

TG/218/1 ORIGINAL: English DATE: 2004-03-31

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS GENEVA

PARSNIP

(Pastinaca sativa L.)

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

Latin	English	French	German	Spanish
Pastinaca sativa L.	Parsnip	Panais	Pastinake	Chirivía

ASSOCIATED DOCUMENTS

These guidelines should be read in conjunction with document TG/1/3, "General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants" (hereinafter referred to as 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. <u>Subject of these Test Guidelines</u>

These Test Guidelines apply to all varieties of Pastinaca sativa L.

2. <u>Material Required</u>

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 seed.

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

100 g or 15,000 seeds.

2.4 The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority.

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. <u>Method of Examination</u>

3.1 Duration of Tests

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

3.2 Testing Place

The tests should normally be conducted at one place. If any characteristics of the variety, which are relevant for the examination of DUS, cannot be observed at that place, the variety may be tested at an additional place.

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 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:

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- 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 200 plants, which should be divided between two or more 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 60 plants or parts taken from each of 60 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 minimum duration of tests recommended in Section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

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

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.

4.2.1 Cros -pollinated varieties

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

4.2.2 Single cross hybrids and self-pollinated varieties (inbred lines)

For the assessment of uniformity of single cross hybrids and self-pollinated varieties (inbred lines), a population standard of 2% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 200 plants, 7 off-types are allowed.

4.2.3 Hybrids

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. In the case of single cross hybrids, the uniformity standards are set out in Section 4.2.2.

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 stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

4.3.3 The stability of a hybrid variety may, in addition to an examination of the hybrid variety itself, also be assessed by examination of the uniformity and stability of its parent lines.

5. <u>Grouping of Varieties and Organization of the Growing Trial</u>

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 is 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.

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5.3 The following have been agreed as useful grouping characteristics:

- (a) Root: length (characteristic 15)
- (b) Root: width (characteristic 16)

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

6. <u>Introduction to the Table of Characteristics</u>

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 Section 6.1.2
- QL Qualitative characteristic see Section 6.3
- QN Quantitative characteristic see Section 6.3
- PQ Pseudo-qualitative characteristic see Section 6.3
- MG Single measurement of a group of plants or parts of plants see Section 3.3.1
- MS Measurement of a number of individual plants or parts of plants see Section 3.3.1
- VG Visual assessment by a single observation of a group of plants or parts of plants see Section 3.3.1
- VS Visual assessment by observation of individual plants or parts of plants see Section 3.3.1
- (a) See Explanations on the Table of Characteristics in Chapter 8, Section 8.1
- (+) See Explanations on the Table of Characteristics in Chapter 8, Section 8.2

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.	VG	Foliage: attitude	Feuillage: port	Laub: Haltung	Follaje: porte		
QN		erect	dressé	aufrecht	erecto	MS 2	1
		erect to semi erect	dressé à demi-dressé	aufrecht bis halbaufrecht	erecto a semierecto	Countess	2
		semi erect	demi dressé	halbaufrecht	semierecto	Gladiator	3
		semi erect to prostrate	demi dressé à étalé	halbaufrecht bis liegend	semierecto a postrado	Guernsey	4
		prostrate	étalé	liegend	postrado		5
2.	VG	Foliage: intensity of green color	Feuillage: intensité de la couleur verte	Laub: Intensität der Grünfärbung	Follaje: intensidad del color verde		
QN		light	claire	hell	claro	Avonresister	3
		medium	moyenne	mittel	medio	Alba, Guernsey	5
		dark	foncée	dunkel	oscuro	Andover	7
3.	VG	Foliage: glossiness	Feuillage: brillance	Laub: Glanz	Follaje: brillo		
QN		weak	faible	gering	débil	Avonresister	3
		medium	moyenne	mittel	medio	Polar	5
		strong	forte	stark	fuerte	Imperial Crown	7
4. (+)	VG/ MS	Foliage: width of basal leaves at crown	Feuillage: largeur des feuilles basales de la partie supérieure	Laub: Breite der basalen Blätter an der Krone	Follaje: anchura de las hojas basales de la corona		
QN		narrow	étroite	schmal	estrecha	Alba	3
		medium	moyenne	mittel	media	New White Skin	5
		broad	large	breit	ancha	Tender and True	7
5.	VG	Foliage: blistering	Feuillage: cloqûre	Laub: Blasigkeit	Follaje: abullonado		
QN		weak	faible	gering	débil	Imperial Crown	3
		medium	moyenne	mittel	medio	Avonresister	5
		strong	forte	stark	fuerte	Paragon	7

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		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6. (*) (+)	VG/ MS	Leaf: length	Feuille: longueur	Blatt: Länge	Hoja: longitud		
QN	(a)	short	courte	kurz	corta	Alba	3
		medium	moyenne	mittel	media	New White Skin	5
		long	longue	lang	larga	Tenor	7
7. (*) (+)	VG/ MS	Leaf: width	Feuille: largeur	Blatt: Breite	Hoja: anchura		
QN	(a)	narrow	étroite	schmal	estrecha	Arrow	3
		medium	moyenne	mittel	media	New White Skin	5
		broad	large	breit	ancha	Tenor	7
8. (+)	MS	Leaf: distance from widest point to tip	Feuille: distance du point le plus large au sommet	Blatt: Abstand von breitester Stelle bis zur Spitze	Hoja: distancia del punto mas ancho al extremo		
QN	(a)	short	petite	klein	pequeña	Alba	3
		medium	moyenne	mittel	media	Avonresister	5
		long	grande	groβ	grande	Tenor	7
9.	VG	Leaf: division	Feuille: division	Blatt: Fiederung	Hoja: división		
(+)							
QN	(a)	weak	faible	gering	débil	Andover	3
		medium	moyenne	mittel	media	Lancer	5
		strong	forte	stark	fuerte	Tender and True	7
10. (+)	VG	Leaflet: division	Foliole: division	Blattfieder: Fiederung	Folíolo: división		
QN	(a)	weak	faible	gering	débil	Countess	3
	·	medium	moyenne	mittel	media	White King	5
		strong	forte	stark	fuerte	Paragon	7

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		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11.	VG	Leaflet: dentation of margin	Foliole: dentelure du bord	Blattfieder: Zähnung des Randes	Folíolo: dentado del borde		
QN	(a)	weak	faible	gering	débil	Avonresister	3
		medium	moyenne	mittel	medio	Javelin	5
		strong	forte	stark	fuerte	Countess	7
12. (+)	VG/ MS	Leaflet: size	Foliole: taille	Blattfieder: Größe	Folíolo: tamaño		
QN	(a)	small	petite	klein	pequeño	Arrow	3
		medium	moyenne	mittel	medio	Panache	5
		large	grande	groß	grande	Tenor	7
13.	VG	Petiole: intensity of anthocyanin coloration	Pétiole: intensité de la pigmentation anthocyanique	Blattstiel: Stärke der Anthocyanfär- bung	Pecíolo: intensidad de la pigmentación antociánica		
QN		weak	faible	gering	débil	Tender and True	3
		medium	moyenne	mittel	media	White Gem	5
		strong	forte	stark	fuerte	MS2	7
14. (*) (+)	VG/ MS	Petiole: length	Pétiole: longueur	Blattstiel: Länge	Pecíolo: longitud		
QN		short	court	kurz	corto	Excalibur	3
		medium	moyen	mittel	medio	New White Skin	5
		long	long	lang	largo	Countess	7
15. (*) (+)	VG/ MS	Root: length	Racine: longueur	Rübe: Länge	Raíz: longitud		
QN		short	courte	kurz	corta	Alba	3
		medium	moyenne	mittel	media	White Gem	5
		long	longue	lang	larga	Paragon	7

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		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16. (*) (+)	VG/ MS	Root: width	Racine: largeur	Rübe: Breite	Raíz: anchura		
QN		narrow	étroite	schmal	estrecha	Arrow	3
		medium	moyenne	mittel	media	Tender and True	5
		broad	large	breit	ancha	White King	7
17. (+)	MS	Root: distance from widest point to crown	Racine: distance du point le plus large à la partie supérieure	breitester Stelle bis	Raíz: distancia del punto mas ancho a la corona		
QN		short	courte	kurz	corta	Andover	3
		medium	moyenne	mittel	media	Tender and True	5
		long	longue	lang	larga	Avonresister, White King	7
18. (*) (+)	VG	Root: shape	Racine: forme	Rübe: Form	Raíz: forma		
PQ		narrow obtriangular	obtriangulaire étroite	schmal verkehrt dreieckig	obtriangular estrecha	Arrow	1
		obtriangular	obtriangulaire	verkehrt dreieckig	obtriangular	Guernsey	2
		broad obtriangular	obtriangulaire large	breit verkehrt dreieckig	obtriangular ancha	Tender and True	3
		obovate	obovale	verkehrt eiförmig	oboval	Avonresister	4
19. (*) (+)	VG	Root: depth of crown depression	Racine: profondeur de la dépression de la partie supérieure	Rübe: Tiefe der Einsenkung der Krone	Raíz: profundidad de la depresión de la corona		
QN		shallow	peu profonde	flach	poco profunda	Polar	3
		medium	moyenne	mittel	media	New White Skin	5
		deep	profonde	tief	profunda	Avonresister, White King	7

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		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
20. (+)	VG	Root: width of crown depression	Racine: largeur de la dépression de la partie supérieure	Rübe: Breite der Einsenkung der Krone	Raíz: anchura de la depresión de la corona		
QN		narrow	étroite	schmal	estrecha	Alba	3
		medium	moyenne	mittel	media	Andover	5
		broad	large	breit	ancha	White Gem, Tenor	7
21.	VG	Root: external color	Racine: couleur externe	Rübe: Außenfarbe	Raíz: color externo		
PQ		white	blanche	weiß	blanco	New White Skin	1
		whitish cream	crème blanchâtre	weißlich cremefarben	crema blanquecino	Gladiator	2
		cream	crème	cremefarben	crema	Avonresister	3
22.	VG	Root: surface	Racine: surface	Rübe: Oberfläche	Raíz: superficie		
QN		very smooth	très lisse	sehr glatt	muy lisa	Javelin	1
		smooth	lisse	glatt	lisa	Gladiator	3
		medium	moyenne	mittel	media	White King	5
		rough	rugueuse	rauh	rugosa	Avonresister	7
		very rough	très rugueuse	sehr rauh	muy rugosa	Exhibition Long	9
23. (+)	VG	Root: core width	Racine: largeur du cœur	Rübe: Breite der Mittelzone	Raíz: anchura del corazón		
QN		narrow	étroit	schmal	estrecho	Arrow	3
-		medium	moyen	mittel	medio	New White Skin	5
		broad	large	breit	ancho	White King	7
24.	VG	Root: internal color		Rübe: Innenfarbe	Raíz: color interno		
PQ		white	blanche	weiß	blanco	New White Skin	1
		whitish cream	crème blanchâtre	weißlich cremefarben	crema blanquecino	Gladiator	2
		cream	crème	cremefarben		Avonresister	3

8. <u>Explanations on the Table of Characteristics</u>

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:

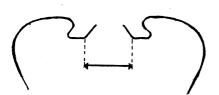
(a) All observations on the leaf and the leafet should be made on fully developed plants before harvest maturity.

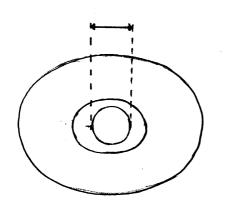
8.2 Explanations for individual characteristics

Ad. 4: Foliage: width of basal leaves at crown

Assessment is easiest when roots are harvested.

Lateral view (longitudinal section)

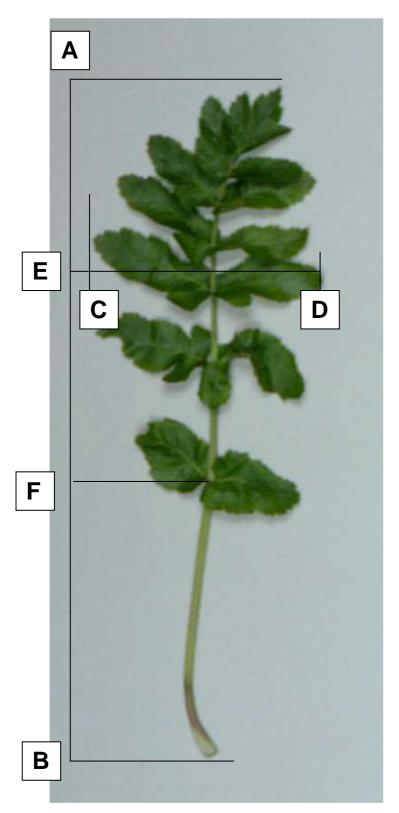




Top view (looking down on the crown)

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Ad. 6, 7, 8: Leaf: length (6), width (7), distance from widest point to tip (8) Ad. 14: Petiole: length



- 6. Leaf: length (A-B)
- 7. Leaf: width (C-D)
- 8. Leaf: distance from widest point to tip (A-E)
- 14. Petiole: length (B-F)

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Ad. 9: Leaf: division

Leaf division is the amount of tissue on the leaf relative to the leaf size.

The number of leaflets, the extent to which leaflets overlap and the degree to which leaflets are subdivided (particularly when tissue grows upwards from the plane of the leaf) all contribute to the expression of leaf division.

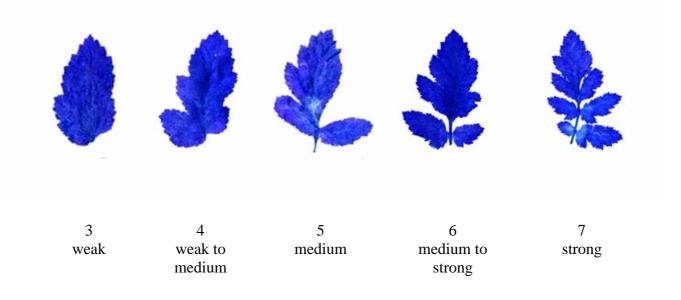


3 weak 5 medium 7 strong

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Ad. 10: Leaflet: division

Assessment should be made on the second leaflet on one side of the midrib for each leaf recorded.



Ad. 12: Leaflet: size

Assessment should be made on the second leaflet on one side of the midrib for each leaf recorded.

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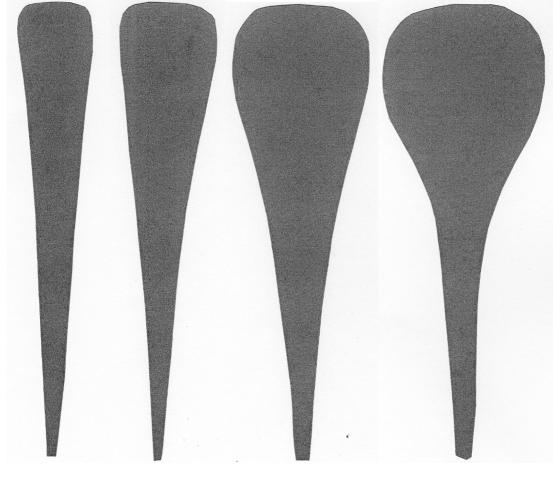
Ad. 15, 16, 17, 19, 20, 23: Root characteristics



- 15. Root: length (A-D)
- 16. Root: width (C-I)
- 17: Root: distance from widest point to crown (A-C)
- 19: Root: depth of crown depression (A-B)
- 20: Root: width of crown depression (E-F)
- 23: Root: core width (G-H)

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Ad. 18: Root: shape



1 narrow obtriangular

2 obtriangular 3 broad obtriangular

4 obovate

9. <u>Literature</u>

Rubatzky, V.E., Quiros, C.F., Simon, P.W. 1999: "Carrots and Related Vegetable *Umbelliferae.*" Crop Production science in horticulture series 10. CAB International, Wallingford, UK. ISBN 0 85199 129 7

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10. Technical Questionnaire

TEC	HNICAL 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							
paren		of the examination of the l	on for plant breeders' rights, and where the hybrid variety, this Technical Questionnaire ompleted for the hybrid variety.				
1.	Subject of the Technical Quest	ionnaire					
	1.1 Latin Name Pa	estinaca sativa L.					
	1.2 Common Name Pa	rsnip					
2.	Applicant						
	Name						
	Address						
	Telephone No.						
	Fax No.						
	E-mail address						
	Breeder (if different from appl	icant)					
3.	Proposed denomination and br	eeder's reference					
	Proposed denomination (if available)						
	Breeder's reference						

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			UESTIONNAIRE Page {x} of {y} Referenc	
•	Info	rmation	on the breeding scheme and propagation of the varie	ety
	4.1	Breed	ing scheme	
		Variet	ty 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	Metho	od of propagating the variety	
		4.2.1	Seed-propagated varieties	
			(a) Self-pollination(b) Cross-pollination	[]
			(i) population(ii) synthetic variety	[]
			(c) Hybrid	[]
			(d) Other (please provide details)	[]
		4.2.2		[]
			(please provide details)	

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TECH	NICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
	Characteristics of the variety to ponding characteristic in Test			
	Characteristics		Example Varieties	Note
5.1 (6)	Leaf: length			
	short		Alba	3[]
	medium		New White Skin	5[]
	long		Tenor	7[]
5.2 (13)	Petiole: intensity of anthocyanin	coloration		
	weak		Tender and True	3[]
	medium		White Gem	5[]
	strong		MS2	7[]
5.3 (15)	Root: length			
	short		Alba	3[]
	medium		White Gem	5[]
	long		Paragon	7[
5.4 (16)	Root: width			
	narrow		Arrow	3[]
	medium		Tender and True	5[
	broad		White King	7[]
5.5 (18)	Root: shape			
	narrow obtriangular		Arrow	1[]
	obtriangular		Guernsey	2[]
	broad obtriangular		Tender and True	3[]
	obovate		Avonresister	4[]

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TECHNICAL QUESTIONNAIRE		NICAL QUESTIONNAIRE Page {x} of {y} Reference		e Number:	
	Characteristics		Example Varieties	Note	
5.6 (21)	Root: external color				
	white		New White Skin	1[
	whitish cream		Gladiator	2[
	cream		Avonresister	3[
5.7 (22)	Root: surface				
	very smooth		Javelin	1[
	smooth		Gladiator	3[
	medium		White King	5[
	rough		Avonresister	7[
	very rough		Exhibition Long	9[

6. Similar varieties and differences from these varieties

Please use the table, and space provided for comments, below 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	Characteristic(s) in	Describe the expression	Describe the expression
variety(ies) similar to	which your candidate	of the characteristic(s)	of the characteristic(s)
your candidate variety	variety differs from the	for the similar	for your candidate
	similar variety(ies)	variety(ies)	variety
Example	Root: external color	whitish cream	cream

Comments:

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TECHNICAL QUESTIONNAIRE			Page {x} of {y}			Reference Number:				
7.	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	Special conditions for the examination of the variety									
	7.2.1 Are there any special conditions for growing the variety or conducting the examination?									
		Yes	[]		No	[]				
	7.2.2	If ye	es, please give det	ails:						
7.3	Other information									
8.	Authorization for release									
0.	(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.									
			· · · · ·		1	-				

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9. Information on plant material to be examined.

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 or pesticide)	Yes []	No []							
	(c)	Tissue culture	Yes []	No []							
	(d)	Other factors	Yes []	No []							
	Please provide details of where you have indicated "yes".										
10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:											
	Appl	licant's name									
	Signa	ature Date									

[End of document]