



TWV/34/2

ORIGINAL: English

DATE: August 1, 2000

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

TECHNICAL WORKING PARTY FOR VEGETABLES

Thirty-Fourth Session
Angers, France, September 11 to 15, 2000

WORKING PAPER ON TEST GUIDELINES FOR CELERIAC
(*Apium graveolens* L. var. *rapaceum* (Mill.) Gaud.)

Document prepared by experts from Germany

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
I. Subject of these Guidelines	3
II. Material Required	3
III. Conduct of Tests	3
IV. Methods and Observations.....	3
V. Grouping of Varieties	4
VI. Characteristics and Symbols	5
VII. Table of Characteristics	6
VIII. Literature	16
IX. Technical Questionnaire	17

I. Subject of these Guidelines

These Guidelines apply to all varieties of Apium graveolens L. var. rapaceum (Mill.) Gaud.

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:

4 g.

The seed should at least meet the minimum requirements for germination capacity, moisture content and purity for marketing standard 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 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, weighting or counting should be made on 40 plants or parts taken 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 plant and the leaf should be made on fully developed plants before harvest maturity. All observations on the leaf should be made on leaves in the middle of the rosette of leaves.

4. All observations on the tuber 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 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) Petiole: anthocyanin coloration (characteristic 11)

VI. Characteristics and Symbols

1. To assess distinctness, homogeneity and stability, the characteristics and their states as given in the Table of Characteristics should be used.

2. Notes (in most cases 1 to 9), 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 Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
1. (*)	Plant: height	Pflanze: Höhe			
	short	niedrig		Ofir	3
	medium	mittel		Ibis, Monarch	5
	tall	hoch		Bergers weisse Mars	Kugel, 7
2. (*)	Foliage: attitude	Laub: Haltung			
(+)	erect	aufrecht		Mars, Regent	1
	erect to semi-erect	aufrecht bis halbaufrecht		Bergers weisse Mars	Kugel, 2
	semi-erect	halbaufrecht		Alba, Anita, Ibis	3
	semi-erect to horizontal	halbaufrecht waagerecht	bis	Ofir	4
	horizontal	waagerecht			5
3.	Plant: number of leaves	Pflanze: Anzahl Blätter			
	low	gering		Alba	3
	medium	mittel		Ibis, Prinz	5
	high	groß		Mars	7
4.	Foliage: green coloration of inner leaves	Laub: Grünfärbung der inneren Blätter			
	light	hell		Alba, Ortho	3
	medium	mittel		Bergers weisse Cesar, Prinz	Kugel, 5
	dark	dunkel		President	7

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties	Note/ Nota
5.	Foliage: green coloration of fully developed leaves	Laub: Grünfärbung der ausgewachsenen Blätter				
	light	hell				3
	medium	mittel				5
	dark	dunkel		Bergers weisse Kugel, Mars, Monarch, Prinz		7
6. (*)	Leaf: length (including petiole)	Blatt: Länge (einschließlich Blattstiel)				
	short	kurz		Ofir, Ortho		3
	medium	mittel		Anita		5
	long	lang		Bergers weisse Kugel		7
7. (+)	Leaf blade: length	Blattspreite: Länge				
	short	kurz		Ortho		3
	medium	mittel		Anita, Cesar, President		5
	long	lang		Bergers weisse Kugel		7
8. (+)	Leaf blade: distance between 1. and 2. pair of leaflets	Blattspreite: Abstand zwischen 1. und 2. Blattfiederpaar				
	short	kurz		Alba		3
	medium	mittel		Monarch, President, Prinz		5
	long	lang		Bergers weisse Kugel		7
9. (+)	Petiole: length	Blattstiel: Länge				
	small	klein		Prinz		3
	medium	mittel		Cesar, Diamant		5
	large	groß		Bergers weisse Kugel, Hochdahler Markt		7

	English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties	Note/ Nota
10.	Petiole: width						
(+)	narrow		schmal		Alba		3
	medium		mittel		Cesar, Prinz, Regent		5
	broad		breit		Bergers weisse Kugel		7
11.	Petiole: (*) anthocyanin coloration						
	absent		fehlend		Alba, Mars, Regent		1
	present		vorhanden		Bergers weisse Kugel, Hochdahler Markt		9
12.	Leaf: size of the (*) terminal leaflet						
(+)	small		klein		Ortho		3
	medium		mittel		Ibis, Kojak		5
	large		groß		Regent		7
13.	Leaflet: shape of (*) tips of margin						
(+)	acute		spitz		Ibis, Dolvi		3
	pointed		zugespitzt		Monarch, President	Prinz,	5
	truncate		stumpf		Radiant		7
14.	Leaflet: density of (+) incisions of margin						
	low		locker		Cesar, Hans, Rex		3
	medium		mittel		Ibis, Prinz		5
	high		dicht		Diamant, Kojak		7
15.	Leaflet: arangement (*) of lobes (+)						
	detached		freistehend		Cascade		1
	touching		sich berührend		Monarch		2
	overlapping		überlappend		Kojak		3

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties	Note/ Nota
16. Tuber: size (*)		Knolle: Größe				
small		klein		Ofir		3
medium		mittel		Anita, Bergers Kugel	weisse	5
large		groß		Ibis		7
17. Tuber: protrusion (+)		Knolle: Wulstbildung				
absent or very weak		fehlend oder sehr gering				1
weak		gering		Alba, Ortho, Regent		3
medium		mittel		Bergers weisse Kugel, Monarch, President		5
strong		stark		Anita, Dolvi		7
very strong		sehr stark				9
18. Tuber: grooving of surface (+)		Knolle: Riefung der Oberfläche				
absent or very weak		fehlend oder sehr gering				1
weak		gering		Diamant		3
medium		mittel		Cesar, Monarch		5
strong		stark		Kojak, Ortho		7
very strong		sehr stark				9
19. Tuber: ground color of skin (*)		Knolle: Grundfarbe der Haut				
white		weiß		Alba, Mars, Monarch		1
brown		braun		Anita, Bergers Kugel	weisse	3

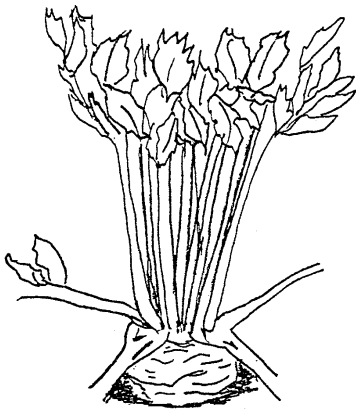
English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
20.	Varieties with brown ground color only Tuber: intensity of ground color of skin	Nur Sorten mit brauner Grundfarbe Knolle: Intensität der Grundfarbe der Haut			
	light	hell		Anita	3
	medium	mittel		Ortho	5
	dark	dunkel		Balder/Bali	7
21. (+)	Tuber: inseration of roots	Knolle: Wurzelansatz			
	low	tief		Cesar, Ortho	3
	medium	mittel		Monarch, Hochdahler Markt	5
	high	hoch			7
22.	Tuber: mass of roots	Knolle: Wurzelmasse			
	low	gering		Cesar, Ortho	3
	medium	mittel		Bergers weisse Kugel, Brilliant, Monarch	5
	high	groß			7
23.	Tuber: thickness of roots	Knolle: Wurzeldicke			
	thin	dünn		Cesar, Ortho	3
	medium	mittel		Diamant, Monarch, Bergers weisse Kugel	5
	thick	dick		Hochdahler Markt	7
24 (* (+)	Tuber: shape in longitudinal section	Knolle: Form im Längsschnitt			
	broad elliptic	breit elliptisch		Kojak	1
	round	rund		Alba, Monarch	2
	transverse broad elliptic	quer breit elliptisch		Bergers weisse Kugel, Anita	3
	truncate conical	kegelstumpfförmig		Dolvi	4
	transverse ovate	quer eiförmig		Alabaster 3/Juwel	5

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
25. Tuber: color of flesh		Knolle: Fleischfarbe			
white		weiß		Monarch, Diamant	1
ivory		elfenbeinfarben		Ofir, Hochdahler Markt	2
26. Tuber: cavity in the middle of the tuber		Knolle: Hohlheit in der Mitte der Knolle			
weak		gering		Alba	3
medium		mittel		Mars, Regent	5
strong		stark		Ortho	7
27. Tuber: sponginess		Knolle: Schwammigkeit			
weak		gering		Monarch, Prinz	3
medium		mittel		Bergers weisse Kugel, Cesar, Regent	5
strong		stark		Ortho	7
28. (+) Tuber: internal rust spot of flesh (after cut open)		Knolle: Eisenfleckigkeit des Fleisches (nach dem Aufschneiden)			
weak		gering		Monarch, Brilliant	3
medium		mittel		Bergers weisse Kugel, Mars	5
strong		stark		Ortho	7

VIII. Explanations on the Table of Characteristics/Explications du tableau des caractères/Erklärungen zu der Merkmalstabelle

Ad/zu 2

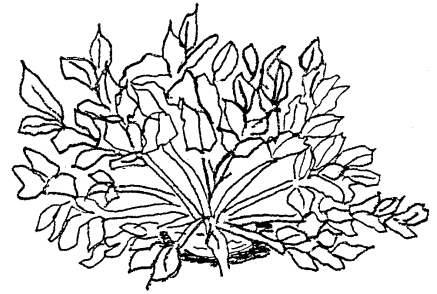
Foliage: attitude
Laub: Haltung



1 erect
aufrecht



3 semi-erect
halbaufrecht



5 horizontal
waagrecht

Ad/zu 7, 8, 9, 10, 12

Leaf blade: length(7)
Blattspreite: Länge (7)

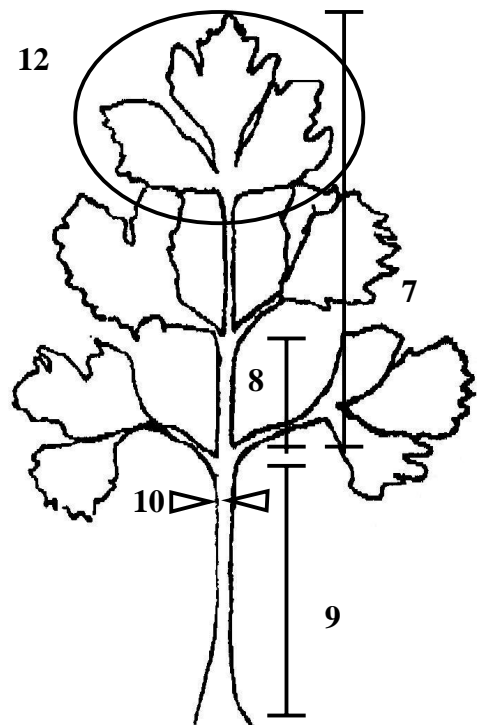
Leaf blade: distance between
1 and 2. pair of
leaflets (8)

Blattspreite: Abstand zwischen
1. und 2. Blattpieder-
paar (8)

Petiole: length (9)
width (10)

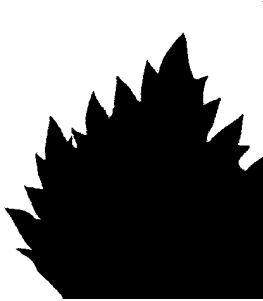
Blattstiel: Länge (9)
Dicke (10)

Leaf: size of the terminal leaflet (12)
Blatt: Größe des Endfiederblattes (12)

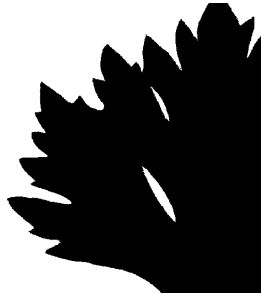


Ad/zu 13

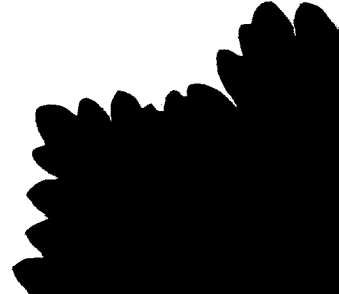
Leaflet: shape of tips of margin
Blattfieder: Form der Spitzen des Randes



3 acute
spitz



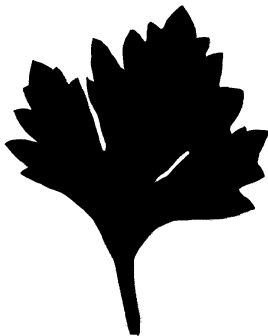
5 pointed
zugespitzt



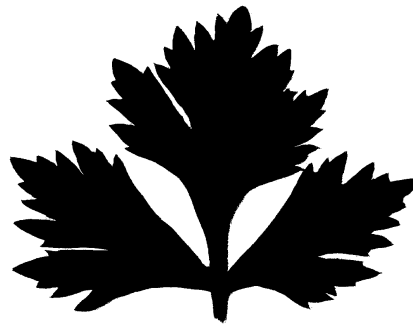
7 truncate
stumpf

Ad/zu 14

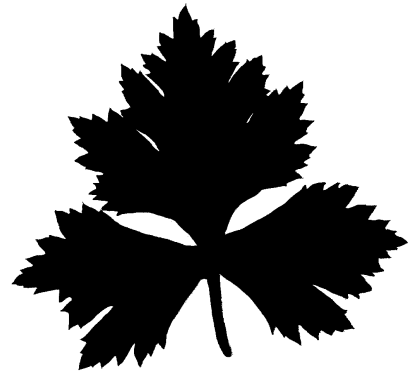
Leaflet: density of incisions of margin
Blattfieder: Dichte der Randeinschnitte



3 sparse
locker



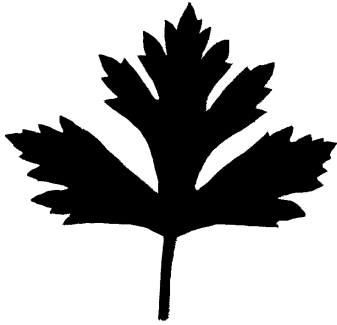
5 medium
mittel



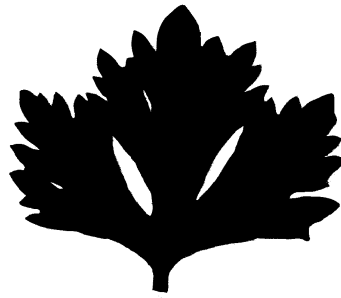
7 dense
dicht

Ad/zu 15

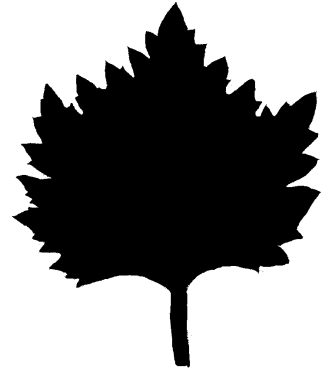
Leaflet: conformation of lobes
Blattfieder: Stellung der Blattlappen



1 detached
freistehend



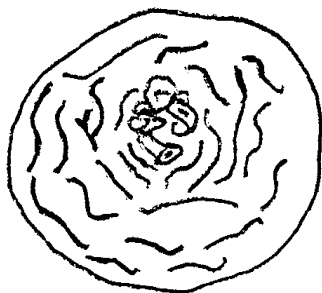
2 touching
sich berührend



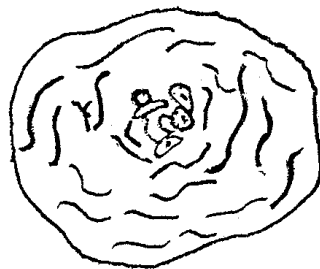
3 overlapping
überlappend

Ad/zu 17

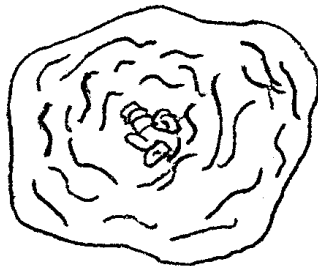
Tuber: protrusion
Knolle: Wulstbildung



3 weak
gering



5 medium
mittel



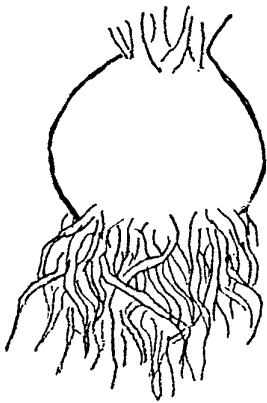
7 strong
stark

Protrusions are raised/heighthened insertion points of the main roots, which gives the tuber an increasing irregular shape in view from above.

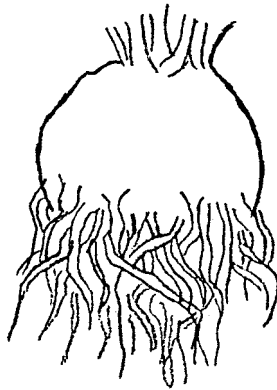
Wülste sind erhöhte Ansatzstellen der Hauptwurzeln, die der Knolle mit zunehmender Stärke ein unförmiges Aussehen in der Draufsicht geben.

Ad/Zu 21

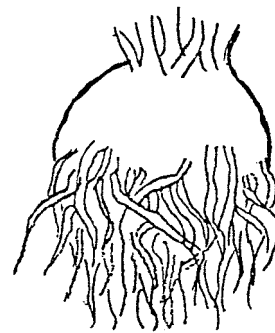
Tuber: inseration of roots
Knolle: Wurzelansatz



3
low
tief



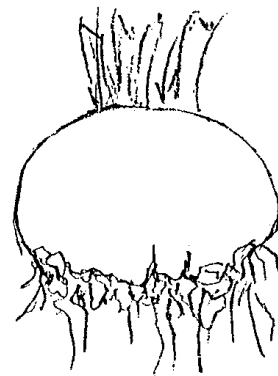
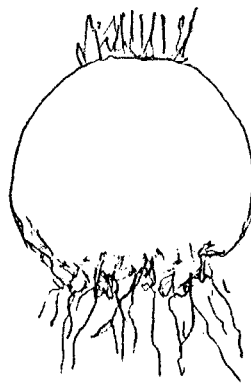
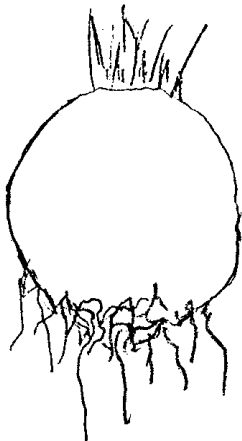
5
medium
mittel



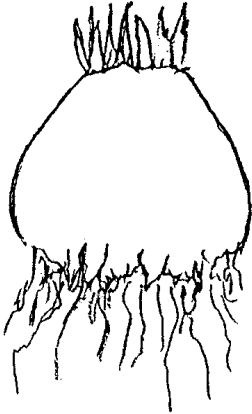
7
high
hoch

Ad/Zu 23

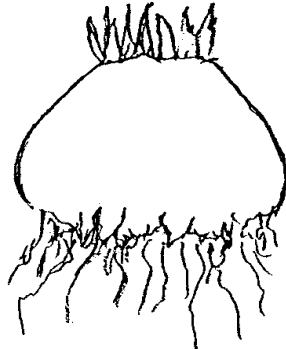
Tuber: shape in longitudinal section
Knolle: Form im Längsschnitt



1
broad elliptic
breit elliptisch



2
round
rund



3
transverse broad elliptic
quer breit elliptisch

4

truncate conical
kegelstumpf

5

transverse ovate
quer eiförmig

Ad/Zu 28

Tuber: internal rust spot of flesh (after cut open)

Knolle: Eisenfleckigkeit des Fleisches (nach dem Aufschneiden)

The tubers should be cut through in longitudinal section. After one hour the internal rust spot of flesh will be judged.

Die Knollen werden längs aufgeschnitten. Nach einer Stunde wird die Eisenfleckigkeit des Fleisches bonitiert.

IX. Literature

BECKER, G. (1962): Knollensellerie in: Handbuch der Pflanzenzüchtung, Band VI, 2. Auflage, Paul Parey Verlag, Berlin – Hamburg, 104-130

BECKER-DILLINGEN, 3. (1956): Sellerie in: Handbuch des gesamten Gemüsebaues, 6. Auflage, Paul Parey Verlag, Berlin – Hamburg, 592-613

HAHN, P. und SCHMITT, U. (1951): Knollensellerie in: Kohl- und Wurzelgemüse, Arten- und Sortenkunde, Band 2, 1. Auflage, Deutscher Bauernverlag, Berlin, 246-255

KAMPE, K.; BASSE, H.; GLASCHKE, B. und SCHREIBER, F. (1956): Sellerie in: Gemüsesorten, II. Teil (Kohl-, Blatt- und Wurzelgemüse), 1. Auflage, Paul Parey Verlag, Berlin – Hamburg, 115-119

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

WIEBE, H.-J. (1998): Blütenbildung von Knollensellerie (*Apium graveolens* L. var *rapaceum*). I. Vernalisation und Devernalisation. Gartenbauwissenschaft 63 (4), Eugen Ulmer Verlag, Stuttgart, 171-177

IX. 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>	
1.1 Species	<p style="text-align: center;"><i>Apium graveolens</i> L. var. <i>rapaceum</i> (Mill.) Gaud. <i>Celeriac/Knollensellerie</i></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 Method of maintenance and reproduction

- (i) hybrid []
- (ii) open-pollinated variety []

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 Plant: height (1)		
short	Ofir	3[]
medium	Ibis, Monarch	5[]
tall	Bergers weisse Kugel, Mars	7[]
5.2 Foliage: attitude (2)		
erect	Mars	1[]
erect to semi erect	Bergers weisse Kugel, Monarch	2[]
semi erect	Alba, Anita, Ibis	3[]
semi erect to horizontal	Ofir	4[]
horizontal		5[]
5.3 Petiole: anthocyanin coloration (11)		
absent	Alba, Mars, Regent	1[]
present	Bergers weisse Kugel	9[]
5.4 Leaf: size of the terminal leaflet (12)		
small	Ortho	3[]
medium	Ibis, Kojak	5[]
large	Regent	7[]
5.5 Leaflet: shape of tips of margin (13)		
acute	Ibis, Dolvi	3[]
pointed	Monarch, Prinz	5[]
truncate	Radiant	7[]

Characteristics	Example Varieties	Note
5.6 Leaflet: conformation of lobes (15)		
detached	Cascade	1[]
touching	Monarch	2[]
overlapping	Kojak	3[]
5.7 Tuber: size (16)		
small	Ofir	3[]
medium	Anita, Bergers weisse Kugel	5[]
large	Ibis	7[]
5.8 Tuber: ground color of skin (19)		
white	Alba, Mars, Monarch	1[]
brown	Anita, Bergers weisse Kugel	2[]
5.9 Tuber: shape in longitudinal section (24)		
broad elliptic	Kojak	1[]
round	Alba, Monarch	2[]
transverse broad elliptic	Anita, Bergers weisse Kugel	3[]
truncate conical	Dolvi	4[]
transverse ovate	Alabaster 3/Juwel	5[]

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

A representative photocopy of one or more terminal leaflets in original size of the variety should be included in the Technical Questionnaire.

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]