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TG/60/6
ORIGINAL: English
DATE: 1996-10-18

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

BEETROOT
*(Beta vulgaris L. var.
conditiva Alef.)*

GENEVA
1996

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 *Beta vulgaris* L. var. *conditiva* Alef.

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:

200 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. As a minimum, 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. All observations determined by measurement or counting should be made on 60 plants or parts of 60 plants.

2. For the assessment of uniformity of hybrid varieties a population standard of 2% with an acceptance probability of at least 95% should be applied to off-types excluding clearly recognizable inbred plants. In the case of a sample size of 200 plants the maximum number of off-types allowed would be 7. In addition a population standard of 2% with the same acceptance probability should be applied to clearly recognizable inbred plants. In the case of a sample size of 200 plants the additional maximum number of clearly recognizable inbred plants allowed would be 7.
3. All observations on the leaf should be made on fully developed leaves.
4. All observations on the root should be made when the root is fully developed and the color is not changing any more.

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) Germity (characteristic 1)
 - (b) Root: shape of longitudinal section (characteristic 16)
 - (c) Root: external color (characteristic 21).

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/Tabla de caracteres

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	Germity	Germie	Germität	Germia		
(*)						
(+)						
	monogerm	monogerme	monogerm	monogérmes	Monodet, Monopoly	1
	multigerm	multigerme	multigerm	multigérmes	Crosby's Egyptian, Detroit 2	2
2.	Seedling: anthocyanin coloration of hypocotyl	Plantule: pigmentation anthocyanique de l'hypocotyle	Keimpflanze: Anthocyanfärbung des Hypokotyls	Plántula: pigmentación antociánica del hipocotilo		
(*)						
	absent	absente	fehlend	ausente	Albina Vereduna	1
	present	présente	vorhanden	presente	Crosby's Egyptian, Detroit 2	9
3.	Leaf: attitude of petiole	Feuille: port du pétiole	Blatt: Haltung des Stieles	Hoja: porte del peciolo		
	erect	dressé	aufrecht	erecto	Dragon, Forono	1
	semi-erect	demi-dressé	halbaufrecht	semierecto	Crosby's Egyptian, Detroit 2	3
	horizontal	horizontal	waagrecht	horizontal	Gladoro	5
4.	Leaf: attitude of blade	Feuille: port du limbe	Blatt: Haltung der Spreite	Hoja: porte del limbo		
(*)						
	erect	dressé	aufrecht	erecto	Dragon	1
	semi-erect	demi-dressé	halbaufrecht	semierecto	Bikores	3
	horizontal	horizontal	waagrecht	horizontal	Detroit 5, Forono	5
	semi-pendulous	demi-retombant	halbhängend	semicolgante	Egyptische Platronde	7
	pendulous	retombant	hängend	colgante		9

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
5. (*)	Leaf: length (including petiole)	Feuille: longueur (pétiole inclus)	Blatt: Länge (einschließlich Stiel)	Hoja: longitud (incluyendo peciolo)		
	short	courte	kurz	corta	Gladoro	3
	medium	moyenne	mittel	media	Boltardy	5
	long	longue	lang	larga	Longue des Vertus	7
6. (*)	Leaf blade: length	Limbe: longueur	Blattspreite: Länge	Limbo: longitud		
	short	court	kurz	corto	Gladoro	3
	medium	moyen	mittel	medio	Detroit 2	5
	long	long	lang	largo	Crosby's Egyptian	7
7. (*)	Leaf blade: width	Limbe: largeur	Blattspreite: Breite	Limbo: anchura		
	narrow	étroit	schmal	estrecho	Bikores	3
	medium	moyen	mittel	medio	Detroit 2	5
	broad	large	breit	ancho	Crosby's Egyptian	7
8. (*)	Leaf blade: shape	Limbe: forme	Blattspreite: Form	Limbo: forma		
	narrow elliptic	elliptique étroit	schmal elliptisch	elíptica estrecha	Cheltenham Mono	3
	elliptic	elliptique	elliptisch	elíptica	Detroit 2	5
	broad elliptic	elliptique large	breit elliptisch	elíptica ancha	Burpee's Golden	7
9. (*)	Leaf blade: intensity of green color	Limbe: intensité de la couleur verte	Blattspreite: Intensität der Grünfärbung	Limbo: intensidad del color verde		
	light	claire	hell	claro	Bikores	3
	medium	moyenne	mittel	medio	Regala	5
	dark	foncée	dunkel	oscuro	Monopoly, Dwegina	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10.	Leaf blade: anthocyanin coloration (at harvest maturity)	Limbe: pigmentation anthocyanique (au stade de récolte)	Blattspreite: Anthocyanfärbung (bei Erntereife)	Limbo: pigmentación antociánica (en la madurez de cosecha)		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Burpee's Golden	1
	weak	faible	gering	débil	Gladoro	3
	medium	moyenne	mittel	media	Regala	5
	strong	forte	stark	fuerte	Egyptische Platronde	7
	very strong	très forte	sehr stark	muy fuerte		9
11. (*)	Leaf blade: undulation of margin	Limbe: ondulation du bord	Blattspreite: Wellung des Randes	Limbo: ondulación del márgen		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Burpee's Golden	1
	weak	faible	gering	débil	Trianon	3
	medium	moyenne	mittel	medio	Regala	5
	strong	forte	stark	fuerte	Egyptische Platronde	7
	very strong	très forte	sehr stark	muy fuerte	Detroit 5	9
12. (*)	Leaf blade: blistering	Limbe: cloûre	Blattspreite: Blasigkeit	Limbo: vesiculación		
	weak	faible	gering	débil	Crosby's Egyptian	3
	medium	moyenne	mittel	media	Bikores	5
	strong	forte	stark	fuerte	Amigo, Burpee's Golden	7
13.	Petiole: width of base (at root insertion)	Pétiote: largeur de la base (à l'insertion sur la racine)	Stiel: Breite der Basis (am Rübenansatz)	Peciolo: anchura de la base (en la inserción de la raíz)		
	narrow	étroite	schmal	estrecha	Cylinder	3
	medium	moyenne	mittel	media	Bikores	5
	broad	large	breit	ancha	Crosby's Egyptian	7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
14. Petiole: main color of lower side (*)	Pétiolle: couleur principale de la face inférieure	Stiel: Hauptfarbe der Unterseite	Peciolo: color principal de la cara inferior		
green	verte	grün	verde	Albina Vereduna	1
orange	orange	orange	naranja	Burpee's Golden	2
red	rouge	rot	rojo	Crapaudine	3
purple	violette	purpur	púrpura		4
15. Root: position in soil (*)	Racine: position dans le sol	Rübe: Sitz im Boden	Raíz: posición en el suelo		
very shallow	très superficielle	sehr flach	muy superficial	Egyptische Platronde	1
shallow	superficielle	flach	superficial	Longue des Vertus	3
medium	moyennement enterrée	mittel	media	Boltardy	5
deep	enterrée	tief	profunda	Albina Vereduna	7
very deep	très enterrée	sehr tief	muy profunda	Crapaudine	9
16. Root: shape of longitudinal section (*) (+)	Racine: forme de la section longitudinale	Rübe: Form des Längsschnittes	Raíz: forma de la sección longitudinal		
transverse narrow elliptic	elliptique transverse étroite	quer schmal elliptisch	elíptica transversal estrecha	D'Egypte	1
transverse elliptic	elliptique transverse	quer elliptisch	elíptica transversal	Crosby's Egyptian	2
circular	circulaire	rund	circular	Detroit 2	3
obovate	obovale	verkehrt eiförmig	oboval		4
narrow oblong	oblongue étroite	schmal rechteckig	oblonga estrecha	Cylinder	5
narrow obtriangular	obtriangulaire étroite	schmal verkehrt dreieckig	obtriangular estrecha	Cheltenham Mono	6

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. Root: length (*)	Racine: longueur	Rübe:Länge	Raíz: longitud		
short	courte	kurz	corta	D'Egypte	3
medium	moyenne	mittel	media	Detroit 2	5
long	longue	lang	larga	Forono	7
18. Root: width (*)	Racine: largeur	Rübe: Breite	Raíz: anchura		
narrow	étroite	schmal	estrecha	Forono	3
medium	moyenne	mittel	media	Gladoro	5
broad	large	breit	larga	D'Egypte	7
19. Root: shape of base (*) (+)	Racine: forme de la base	Rübe: Form der Basis	Raíz: forma de la base		
pointed	pointue	spitz	puntiaguda	Cheltenham Mono, Crapaudine	1
rounded	arrondie	abgerundet	redondeada	Crimson King, Red Pack	2
flat	aplatie	flach	plana	Ferando, Ramses	3
recessed	déprimée aplatie	eingesunken	deprimida		4
20. Root: corkiness	Racine: présence de liège	Rübe: Korkbildung	Raíz: acorchado		
absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil		1
weak	faible	gering	débil	Boltardy	3
medium	moyenne	mittel	medio	Monami	5
strong	forte	stark	fuerte	Crapaudine	7
very strong	très forte	sehr stark	muy fuerte		9
21. Root: external color (*)	Racine: couleur externe	Rübe: Außenfarbe	Raíz: color externo		
white	blanche	weiß	blanco	Albina Vereduna	1
yellow	jaune	gelb	amarillo	Burpee's Golden	2
red	rouge	rot	rojo	Detroit 2	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22. (*)	Root: main color of flesh	Racine: couleur principale de la chair	Rübe: Hauptfarbe des Fleisches	Raíz: color principal de la carne		
	white	blanche	weiß	blanco	Albina Vereduna	1
	yellow	jaune	gelb	amarillo	Burpee's Golden	2
	red	rouge	rot	rojo	Gladoro	3
	purple	violette	purpur	púrpura	Cylinder	4
23.	Root: intensity of main color of flesh	Racine: intensité de la couleur principale de la chair	Rübe: Intensität der Hauptfarbe des Fleisches	Raíz: intensidad del color principal de la carne		
	light	claire	hell	claro		3
	medium	moyenne	mittel	medio		5
	dark	foncée	dunkel	oscuro		7
24.	Root: prominence of rings	Racine: proéminence des cercles	Rübe: Auffälligkeit von Ringen	Raíz: prominencia de anillos		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Akela, Larka	1
	weak	faible	gering	débil	Forono	3
	medium	moyenne	mittel	media	Renova, Juwakugel	5
	strong	forte	stark	fuerte	Detroit 3, Detroit 7	7
	very strong	très forte	sehr stark	muy fuerte	Alvro-Mono	9
25. (*) (+)	Bolting tendency (from an early sowing)	Tendance à la montaison (en semis précoce)	Neigung zum Schossen (bei Fröhhkultur)	Tendencia a la salida a flor (en siembra temprana)		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Boltardy, Dragon	1
	weak	faible	gering	débil		3
	medium	moyenne	mittel	media		5
	strong	forte	stark	fuerte	Detroit 3, Juwakugel	7
	very strong	très forte	sehr stark	muy fuerte		9

VIII. Explanation on the Table of Characteristics

Ad. 1: Germity

Germity should be observed in 200 plants. Monogerm seed should be genetically monogerm and at least 90% of seed clusters should lead to single plants. Multigerm seed would lead to less than 90% single plants.

Ad. 16: Root: shape of longitudinal section



1

transverse narrow
elliptic



2

transverse elliptic



3

circular



4

obovate



5

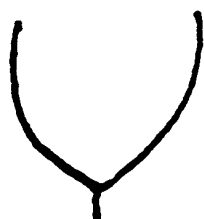
narrow oblong



6

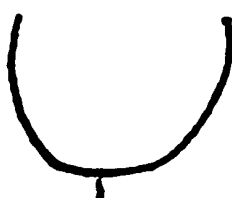
narrow obtriangular

Ad. 19: Root: shape of base



1

pointed



2

rounded



3

flat



4

recessed

Ad. 25: Bolting tendency (from an early sowing)

Method of cold treatment

Seed is laid out on a filter paper, which will be kept moist for germination. The minimum germination temperature is 18°C. With emergence of the root the seedlings will be transplanted into little pots (i.e. Jiffy with 4 cm diameter) and subjected to cold treatment in cold storage for four weeks at 3°C without artificial lighting.

After the cold treatment the seedlings will be cultivated under normal conditions preferably in the greenhouse (2°C minimum temperature, ventilation at 7°C). Multigerm varieties with several emerging seedlings from one cluster usually will not be singled. After the development of two true leaves the young plants will be transplanted into the open field.

The bolted plants (with shoot axis elongated by more than 5 cm) will be counted at least once a week.

It is recommended to conduct this test as early as possible in the year, because the bolting is very strongly influenced by the climatic conditions after the cold treatment. Beetroot is very sensitive to devernialization at temperatures above 18°C.

IX. Literature

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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	<i>Beta vulgaris</i> L. var. <i>conditiva</i> Alef. BEETROOT	
2. Applicant (Name and address)		
3. Proposed denomination or breeder's reference		
4. Information on origin, maintenance and reproduction of the variety		
4.1 Method of maintenance and reproduction		
(a) Hybrid		[]
(b) Open-pollinated variety		[]

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 Germity (1)		
monogerm	Mondoet, Monopoly	1[]
multigerm	Crosby's Egyptian, Detroit 2	2[]
5.2 Leaf blade: shape (8)		
narrow elliptic	Cheltenham Mono	3[]
elliptic	Detroit 2	5[]
broad elliptic	Burpee's Golden	7[]
5.3 Leaf blade: intensity of green color (9)		
light	Bikores	3[]
medium	Regala	5[]
dark	Monopoly, Dwergina	7[]
5.4 Root: shape of longitudinal section (16)		
transverse narrow elliptic	D'Egypte	1[]
transverse elliptic	Crosby's Egyptian	2[]
circular	Detroit 2	3[]
obovate		4[]
narrow oblong	Cylinder	5[]
narrow obtriangular	Cheltenham Mono	6[]

Characteristics	Example Varieties	Note
5.5 Root: length (17)		
short	D’Egypte	3[]
medium	Detroit 2	5[]
long	Forono	7[]
5.6 Root: external color (21)		
white	Albina Vereduna	1[]
yellow	Burpee’s Golden	2[]
red	Detroit 2	3[]
5.7 Root: main color of flesh (22)		
white	Albina Vereduna	1[]
yellow	Burpee’s Golden	2[]
red	Gladoro	3[]
purple	Cylinder	4[]
5.8 Bolting tendency (from an early sowing) (25)		
absent or very weak	Boltardy, Dragon	1[]
weak		3[]
medium		5[]
strong	Detroit 3, Juwakugel	7[]
very strong		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

7.3 Other information

[End of document]