E

TG/172/3

UPOV

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

INDUSTRIAL CHICORY

(*Cichorium intybus* L. partim)

GENEVA
2000

* * * * * * *

E

UPOV

TG/172/3
ORIGINAL: English
DATE: 2000-04-05

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

INDUSTRIAL CHICORY

(*Cichorium intybus* L. partim)

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.

TABLE OF CONTENTS PAGE

I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Cichorium intybus* L. partim of the family *Compositae*, excluding witloof (TG/173/3) and leaf chicory (TG/154/3).

II. Material Required

1. The competent authorities decide when, where and in what quantity and quality the plant material 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.

2. 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.

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 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 100 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 60 plants or parts taken from each of 60 plants.

2. All observations on the leaf should be made on the full-grown leaf before deterioration, this means 2 to 3 weeks before harvesting the roots.

3. All observations on the root should be made imediately after harvesting; assessment of inulin content within a week from harvesting the roots.

V. Grouping of Varieties

If necessary, 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.

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 Beispielssorten Variedades ejemplo	Note/ Nota
1. (*)	**Ploidy**	**Ploïdie**	**Ploidie**	**Ploidía**		
	diploid	diploïde	diploid	diploide	Turquoise	2
	triploid	triploïde	triploid	triploide	Perle	3
	tetraploid	tétraploïde	tetraploid	tetraploide		4
2. (*) (+)	**Plant: height (at end of first growing season)**	**Plante: hauteur (à la fin du premier cycle)**	**Pflanze: Höhe (am Ende der ersten Wachstumsperiode)**	**Planta: altura (al final del primer período de crecimiento)**		
	short	courte	niedrig	baja		3
	medium	moyenne	mittel	media	Orchies	5
	tall	haute	hoch	alta	Katrien, Luxor	7
3. (*)	**Foliage: attitude**	**Feuillage: port**	**Laub: Haltung**	**Follaje: porte**		
	erect	dressé	aufrecht	erecto	Luxor, Madona, Rubis	1
	semi-erect	demi-dressé	halbaufrecht	semierecto	Fruitosa, Orchies	3
	horizontal	horizontal	waagerecht	horizontal		5
4. (*) (+)	**Leaf: length**	**Feuille: longueur**	**Blatt: Länge**	**Hoja: longitud**		
	short	courte	kurz	corta		3
	medium	moyenne	mittel	media	Orchies	5
	long	longue	lang	larga	Jade, Luxor	7
5. (*) (+)	**Leaf: width**	**Feuille: largeur**	**Blatt: Breite**	**Hoja: anchura**		
	narrow	étroite	schmal	estrecha	Eva, Luxor, Vanessa	3
	medium	moyenne	mittel	media	Rubis	5
	broad	large	breit	ancha	Jade	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6. (*)	**Leaf: intensity of green color**	**Feuille: intensité de la couleur verte**	**Blatt: Intensität der Grünfärbung**	**Hoja: intensidad del color verde**		
	light	claire	hell	claro	Eva	3
	medium	moyenne	mittel	medio	Katrien	5
	dark	foncée	dunkel	oscuro	Madona, Rubis	7
7.	**Leaf: glossiness**	**Feuille: brillance**	**Blatt: Glanz**	**Hoja: brillo**		
	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil	Luxor	3
	medium	moyenne	mittel	medio	Rubis	5
	strong	forte	stark	fuerte		7
8.	**Leaf: shape in cross section**	**Feuille: forme en section transversale**	**Blatt: Form im Querschnitt**	**Hoja: forma en sección transversal**		
	concave	concave	konkav	cóncava		1
	flat	plane	eben	plana	Luxor, Madona	2
	convex	convexe	konvex	convexa		3
9. (*)	**Leaf: blistering**	**Feuille: cloqûre**	**Blatt: Blasigkeit**	**Hoja: abullonado**		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Jade	1
	weak	faible	gering	débil	Luxor	3
	medium	moyenne	mittel	medio	Bergues	5
	strong	forte	stark	fuerte	Cassel	7
	very strong	très forte	sehr stark	muy fuerte		9
10.	**Leaf: anthocyanin coloration of midrib**	**Feuille: pigmentation anthocyanique de la nervure médiane**	**Blatt: Anthocyanfärbung der Mittelrippe**	**Hoja: pigmentación antociánica del nervio central**		
	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Bergues	1
	weak	faible	gering	débil	Luxor, Rubis	3
	medium	moyenne	mittel	media		5
	strong	forte	stark	fuerte		7
	very strong	très forte	sehr stark	muy fuerte		9

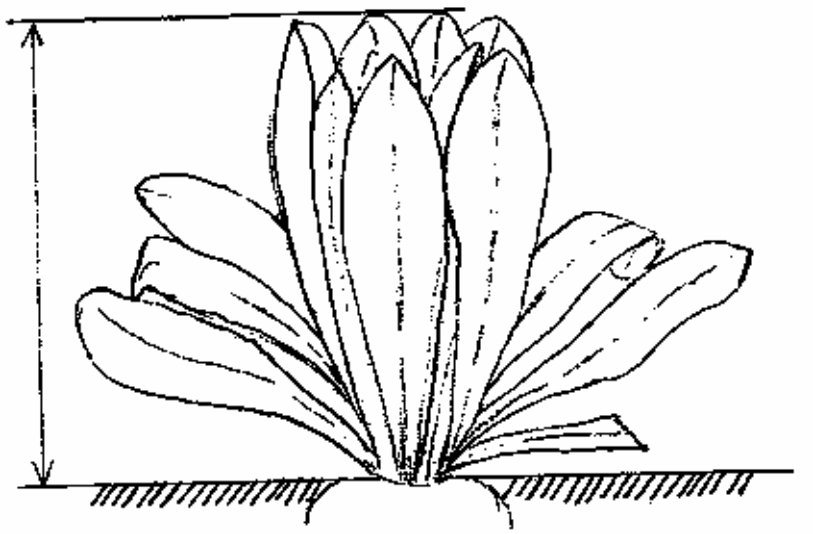
	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11.	**Leaf: undulation of margin**	**Feuille: ondulation du bord**	**Blatt: Wellung des Randes**	**Hoja: ondulación del borde**		
	weak	faible	gering	débil	Madona, Rubis	3
	medium	moyenne	mittel	media	Marlene	5
	strong	forte	stark	fuerte		7
12.	**Leaf: number of incisions of margin**	**Feuille: nombre d'incisions du bord**	**Blatt: Anzahl Randeinschnitte**	**Hoja: número de las incisiones del borde**		
	absent or very few	nul ou très petit	fehlend oder sehr gering	ausente o muy baja	Luxor	1
	few	petit	gering	bajo	Marlene, Rubis	3
	medium	moyen	mittel	medio	Katrien	5
	many	grand	groß	alto		7
13.	**Leaf: depth of incisions of margin**	**Feuille: profondeur des incisions du bord**	**Blatt: Tiefe der Randeinschnitte**	**Hoja: profundidad de las incisiones del borde**		
	shallow	peu profondes	flach	poco profunda	Bergues	3
	medium	moyennes	mittel	media		5
	deep	profondes	tief	profunda	Capucijnerbaard	7
14. (*)	**Root: length**	**Racine: longueur**	**Rübe: Länge**	**Raíz: longitud**		
	short	courte	kurz	corta		3
	medium	moyenne	mittel	media	Madona, Marlene	5
	long	longue	lang	larga	Magdeburger Spitzkopf	7
15. (*)	**Root: maximum width**	**Racine: largeur maximale**	**Rübe: maximale Breite**	**Raíz: anchura máxima**		
	narrow	étroite	schmal	estrecha	Magdeburger Spitzkopf	3
	medium	moyenne	mittel	media	Luxor, Rubis	5
	broad	large	breit	ancha		7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16. (*) (+)	**Root: shape of shoulder**	**Racine: forme de l'épaulement**	**Rübe: Form der Schulter**	**Raíz: forma del hombro**		
	flat	plat	flach	plana	Luxor	1
	slightly rounded	légèrement arrondi	leicht abgerundet	ligeramente redondeada	Madona, Rubis	2
	clearly rounded	nettement arrondi	deutlich abgerundet	claramente redondeada		3
	conical	conique	konisch	cónica	Magdeburger Spitzkopf	4
17. (+)	**Root: inulin content**	**Racine: teneur en inuline**	**Rübe: Inulingehalt**	**Raíz: contenido de inulina**		
	very low	très faible	sehr niedrig	muy bajo	Sabau 3	1
	low	faible	niedrig	bajo	Luxor, Orchis	3
	medium	moyenne	mittel	medio	Brinco, Markise, Vanessa	5
	high	forte	hoch	alto	Dageraad, Fredonia, Katrien, Marlene	7
	very high	très forte	sehr hoch	muy alto	Eva	9
18.	**Bolting tendency (from an early sowing)**	**Tendance à la montaison (en semis précoce)**	**Neigung zum Schossen (bei Frühkultur)**	**Tendencia a la floración (en siembra temprana)**		
	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Katrien, Orchies	1
	weak	faible	gering	débil	Bergues, Marlene	3
	medium	moyenne	mittel	media	Madona	5
	strong	forte	stark	fuerte	Vanessa	7
	very strong	très forte	sehr stark	muy fuerte	Inula	9
19.	**Flowering stem: height**	**Tige florifère: hauteur**	**Blütenstandstiel: Höhe**	**Tallo floral: altura**		
	short	basse	niedrig	baja		3
	medium	moyenne	mittel	media		5
	tall	haute	hoch	alta		7

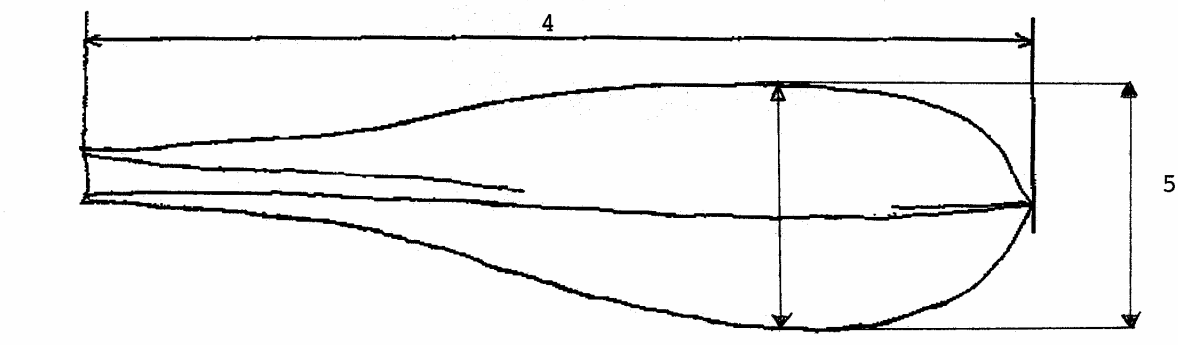
	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.	**Flowering stem: branching**	**Tige florifère: ramification**	**Blütenstandstiel: Verzweigung**	**Tallo floral: ramificación**		
	weak	faible	gering	débil		3
	medium	moyenne	mittel	media		5
	strong	forte	stark	fuerte		7
21.	**Flower: color**	**Fleur: couleur**	**Blüte: Farbe**	**Flor: color**		
	white	blanche	weiß	blanco		1
	pink	rose	rosa	rosa		2
	blue	bleue	blau	azul	Luxor	3

VIII. Explanations on the Table of Characteristics

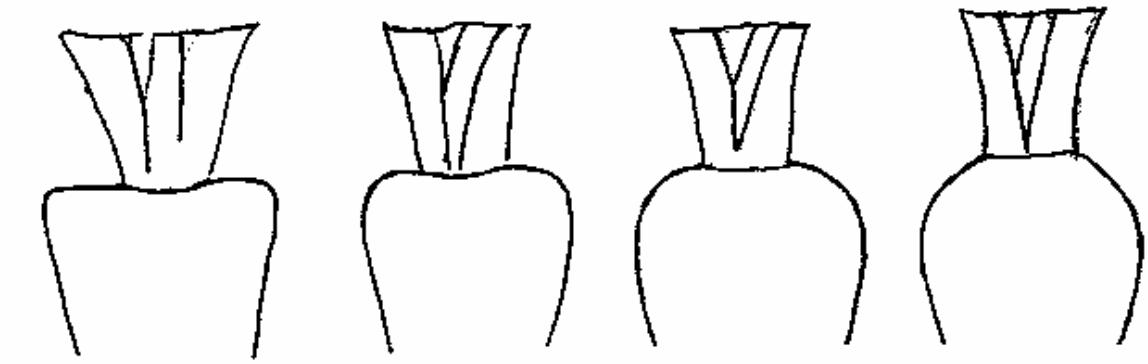
Ad. 2: Plant: height (at end of first growing season)



Ad. 4 and 5: Leaf: length (4) and width (5)



Ad. 16: Root: shape of shoulder



1	2	3	4
flat	slightly rounded	clearly rounded	conical

Ad. 17: Root: inulin content

Relative inulin content should be measured on the basis of bulk samples.

A sample of 25 roots should be taken randomly from each plot. The roots should be thoroughly washed and all impurities should be removed.

A representative sub-sample of pulp is produced by taking small quantities of material from throughout each of the roots i.e. from the top to the base, at equal distances, and from the outer to the central part of the root. This can be achieved, for example, by making incisions to the center of the root at 2-3 cm intervals along the length of each root.

The sub-sample of pulp is homogenized and the resultant juice is then filtered under pressure. Readings for the juice are then taken from a refractometer. Three separate readings should be taken to obtain a representative result.

The exact correlation between the refractometer reading and the content of fructose polymers (inulin) varies for each testing method. However, where the refractometer readings are obtained using the same standardized method it is acceptable to use this as a basis for examining “relative” inulin content. The absolute inulin content, if required, could be determined by use of a test range and sample weights.

IX. Literature

Frese, L., Dambroth, M. and Bramm, A., 1991: Breeding Potential of Root Chicory (*Cichorium intybus* L. var. *sativum*) Plant Breeding 106, 107-113.

X. Technical Questionnaire

	Reference Number (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Species *Cichorium intybus* L. partim

INDUSTRIAL CHICORY

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) Population [ ]

(b) Hybrid [ ]

(c) Synthetic Variety [ ]

(d) Other (please indicate)

..... [ ]

4.2 Other information

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

	Characteristics	Example Varieties	Note
5.1 (1)	**Ploidy**		
	diploid	Turquoise	2[ ]
	triploid	Perle	3[ ]
	tetraploid		4[ ]
5.2 (4)	**Leaf: length**		
	short		3[ ]
	medium	Orchies	5[ ]
	long	Jade, Luxor	7[ ]
5.3 (6)	**Leaf: intensity of green color**		
	light	Eva	3[ ]
	medium	Katrien	5[ ]
	dark	Madona, Rubis	7[ ]

	Characteristics	Example Varieties	Note
5.4 (14)	**Root: length**		
	short		3[ ]
	medium	Madona, Mariene	5[ ]
	long	Magdeburger Spitzkopt	7[ ]

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

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.

[End of document]