

PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

***Allium cepa* (Cepa Group), *Allium cepa* (Aggregatum Group) and
Allium oschaninii O. Fedtsch. and hybrids between them**

ONION, ECHALION, SHALLOT, GREY SHALLOT

UPOV Code: ALLIU_CEP_CEP, ALLIU_CEP_AGG, ALLIU_OSC

Adopted on 01/04/2009

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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/046/7 dated 09/04/2008 for the conduct of tests for Distinctness, Uniformity and Stability. This protocol applies to varieties of ***Allium cepa* (Cepa Group), *Allium cepa* (Aggregatum Group) and *Allium oschaninii* O. Fedtsch and hybrids between them.**

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 variety 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 to coordinate the work with other Offices involved in DUS testing of onion/shallot. 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 the 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 characteristics used for grouping could be the following:

- a) Seed propagated varieties only: Bulb: Tendency to split into bulbets (with dry skin around each bulblet) (characteristic 10)
Bulb: degree of splitting into bulbets (with dry skin around each bulblet) (characteristic 11)
- b) Bulb/Bulblet: shape (in longitudinal section) (characteristic 18)
- c) Bulb/Bulblet: base colour of dry skin (characteristic 23)
- d) Bulb/Bulblet: number of growing points per kg (characteristic 27)
- e) Male sterility (characteristic 36)

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 100 plants for vegetatively propagated varieties, 200 plants for seed-propagated applied for as onions, and 300 plants for seed propagated varieties applied as shallots, divided between two or more replicates.

All observations determined by measurement or counting should be made on 60 plants or parts of 60 plants for seed-propagated varieties, and 40 plants or parts of 40 plants for vegetatively propagated varieties.

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:

- (i) – seed propagated varieties: relative uniformity standards should be applied.
- (ii) – vegetatively propagated varieties: a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 40 plants, 2 off-types are allowed; in the case of a sample size of 100 plants, 3 off-types are allowed.

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 as well as the final report shall be sent by the Examination Office to the CPVO.

VI - ENTRY INTO FORCE

The present protocol enters into force on **12 March 2009**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the new TP. Technical examinations of candidate varieties are carried out according to the TP in force when the DUS test starts. The starting date of a DUS examination is considered to be the due date for the submission of plant material for the first growing period.

In cases where the CPVO requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process of being carried out at the moment of the request, such report can only be accepted if the technical examination has been carried out according to the CPVO TP which was in force at the moment when the technical examination started.

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
- (a) – (b) 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.

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ANNEX II

Technical Questionnaire

ANNEX I

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

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note			
1.	1.	VG	Plant: number of leaves per pseudostem					
				(*)	few	SY300 (O)	3	
				QN	QN	medium	The Kelsae (O)	5
many	Yellow sweet spanish (O)	7						
2.	2.	VG	Foliage: attitude					
				(*)	erect	Pikant (S), Santé (S)	1	
				QN	QN	erect to semi-erect	Keep Well (O)	2
						semi-erect	Southport Red Globe (O), Bonilla (S), Mirage(S), Pikant (S), Prisma (S), Saffron (S)	3
						semi-erect to horizontal	Hygro (O)	4
horizontal		5						
3.	3.	VG	Foliage: waxiness					
				(*)	absent or very weak		1	
				QN	QN	weak	Yellow sweet spanish (O)	3
						medium	Hikeeper (O), Golden Gourmet (S)	5
						strong	Calypso (O), Flevo (O), Santé (S)	7
very strong		9						
4.	4.	VG	Foliage: intensity of green colour					
				(*)	very light	Bretor (S)	1	
				QN	QN	light	Guimar (O), Yellow sweet spanish (O), Tropix (S)	3
						medium	Caribo (O), Texas grano 502 (O), Golden Gourmet (S)	5
dark	Hikeeper (O), La Reine (O), Santé (S)	7						

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note
5.	5.	VG	Foliage: cranking		
(+)	(+)		absent or weak	Golden Bear (O), Santé (S)	1
QN	QN		intermediate	Hyduro (O)	2
			strong		3
6.1	6.1	VG/MS	<u>Onion varieties only:</u> Leaf: length		
QN	QN		very short	Barletta, Pompei	1
			short	Nocera	3
			medium	Jetset	5
			long		7
			very long	The Kelsae	9
6.2	6.2	VG/MS	<u>Shallot varieties only:</u> Leaf: length		
QN	QN		short	Pikant	3
			medium	Spring Field	5
			long	Golden Gourmet, Topper	7
7.1	7.1	VG	<u>Onion varieties only:</u> Leaf: diameter		
	(*)		small	Nocera, Paris	3
QN	QN		medium	Hyfast	5
			large	Dorata di Parma	7
7.2	7.2	VG	<u>Shallot varieties only:</u> Leaf: diameter		
	(*)		small	Pikant	3
QN	QN		medium	Spring Field	5
			large	Golden Gourmet, Lyska	7
8.	8.	VG/MS	<u>Onion varieties only:</u> Pseudostem: length (up to highest green leaf)		
	(+)		short	Barletta	3
QN	QN		medium	Hyduro, The Kelsae	5
			long	Goldito	7

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note
9.	9.	VG/MS	<u>Onion varieties only:</u> Pseudostem: diameter (at mid-point of length)		
(+)	(+)		small		3
QN	QN		medium	Calypso, La Reine	5
			large	Blanca grande tardía de Lérida, The Kelsae	7
10.	10. (*)	VG	<u>Seed propagated varieties only:</u> Bulb: Tendency to split into bulblets (with dry skin around each bulblet)		
(+)	(+)	(a)	absent or very weak	Cuisse de Poulet du Poitou (O), Lagos (O)	1
QN	QN		weak		3
			medium	Mirage (S)	5
			strong	Bonilla (S), Creation (S), Longor (S), Mikor (S)	7
G			very strong	Delvad (S), Rox (S), Tropix (S)	9
11.	11. (*)	VG	<u>Bulb: degree of splitting into bulblets (with dry skin around each bulblet)</u>		
	(*)	(b)	absent or very weak	Cuisse de Poulet du Poitou (O)	1
(+)	(+)		weak		3
QN	QN		medium	Santé (S)	5
			strong		7
G			very strong	Griselle (S)	9
12.1	12.1 (*)	VG	<u>Onion varieties only:</u> Bulb: size		
	(*)		small		3
QN	QN		medium	Lagos	5
			large	The Kelsae	7
12.2	12.2 (*)	VG	<u>Shallot varieties only:</u> Bulblet: size		
	(*)	(b)	small	Atlas	3
QN	QN		medium	Spring Field, Topper	5
			large	Delicato, Santé	7

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note
13.1	13.1	VG/MS	<u>Onion varieties only: Bulb: height</u>		
	(*)		very short	Prompto	1
QN	QN		short	Nocera, Stuttgarter Riesen	3
			medium	Golden Bear	5
			tall	Birnförmige, The Kelsae	7
			very tall	Cuisse de Poulet du Poitou	9
13.2	13.2	VG/MS	<u>Shallot varieties only: Bulblet: height</u>		
	(*)	(b)	very short		1
QN	QN		short	Atlas	3
			medium	Topper	5
			tall	Jermor	7
			very tall	Longor, Pesandor	9
14.1	14.1	VG/MS	<u>Onion varieties only: Bulb: diameter</u>		
	(*)		small	Nocera, Owa	3
QN	QN		medium		5
			large	Stuttgarter Riesen	7
14.2	14.2	VG/MS	<u>Shallot varieties only: Bulblet: diameter</u>		
	(*)				
QN	QN	(b)	small	Pikant, Primalys	3
			medium	Arvro	5
			large	Santé	7
15.1	15.1	VG/MS	<u>Onion varieties only: Bulb: ratio height/diameter</u>		
	(*)				
QN	QN		very small	Pompei	1
			small	La Reine	3
			medium	Valenciana Temprana	5
			large	The Kelsae	7
			very large	Owa	9

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note
15.2	15.2 (*)	VG/MS	<u>Shallot varieties only:</u> Bulblet: ratio height/diameter		
QN	QN	(b)	very small	Rondeline	1
			small	Topper	3
			medium	Pikant	5
			large	Longor	7
			very large	Pesandor, Ploumor	9
16.	16. (*)	VG	Bulb/Bulblet: position of maximum diameter		
(+)	(+)		towards stem end	Dorata di Parma (O), Texas grano 502 (O)	1
QN	QN		at middle	Valenciana tardía de exportación (O), Red Sun (S)	2
			towards root end	The Kelsae (O), Jermor (S)	3
17.	17.	VG	Bulb/Bulblet: width of neck		
(+)	(+)		very narrow	Pikant (S)	1
QN	QN		narrow	La Reine (O), Topper (S)	3
			medium	Hyduro (O), Santé (S)	5
			broad	Blanca grande tardía de Lérida (O)	7
			very broad		9

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note
18.	18. (*)	VG	Bulb/Bulblet: shape (in longitudinal section)		
(+)	(+)		elliptic	Owa (O), Longor (S)	1
PQ	PQ		medium ovate	Birnenförmige (O), Rossa lunga di Firenze (O), Breton (S)	2
			broad elliptic	Ailsa Craig (O), Beacon (O), Hiball (O), Vigarmor (S)	3
			circular	Lagos (O), Pikant (S)	4
			broad ovate	Hysam (O), Arvro (S)	5
			broad obovate	Lilia (O), Texas grano 502 (O)	6
			rhombic	Zittauer gelbe (O)	7
			transverse medium elliptic	Sturka (O), Stuttgarter Riesen (O), Atlantic (S), Golden Gourmet (S)	8
G			transverse narrow elliptic	Brunswijker (O), De Moissac (O), Paille des vertus (O), Pompei (O)	9
19.	19. (*)	VG	<u>Onion varieties only:</u> Bulb/bulblet: shape of stem end (as for 18)		
(+)	(+)		depressed	Dorata di Parma	1
QN	QN		flat	La Reine	2
			slightly raised	Valenciana Temprana	3
			rounded	Valenciana tardía de exportación	4
			slightly sloping	Ailsa Craig, Rouge pale de Niort	5
			strongly sloping	Owa	6
20.	20. (*)	VG	Bulb/Bulblet: shape of root end (as for 18)		
(+)	(+)		depressed	Paille des vertus (O)	1
QN	QN		flat	Nocera (O), Valenciana Temprana (O)	2
			round	Valenciana tardía de exportación (O), Atlas (S), Delicato (S)	3
			weakly tapered	Pompei (O), The Kelsae (O), Bonilla (S), Santé (S)	4
			strongly tapered	Owa (O), Bretor (S)	5

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note
21.	21.	VG	Bulb/Bulblet: adherence of dry skin after harvest		
QN	QN		weak	Ailsa Craig (O), Tropix (S)	3
			medium	Rjinsburger 7 (O), Golden Gourmet (S)	5
			strong	Stuttgarter Riesen (O), Bonilla (S), Santé (S)	7
22.	22.	VG	Bulb/Bulblet: thickness of dry skin		
QN	QN		thin	La Reine (O), Pikant (S)	3
			medium	Sturon (O), Santé (S)	5
			thick	Birnförmige (O), Espagnol (O)	7
23.	23.	VG	Bulb/Bulblet: base colour of dry skin		
	(*)		white	La Reine (O), Pompei (O)	1
PQ	PQ		grey	Griselle (S)	2
			green		3
			yellow	Zittauer gelbe (O), Creation (S), Golden Gourmet (S), Topper (S)	4
			brown	Valenciana Temprana (O), Delicato(S), Mirage(S), Mikor (S), Pikant (S)	5
			pink	Colorada de Figueras (O), Rox (S), Santé (S)	6
G			red	Brunswijker (O), Red Baron (O)	7
24.	24.	VG	<u>Excluding varieties with white dry skin</u>: Bulb/Bulblet: intensity of base colour of dry skin		
QN	QN		light		3
			medium		5
			dark		7

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note
25.	25. (*)	VG	Bulb/Bulblet: hue of colour of dry skin (in addition to base colour)		
PQ	PQ		absent	Pompei (O)	1
			greyish		2
			greenish		3
			yellowish	Topper (S)	4
			brownish	Santé (S)	5
			pinkish	Delicato (S)	6
			reddish	Mikor (S), Mirage (S), Pikant (S)	7
			purplish		8
26.	26. (*)	VG	Bulb/Bulblet: coloration of epidermis of fleshy scales		
PQ	PQ		absent		1
			greenish	Sturon (O), Golden Gourmet (S)	2
			reddish	Brunswijker (O), Pikant (S), Santé (S)	3
27.	27. (*)	MS	Bulb/Bulblet: number of growing points per kg		
(+)	(+)	(a)	very low	Barletta (O), Pompei (O)	1
QN	QN	(b)	low	Cuisse de Poulet du Poitou (O), Figaro (O), Owa (O)	3
			medium	Longor (S), Mirage (S), Prisma (S)	5
			high	Bonilla (S), Creation (S), Mikor (S)	7
G			very high	Griselle (S), Rox (S), Tropix (S)	9
28.	28. (*)	MG	Bulb/Bulblet: dry matter content		
			very low	Exhibition (O)	1
(+)	(+)		low	Golden Bear (O), The Kelsae (O)	3
QN	QN		medium	Golden Gourmet (S), Topper (S)	5
			high	Birnförmige (O), Zittauer gelbe (O), Creation (S), Longor (S)	7
			very high	Griselle (S)	9

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note
29.	29.	VG	<u>Onion varieties only</u>: Tendency to bolting in <u>spring</u> sown trials		
QN	QN		absent or very weak	Desihdrobat	1
			weak	Stuttgarter Riesen, Zittauer gelbe	3
			medium	Legio	5
			strong		7
			very strong	Bronzé d'Amposta	9
30.	30.	MS	<u>Onion varieties only</u>: Time of beginning of bolting in <u>spring</u> sown trials		
QN	QN		early	Bronzé d'Amposta	3
			medium	Legio	5
			late		7
31.	31.	VG	<u>Onion varieties only</u>: Tendency to bolting in <u>autumn</u> sown trials		
QN	QN		absent or very weak		1
			weak	Valenciana Temprana	3
			medium		5
			strong	Guimar	7
			very strong	Valenciana tardía de exportación	9
32.	32.	MS	<u>Onion varieties only</u>: Time of beginning of bolting in <u>autumn</u> sown trials		
QN	QN		early		3
			medium		5
			late		7

CPVO No.	UPOV No.	Stage, Method	Characteristics	Examples	Note
33.	33.	MS	Onion varieties only: Time of harvest maturity for <u>autumn</u> sown trials (foliage fall-over in 80% of plants)		
	(*)		very early		1
QN	QN		early	La Reine, Sonic	3
			medium	Buffalo, Imai Early Yellow, Valenciana Temprana	5
			late	Guimar, Senshyu Semi Globe Yellow, Shakespeare	7
			very late	Valencia tardía	9
34.1.	34.1	MS	Onion varieties only: Time of harvest maturity for <u>spring</u> sown trials (as for 33)		
	(*)		early	Buffalo, Golden Bear	3
QN	QN		medium	Piroska	5
			late	Beacon	7
34.2.	34.2	MS	Shallot varieties only: Time of harvest maturity (as for 33)		
	(*)		early	Ploumor, Rox	3
QN	QN		medium	Creation, Pikant	5
			late	Golden Gourmet, Santé	7
35.	35.	MS	Time of sprouting during storage		
	(+)		early	Golden Bear (O), The Kelsae (O)	3
QN	QN		medium	Hygro (O), Hyper (O)	5
			late	Marion (O)	7
36.	36. (*)	VG	Male sterility		
(+)	(+)		absent or very weak	Rijnsburger 5 (O)	1
QN	QN		weak	Hyduro (O), Creation (S)	2
G			strong	Atlas (S)	3

EXPLANATIONS AND METHODS

Explanations for covering several characteristics

Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

- (a) to be judged on material directly grown from seed.
- (b) to be judged on material directly grown from submitted bulbs or from replanted bulbs harvested from seed-propagated varieties.

Type of example variety: O = onion/echalion
S = shallot/grey shallot

Grouping for onion and shallot:

Grouping for onion and shallot is based on characteristics 10 and/or 11, in conjunction with characteristic 27.

Characteristic 10

Seed-propagated varieties applied for as onion/echalion with notes 1 to 3 for characteristic 10 are grouped as onion/echalion and varieties with notes 7 to 9 are grouped as shallot. Varieties with notes 4, 5 or 6 need to be considered according to characteristic 11, after replanting in a second growing cycle.

Varieties applied for as seed shallots with notes 1 to 6 for characteristic 10, need to be considered according to characteristic 11, after replanting in a second growing cycle. Varieties with notes 7 to 9 are grouped as shallot.

Characteristic 11

Varieties with notes 1 to 3 for characteristic 11 are grouped as onion/echalion and varieties with notes 7 to 9 are grouped as shallots. Varieties with notes 4, 5 or 6 for characteristic 11 need to be considered according to characteristic 27 (number of growing points) after vegetative multiplication (in the second growing cycle).

Characteristic 27

Varieties with notes 1 to 3 for characteristic 27 are grouped as onion/echalion and varieties with notes 5 to 9 are grouped as shallot.

Varieties with state 4 for characteristic 27 should be compared with varieties in both the onion and shallot group. [To determine the group, the variety needs to be observed in at least two further independent growing cycles to determine if the description is nearer to 3 or 5.] This is illustrated as follows:

Characteristic 10: Seed-propagated varieties only:
Bulb: Tendency to split into bulblets (with dry skin around each bulblet)

<p>varieties applied for as: shallot</p> <p style="font-size: 2em;">}</p> <p>shallot</p> <p>→ <u>Characteristic 11:</u></p>	<table border="0"> <tr><td>1</td><td>absent or very weak</td><td>1</td></tr> <tr><td>2</td><td></td><td>2</td></tr> <tr><td>3</td><td>weak</td><td>3</td></tr> <tr><td>4</td><td></td><td>4</td></tr> <tr><td>5</td><td>medium</td><td>5</td></tr> <tr><td>6</td><td></td><td>6</td></tr> <tr><td>7</td><td>strong</td><td>7</td></tr> <tr><td>8</td><td></td><td>8</td></tr> <tr><td>9</td><td>very strong</td><td>9</td></tr> </table>	1	absent or very weak	1	2		2	3	weak	3	4		4	5	medium	5	6		6	7	strong	7	8		8	9	very strong	9	<table border="0"> <tr><td>1</td><td></td><td>1</td></tr> <tr><td>2</td><td></td><td>2</td></tr> <tr><td>3</td><td></td><td>3</td></tr> <tr><td>4</td><td></td><td>4</td></tr> <tr><td>5</td><td></td><td>5</td></tr> <tr><td>6</td><td></td><td>6</td></tr> <tr><td>7</td><td></td><td>7</td></tr> <tr><td>8</td><td></td><td>8</td></tr> <tr><td>9</td><td></td><td>9</td></tr> </table>	1		1	2		2	3		3	4		4	5		5	6		6	7		7	8		8	9		9	<p>varieties applied for as: onion/echalion</p> <p>onion/echalion</p> <p>shallot</p> <p>←</p>
1	absent or very weak	1																																																							
2		2																																																							
3	weak	3																																																							
4		4																																																							
5	medium	5																																																							
6		6																																																							
7	strong	7																																																							
8		8																																																							
9	very strong	9																																																							
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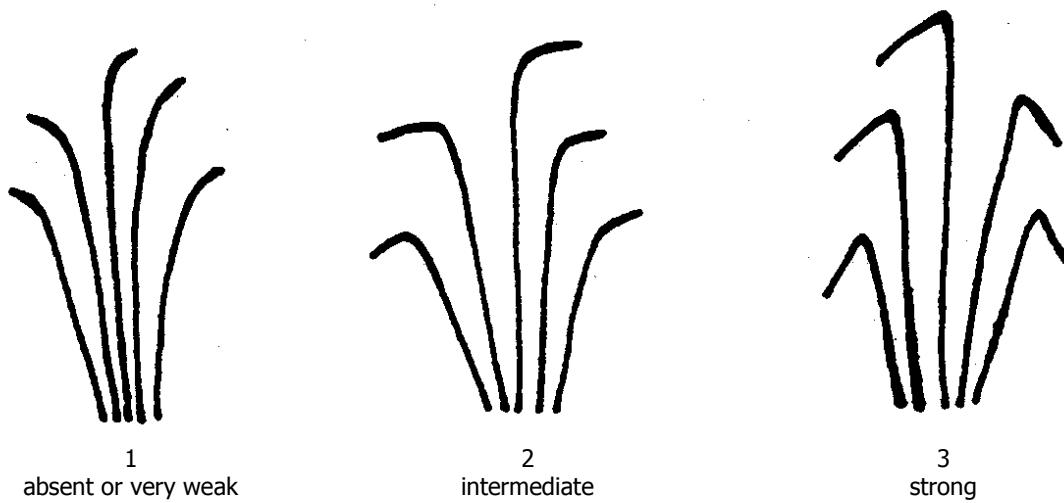
Bulb: degree of splitting into bulblets (with dry skin around each bulblet)

absent or very weak	1	}	onion/echalion
	2		
weak	3		
	4		
medium	5		
	6		
strong	7	}	shallot
	8		
very strong	9		

Characteristic 27: Bulb/Bulblet: number of growing points per kg

very low	1	}	onion/echalion
	2		
low	3		
	4		varieties with state 4 should be compared with varieties in both the onion and shallot groups
medium	5		
	6		
high	7	}	shallot
	8		
very high	9		

Ad 5: Foliage: cranking

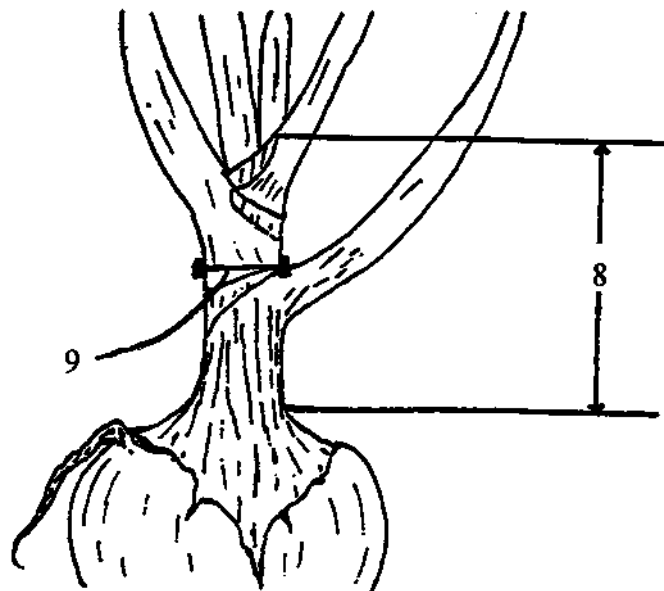


Ad 8: Onion varieties only: Pseudostem: length (up to highest green leaf)

Ad 9: Onion varieties only: Pseudostem: diameter (at midpoint of length)

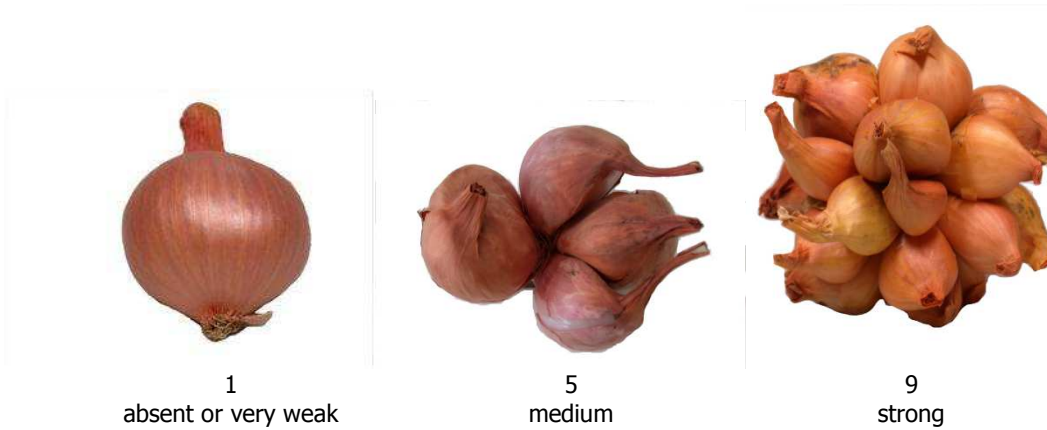
Ad. 8: The length of the pseudo stem should be assessed from the top of the bulb (defined by the point of inflection to the neck) to the point where the highest green leaf emerges from the pseudo stem.

Ad. 9: The diameter of the pseudo stem should be assessed in the middle of the pseudo stem.

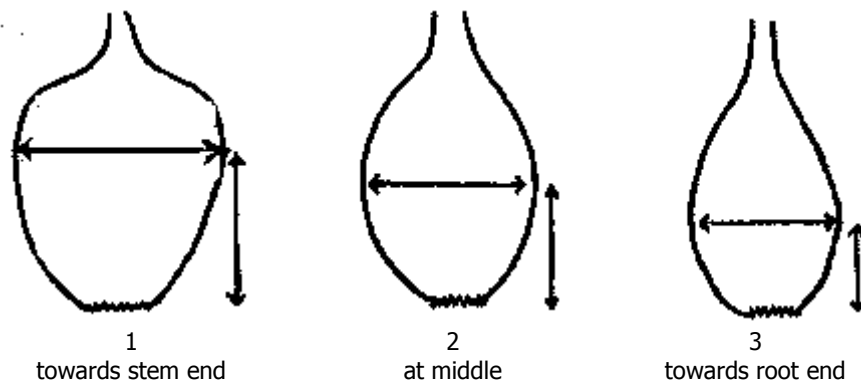


Ad. 10: Seed propagated varieties only: Bulb: tendency to split into bulblets (with dry skin around each bulblet)

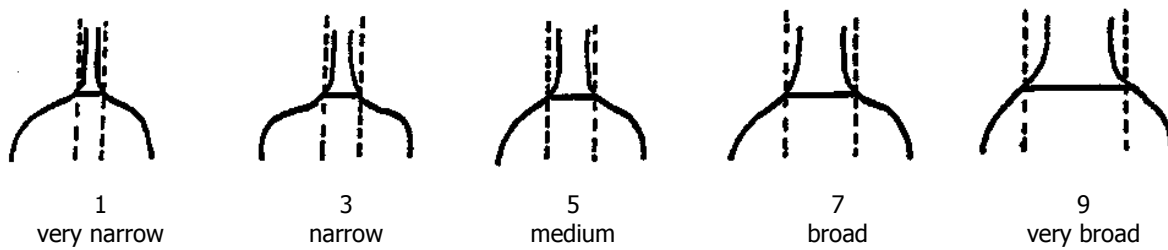
Ad. 11: Bulb: degree of splitting into bulblets (with dry skin around each bulblet)



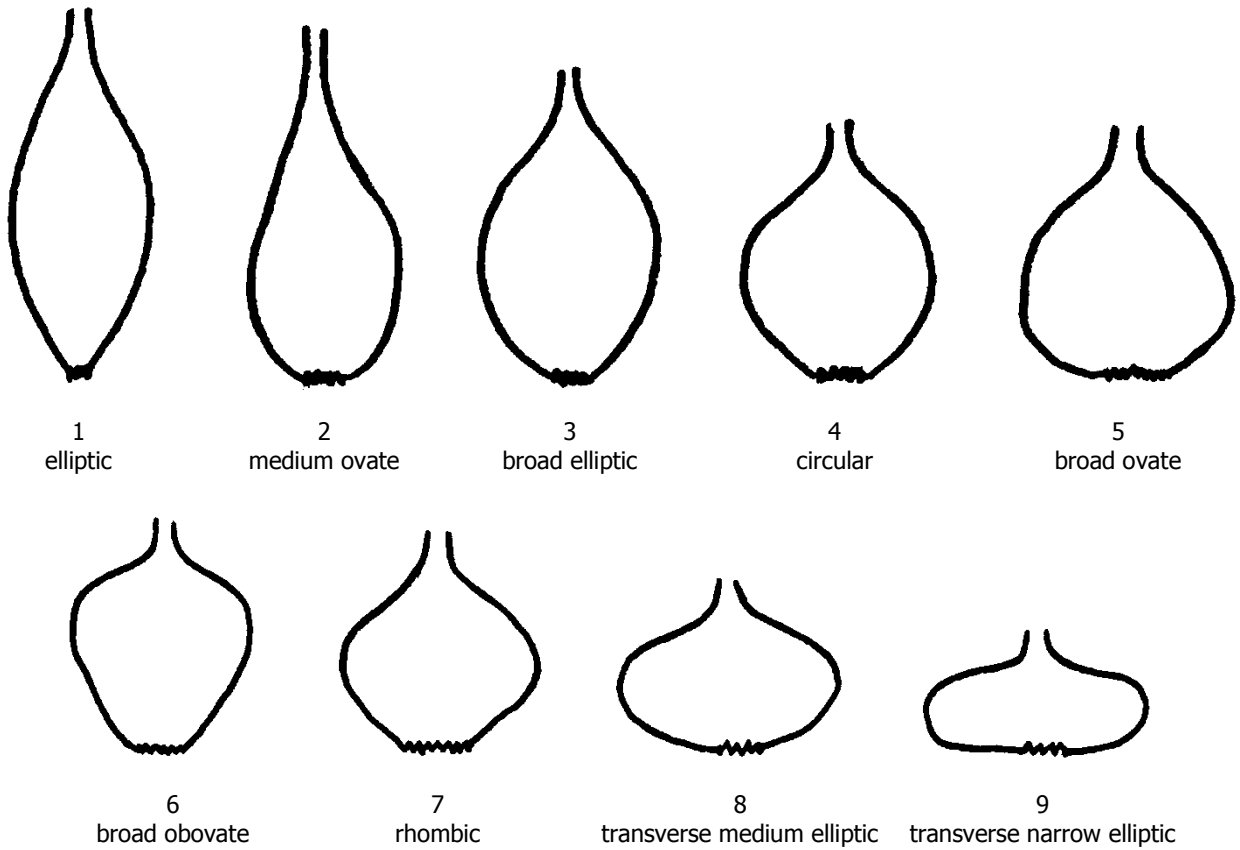
Ad 16: Bulb/Bulblet: position of maximum diameter



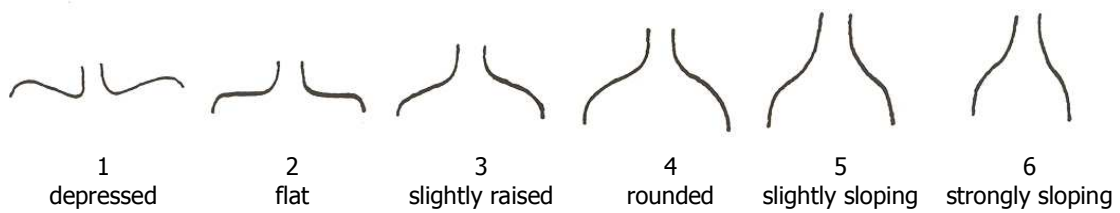
Ad 17: Bulb/Bulblet: width of neck



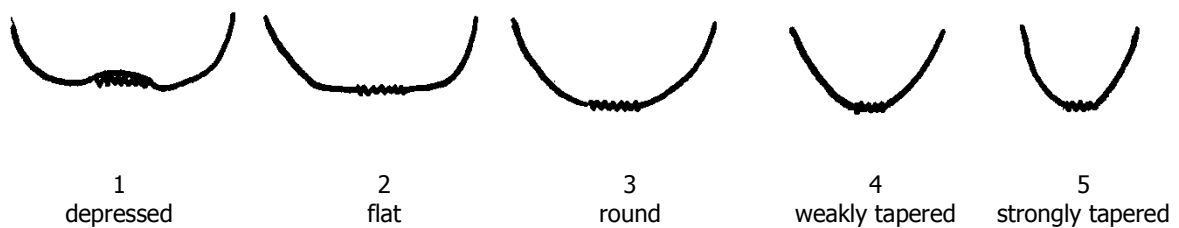
Ad 18: Bulb/Bulblet: shape (in longitudinal section)



Ad 19: Onion varieties only: Bulb: shape of stem end (as for 18)



Ad 20: Bulb/Bulblet: shape of root end (as for 18)



Ad 27: Bulb/Bulblet: number of growing points per kg

(a) For varieties applied as onions

The number of growing points (axes) should be assessed when the bulb/bulblet has completely dried back at the end of storage, just before sprouting commences. Taking median sized bulbs, the bulb or bulblet should be cut in transverse section at $\frac{1}{3}$ of the length from the base. Each axis appears as a point, often greenish in colour surrounded by tissue rings.

For a given variety, the number of growing points per bulb will vary according to the size of the bulb, and the size of the bulb will be influenced by the size of the bulb from which it originated. However, the weight of bulb per growing point is consistent for a given variety, irrespective of the size of the bulb. Thus, the characteristic observes the number of growing points per kg (i.e. the inverse of the weight of bulb per growing point).

Ad 28: Bulb/Bulblet: dry matter content

Dry matter content should be determined according to Chapter 3.5 (e.g. one sample of 20 bulbs from each plot). From these bulbs the dry skin should be removed as well as the protruding part of the root disk. From these 20 bulbs a bulk sample should be prepared by cutting the bulbs into small pieces of 1-5 mm size. A representative sample should be weighed directly after cutting (the biodegradation of sugars and carbohydrates starts as soon as cells are damaged). The samples should be dried for 2 hours at 105°C and then the temperature should be lowered to 65°C during 22 hours. Lowering of temperature is necessary to avoid caramelisation. The remaining weight should be assessed after 24 hours. From these figures the dry matter content may be calculated.

The dry matter content could also be assessed by refractometer.

Ad 35: Time of sprouting during storage

Care should be taken to exclude damaged bulbs. Storage temperature should be maintained between 2°C and 5°C with good ventilation which can be achieved by storing in stacking, slotted trays.

In climates which have cooler summer temperature, it is advisable to 'cure' bulbs for 2 weeks at a temperature of 30-35°C. Temperatures above 40°C should be avoided to prevent growth of *Aspergillus niger*.

A minimum of 50 bulbs are required to assess sprouting. Assessment should be carried out every 2 to 4 weeks.

Ad 36: Male sterility

After re-planting of harvested bulbs in the second year, flowers will emerge. In dry weather, when flowers are completely open, male sterility should be assessed by checking if pollen is released from the anthers. This characteristic has to be observed plant by plant; the expression represents the percentage of male sterile plants.

State	Note	% male sterility
absent or very weak	1	0-10 %
weak	2	11-80 %
strong	3	81-100 %

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ANNEX II

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO-TQ/046/2