



EUROPEAN UNION

COMMUNITY PLANT VARIETY OFFICE

PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

Apium graveolens L. var *rapaceum* (Mill.) Gaud.

CELERIAC

UPOV Code: APIUM_GRA_RAP

Adopted on 13/03/2008

I - SUBJECT OF THE PROTOCOL

The protocol describes the technical procedures to be followed in order to meet the Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on general UPOV Document TG/1/3 and UPOV Guideline TG/74/4 Corr. dated 05/04/2006 for the conduct of tests for Distinctness, Uniformity and Stability. This protocol applies to varieties of *Apium graveolens* L. var *rapaceum* (Mill.) Gaud.

II - SUBMISSION OF SEED AND OTHER PLANT MATERIAL

1. The Community Plant Variety Office (CPVO) is responsible for informing the applicant of

- the closing date for the receipt of plant material;
- the minimum amount and quality of plant material required;
- the examination office to which material is to be sent.

A sub-sample of the material submitted for test will be held in the variety collection as the definitive sample of the candidate variety.

The applicant is responsible for ensuring compliance with any customs and plant health requirements.

2. Final dates for receipt of documentation and material by the Examination Office

The final dates for receipt of requests, technical questionnaires and the final date or submission period for plant material will be decided by the CPVO and each Examination Office chosen.

The Examination Office is responsible for immediately acknowledging the receipt of requests for testing, and technical questionnaires. Immediately after the closing date for the receipt of plant material the Examination Office should inform the CPVO whether acceptable plant material has been received or not. However if unsatisfactory plant material is submitted the CPVO should be informed as soon as possible.

3. Plant material requirements

The current quality and quantity requirements as well as the final dates for submission of the plant material are available on the CPVO website (www.cpvo.europa.eu) and are published in the CPVO gazette 'S2'.

Quality of seed: Should not be less than the standards laid down for certified seed in Annex II of Council Directive 2002/55/EC.

Seed Treatment: The plant material must not have undergone any treatment unless the CPVO and the Examination Office allow or request such treatment. If it has been treated, full details of the treatment must be given.

Special requirements: -

Labelling of sample:..... - Species
- File number of the application allocated by the CPVO
- Breeder's reference
- Examination reference (if known)
- Name of applicant
- The phrase "On request of the CPVO"

III - CONDUCT OF TESTS

1. Variety collection

A variety collection will be maintained for the purpose of establishing distinctness of the candidate varieties in test. A variety collection may contain both living material and descriptive information. A variety will be included in a reference collection only if plant material is available to make a technical examination.

Pursuant to Article 7 of Council Regulation No. 2100/94, the basis for a collection should be the following:

- varieties listed or protected at the EU level or at least in one of the EEA Member States;
- varieties protected in other UPOV Member States;
- any other variety in common knowledge.

The composition of the variety collection in each Examination Office depends on the environmental conditions in which the Examination Office is located.

Variety collections will be held under conditions which ensure the long term maintenance of each accession. It is the responsibility of Examination Offices to replace reference material which has deteriorated or become depleted. Replacement material can only be introduced if appropriate tests confirm conformity with the existing reference material. If any difficulties arise for the replacement of reference material Examination Offices must inform the CPVO. If authentic plant material of a variety cannot be supplied to an Examination Office the variety will be removed from the variety collection.

2. Material to be examined

Candidate varieties will be directly compared with other candidates for Community plant variety rights tested at the same Examination Office, and with appropriate varieties in the variety collection. When necessary an Examination Office may also include other candidates and varieties. Examination Offices should therefore make efforts should be made to co-ordinate the work with other offices involved in DUS-testing of celeriac. There should be at least an exchange of technical questionnaires for each candidate variety, and during the test period, Examination Offices should notify each other and the CPVO of candidate varieties which are likely to present problems in establishing distinctness. In order to solve particular problems Examination Offices may exchange plant material.

3. Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in Annex 1. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted. In the latter case, the CPVO should be informed. In addition the existence of some other regulation e.g. plant health, may make the observation of the characteristic impossible.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N° 1239/95, to insert additional characteristics and their expressions in respect of a variety.

4. Grouping of varieties

The varieties and candidates to be compared will 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 and which in their various states of expression are fairly evenly distributed throughout the collection. In the case of continuous grouping characteristics overlapping states of expression between adjacent groups is required to reduce the risks of incorrect allocation of candidates to groups. The characters used for grouping are the following (the numbers in brackets refer to the CPVO numbering):

- a) Petiole: anthocyanin coloration (characteristic 11)

5. Trial designs and growing conditions

The minimum duration of tests will normally be two independent growing cycles. For vegetatively propagated varieties, the duration of the testing may be reduced to one growing cycle if the results on distinctness and uniformity are conclusive. Tests will be carried out under conditions ensuring normal growth. The size of the plots will be such that plants or parts of plants may be removed for measuring and counting without prejudice to the observations which must be made up to the end of the growing period.

The test design is as follows:

As a minimum, each test should include a total of at least 60 plants, which should be divided between two or more replicates.

All observations determined by measurement or counting should be made on 30 plants or parts of 30 plants.

6. Special tests

In accordance with Article 83(3) of Council Regulation No. 2100/94 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

Special tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characters listed in the protocol.

7. Standards for decisions

a) **Distinctness**

A candidate variety will be considered to be distinct if it meets the requirements of Article 7 of Council Regulation No. 2100/94.

b) **Uniformity**

For the assessment of uniformity of open pollinated and hybrid varieties relative uniformity standards should be applied.

c) **Stability**

A candidate will be considered to be sufficiently stable when there is no evidence to indicate that it lacks uniformity.

IV – REPORTING OF RESULTS

After each recording season the results will be summarised and reported to the CPVO in the form of a UPOV model interim report in which any problems will be indicated under the headings distinctness, uniformity and stability. Candidates may meet the DUS standards after two growing periods but in some cases three growing periods may be required. When tests are completed the results will be sent by the Examination Office to the CPVO in the form of a UPOV model final report.

If it is considered that the candidate complies with the DUS standards, the final report will be accompanied by a variety description in the format recommended by UPOV. If not the reasons for failure and a summary of the test results will be included with the final report.

The CPVO must receive interim reports and final reports by the date agreed between the CPVO and the examination office.

Interim reports and final examination reports shall be signed by the responsible member of the staff of the Examination Office and shall expressly acknowledge the exclusive rights of disposal of CPVO.

V - LIAISON WITH THE APPLICANT

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

The interim report and final report shall be sent by the Examination Office to the CPVO.

ANNEXES TO FOLLOW

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Legend:

Note: For the CPVO numbered characteristics, all characteristics in the table are compulsory; notwithstanding, in the case of disease resistance characteristics, only those resistances marked with an asterisk (*) in the CPVO column are compulsory. The asterisks in the UPOV numbered characteristics are there for information purposes and denote those characteristics which should always be observed when a UPOV guideline is utilised.

In general for the assessment of resistance characteristics, the facilities of other Examination Offices or specialised institutions might be used, subject to previous arrangements.

Some characteristics may be discarded: if there are already phytosanitary restrictions.

(+) See explanations on the Table of characteristics

G Grouping characteristic

Types of expression of characteristics:

QL – Qualitative characteristic

QN – Quantitative characteristic

PQ – Pseudo-qualitative characteristic

Type of observation of characteristics:

MG – Single measurement of a group of plants or parts of plants

MS – Measurement of a number of individual plants or parts of plants

VG – Visual assessment by a single observation of a group of plants or parts of plants

VS – Visual assessment by observation of individual plants or parts of plants

When a method of observation is attributed to a certain characteristic, the first differentiation is made depending if the action taken is a visual observation (V) or a measurement (M).

The second differentiation deals with the number of observations the expert attributes to each variety, thus the attribution of either G or S.

If a single observation of a group consisting of an undefined number of individual plants is appropriate to assess the expression of a variety, we talk about a visual observation or a measurement made on a group of plants, thus we attribute the letter G (either VG or MG). If the expert makes more than one observation on that group of plants, the decisive part is that we have at the end only one data entry per variety which means that we have to deal with G (e.g. measurement of plant length on a plot – MG, visual observation of green colour of leaves on a plot – VG).

If it is necessary to observe a number of individual plants to assess the expression of a variety, we should attribute the letter S (thus either VS or MS). Single plant data entries are kept per variety for further calculations like the variety mean (e.g. measurement of length of ears – MS, visual observation of growth habit of single plants in grasses – VS). The number of individual plants to be observed in such cases is stated in section III.5.

Literature 18

ANNEX II

Technical Questionnaire

ANNEX I

TABLE OF CHARACTERISTICS TO BE USED IN DUS-TEST AND PREPARATION OF DESCRIPTIONS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1. QN	1. (* (+)	VG	Plant: height		
			short	Ofir	3
			medium	Ibis, Monarch	5
			tall	Bergers weisse Kugel, Boule de Marbre, Mars	7
2. (+) QN	2. (* (+)	VG	Foliage: attitude		
			erect	Mars	1
			erect to semi-erect	Bergers weisse Kugel, Monarch	2
			semi-erect	Anita, Ibis	3
			semi-erect to horizontal	Ofir	4
			horizontal	Ilona	5
3. QN	3.	VG	Foliage: number of leaves		
			few		3
			medium	Ibis, Prinz	5
			many		7
4. QN	5.	VG	Foliage: green coloration of inner leaves		
			light	Ortho	3
			medium	Bergers weisse Kugel, Cesar, Prinz	5
			dark	President	7
5. QN	6.	VG	Foliage: green coloration of fully developed leaves		
			light	Ibis	3
			medium		5
			dark	Bergers weisse Kugel, Mars, Monarch, Prinz	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
6.	7.	VG/MS	Leaf: length (including petiole)		
QN	(*)		short	Ofir, Ortho	3
			medium	Anita	5
			long	Bergers weisse Kugel	7
7.	8.	VG/MS	Leaf blade: length		
(+)	(+)		short	Ortho	3
QN			medium	Anita, Cesar, President	5
			long	Bergers weisse Kugel	7
8.	9.	VG/MS	Leaf blade: distance between 1st and 2nd leaflet pairs		
(+)	(+)		short		3
QN			medium	Monarch, President, Prinz	5
			long	Bergers weisse Kugel	7
9.	10.	VG/MS	Petiole: length		
(+)	(+)		short	Prinz	3
QN			medium	Cesar, Diamant	5
			long	Bergers weisse Kugel	7
10.	11.	VG/MS	Petiole: width		
(+)	(+)		narrow		3
QN			medium	Cesar, Prinz	5
			broad	Bergers weisse Kugel	7
11.	12.	VG	Petiole: anthocyanin coloration		
QL	(*)		absent	Mars, Neve	1
G			present	Bergers weisse Kugel, Geant Danois	9
12.	13.	VG	Leaf blade: size of terminal leaflet		
QN	(*)		small	Ortho	3
(+)	(+)		medium	Ibis, Kojak	5
			large		7

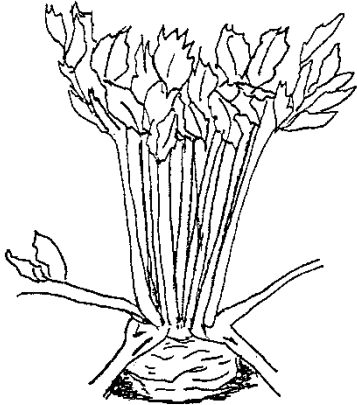
CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
13.	14.	VG	Leaflet: shape of tips of margin		
(+)	(+)		pointed	Ibis	1
QN			intermediate	Monarch, President, Prinz	2
			rounded	Radiant	3
14.	15.	VG	Leaflet: density of margin incisions		
(+)	(+)		sparse	Cesar, Hans, Rex	3
QN			medium	Ibis, Prinz	5
			dense	Diamant, Kojak	7
15.	16.	VG	Leaflet: spacing of lobes		
	(*)		not touching	Cascade	1
(+)	(+)		touching	Monarch	2
QL			overlapping	Kojak	3
16.	17.	VG	Tuber: size		
	(*)		small	Ofir	3
QN			medium	Anita, Bergers weisse Kugel	5
			large	Ibis, Neve	7
17.	18.	VG	Tuber: protrusion		
(+)	(+)		absent or very weak		1
QN			weak	Ortho	3
			medium	Bergers weisse Kugel, Monarch, President	5
			strong	Anita, Boule de Marbre,	
			very strong		7
18.	19.	VG	Tuber: main colour of skin		
	(*)		whitish	Mars, Monarch, Neve	1
QL			brown	Anita, Bergers weisse Kugel	2

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
19.	20.	VG	<u>Varieties with tubers with brown main colour only:</u> Tuber: intensity of main colour of skin		
QN			light	Anita	3
			medium	Ortho	5
			dark		7
20.	21.	VG	Tuber: insertion of roots		
	(*)		low	Cesar, Ortho	3
(+)	(+)		medium	Monarch	5
QN			high		7
21.	22.	VG	Tuber: number of roots		
QN			few	Cesar, Ortho	3
			medium	Bergers weisse Kugel, Brilliant, Monarch	5
			many		7
22.	23.	VG	Tuber: thickness of roots		
QN			thin	Cesar, Ortho	3
			medium	Bergers weisse Kugel, Diamant, Monarch	5
			thick		7
23.	24.	VG	Tuber: shape in longitudinal section		
	(*)		broad elliptic	Kojak	1
(+)	(+)		round	Monarch	2
PQ			transverse broad elliptic	Anita, Bergers weisse Kugel	3
			truncate conical		4
			flattened truncated conical		5
24.	25.	VG	Tuber: colour of flesh		
PQ	(*)		white	Diamant, Monarch	1
			ivory	Ofir	2

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
25. QN	26.	VG	Tuber: inner cavity		
			small		3
			medium	Mars	5
			large	Ortho	7
26. QN	27.	VG	Tuber: sponginess		
			weak	Monarch, Prinz	3
			medium	Bergers weisse Kugel, Cesar	5
			strong	Ortho	7
27. (+) QN	28.	VG	Tuber: internal rust spot of flesh		
			weak	Brilliant, Monarch	3
			medium	Bergers weisse Kugel, Mars	5
			strong	Ortho	7

EXPLANATIONS AND METHODS

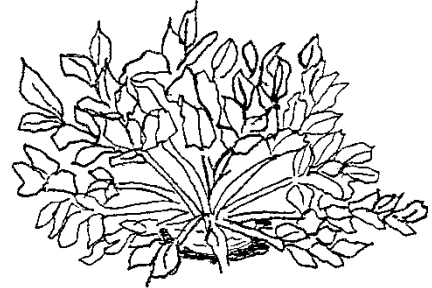
Ad. 2: Foliage: attitude



1
erect



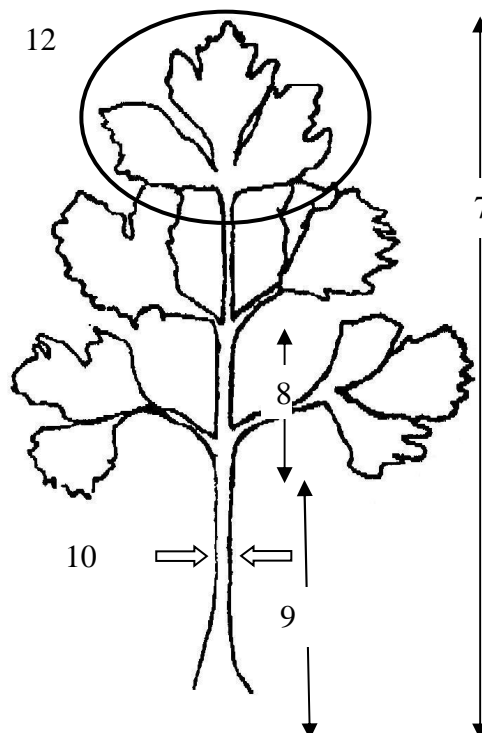
3
semi-erect



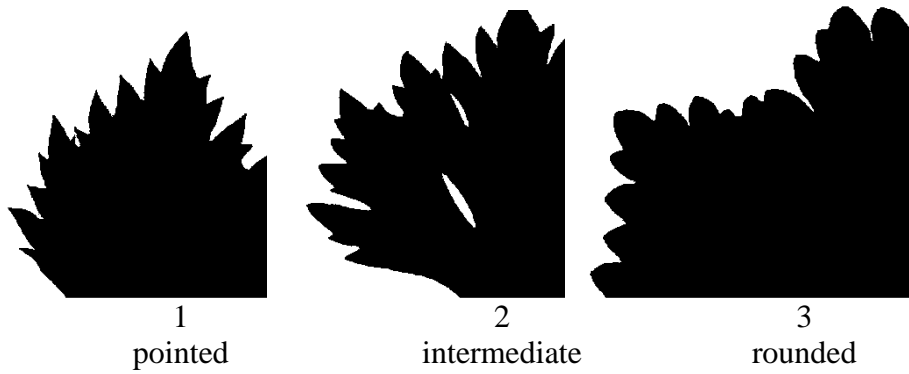
5
horizontal

Ad. 7, 8, 9, 10, 12:

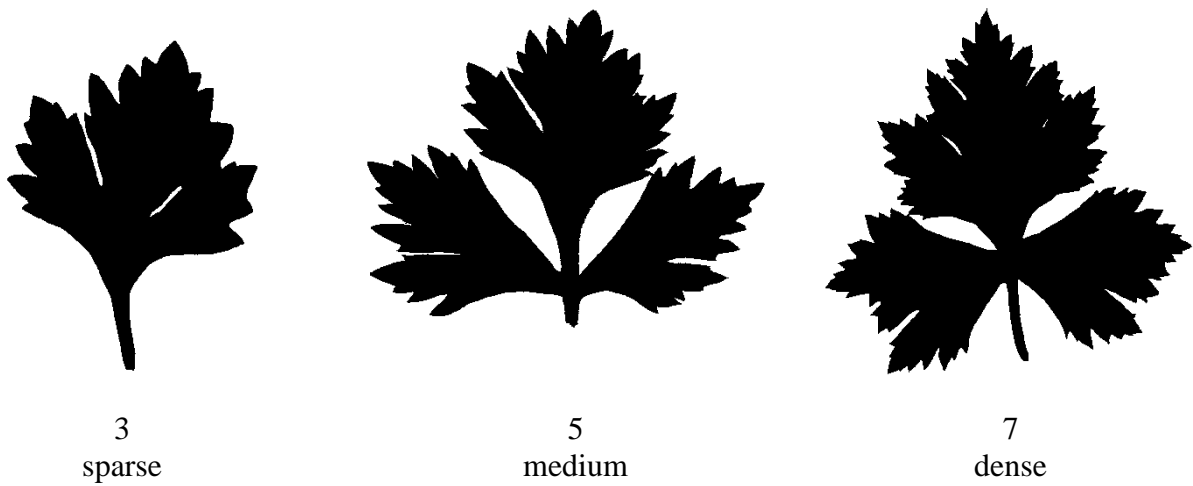
- Leaf blade: length (7)
- Leaf blade: distance between 1st and 2nd pair of leaflets (8)
- Petiole: length (9)
- Petiole: width (10)
- Leaf: size of the terminal leaflet (12)



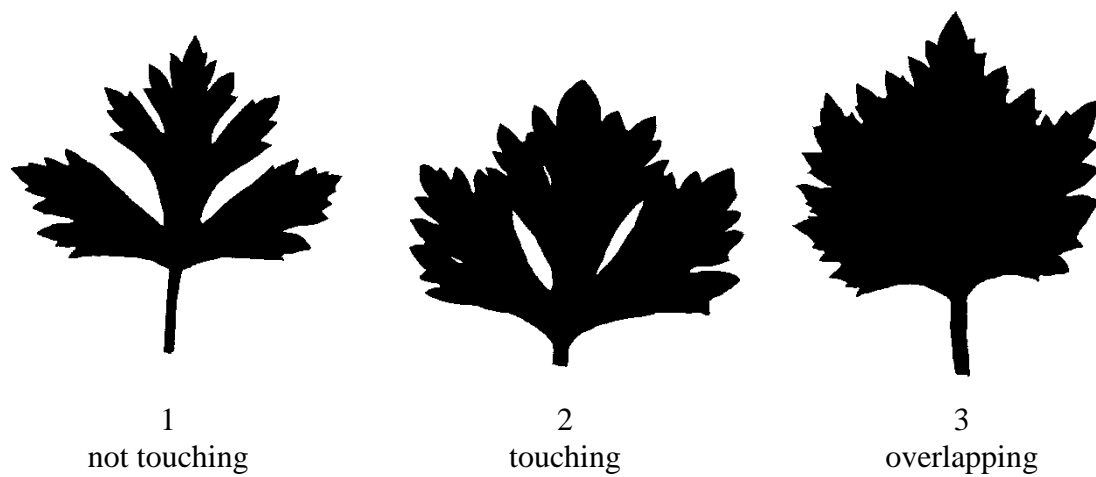
Ad 13: Leaflet: shape of tips of margin



Ad 14: Leaflet: density of margin incisions



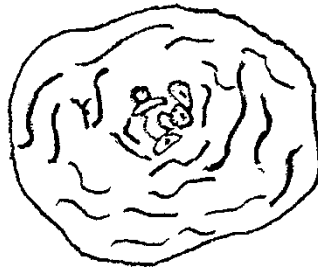
Ad. 15: Leaflet: spacing of lobes



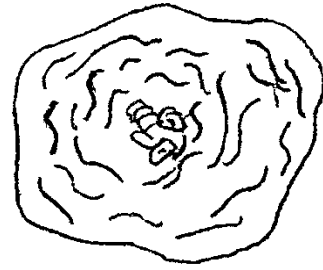
Ad. 17: Tuber: protrusion



3
weak



5
medium



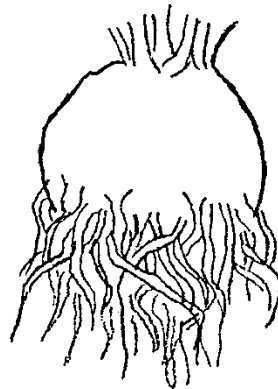
7
strong

Protrusions are raised/heightened insertion points of the main roots, which result in a more irregular shape, when viewed from above, as their intensity increases.

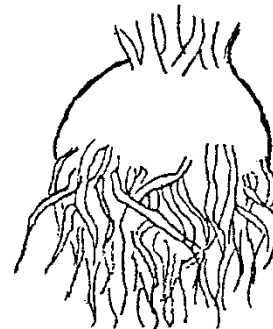
Ad 20: Tuber: insertion of roots



3
low

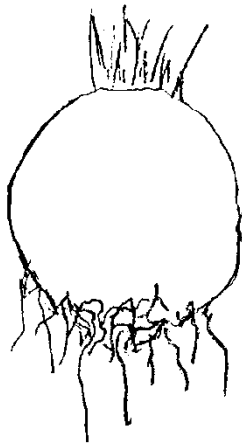


5
medium

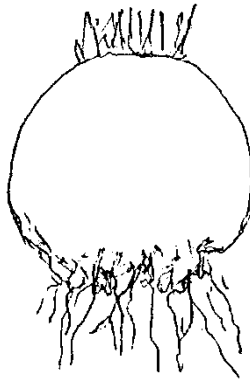


7
high

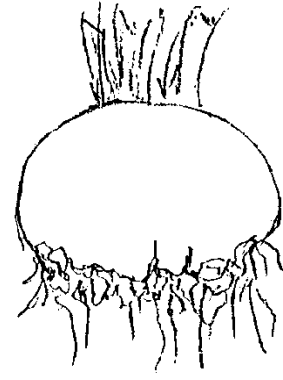
Ad 23: Tuber: shape in longitudinal section



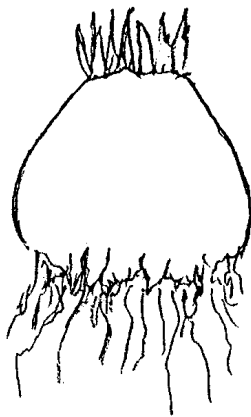
1
broad elliptic



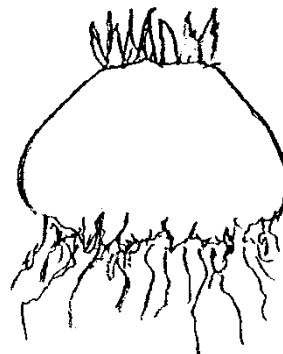
2
round



3
transverse broad elliptic



4
truncate conical



5
flattened truncated conical

Ad 27: Tuber: internal rust spot of flesh

The flesh should be assessed for internal rust spots, one hour after cutting the tuber in longitudinal section.

LITERATURE

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ANNEX II

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO-TQ/074/1