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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

ASPARAGUS

UPOV Code: ASPAR_OFF

Asparagus officinalis L.

*

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Japan

to be considered by the

Technical Committee for adoption by correspondence

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Asparagus officinalis L.	Asparagus	Asperge	Spargel	Espárrago

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Asparagus officinalis* L.

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of plants (crowns) or seed.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

seed propagated varieties: 1,200 seeds
vegetatively propagated varieties: 60 plants (crowns).

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.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

3.1.1 The minimum duration of tests should normally be two independent growing cycles.

3.1.2 The two independent growing cycles may be observed from a single planting, examined in two separate growing cycles.

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 Conditions for Conducting the Examination

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination. In particular, it is essential that the plant produces satisfactory spears in each of the two growing cycles.

3.3.2 The recommended method of observing the characteristic is indicated by the following key in the second column of the Table 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

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 40 plants, which should be divided between at least 2 replicates.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, all observations on single plants should be made on 30 plants or parts taken from each of 30 plants and any other observations made on all plants in the test.

3.6 Additional Tests

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative

manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.2 Uniformity

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

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

4.2.3 For the assessment of uniformity of vegetatively propagated varieties and male F1 hybrids, 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.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be tested, either by growing a further generation, or by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Spear: anthocyanin coloration of apex (characteristic 2)
(b) Plant: intensity of green coloration of foliage (characteristic 11)
(c) Stem: length (characteristic 12)
(d) Type of flowering (characteristic 16)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.5 Legend

(*) Asterisked characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3
QN: Quantitative characteristic – see Chapter 6.3
PQ: Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS: see Chapter 3.3.2

(a)-(c) See Explanations on the Table of Characteristics in Chapter 8.1
(+) See Explanations on the Table of Characteristics in Chapter 8.2

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. (*) (+)	**MS**	**Time of emergence of spears**	**Époque du début de sortie du sol des turions**	**Zeitpunkt des Durchstoßens der Sprosse**	**Época de emergencia de los turiones**		
QN		early	précoce	früh	temprana	Fileas, Gijnlim	3
		medium	moyenne	mittel	media	Darbella, Herkolim	5
		late	tardive	spät	tardía	Backlim	7
2. (*)	**VG**	**Spear: anthocyanin coloration of apex**	**Turin : pigmentation anthocyanique du sommet**	**Sproß: Anthocyanfärbung der Spitze**	**Turión: pigmentación antociánica del ápice**		
QL	**(a)**	absent	absente	fehlend	ausente	Spaganiva, Steiniva	1
		present	présente	vorhanden	presente	Backlim	9
3. (*) (+)	**VG**	**Spear: shape of apex**	**Turion : forme du sommet**	**Sproß: Form der Spitze**	**Turión: forma del ápice**		
QN	**(a)**	narrow triangular	triangulaire étroite	schmal dreieckig	triangular estrecha		1
		medium triangular	triangulaire moyenne	mittel dreieckig	triangular media	Grolim	2
		broad triangular	triangulaire large	breit dreieckig	triangular ancha		3
4. (*) (+)	**VG**	**Spear: diameter of base of apex compared to middle of stem**	**Turion : diamètre de la base du sommet par rapport au milieu de la tige**	**Sproß: Durchmesser der Basis der Spitze im Vergleich zur Mitte des Stengels**	**Turión: diámetro de la base del ápice con respecto al de la mitad del tallo**		
QN	**(a)**	smaller	plus petit	kleiner	menor	Horlim	1
		equal	de même largeur	gleich groß	igual	Gijnlim	2
		larger	plus grand	größer	mayor	Raffaelo	3
5. (+)	**VG**	**Spear: attitude of bracts**	**Turion: port des bractées**	**Sproß: Stellung der Hüllblätter**	**Turión: porte de las brácteas**		
QN	**(a)**	adpressed	appliquées	anliegend	adheridas	Backlim, Gijnlim	1
		slightly held out	légèrement divergentes	leicht abstehend	moderadamente separadas	Steiniva	2
		markedly held out	fortement divergentes	deutlich abstehend	marcadamente separadas		3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6. (*) (+)	**VG/ MS**	**Spear: length of first bracts at base of apex**	**Turion : longueur des premières bractées à la base du sommet**	**Sproß: Länge der ersten Hüllblätter an der Basis der Spitze**	**Turión: longitud de las primeras brácteas en la base del ápice**		
QN	**(a)**	short	courtes	kurz	cortas		3
		medium	moyennes	mittel	medias	Grolim, Herkolim	5
		long	longues	lang	largas	Ravel	7
7. (*) (+)	**VG/ MS**	**Spear: width of first bracts at base of apex**	**Turion : largeur des premières bractées à la base du sommet**	**Sproß: Breite der ersten Hüllblätter an der Basis der Spitze**	**Turión: anchura de las primeras brácteas en la base del ápice**		
QN	**(a)**	small	étroites	schmal	estrechas		3
		medium	moyennes	mittel	medio	Grolim, Herkolim	5
		wide	larges	breit	anchas		7
8. (*)	**VG**	**Plant: number of stems**	**Plante : nombre de tiges**	**Pflanze: Anzahl Stengel**	**Planta: número de de tallos**		
QN	**(b)**	few	petit	gering	pequeño	Atlas, Darbella	3
		medium	moyen	mittel	mediano	Avalim, Fileas	5
		many	grand	groß	grande	Gijnlim, Mondeo	7
9. (+)	**VG**	**Spear: opening of bracts**	**Turion : ouverture des bractées**	**Sproß: Öffnen der Hüllblätter**	**Turión: apertura de las brácteas**		
QN		weakly open	légèrement ouvert	leicht offen	ligeramente abiertos		3
		moderately open	modérément ouvert	mäßig offen	moderadamente abiertos		5
		strongly open	fortement ouvert	stark offen	fuertemente abiertos		7
10. (+)	**VG**	**Plant: density of phylloclades**	**Plante : densité des phylloclades**	**Pflanze: Dichte der Phyllokladen**	**Planta: densidad de los filocladios**		
QN	**(b)**	sparse	lâche	locker	laxa	Horlim	3
		medium	moyenne	mittel	media	Grolim	5
		dense	dense	dicht	densa		7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11. (*)	**VG**	**Plant: intensity of green coloration of foliage**	**Plante : intensité de la coloration verte du feuillage**	**Pflanze: Intensität der Grünfärbung des Laubes**	**Planta: intensidad del color verde del follaje**		
QN	**(b)**	light	claire	hell	claro	Atlas	3
		medium	moyenne	mittel	medio	Ramada	5
		dark	foncée	dunkel	oscuro	Avalim, Grolim	7
12. (*) (+)	**VG/ MS**	**Stem: length**	**Tige : longueur**	**Stengel: Länge**	**Tallo: longitud**		
QN	**(b)**	short	courte	kurz	corta	Argenteuil, Mondeo	3
		medium	moyenne	mittel	media	Orus	5
		long	longue	lang	larga	Gijnlim	7
13. (*) (+)	**VG/ MS**	**Stem: length up to first ramification**	**Tige : longueur jusqu'à la première ramification**	**Stengel: Länge bis zur ersten Verzweigung**	**Tallo: longitud hasta la primera ramificación**		
QN	**(b)**	short	courte	kurz	corta	Mondeo, Orus	3
		medium	moyenne	mittel	media	Avalim, Gijnlim	5
		long	longue	lang	larga	Thielim	7
14. (*)	**VG**	**Stem: diameter at ground level**	**Tige : diamètre au niveau du sol**	**Stengel: Durchmesser am Boden**	**Tallo: diámetro en el nivel del suelo**		
QN	**(b)**	small	petit	klein	pequeño	Primaverde	3
		medium	moyen	mittel	medio	Fileas, Gijnlim	5
		large	grand	groß	grande	Darbella, Grolim	7
15. (+)	**MS**	**Time of beginning of flowering**	**Époque du début de floraison**	**Zeitpunkt des Blühbeginns**	**Época del comienzo de la floración**		
QN		early	précoce	früh	temprana	Fileas, Gijnlim	3
		medium	moyenne	mittel	media	Darbella, Herkolim	5
		late	tardive	spät	tardía	Backlim	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16. (+) (*)	**VG**	**Type of flowering**	**Type de floraison**	**Blühtyp**	**Tipo de floración**		
QL		only plants with male flowers without style rudiments	seulement plantes avec des fleurs mâles sans rudiments de style	nur Pflanzen mit männlichen Blüten ohne Griffelrudimente	solo plantas con flores masculinas sin estilo	Cumulus	1
		plants with male flowers and plants with female flowers	plantes avec des fleurs mâles et plantes avec des fleurs femelles	Pflanzen mit männlichen Blüten und Pflanzen mit weiblichen Blüten	plantas con flores masculinas y plantas con flores femeninas	Argenteuil, Desto	2
		only plants with male flowers with style rudiments	seulement plantes avec des fleurs mâles avec rudiments de style	nur Pflanzen mit männlichen Blüten mit Griffelrudimenten	solo plantas con flores masculinas con estilo	Backlim, Gijnlim	3
		only plants with female flowers	seulement des plantes avec des fleurs femelles	nur Pflanzen mit weiblichen Blüten	solo plantas con flores femeninas	L324	4

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

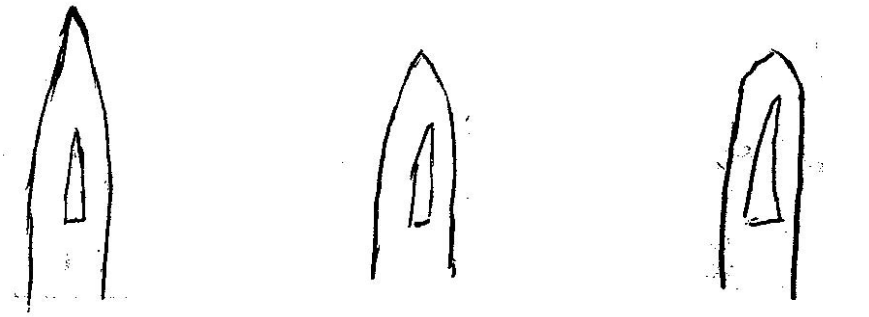
(a) to be observed at emergence of spears
(b) to be observed on non harvested plants at the end of the growing season, when the plants and phylloclades are fully developed.

8.2 Explanations for individual characteristics

Ad. 1: Time of emergence of spears

The time of emergence of spears is when at least 30% of the plants have at least 1 spear emerged.

Ad. 3: Spear: cross-section of apex

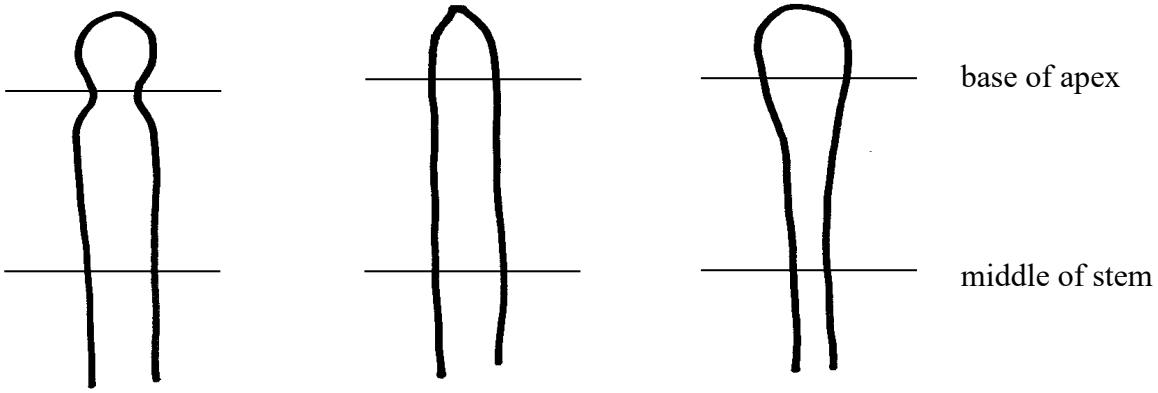


1
narrow triangular

2
medium triangular

3
broad triangular

Ad. 4: Spear: diameter of base of apex compared to middle of stem

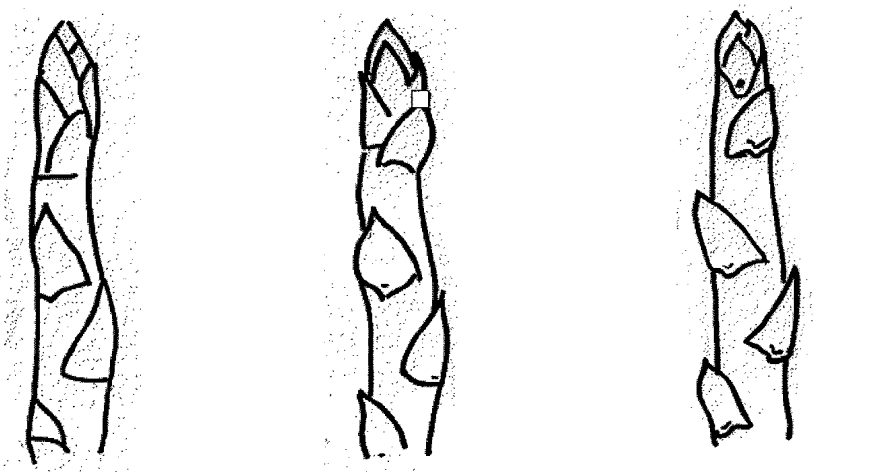


1
smaller

2
equal

3
larger

Ad. 5: Spear: attitude of bracts

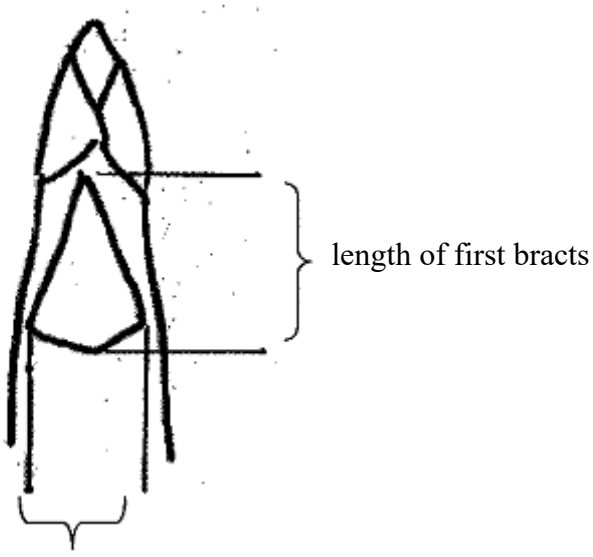


1
adpressed

2
slightly held out

3
markedly held out

Ad. 6: Spear: length of first bracts at base of apex
Ad. 7: Spear: width of first bracts at base of apex



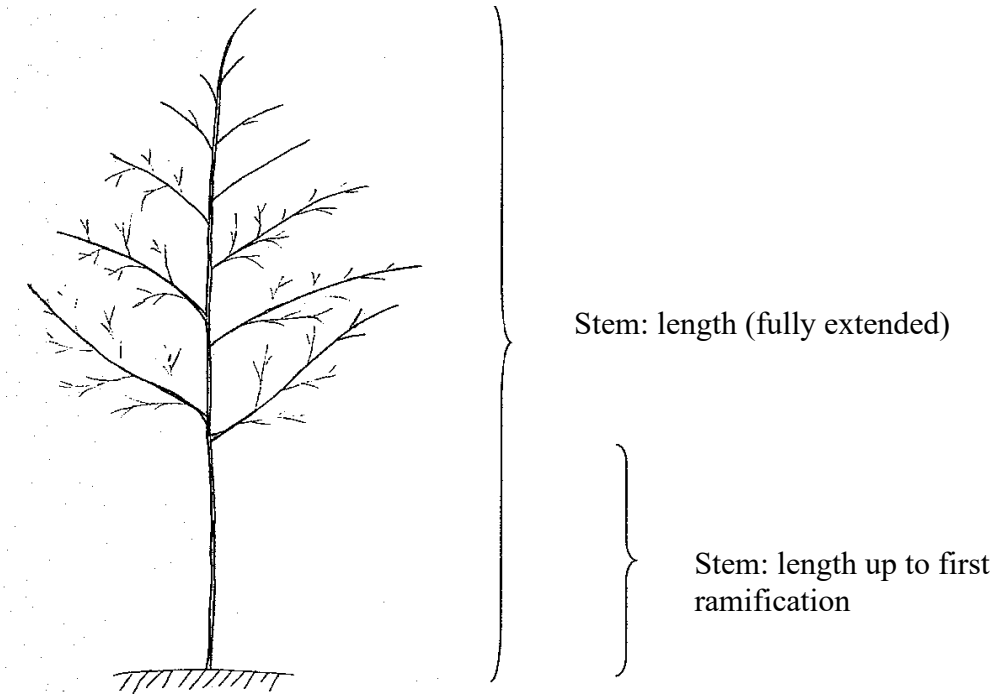
Ad. 9: Spear: opening of bracts

To be observed when the spear is 5-10 cm above soil surface.

Ad. 10: Plant: density of phylloclades

The density of phylloclades should be observed on the first non-branched side shoot.

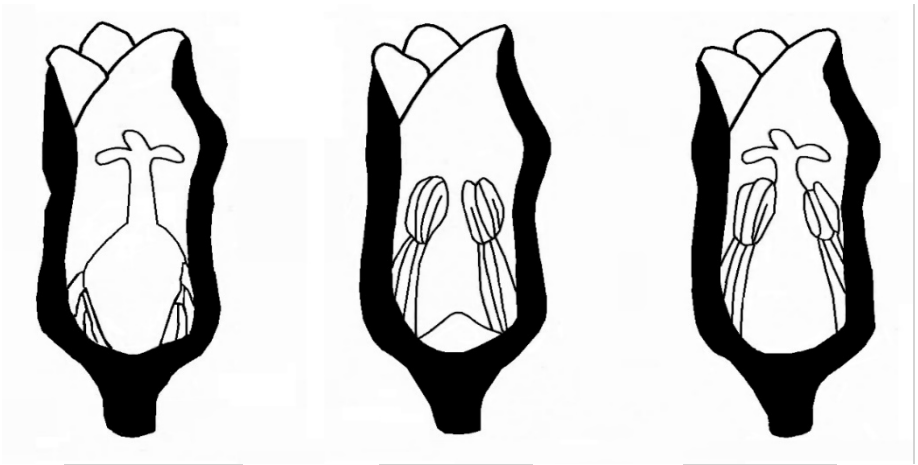
Ad. 12: Stem: length
Ad. 13: Stem: length up to first ramification



Ad. 15: Time of beginning of flowering

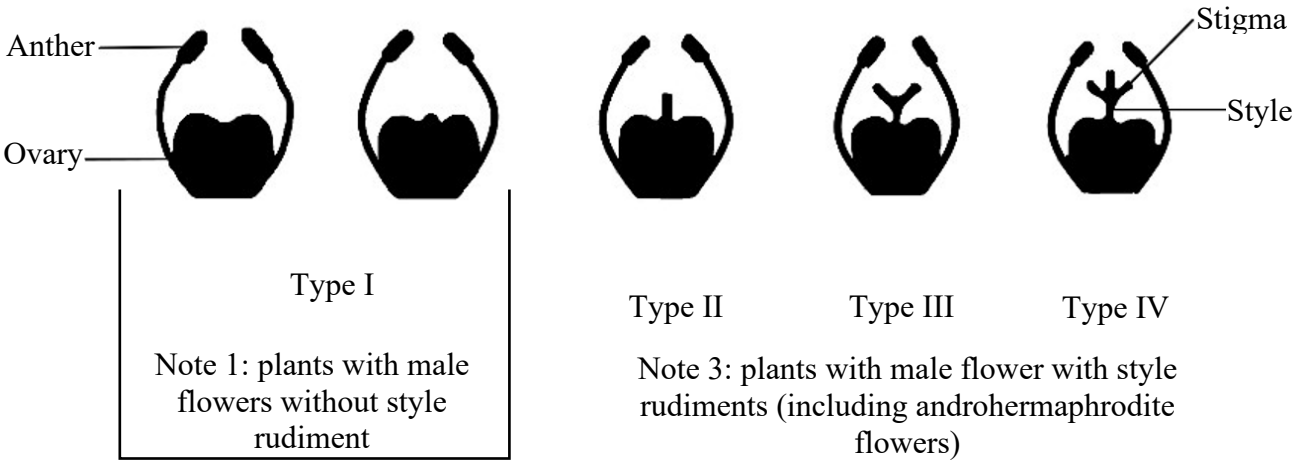
To be observed on non-harvested plants. The time of flowering is when 30% of the plants have at least one flower open.

Ad. 16: Type of flowering



female flower | male flower (without style rudiment) | male flower (with style rudiment including androhermaphrodite)

Type of male flowers



Type of male flowers: the flowers always have fully developed anthers; the style can be from absent to fully developed (Type I to IV), but the stigmas are always rudimentary or absent. Even when two of the three stigmas are present, the flower is considered to be male. The male flower will not produce seeds.

The androhermaphrodite flower (Type IV) has three stigmas and anthers which produce pollen. The flower has the possibility, when self-pollinated, to produce a berry with some seeds. These berries are always smaller and with less seeds than on female plants and in much smaller quantities.

Varieties with note 3 (plants with male flowers with style rudiment) can also have plants with androhermaphrodite flowers. Within these plants the ratio between male flowers with style rudiments (type II and III) and androhermaphrodite flowers (type IV) can vary, leading to a smaller or larger percentage of male plants with a varying number of small berries.

9. Literature

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10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Application date: (not to be filled in by the applicant)

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

1. Subject of the Technical Questionnaire

1.1 Botanical name	*Asparagus officinalis* L.
1.2 Common name	Asparagus

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

(b) partially known cross [ ]
(please state known parent variety(ies))

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.4 Other [ ]
(please provide details)

4.2 Method of propagating the variety

4.2.1 Vegetative propagation

(a) cuttings [ ]

(b) in vitro propagation [ ]

(c) other (state method) [ ]

4.2.2 Seed [ ]

4.2.3 Other [ ]
(please provide details)

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

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

	Characteristics	Example Varieties	Note
5.1 (2)	**Spear: anthocyanin coloration of apex**		
	absent	Spaganviva, Steiniva	1[ ]
	present	Backlim	9[ ]
5.2 (11)	**Plant: intensity of green coloration of foliage**		
	light	Atlas	3[ ]
	medium	Ramada	5[ ]
	dark	Avalim, Grolin	7[ ]
5.3 (12)	**Stem: length**		
	short	Argenteuil, Mondeo	3[ ]
	medium	Orus	5[ ]
	long	Gijnlim	7[ ]
5.4 (14)	**Stem: diameter at ground level**		
	small	Primaverde	3[ ]
	medium	Fileas, Gijnlim	5[ ]
	large	Darbella, Grolim	7[ ]
5.5 (16)	**Type of flowering**		
	only plants with male flowers without style rudiments	Cumulus	1[ ]
	plants with male flowers and plants with female flowers	Argenteuil, Desto	2[ ]
	only plants with male flowers with style rudiments	Backlim, Gijnlim	3[ ]
	only plants with female flowers	L324	4[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Stem: length*	*long*	*short*

Comments:

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[#]7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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9. Information on plant material to be examined or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details for where you have indicated “yes”.

……

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

[End of document]