

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 OBTENCIÓNES
VEGETALES

**GUIDELINES
FOR THE CONDUCT OF TESTS
FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

GARLIC

(Allium sativum L.)

**GENEVA
2001, 2022**

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These Guidelines should be read in conjunction with document TG/1/2, which contains explanatory notes on the general principles on which the Guidelines have been established.

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I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Allium sativum* L.

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.
2. The material is to be supplied in the form of seed in the case of seed-propagated varieties, or in the form of bulbs in the case of vegetatively propagated varieties.
3. The minimum quantity of plant material, to be supplied by the applicant, should be:

Seed-propagated varieties: 15,000 seeds, or
Vegetatively propagated varieties: 60 bulbs

4. In the case of seed, the seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority.
5. In the case of bulbs, the plant material should at least meet the minimum requirements for sprouting capacity, moisture content and purity for marketing plant material in the country in which the application is made. It must be in good sanitary condition and free from virus, in particular from leek yellow stripe virus and onion yellow dwarf virus.
6. 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 independent growing cycles.
2. The tests should normally be conducted at one place. If any important characteristic 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. In the case of seed-propagated varieties, each test should be designed to result in a total of at least 200 plants divided between two or more replicates. In the case of vegetatively propagated varieties, each test should be designed to result in a total of at least 100 plants divided between two or more replicates. Separate plots for visual observation and for measuring can only be used if they have been subject to similar environmental conditions.

4. Because of the effect of conditions of storage of bulbs on the expression of characteristics, comparison of varieties should be made only on material which has been propagated and stored under the same temperature and humidity conditions (e.g. 15°C to 18°C).

5. Additional tests for special purposes may be established.

IV. Methods and Observations

1. Unless otherwise indicated, in the case of seed-propagated varieties, all observations on single plants should be made on 60 plants or parts taken from each of 60 plants. In the case of vegetatively propagated varieties, all observations on single plants should be made on 30 plants or parts taken from each of 30 plants.

2. The assessment of uniformity for cross-pollinated varieties should be according to the recommendations for cross pollinated varieties in the General Introduction.

3. The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction.

4. For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% with an acceptance probability of at least 95% should be applied. In the case of a sample size of 100 plants, three off-types are allowed.

5. All observations on the leaf, foliage and flowering stem should be made before foliage fall-over.

6. All observations on the bulbs should be made on bulbs harvested in the trial.

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) Pseudostem: flowering stem (characteristic 10);
- (b) Clove: color of scale (characteristic 29);
- (c) Time of harvest maturity (characteristic 33);
- (d) End of dormancy of clove in bulb (characteristic 34).

VI. Characteristics and Symbols

1. To assess distinctness, uniformity and stability, the characteristics and their states as given in the Table of Characteristics should be used.
2. Notes (numbers), for the purposes of electronic data processing, are given opposite the states of expression for each characteristic.
3. Legend:
 - (*) Characteristics that should be used on all varieties in every growing cycle 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	Note/ Nota
1. Foliage: density (*)	Feuillage: densité	Laub: Dichte	Follaje: densidad		
loose	lâche	locker	laxo	Ramses	3
medium	moyen	mittel	medio	Printanor	5
dense	dense	dicht	denso	Germidour	7
2. Foliage: attitude (*)	Feuillage: port	Laub: Haltung	Follaje: porte		
(+) erect	dressé	aufrecht	erecto	Jolimont	1
erect to semi-erect	dressé à demi-dressé	aufrecht bis halbaufrecht	erecto a semierecto	Printanor	2
semi-erect	demi-dressé	halbaufrecht	semierecto	Jardinor	3
3. Leaf: green color (*)	Feuille: couleur verte	Blatt: Grünfärbung	Hoja: color verde		
light	claire	hell	claro		3
medium	moyenne	mittel	medio	Messidrome	5
dark	foncée	dunkel	oscuro	Germidour	7
4. Leaf: waxiness	Feuille: pruine	Blatt: Wachsschicht	Hoja: cerosidad		
absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil		1
weak	faible	gering	débil	Sprint	3
medium	moyenne	mittel	media	Messidrome	5
strong	forte	stark	fuerte	Germidour, Moratop	7
very strong	très forte	sehr stark	muy fuerte	Gayant, Printanor	9
5. Leaf: length (*) (longest leaf)	Feuille: longueur (feuille la plus longue)	Blatt: Länge (längstes Blatt)	Hoja: longitud (hoja más larga)		
short	courte	kurz	corta	Jardinor	3
medium	moyenne	mittel	media	Moraluz, Morasur	5
long	longue	lang	larga	Sultop	7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6. Leaf: width (*) (as for 5)	Feuille: largeur (comme pour 5)	Blatt: Breite (wie unter 5)	Hoja: anchura (como para 5)		
narrow	étroite	schmal	estrecha	Ramses	3
medium	moyenne	mittel	media	Printanor	5
broad	large	breit	ancha	Germidour	7
7. Leaf: shape in cross (*) section	Feuille: forme en section transversale	Blatt: Form im Querschnitt	Hoja: forma de la sección transversal		
strongly concave	fortement concave	stark konkav	fuertemente cóncava		1
slightly concave	légèrement concave	leicht konkav	ligeramente cóncava	Ramses	2
flat	plane	flach	plana	Germidour	3
8. Pseudostem: intensity (*) of anthocyanin coloration at base	Pseudotige: intensité de la pigmentation anthocyane à la base	Pseudostamm: Intensität der Anthocyanfärbung an der Basis	Pseudotallo: intensidad de la pigmentación antociánica en la base		
absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Printanor	1
weak	faible	gering	débil	Messidrome	3
medium	moyenne	mittel	media		5
strong	forte	stark	fuerte	Germidour	7
very strong	très forte	sehr stark	muy fuerte		9
9. Pseudostem: width of (*) the base	Pseudotige: largeur de la base	Pseudostamm: Breite der Basis	Pseudotallo: anchura de la base		
narrow	étroite	schmal	estrecha	Ramses	3
medium	moyenne	mittel	media	Printanor	5
broad	large	breit	ancha	Germidour	7
10. Pseudostem: flowering (*) stem	Pseudotige: tige florifère	Pseudostamm: Blütenstandsstiel	Pseudotallo: tallo floral		
absent	absente	fehlend	ausente	Germidour	1
present	présente	vorhanden	presente	Rose de Lautrec	9

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11. Flowering stem: (*) curvature (+) absent present	Tige florale: courbure absente présente	Blütenstandstiel: Krümmung fehlend vorhanden	Tallo floral: curvatura ausente presente	Morasur, Sultop Iberose	1 9
12. Flowering stem: (*) length (+) short medium long	Tige florale: longueur courte moyenne longue	Blütenstandstiel: Länge kurz mittel lang	Tallo floral: longitud corto medio largo	Rose de Lautrec Morasol Sultop	3 5 7
13. Flowering stem: (*) bulblets (+) absent present	Tige florale: bulbes absentes présentes	Blütenstandstiel: Bulbillen fehlend vorhanden	Tallo floral: bulbillos ausentes presentes	Rose de Lautrec Germidour	1 9
14. Bulb: size (*) small medium large	Bulbe: taille petite moyenne grande	Zwiebel: Größe klein mittel groß	Bulbo: tamaño pequeño mediano grande	Fructidor Printanor Messidrome	3 5 7
15. Bulb: shape in (*) longitudinal section (+) transverse narrow elliptic transverse broad elliptic circular	Bulbe: forme en section longitudinale elliptique étroite transverse elliptique large transverse arrondie	Zwiebel: Form im Längsschnitt quer schmal elliptisch quer breit elliptisch kreisförmig	Bulbo: forma en sección longitudinal elíptica estrecha transversal elíptica ancha transversal circular	Sprint Germidour De Roumanie	1 2 3
16. Bulb: shape in cross section	Bulbe: forme en section transversale	Zwiebel: Form im Querschnitt	Bulbo: forma en sección transversal		
elliptic	elliptique	elliptisch	elíptica	Fructidor	1
circular	arrondie	kreisförmig	circular	Sprint	2

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. Bulb: position of cloves at tip of bulb (+)	Bulbe: position des caïeux à l'extrémité supérieure du bulbe	Zwiebel: Position der Zehen an der Spitze der Zwiebel	Bulbo: posición de los dientes en el extremo del bulbo		
inserted	insérée	im Hals	insertos	Sprint	1
at same level	au même niveau	am Halsbeginn	al mismo nivel	Corail	2
exerted	extérieure	unterhalb des Halses	exertos	Germidour	3
18. Bulb: position of root disc (*)	Bulbe: position du plateau racinaire	Zwiebel: Position der Wurzelscheibe	Bulbo: posición del disco radicular		
depressed	déprimée	eingesenkt	deprimido	Germidour	1
flat	plane	flach	plano	Rose de Lautrec	2
raised	en saillie	vorgewölbt	protuberante		3
19. Bulb: shape of base (*) (+)	Bulbe: forme de la base	Zwiebel: Form der Basis	Bulbo: forma de la base		
recessed	déprimée	eingebuchtet	deprimida	Germidour, Ramses	1
flat	plate	flach	plana	Printanor	2
rounded	arrondie	abgerundet	redonda	de Roumanie	3
20. Bulb: compactness of cloves	Bulbe: compacité des caïeux	Zwiebel: Dichte der Zehen	Bulbo: compactidad de los dientes		
loose	faible	locker	laxo	Sprint	3
medium	moyenne	mittel	medio	Germidour	5
compact	forte	dicht	compacto	Printanor	7
21. Bulb: ground color of dry external scales (*)	Bulbe: couleur de fond des tuniques externes sèches	Zwiebel: Grundfarbe der trockenen Außenschalen	Bulbo: color de fondo de las catáfilas externas		
white	blanche	weiß	blanco	Printanor, Ramses	1
yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Vigor Max, Vigor Supreme	2
reddish white	blanc rougeâtre	rötlichweiß	blanco rojizo	Germidour	3

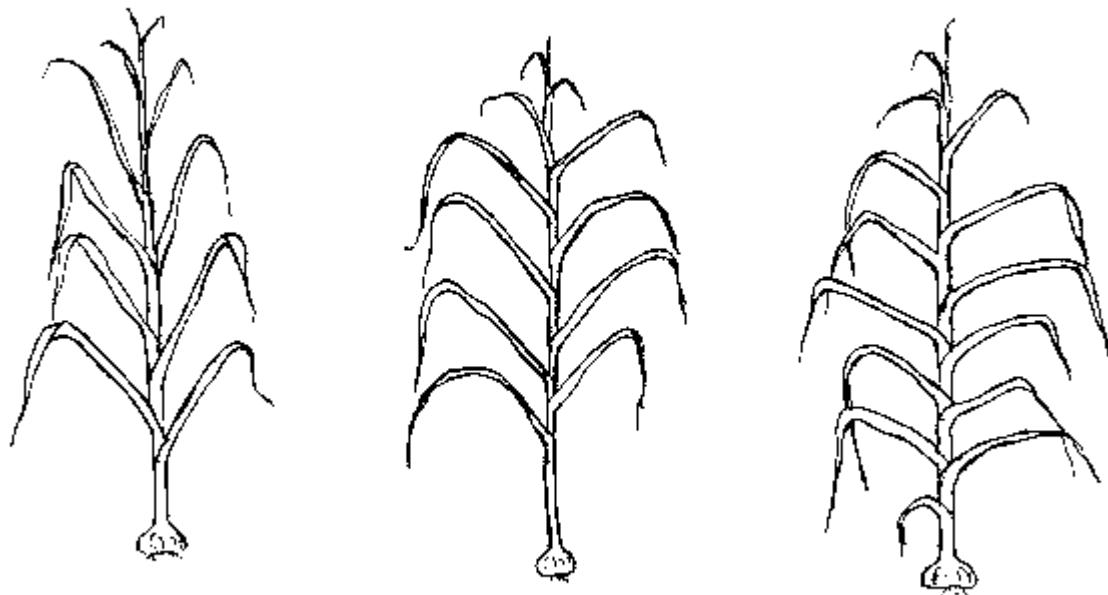
English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22. Bulb: anthocyanin stripes on dry external scales	Bulbe: striures anthocyaniques sur les tuniques externes sèches	Zwiebel: Anthocyanstreifen auf den trockenen Außenschalen	Bulbo: estrías antociánicas en las catáfilas externas		
absent	absentes	fehlend	ausentes	Printanor, Ramses	1
present	présentes	vorhanden	presentes	Germidour, Sprint	9
23. Bulb: skin adherence of dry external scales	Bulbe: adhérence des tuniques externes sèches	Zwiebel: Anhaften der trockenen Außenschalen	Bulbo: adherencia de las catáfilas externas		
weak	faible	gering	débil	Sprint	3
medium	moyenne	mittel	media	Messidrome	5
strong	forte	stark	fuerte	Printanor, Gayant	7
24. Bulb: thickness of dry external scales	Bulbe: épaisseur des tuniques externes sèches	Zwiebel: Dicke der trockenen Außenschalen	Bulbo: espesor de las catáfilas externas		
thin	minces	dünn	delgadas	Ramses	3
medium	moyennes	mittel	medias	Morasur	5
thick	épaissees	dick	gruesas	Jolimont	7
25. Bulb: number of cloves	Bulbe: nombre de caïeux	Zwiebel: Anzahl Zehen	Bulbo: número de dientes		
few	petit	gering	bajo	Mondor	3
medium	moyen	mittel	medio	Printanor	5
many	grand	groß	alto	Ramses	7
26. Bulb: distribution of cloves	Bulbe: distribution des caïeux	Zwiebel: Verteilung der Zehen	Bulbo: distribución de los dientes		
(*)					
radial	rayonnante	radial	radial	Rose de Lautrec, Sprint	1
(+)					
non-radial	non rayonnante	nicht radial	non radial	Blanc de Beaumont, Messidrome, Rougeatre de Vendée	2

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27. Bulb: external cloves (*) (+)	Bulbe: caïeux externes	Zwiebel: externe Zehen	Bulbo: dientes exteriores		
absent	absents	fehlend	ausentes	Sprint, Sultop	1
present	présents	vorhanden	presentes	Blanc de Beaumont, Morasol	9
28. Clove: size (*)	Caïeu: taille	Zehe: Größe	Diente: tamaño		
small	petite	klein	pequeño	Rose de Lautrec	3
medium	moyenne	mittel	medio	Printanor	5
large	grande	groß	grande	Germidour	7
29. Clove: color of scale (*)	Caïeu: couleur de la tunique	Zehe: Schalenfarbe	Diente: color de la piel		
white	blanche	weiß	blanco	Ramses	1
cream	crème	cremefarben	crema	Messidrome	2
pink	rose	rosa	rosa	Printanor	3
purple	violette	purpur	violeta	Morasol, Sprint	4
brown	brune	braun	marrón	Corail	5
30. Clove: intensity of color of scale (*)	Caïeu: intensité de la couleur de la tunique	Zehe: Intensität der Schalenfarbe	Diente: intensidad del color de la piel		
weak	faible	gering	débil	Printanor	3
medium	moyenne	mittel	media	Ibérose, Sultop	5
strong	forte	stark	fuerte	Morasol, Morasur, Moratop	7
31. Clove: anthocyanin stripes on scale (*)	Caïeu: striures anthocyaniques de la tunique	Zehe: Anthocyanstreifen auf der Schale	Diente: estrías antociánicas en la piel		
absent	absentes	fehlend	ausentes	Ramses	1
present	présentes	vorhanden	presentes	Morasur	9
32. Clove: color of flesh (*)	Caïeu: couleur de la chair	Zehe: Farbe des Fleisches	Diente: color de la pulpa		
white	blanche	weiß	blanco	Printanor	1
yellowish	jaunâtre	gelblich	amarillento	Germidour	2

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33. Time of harvest (*) maturity	Époque de maturité de la récolte	Zeitpunkt der Erntereife	Época de madurez para la cosecha		
very early	très précoce	sehr früh	muy temprana	Ramses	1
early	précoce	früh	temprana	Sprint	3
medium	moyenne	mittel	media	Germidour, Messidrome	5
late	tardive	spät	tardía	Printanor	7
very late	très tardive	sehr spät	muy tardía	Gayant	9
34. End of dormancy of (*) clove in bulb (+)	Levée de dormance des caïeux dans le bulbe	Ende der Keimruhe der Zehen in der Zwiebel	Final de la dormancia de los dientes en el bulbo		
very early	très précoce	sehr früh	muy temprana	Ramses	1
early	précoce	früh	temprana	Sprint	3
medium	moyenne	mittel	media	Rose de Lautrec	5
late	tardive	spät	tardía	Fructidor	7
very late	très tardive	sehr spät	muy tardía	Gayant	9

VIII. Explanations on the Table of Characteristics

Ad. 2: Foliage: attitude



1
erect

2
erect to semi-erect

3
semi-erect

Ad. 11: Flowering stem: curvature

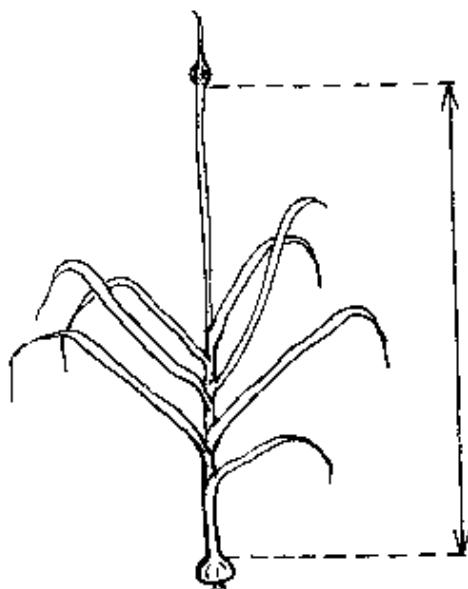


1
absent

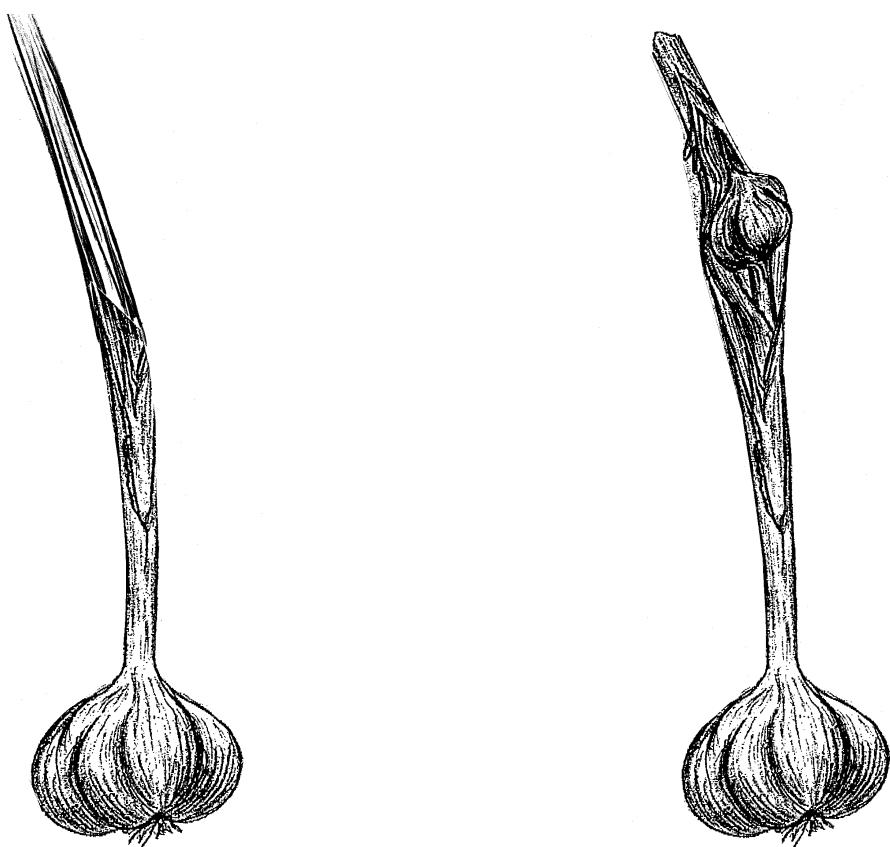


9
present

Ad. 12: Flowering stem: length



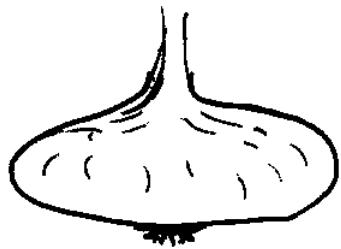
Ad. 13: Flowering stem: bulblets



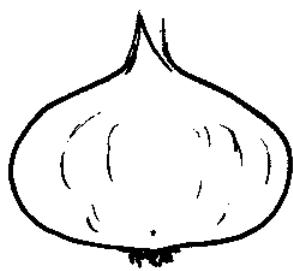
1
absent

9
present

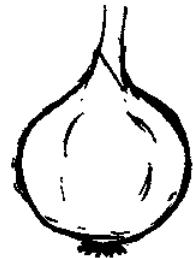
Ad. 15: Bulb: shape in longitudinal section



1
transverse narrow elliptic

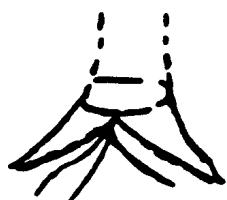


2
transverse broad elliptic

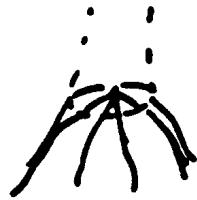


3
circular

Ad. 17: Bulb: position of cloves at tip of bulb



1
inserted

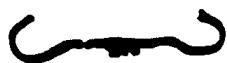


2
at same level



3
exerted

Ad. 19: Bulb: shape of base



1
recessed

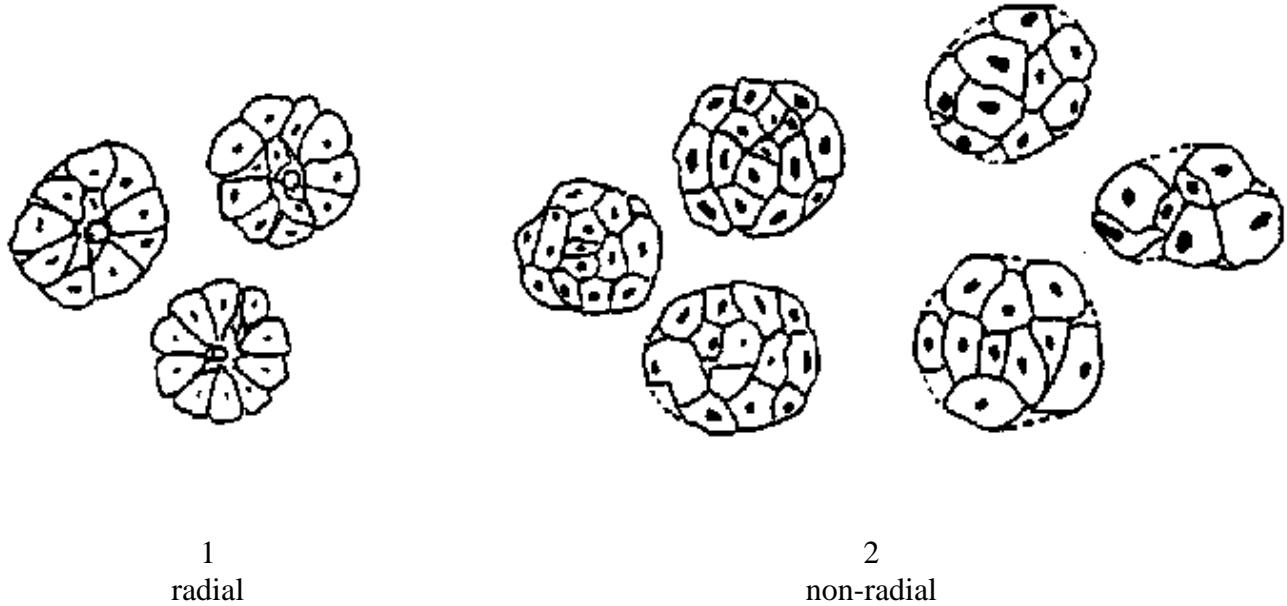


2
flat

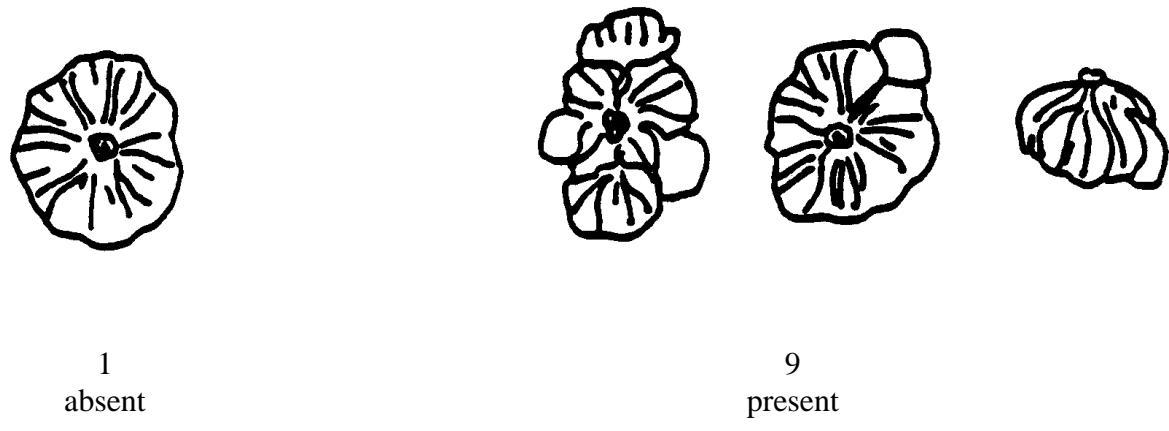


3
rounded

Ad. 26: Bulb: distribution of cloves



Ad. 27: Bulb: external cloves



Ad. 34: End of dormancy of clove in bulb

After harvest, bulbs are stored in a room at an optimum temperature (20°C to 25°C) without being split into cloves. The end of dormancy is evaluated by observing the percentage of sprouted bulbs.

IX. Literature

Brand, R., "L'Ail, une semence à part dans les Allium", La Lettre des Ressources Génétiques Végétales, n° 9, octobre 1996, pp. 11-16.

Messiaen, C.M., "6 La variabilité chez l'Ail", La Lettre des Ressources Génétiques Végétales, n° 9, octobre 1996, pp. 7-10.

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	<i>Allium sativum L.</i> GARLIC
2. Applicant (Name and address)	
3. Proposed denomination or breeder's reference	

4. Information on origin, maintenance and reproduction of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

- (a) controlled cross []
- (b) partially known cross []
- (c) unknown cross []

4.1.2 Clone

- (a) natural clone []
 - (b) clone from *in vitro* culture []
 - (c) clone from seedlings []
 - (d) others (please indicate) []
-

4.2 Mode of propagation

4.2.1 Seed propagated varieties

- (a) parent line []
 - (b) cross-pollinated []
 - (c) hybrid
 - seed propagated parents []
 - one vegetatively propagated and one seed propagated parent []
 - two vegetatively propagated parents []
 - (d) other (please provide details) []
-

4.2.2 Vegetatively propagated variety

- (a) clone []
 - (b) other (please indicate) []
-

4.3 Other information

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

Characteristics	Example Varieties	Note
5.1 Foliage: attitude (2)		
erect	Jolimont	1[]
erect to semi-erect	Printanor	2[]
semi-erect	Jardinor	3[]
5.2 Leaf: green color (3)		
light		3[]
medium	Messidrome	5[]
dark	Germidour	7[]
5.3 Pseudostem: flowering stem (10)		
absent	Germidour	1[]
present	Rose de Lautrec	9[]
5.4 Bulb: size (14)		
small	Fructidor	3[]
medium	Printanor	5[]
large	Messidrome	7[]
5.5 Bulb: shape in longitudinal section (15)		
transverse narrow elliptic	Sprint	1[]
transverse broad elliptic	Germidour	2[]
circular	De Roumanie	3[]

Characteristics	Example Varieties	Note
5.6 Bulb: ground color of dry external scales (21)		
white	Printanor, Ramses	1[]
yellowish white	Vigor Max, Vigor Supreme	2[]
reddish white	Germidour	3[]
5.7 Bulb: external cloves (27)		
absent	Sprint, Sultop	1[]
present	Blanc de Beaumont, Morasol	9[]
5.8 Clove: size (28)		
small	Rose de Lautrec	3[]
medium	Printanor	5[]
large	Germidour	7[]
5.9 Clove: color of scale (29)		
white	Ramses	1[]
cream	Messidrome	2[]
pink	Printanor	3[]
purple	Morasol, Sprint	4[]
brown	Corail	5[]
5.10 Clove: color of flesh (32)		
white	Printanor	1[]
yellowish	Germidour	2[]

Characteristics	Example Varieties	Note	
5.11 Time of harvest maturity (33)			
very early	Ramses	1[]	
early	Sprint	3[]	
medium	Germidour, Messidrome	5[]	
late	Printanor	7[]	
very late	Gayant	9[]	
5.12 End of dormancy of clove in bulb (34)			
very early	Ramses	1[]	
early	Sprint	3[]	
medium	Rose de Lautrec	5[]	
late	Fructidor	7[]	
very late	Gayant	9[]	
6. Similar varieties and differences between these varieties			
Denomination of similar variety	Characteristic in which the similar variety is different ^{o)}	State of expression of similar variety	State of expression of candidate variety
<hr/>			
^{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 Type

Long-day type Autumn []
Short-day type Spring []

7.4 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.