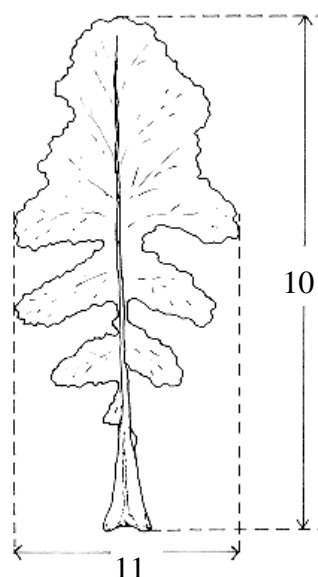
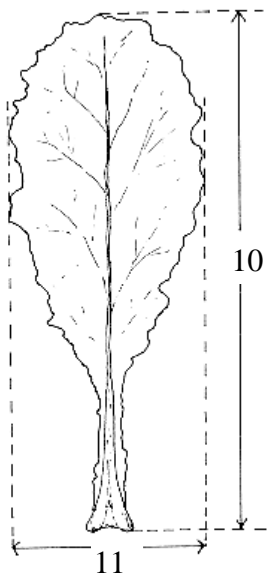
Ad.9:Leaf:dentationofmargin



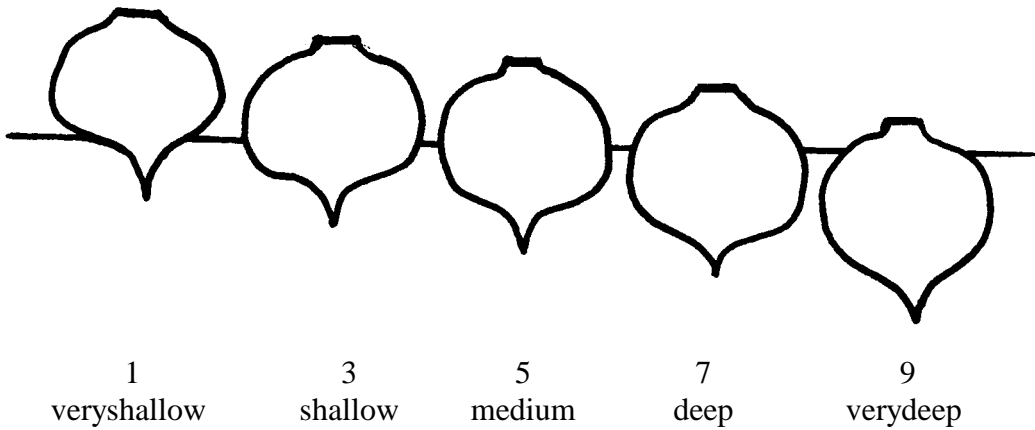
part on which the dentations should be recorded
(characteristic 9)

part on which the incisions of base of the blade should be recorded (characteristic 7)

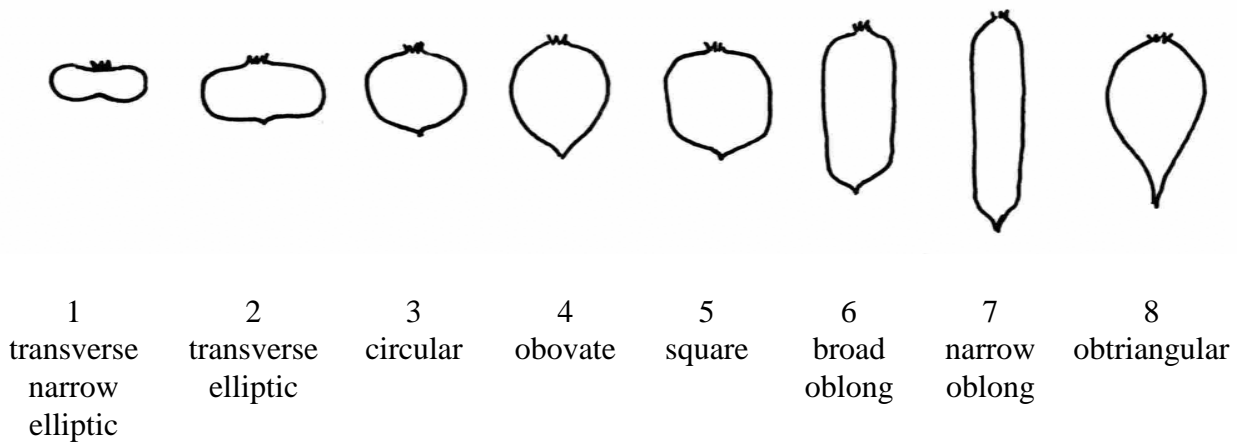
Ad.10,11:Leaf:length(10),width(11)



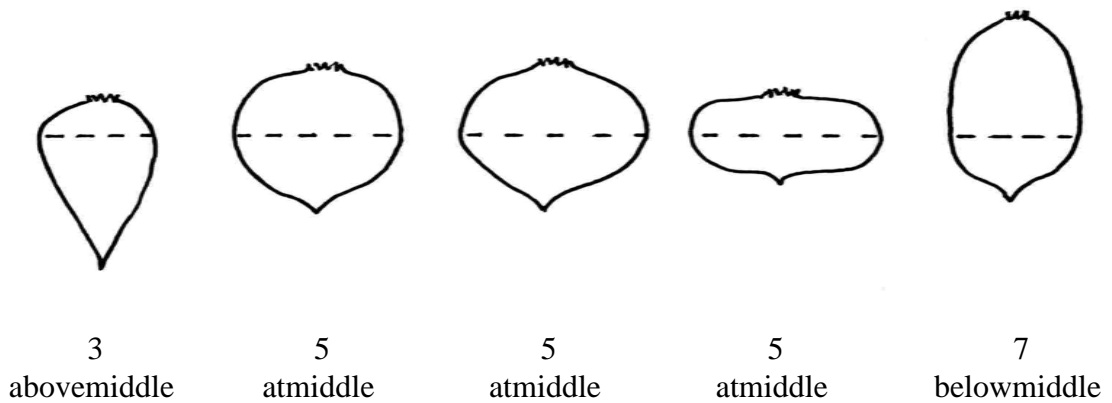
Ad.16:Root:positioninsoil



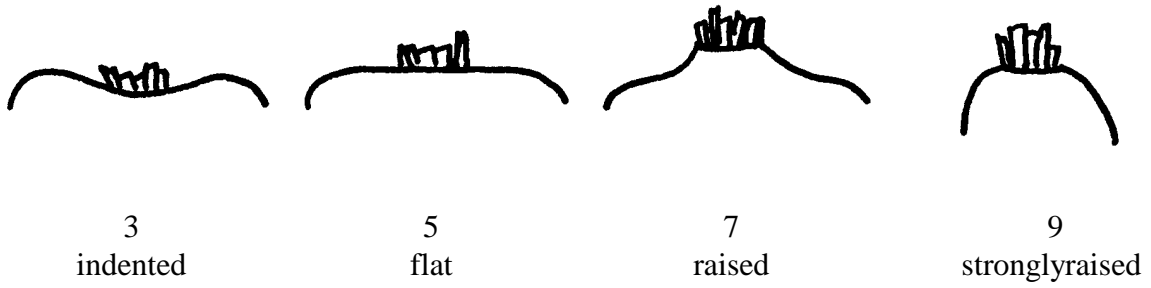
Ad.24:Root:Shapeinlongitudinalsection



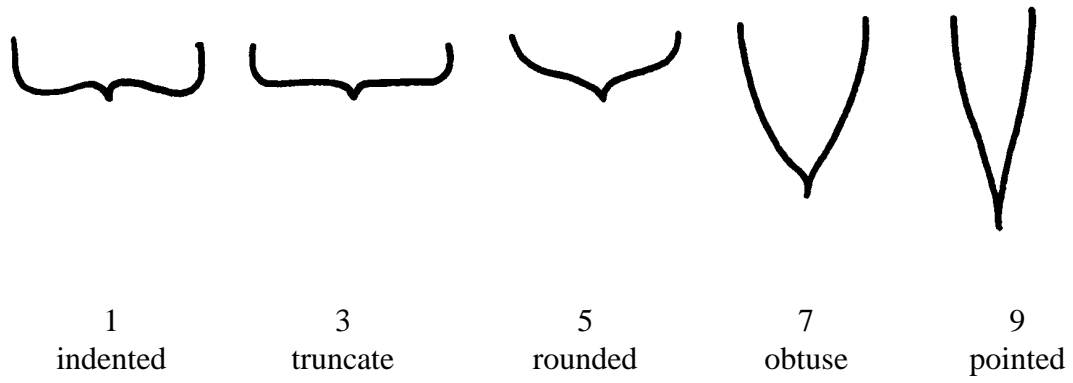
Ad.27:Root:positionofwidestpoint



Ad.29:R oot:shapeoftop



Ad.30:Root:shapeofbase



KeytoGrowthStages

00 Dryseed

1-10 Germinationandemergence throughsoil

Seedlinggrowth

12 Elongationofemergingshoot

15 Elongationandopeningofcotyledons

20 Cotyledonsfullyopened

30 Cotyledonsfullyopenedandfulldevelopmentoffirsttrueleaf

40 Secondleaffullydeveloped

50 Thirdleaffullydevelopedandinitialsenescenceofcotyledons

60 Fourthleaffullydevelopedandpartialsenescenceofcotyledons

70 Fifthleaffullydevelopedandadvancedsenescence/dropofcotyledons

Leafdevelopment

80 Sixthleaffullydeveloped

90 Seventhleaffullydeveloped; initialsenscencenofirsttrueleafinearlycultivars

100 Eighthleaffullydeveloped; 30%senescenceoffirsttrueleaf

110 Ninthleaffullydeveloped; 60%senescenceoffirsttrueleaf

120 Tenthleaffullydeveloped; completesenscencenanddropoffirsttrueleaf

130 Eleventhleaffullydeveloped.

Rootdevelopment

200 Slightswellingoftherootatgroundlevel

220 Developmentofasmallswollenrootabovegroundlevel

240 Swollenrootincreasinginsizebutnotfullydeveloped

260 Rootfullydevelopedwithnocorkonskin

270 Rootfullydevelopedwith40% corkdevelopmentonskin

280 Rootfullydevelopedwith80 -100% corkdevelopment

290 Rootfleshbecomingpithyandfibrous

300 Rootfleshpithyandfibrous

Floweringandseedproductiononmainstem

310 Initialformationandelongationofthefloweringstem

330 Elongationofthefloweringstemwithclearspacebetweenleaves

350 Firstbudformationandfurtherelongationofstem

360 Terminalinflorescenceinbud

370 Terminalinflorescence withfirstopenflower

380 Terminalinflorescencepartiallyflowering

400 Terminalinflorescencefullyflowering

420 Developmentofsiliquawithelongationoffloweringstem

430 Lowestfullydevelopedsiliquagreen

450 Lowestfullydevelopedsiliquasenesc ingandgoingbrown

475 Lowestfullydevelopedsiliquadrywithseedbeginningtodry

500 Lowestfullydevelopedsiliquadrywithmaturedryseed

IX. Literature

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Green, F. N. and Winfield, P. J., 1984: The Development of Distinctness, Uniformity and Stability tests for Turnip, Turnip Rape and Swede in the United Kingdom. Procedures of Better Brassicas '84 Conference. St. Andrews. Eds. W. H. Macfarlane Smith, T. Hodgkin and A. B. Wills. 96 -107. Scottish Crop Research Institute, Dundee.

Kajanus, B., 1913: Über die Vererbungsweise gewisser Merkmale der Beta - und Brassica-Rüben. II Brassica. Zeitschrift für Pflanzenzüchtung, Band I(4):419 -466.

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McMaster Davey, V., 1931: Color Inheritance in Swedes and Turnips and its Bearing on the Identification of Commercial Stocks. Nat. Journ. Agric. XIV(3):1 -13.

X. Technical Questionnaire

	Reference Number (not to be filled in by the applicant)
<p>TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p>	
1. Species	<p><i>Brassicarapa</i> L. var. <i>.rapa</i> L. TURNIP</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	MilanWhite	2[]
tetraploid	Taronda	4[]
5.2 Leaf:greencolor (4)		
verylight		1[]
light	Leielander	3[]
medium	Bency	5[]
dark	Frisia	7[]
verydark	AberdeenGreenTopYellow	9[]
5.3 Leaf:type (5)		
entire	Polybra	1[]
lobed	Samson	2[]
5.4 Leaf:length (10)		
short	MilanWhiteForcing	3[]
medium	TokyoCross	5[]
long	Tyfon	7[]
5.5 Root:positioninsoil (16)		
veryshallow	MilanWhiteForcing	1[]
shallow	Oasis	3[]
medium	Agressa	5[]
deep	Noirlong	7[]
verydeep	TeltowerKleine	9[]

Characteristics	Example Varieties	Note
5.6 Root:thickcorklayeraroundskin (17)		
absent	Bency	1[]
present	Noirlong	9[]
5.7 Root:colorofskina bovesoil (18)		
white	TokyoCross	1[]
green	Leielander	2[]
yellow	Topaz	3[]
orange	GoldenBall	4[]
bronze	Grandessa	5[]
scarlet	ScarletBall	6[]
reddishpurple	Bency	7[]
bluishpurple	TheBruce	8[]
5.8 Root:color offlesh (21)		
white	Agressa	1[]
yellow	Teutonengold	2[]
5.9 Root:shapeinlongitudinalsection (24)		
transversenarrowelliptic	PlatteWitteMei	1[]
transverseelliptic	MilanWhite	2[]
circular	Rondo	3[]
obovate	Alwi	4[]
square	ChampionGreenTopYellow	5[]
broadoblong	Rekord	6[]
narrowoblong	Longd'Alsace	7[]
obtriangular	Sirius	8[]

Characteristics	Example Varieties	Note
5.10 Root:length (25)		
veryshort	MilanWhite	1[]
short	TheWallace	3[]
medium	Dynamo	5[]
long	Taronda	7[]
verylong	Alander	9[]
5.11 Root:diameter(atwidestpoint) (26)		
small	Hakutaka	3[]
medium	Rondo	5[]
large	Massif	7[]
5.12 Root:positionofwidestpoint (27)		
abovemiddle	Marteau	3[]
atmiddle	Taronda	5[]
belowmiddle	Blancdurd'hiver	7[]
5.13 Root:shapeoftop (29)		
stronglyindented		1[]
indented	MilanWhiteForcing	3[]
flat	MilanWhite	5[]
raised	Taronda	7[]
stronglyraised	Agressa	9[]
5.14 Root:shapeofbase (30)		
indented	MilanWhiteForcing	1[]
truncate	MilanWhite	3[]
rounded	Frisia	5[]
obtuse	Sirius	7[]
pointed	Noirlong	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
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^{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 Main use:

- Root Vegetable
- Stubble or Forage Turnip

7.3 Time of Sowing

- Spring sown
- Summer sown
- Autumn sown

7.4 Other information

8. Authorizationforrelease

- (a) Does the variety require prior authorization for release under legislation concerningtheprotectionoftheenvironment,humanandanimalhealth?

Yes No

- (b) H assuchauthorizationbeenobtained?

Yes No

Iftheanswertothatquestionisyes,pleaseattachacopyofsuchanauthorization.

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