



TG/65/4

INTERNATIONAL UNION
FOR THE PROTECTION
OF NEW VARIETIES OF
PLANTS

UNION INTERNATIONALE
POUR LA PROTECTION
DES OBTECTIONS
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

KOHLRABI

*(Brassica oleracea L. convar.
acephala (DC.) Alef. var. gongylodes L.;*
Brassica oleracea L. Gongylodes Group)

GENEVA
2002

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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 Guidelines apply to all varieties of *Brassica oleracea* L. convar. *acephala* (DC.) Alef. var. *gongylodes* L. (*Brassica oleracea* L. *Gongylodes* Group).

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. As a minimum, for each year of the test the following quantity of seed is recommended:

20g. or at least 4,000 seeds.

2. The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should be stated by the applicant.

3. 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 satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination. 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 be designed to result in a total of at least 40 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 part taken from each of 40 plants.

2. The assessment of uniformity for cross -pollinated varieties should be according to the recommendations in the General Introduction.
3. The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations in the General Introduction.
4. All observations on the plant and the leaf should be made before harvest maturity.
5. All observations on the kohlrabi should be made at harvest maturity.

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 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) Seedling: anthocyanin coloration of cotyledons (characteristic 1);
 - (b) Harvest maturity (characteristic 23).

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 expression for each characteristic.
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/Tablă de caractere

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. Seedling: (*) anthocyanin coloration of cotyledons	Plantule: pigmentation anthocyanique des cotylédons	Keimpflanze: Anthocyanfärbung der Keimblätter	Plántula: pigmentación antociánica de los cotiledones		
absent	absente	fehlend	ausente	ExpreßForcer	1
present	présente	vorhanden	presente	Azur-Star	9
2. Seedling: intensity of green coloration of cotyledons	Plantule: intensité de la couleur verte des cotylédons	Keimpflanze: Intensität der Grünfärbung der Keimblätter	Plántula: intensidad del color verde del cotiledón		
light	faible	hell	clara	Erko	3
medium	moyenne	mittel	media	ExpreßForcer	5
dark	forte	dunkel	oscura	Eder	7
3. Petioles: crossing (+)	Pétioles: recouvrement	Blattstiele: Überschlagen	Pecíolos: cruzamiento		
absent	absent	fehlend	ausente	ExpreßForcer	1
present	présent	vorhanden	presente	Delikateßblauer	9
4. Petiole: length (*) (+)	Pétiole: longueur	Blattstiel: Länge	Pecíolo: longitud		
very short	très court	sehr kurz	muy corto	Primavera weiß	1
short	court	kurz	corto	Quickstar, Spree	3
medium	moyen	mittel	medio	Patrick, Rolano	5
long	long	lang	largo	Delikateßblauer	7
very long	très long	sehr lang	muy largo		9
5. Petiole: thickness (in the middle)	Pétiole: épaisseur (au centre)	Blattstiel: Dicke (in der Mitte)	Pecíolo: grosor (en el medio)		
thin	mince	dünn	delgado	Avanti, Kohyro	3
medium	moyenne	mittel	medio	Noriko, Rolano	5
thick	forte	dick	grueso	Adriana	7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedadesejemplo	Note/ Nota
6. Petiole:attitude (*)	Pétiole:port	Blattstiel:Haltung	Pecíolo:porte		
erect	dressé	aufrecht	erecto	Eder,Pader	1
semi-erect	demi-dressé	halbaufrecht	semierecto	Erko,Lanro	3
horizontal	horizontal	waagerecht	horizontal		5
7. Leafblade:attitude (*)	Limbe:port	Blattspreite: Haltung	Limbo:porte		
erect	dressé	aufrecht	erecto	Eder	1
semi-erect	demi-dressé	halbaufrecht	semierecto	Erko,Lanro	3
horizontal	horizontal	waagerecht	horizontal		5
8. Leafblade:length (*) (+)	Limbe:longueur	Blattspreite:Länge	Limbo:longitud		
veryshort	trèscourt	sehrkurz	muycorto		1
short	court	kurz	corto	Kohyro,Primaveraweiß	3
medium	moyen	mittel	medio	Domino,Logo	5
long	long	lang	largo	Lanro,Noriko	7
verylong	trèslong	sehrlang	muylargo	Gigant,Superschmelz	9
9. Leafblade:width (*) (+)	Limbe:largeur	Blattspreite:Breite	Limbo:anchura		
verynarrow	trèsétroit	sehrschmal	muyestrec ho		1
narrow	étroit	schmal	estrecho	KnaufsIdeal	3
medium	moyen	mittel	medio	ExpreßForcer	5
broad	large	breit	ancho	Noriko	7
verybroad	trèslarge	sehrbreit	muyancho	Gigant,Superschmelz	9

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10. Leafblade:shape of apex (+)	Limbe:formedela partieapicale	Blattspreite:Form desoberenTeils	Limbo:formadel ápice		
acute	aigüe	schmalspitz	aguda		1
pointed	pointue	spitz	puntiaguda		2
obtuse	obtuse	stumpf	obtusa	Avanti,ExpreßForcer	3
rounded	arrondie	abgerundet	redondeada	Noriko,Spre e	4
broadlyrounded	arrondielarge	breitabgerundet	redondeadaancha	Gigant,Superschmelz	5
11. Leafblade:divisions tomidrib(onlower partofleaf) (* (+)	Limbe:incisions jusqu'àlanervure principale(partie inférieuredela feuille)	Blattspreite: Einschnittebis zur Mittelrippe(am unterenTeildes Blattes)	Limbo:divisionesde lanervadura principal(enla parteinferiordela hoja)		
absentorveryfew	absentesoutrèspeu	fehlendoder sehrwenige	ausenteso muyescasas		1
few	peu	wenige	escasas	Azur-Star	3
medium	moyennes	mittel	medias	Noriko	5
many	nombreuses	viele	numerosas	Avanti,Korist	7
verymany	trèsnombreuses	sehrviele	muynumerosas	Lanro	9
12. Leafblade:number ofmarginincisions (onupperpartof leaf) (+)	Limbe:nombre d'incisionsdubord (partiesupérieurede lafeuille)	Blattspreite:Anzahl Randeinschnitte (amoberenTeildes Blattes)	Limbo:númerode incisionesdelborde (enlapartesuperior delahoja)		
absentorveryfew	nuloutrèspetit	fehlendoder sehrgering	ausenteso muyescasas		1
few	petit	gering	escasas	Azur-Star	3
medium	moyen	mittel	medias	ExpreßForcer	5
many	grand	groß	numerosas		7
verymany	trèsgrand	sehrgroß	muynumerosas		9

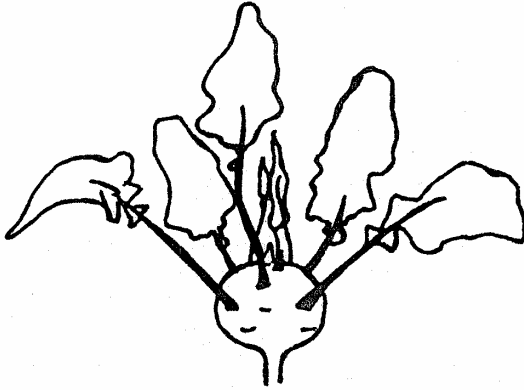
English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedadesejemplo	Note/ Nota
13. Leafblade:depth of margin incisions (+) (on upper part of leaf)	Limbe:profondeur des incisions du bord (partie supérieure de la feuille)	Blattspreite:Tiefe der Randeinschnitte (am oberen Teiles Blattes)	Limbo:profundidad de las incisiones del borde (en la parte superior de la hoja)		
absent or very shallow	nulle ou très faible	fehlend oder sehr flach	ausente o muy poco profundas		1
shallow	faible	flach	poco profundas	Oste	3
medium	moyenne	mittel	medias	ExpreßForcer	5
deep	profonde	tief	profundas	Soko	7
very deep	très profonde	sehr tief	muy profundas		9
14. Leafblade: shape in cross section	Limbe:forme en coupe transversale	Blattspreite:Form im Querschnitt	Limbo:forma en sección transversal		
concave	concave	konkav	cóncava		1
plane	droite	eben	plana	ExpreßForcer	2
convex	convexe	konvex	convexa	Azur-Star, Erko	3
15. Leafblade: blistering (*)	Limbe:cloûre	Blattspreite: Blasigkeit	Limbo:abullonado		
weak	faible	gering	débil	Avanti	3
medium	moyenne	mittel	media	Spree	5
strong	forte	stark	fuerte	Lanro	7
16. Leafblade: waxiness	Limbe:pruine	Blattspreite: Wachsschicht	Limbo:cerosidad		
weak	faible	gering	débil		3
medium	moyenne	mittel	media	ExpreßForcer	5
strong	forte	stark	fuerte	Blaril	7
17. Leafblade: hue of green color (*)	Limbe:teinte de la couleur verte	Blattspreite: Ton der Grünfärbung	Limbo:tono del color verde		
absent	absente	fehlend	ausente	Erko, Noriko	1
greyish	grisâtre	gräulich	grisáceo	ExpreßForcer, Lanro	2
bluish	bleuâtre	bläulich	azulado	Azur-Star	3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18. Leafblade:intensity ofgreencolor (*)	Limbe:intensitéde lacouleurverte	Blattspreite: Intensitätder Grünfärbung	Limbo:intensidad delcolorverde		
verylight	trèsclaire	sehrhell	muyclaro		1
light	claire	hell	claro		3
medium	moyenne	mittel	medio	Noriko,Quickstar	5
dark	foncée	dunkel	oscuro	Avanti,Lanro	7
verydark	trèsfoncée	sehrdunkel	muyoscuro	Pader	9
19. Kohlrabi:numberof innerleaves (+)	Rave:nombrede feuillesintérieures	Kohlrabi:Anzahl derinnerenBlätter	Colinabo:número dehojasinteriores		
few	petit	gering	escasas	Erko	3
medium	moyen	mittel	medias	ExpreßForcer	5
many	grand	groß	numerosas	Lanro	7
20. Kohlrabi:colorof skin (*)	Rave:couleurde l'épiderme	Kohlrabi:Farbeder Haut	Colinabo:colordela epidermis		
whitegreen	vertblanc	weißgrün	verdeblanquecino	ExpreßForcer,Lanro	1
green	vert	grün	verde	Erko,Noriko	2
paleviolet	violetclair	hellviolett	violetapálido		3
darkviolet	violetfoncé	dunkelviolett	violetaoscuro	Azur-Star	4
21. Kohlrabi:shape (*) (inlongitudinal section) (+)	Rave:forme (coupe longitudinale)	Kohlrabi:Form (imLängsschnitt)	Colinabo:forma (ensección longitudinal)		
transversenarrow elliptic	elliptiquetransversal étroit	querschmalelliptisch	elípticatransversal estrecha	Erko	1
transverseelliptic	elliptiquetransversal	querelliptisch	elípticatransversal	Azur-Star,Quickstar	2
transversebroad elliptic	elliptiquetransversal large	querbreitelliptisch	elípticatransversal ancha	Noriko	3
circular	rond	rund	circular	Blaril	4
broadelliptic	elliptiquelarge	breitelliptisch	elípticaancha		5

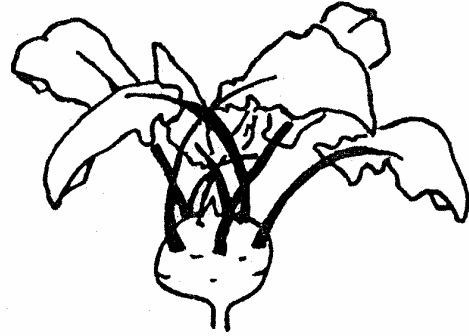
English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22. Kohlrabi: shape of apex (+)	Rave: forme du sommet	Kohlrabi: Form des oberen Endes	Colinabo: forma del ápice		
indented	concave	eingesunken	hundido	ExpreßForcer	3
level	plane	eben	plano	Avanti, Spree	5
raised	convexe	vorgewölbt	elevado	Gigant, Superschmelz	7
23. Harvest maturity (* (+)	Maturité de récolte	Erntereife	Madurez para la cosecha		
very early	très précoce	sehr früh	muy temprana	ExpreßForcer	1
early	précoce	früh	temprana	Azur-Star, Quickstar	3
medium	moyenne	mittel	media	Lanro	5
late	tardive	spät	tardía	Delikateßblauer	7
very late	très tardive	sehr spät	muy tardía	Blaril	9

VIII. ExplanationsontheTableofCharacteristics

Ad.3:Petioles:crossing



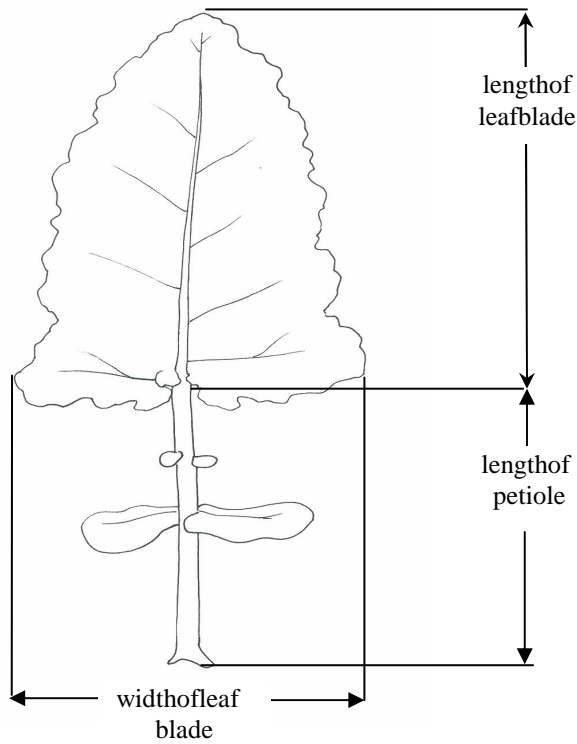
1
absent



9
present

Ad.4:Petiole:length

Ad.8and9:Leafblade:lengthandwidth



Ad.10:Leafblade:shapeofapex



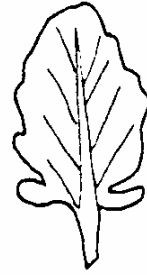
1
acute



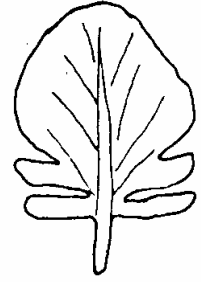
2
pointed



3
obtuse

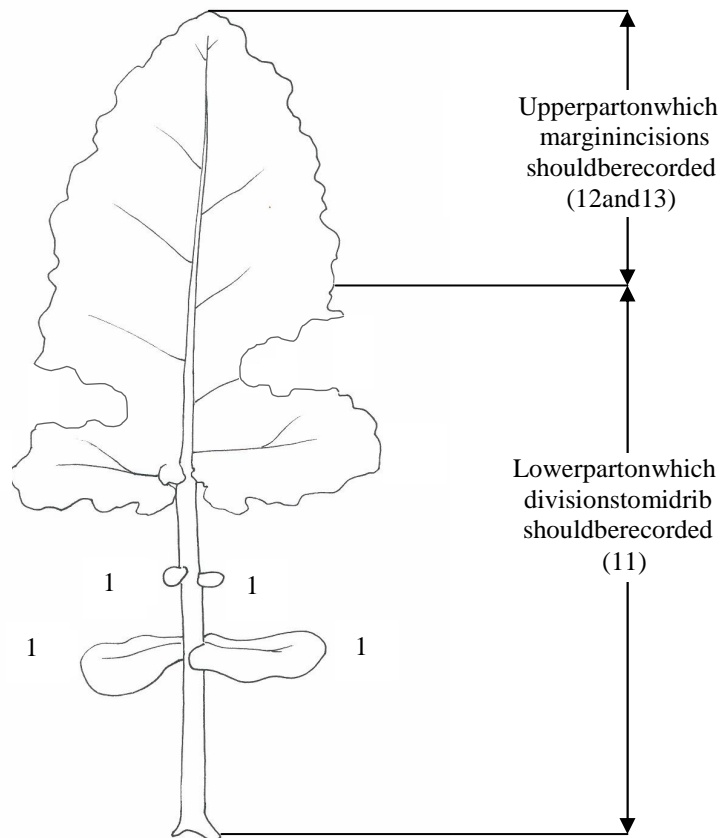


4
rounded



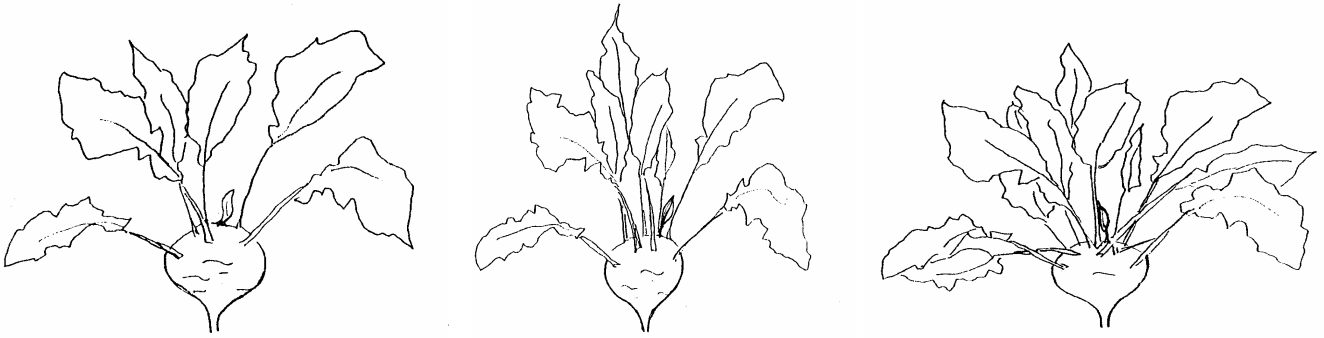
5
broadlyrounded

Ad.11 -13:Leafblade:divisionstomidrib(11),marginincisions(12and13)



1=divisionstomidrib

Ad.19:Kohlrabi:numberofinnerleaves



3
few

5
medium

7
many

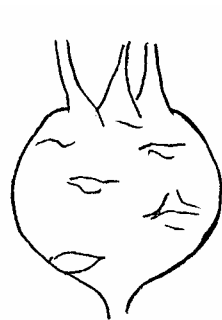
Ad.21:Kohlrabi:shape(inl ongitudinalsection)



1
transversenarrowelliptic

2
transverseelliptic

3
transversebroadelliptic



4
circular

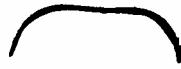


5
broadelliptic

Ad.22:Kohlrabi:shapeofapex



3
indented



5
level



7
raised

Ad.23:Harvestmaturity

Harvest maturity is considered as being reached if 50% of kohlrabis reach 7 cm diameter in the greenhouse or 8 cm diameter in the open field.

IX. Literature

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Wiebe, H. -J. (1989): Vernalisation von wichtigen Gemüsearten – Ein Überblick. Gartenbauwissenschaft 54(3), Ulmer Verlag, Stuttgart, 97 -104.

Vogel, G. (1996): Kohlrabi in: Handbuch des speziellen Gemüsebaues. Ulmer Verlag, Stuttgart, 304 –323.

X. TechnicalQuestionnaire

	<p>ReferenceNumber (nottobefilledinbytheapplicant)</p>
<p>TECHNICALQUESTIONNAIRE tobecompletedinconnectionwithanapplicationforplantbreeders' rights</p>	
<p>1. Species <i>Brassicaoleracea</i> L.convar. <i>acephala</i> (DC.)Alef.var. <i>gongyloides</i> L. (<i>Brassicaoleracea</i> L. <i>Gongyloides</i> Group) KOHLRABI</p>	
<p>2. Applicant(Nameandaddress)</p>	
<p>3. Proposeddenominationorbreeder'sreference</p>	

4. Information on origin, maintenance and reproduction of the variety			
4.1 Method of maintenance and reproduction			
(i)	hybrid		<input type="checkbox"/>
(ii)	open-pollinated variety		<input type="checkbox"/>
(iii)	other		<input type="checkbox"/>
4.2 Other information			
5. Characteristics of the variety to be given (the number in brackets refers to the corresponding characteristics in the Test Guidelines; please mark the state of expression which best corresponds)			
Characteristics	Example Varieties		Note
5.1 Seedling: anthocyanin coloration of cotyledons (1)			
absent	ExpreßForcer		1 <input type="checkbox"/>
present	Azur-Star		9 <input type="checkbox"/>
5.2 Leafblade: division to midrib (on lower part of leaf) (11)			
absent or very few			1 <input type="checkbox"/>
few	Azur-Star		3 <input type="checkbox"/>
medium	Noriko		5 <input type="checkbox"/>
many	Avanti, Korist		7 <input type="checkbox"/>
very many	Lanro		9 <input type="checkbox"/>
5.3 Leafblade: blistering (15)			
weak	Avanti		3 <input type="checkbox"/>
medium	Spree		5 <input type="checkbox"/>
strong	Lanro		7 <input type="checkbox"/>

Characteristics	Example Varieties	Note
5.4 Leafblade:intensityofgreencolor (18)		
verylight		1[]
light		3[]
medium	Noriko,Quickstar	5[]
dark	Avanti,Lanro	7[]
verydark	Pader	9[]
5.5 Kohlrabi:colorofskin (20)		
whitegreen	ExpreßForcer,Lanro	1[]
green	Erko,Noriko	2[]
paleviolet		3[]
darkviolet	Azur-Star	4[]
5.6 Kohlrabi:shape(inlongitudinalsection) (21)		
transversenarrowelliptic	Erko	1[]
transverseelliptic	Azur-Star,Quickstar	2[]
transversebroadelliptic	Noriko	3[]
circular	Blaril	4[]
broadelliptic		5[]
5.7 Harvestmaturity (23)		
veryearly	ExpreßForcer	1[]
early	Azur-Star,Quickstar	3[]
medium	Lanro	5[]
late	Delikateßblauer	7[]
verylate	Blaril	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
<p>^{o)} In the case of identical states of expressions of both varieties, please indicate the size of the difference.</p>			

7. Additional information which may help to distinguish the variety

7.1 Resistances to pests and diseases

7.2 Special conditions for the examination of the variety

Variety for glasshouse culture 1

Variety for field production at
spring 2
summer 3
autumn 4

7.3 Other information

A representative photograph of one or more leaf blades of the variety may be added to the Technical Questionnaire.

8. Authorizationforrelease

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

Yes

No

(b) Hassuchauthorizationbeenobtained?

Yes

No

Iftheanswertothatquestionisyes,pleaseattachacopyofsuchanauthorization.

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