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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 the Netherlands**to be considered by the
Technical Working Party for Vegetables
at its forty-third session, to be held in Beijing, from April 20 to 24, 2009*

Alternative Names: *

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Asparagus officinalis</i> 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:

1200 seeds or 80 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 growing cycles.

3.1.2 The two 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*

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.

3.3.1 Stage of development for the assessment

All observations should be made in the second and third growing cycle.

The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described at the end of Chapter 8.

3.3.2 Type of observation

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 60 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 should be made on 40 plants or parts taken from each of 40 plants.

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, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 60 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) Ploidy (characteristic 1)
- (b) Spear: anthocyanin coloration of apex (characteristic 3)
- (c) Plant: green coloration of foliage (characteristic 12)
- (d) Stem: length (characteristic 13)
- (e) Type of flowering (characteristic 17)

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)-(g) 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. VG (*)	Ploidy	Ploïdie	Ploidie			
QL	diploid	diploïde	diploid		Andreas, Gijnlim	2
	triploid	triploïde	triploid			3
	tetraploid	tetraploïde	tetraploid		Stewarts Purple	4
2. MS (*)	Time of emergence of spears	Epoque du début de la sortie du sol des turions	Zeitpunkt des Beginns des Durchstossens der Sprosse			
QN (a)	early	précoce	früh		Fileas, Gijnlim	3
	medium	moyenne	mittel		Darbella, Herkolim	5
	late	tardive	spät		Backlim	7
3. VG (*)	Spear: anthocyanin coloration of apex	Turion: coloration anthocyanique du sommet	Spross: Anthocyanfärbung der Spitze			
QL (b)	absent	absente	fehlend		Spaganiva, Steiniva	1
	present	présente	vorhandenl		Backlim	9
4. VG	Spear: intensity of chlorophyl coloration of apex after emergence	Turion : intensité de la coloration chlorophyllienne du sommet après la sortie du sol	Spross: Chlorophyllfärbung der Spitze nach dem Durchstossen des Bodens			
QN (c)	weak	faible	gering		Steiniva	3
	medium	moyenne	mittel		Avalim, Horlim	5
	strong	forte	stark		Ravel	7
5. VG (*)	Spear: shape of apex	Turion : forme de sommet	Spross: Form der Spitze			
QN (b)	narrow triangular	triangulaire étroit	schmal dreieckig			1
	triangular	triangulaire	dreieckig		Grolim	2
	broad triangular	triangulaire large	breit dreieckig			3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
6. (*) (+)	VG	Spear: diameter of base of apex compared to remaining stem	Turion : diamètre de la base du sommet par rapport au reste de la tige	Spross: Durchmesser der Basis der Spitze in Verhältnis zum übrigen Stengel		
QN	(b)	smaller	plus petit	kleiner	Horlim	1
		equal	de même largeur	gleich breit	Gijnlim	2
		larger	plus grand	grösser	Raffaello	3
7. (+)	VG	Spear: attitude of bracts	Turion: port des bractées	Spross: Stellung der Hüllblätter		
QN	(b)	adpressed	appliquées	anliegend	Backlim, Gijnlim	1
		slightly held out	légèrement divergentes	leicht abstehend	Steiniva	2
		markedly held out	fortement divergentes	deutlich abstehend		3
8. (*) (+)	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		
QN	(b)	short	courte	kurz		3
		medium	moyenne	mittel	Grolim, Herkolim	5
		long	longue	lang	Ravel	7
9. (*) (+)	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		
QN	(b)	small	étroites	schmal		3
		medium	moyennes	mittel	Grolim, Herkolim	5
		wide	larges	breit		7
10. (*)	VG	Plant: number of stems	Plante: nombre de tiges	Pflanze: Anzahl Stengel		
QN	(d)	few	petit	gering	Atlas, Darbella	3
		medium	moyenne	mittel	Avalim, Fileas	5
		many	grand	gros	Gijnlim, Mondeo	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11.	VG	Plant: density of phylloclades	Plante: densité des phylloclades	Pflanze: Dichte der Phyllokladen		
(+)						
QN	(e)	sparse	lâche	locker	Horlim	3
		medium	moyenne	mittel	Grolim	5
		dense	dense	dicht		7
12.	VG	Plant: green coloration of foliage	Plante : couleur verte du feuillage	Pflanze: Grünfärbung des Laubes		
(*)						
QN	(g)	light	claire	hell	Atlas	3
		medium	moyenne	mittel	Ramada	5
		dark	foncé	dunkel	Avalim, Grolim	7
13.	VG/ MS	Stem: length	Tige: longueur	Stengel: Länge		
(*)						
(+)						
QN	(g)	short	courte	kurz	Argenteuil, Mondeo	3
		medium	moyenne	mittel	Orus	5
		long	longue	lang	Gijnlim	7
14.	VG/ MS	Stem: length up to first ramification	Tige: longueur jusqu'à la 1 ère ramification	Stengel : Länge bis zur ersten Verzweigung		
(*)						
(+)						
QN	(d)	short	courte	kurz	Mondeo, Orus	3
		medium	moyenne	mittel	Avalim, Gijnlim	5
		long	longue	lang	Thielim	7
15.	VG	Stem: diameter at ground level	Tige : diamètre au niveau du sol	Stengel: Durchmesser am Boden		
(*)						
QN	(d)	small	petit	klein	Primaverde	3
		medium	moyen	mittel	Fileas, Gijnlim	5
		large	grand	gross	Darbella, Grolim	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16.	MS	Time of beginning of flowering	Epoque du début de floraison	Zeitpunkt des Beginns der Blüte		
(+)						
QN	(f)	early	précoce	früh	Fileas, Gijnlim	3
		medium	moyenne	mittel	Darbella, Herkolim	5
		late	tardive	spät	Backlim	7
17.	VG	Type of flowering				
(+)						
(*)						
QL	(f)	only plants with female flowers				1
		only plants with male flowers			Andreas	2
		plants with male and female flowers			Argenteuil, Desto	3
		plants with androhermaphrodite flowers and plants with male flowers with style rudiments			Backlim, Gijnlim	4
18.	VG/ VS	Plants with androherma phrodite flowers and plants with male flowers with style rudiments only: Proportion of plants with androherma-phrodite flowers/plants with male flowers with style rudiments				
(+)						
QN	(f)	low			Avalim, Herkolim	3
		medium				5
		high				7

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 when at least at 30% of the plants has at least 1 spear emerged
- (b) to be observed at emergence
- (c) to be observed 5-10 cm above soil surface
- (d) to be observed on non harvested plants at the end of the growing season
- (e) to be observed on first nonbranched side shoot
- (f) to be observed when the plant has at least 1 flower open
- (g) to be observed when the plants are fully developed

8.2 *Explanations for individual characteristics*

Ad. 6: Spear: diameter of base of apex compared to remaining stem



1
smaller

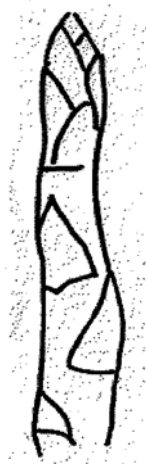


2
equal



3
larger

Ad. 7: Spear: attitude of bracts



1
adpressed



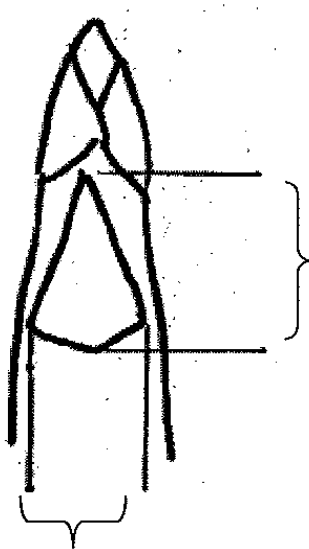
2
slightly held out



3
markedly held out

Ad. 8: Spear: length of first bracts at base of apex

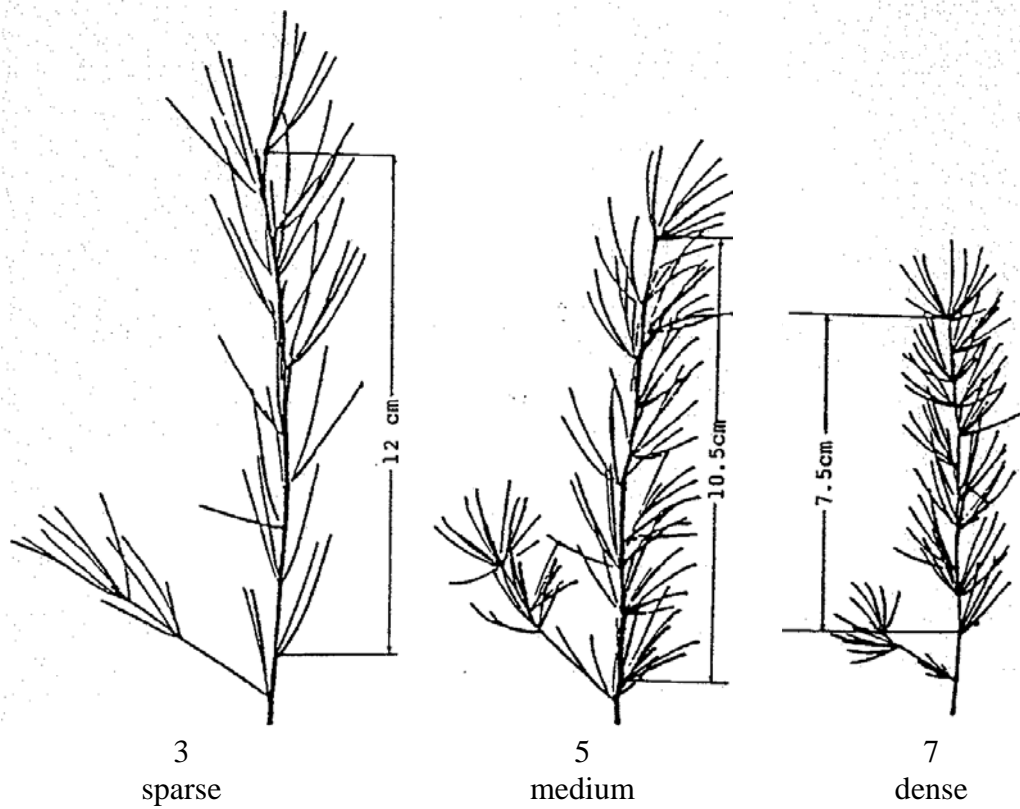
Ad. 9: Spear: width of first bracts at base of apex



Ad 8: Spear: length
of first bracts at base
of apex

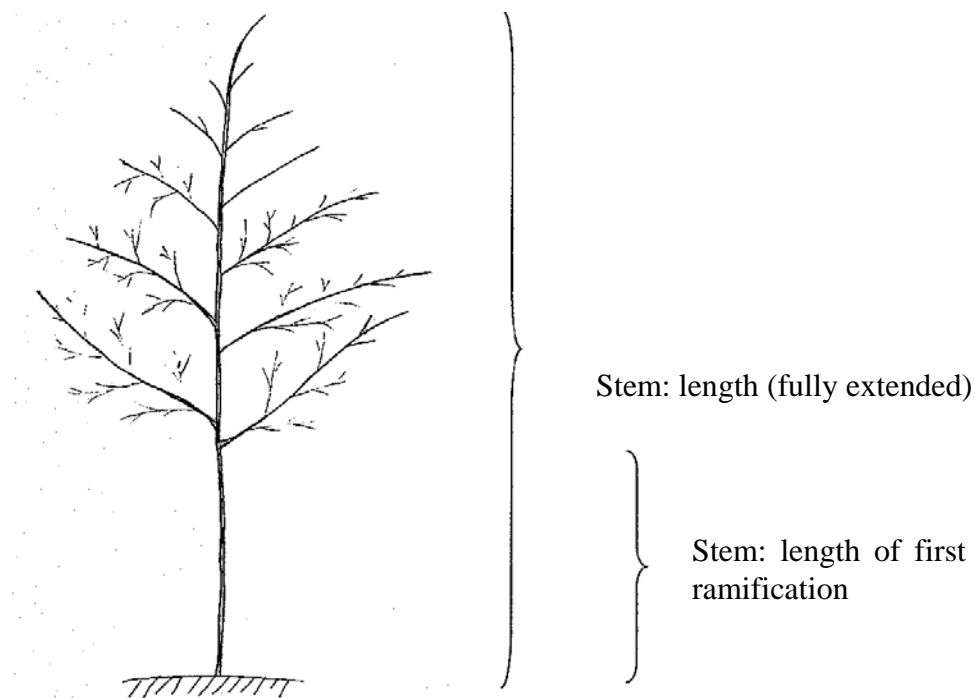
Ad 9: Spear: width of first bracts at base of apex

Ad. 11: Plant: density of phylloclades



Ad. 13: Stem: length

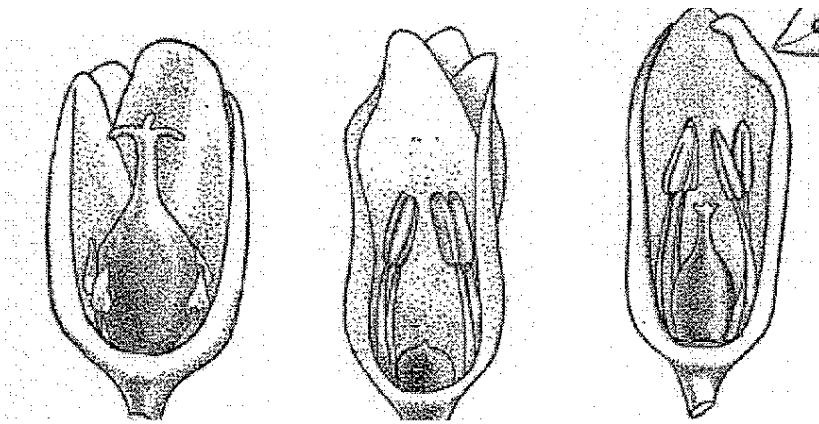
Ad. 14: Stem: length up to first ramification



Ad. 16: Time of beginning of flowering

To be observed on none harvested plants. Time of flowering is calculated as the moment when 30% of the plants have at least one flower open.

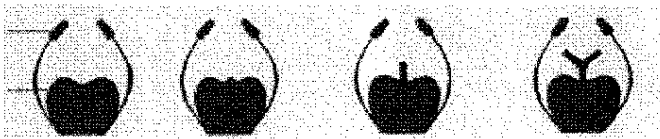
Ad. 17: Type of flowering



Female

male

androhermaphrodite



Types of male flowering: The stamen always has rudimentary developed stigma's.

Ad. 18: Plants with androherma phrodite flowers and plants with male flowers with style rudiments only: Proportion of plants with androherma- phrodite flowers/plants with male flowers with style rudiments

TO BE PROVIDED

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	<input type="text" value="Asparagus officinalis L."/>	
1.2 Common name	<input type="text" value="Asparagus"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

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:
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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 Ploidy (1)		
diploid	Andreas, Gijnlim	2[]
triploid		3[]
tetraploid	Stewarts Purple	4[]
5.2 Spear: anthocyanin coloration of apex (3)		
absent	Spaganviva, Steiniva	1[]
present	Backlim	9[]
5.3 Plant: green coloration of foliage (12)		
light	Atlas	3[]
medium	Ramada	5[]
dark	Avalim, Grolin	7[]
5.4 Stem: length (13)		
short	Argenteuil, Mondeo	3[]
medium	Orus	5[]
long	Gijnlim	7[]
5.5 Stem: diameter at ground level (15)		
small	Primaverde	3[]
medium	Fileas, Gijnlim	5[]
large	Darbella, Grolim	7[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.6 Type of flowering (17)		
only plants with female flowers		1[]
only plants with male flowers	Andreas	2[]
plants with male and female flowers	Argenteuil, Desto	3[]
plants with androhermaphrodite flowers and plants with male flowers with style rudiments	Backlim, Gijnlim	4[]

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
<i>Geijnlim</i>	<i>Stem: length</i>	<i>long (7)</i>	<i>short (3)</i>

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>#7. Additional information which may help in the examination of the variety</p> <p>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?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.2 Are there any special conditions for growing the variety or conducting the examination?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.3 Other information</p>		
<p>8. Authorization for release</p> <p>(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?</p> <p>Yes [] No []</p> <p>(b) Has such authorization been obtained?</p> <p>Yes [] No []</p> <p>If the answer to (b) is yes, please attach a copy of the authorization.</p>		

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:
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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]