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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

PEA

UPOV Code: PISUM_SAT

Pisum sativum L.

[*]

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:[*]

Botanical name	*English*	*French*	*German*	*Spanish*
Pisum sativum L., *Pisum arvense* L.	Pea	Pois	Erbse	Guisante, Arveja

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 *Pisum sativum* 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 seed.

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

1,000 g or at least 12,000 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. In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.

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

2.6 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

The minimum duration of tests should normally be two independent 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.

3.3.2 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.

3.3.3 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 100 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 20 plants or parts taken from each of 20 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 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 100 plants, 3 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 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) Plant: anthocyanin coloration (characteristic 1)
(b) Stem: fasciation (characteristic 3)
(c) Stem: length (characteristic 4)
(d) Stem: number of nodes up to and including first fertile node (characteristic 5)
(e) Leaf: leaflets (characteristic 8)
(f) Stipule: flecking (characteristic 20)

(g) Only varieties with stem fasciation absent: Plant: maximum number of flowers per node (characteristic 25)
(h) Pod: length (characteristic 37)
(i) Pod: parchment (characteristic 39)
(j) Excluding varieties with pod parchment: entire: Pod: thickened wall (characteristic 40)
(k) Only varieties with Pod: thickened wall: absent: Pod: shape of distal part (characteristic 41)
(l) Pod: curvature (characteristic 42)
(m) Pod: color (characteristic 43)
(n) Immature seed: intensity of green color (characteristic 47)
(o) Seed: type of starch grains (characteristic 49)
(p) Seed: color of cotyledon (characteristic 52)
(q) Only varieties with plant anthocyanin coloration present: Seed: marbling of testa (characteristic 53)
(r) Only varieties with plant anthocyanin coloration present: Seed: violet or pink spots on testa (characteristic 54)
(s) Seed: hilum color (characteristic 55)
(t) Seed: weight (characteristic 57)
(u) Resistance to *Fusarium oxysporum* f. sp. *pisi* – Race 1 (characteristic 58)
(v) Resistance to *Erysiphe pisi* Syd. (characteristic 59)

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 3.3.3

(a)-(d) 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. (*) (+)	**30-240 VG**	**Plant: anthocyanin coloration**	**Plante: pigmentation anthocyanique**	**Pflanze: Anthocyan-färbung**	**Planta: pigmentación antociánica**		
QL		absent	absente	fehlend	ausente	Avola, Solara	1
		present	présente	vorhanden	presente	Pidgin, Rosakrone	9
2.	**30-240 VG**	**Stem: anthocyanin coloration of axil**	**Tige: pigmentation anthocyanique à l'aisselle**	**Stengel: Anthocyanfärbung der Achsel**	**Tallo: pigmentación antociánica de la axila**		
QL		absent	absente	fehlend	ausente	Avola, Maro	1
		single ring	anneau simple	einfacher Ring	anillo simple	Assas, Tirabeque	2
		double ring	anneau double	doppelter Ring	anillo doble	Caroubel	3
3. (*) (+)	**30-199 VG**	**Stem: fasciation**	**Tige: fasciation**	**Stengel: Verbänderung**	**Tallo: fasciación**		
QL		absent	absente	fehlend	ausente	Avola, Solara	1
		present	présente	vorhanden	presente	Bikini, Rosakrone	9
4. (*) (+)	**240-250 MS**	**Stem: length**	**Tige: longueur**	**Stengel: Länge**	**Tallo: longitud**		
QN		very short	très petite	sehr kurz	muy corto	Zephyr	1
		short	petite	kurz	corto	Nobel, Mini	3
		medium	moyenne	mittel	medio	Calibra, Xantos	5
		long	grande	lang	largo	Blauwschokker, Livia	7
		very long	très grande	sehr lang	muy largo	Mammoth Melting Sugar	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5. (*) (+)	**210-240 MS**	**Stem: number of nodes up to and including first fertile node**	**Tige : nombre de nœuds jusqu'au premier nœud fertile inclus**	**Stengel: Anzahl Knoten bis einschließlich des ersten Blütenstandes**	**Tallo: número de nudos hasta el primer nudo fértil, con inclusión de éste**		
QN		very few	très peu	sehr gering	muy bajo	Kelvil	1
		few	peu	gering	bajo	Smart, Zero4	3
		medium	moyen	mittel	medio	Markana, Susan	5
		many	élevé	groß	alto	Cooper	7
		very many	très élevé	sehr groß	muy alto	Regina	9
6. (*)	**40-240 VG**	**Foliage: color**	**Feuillage: couleur**	**Laub: Farbe**	**Follaje: color**		
PQ		yellow green	vert jaune	gelbgrün	verde amarillento	Pilot	1
		green	vert	grün	verde	Avola, Paris, Progreta, Waverex	2
		blue green	vert bleu	blaugrün	verde azulado	Polar	3
7.	**40-240 VG**	**Only varieties with foliage color: green (Char. 6, state 2): Foliage: intensity of color**	**Variétés avec couleur du feuillage seulement : vert (car. 6, état 2) : Feuillage : intensité de la couleur**	**Nur Sorten mit Laubfarbe: grün (Merkmal 6, Stufe 2): Laub: Intensität der Farbe**	**Sólo variedades con color de follaje: verde (car. 6, estado 2): Follaje: intensidad del color**		
QN		light	claire	hell	claro	Paris, Twinkle	3
		medium	moyenne	mittel	medio	Lisa, Rondo	5
		dark	foncée	dunkel	oscuro	Waverex	7
8. (*)	**20-240 VG**	**Leaf: leaflets**	**Feuille: folioles**	**Blatt: Blattfiedern**	**Hoja: folíolos**		
QL		absent	absentes	fehlend	ausentes	Hawk, Solara	1
		present	présentes	vorhanden	presentes	Avola, Rhea	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. (+)	**200-240 MS/ VG**	**Leaf: maximum number of leaflets**	**Feuille : nombre maximum de folioles**	**Blatt: maximale Anzahl Blattfiedern**	**Hoja: número máximo de folíolos**		
QN		few	petit	gering	bajo	Jof	3
		medium	moyen	mittel	medio	Dark Skin Perfection, Finale	5
		many	grand	groß	alto	Ultimo	7
10.	**216-226 MS/ VG**	**Leaflet: size**	**Foliole : taille**	**Blattfieder: Größe**	**Folíolo: tamaño**		
QN	**(a)**	very small	très petite	sehr klein	muy pequeño	Payette	1
		small	petite	klein	pequeño	Mini	3
		medium	moyenne	mittel	medio	Finale	5
		large	grande	groß	grande	Alderman	7
		very large	très grande	sehr groß	muy grande	Mammoth Melting Sugar	9
11.	**216-226 MS/ VG**	**Leaflet: length**	**Foliole: longueur**	**Blattfieder: Länge**	**Folíolo: longitud**		
QN	**(a)**	short	courte	kurz	corto	Eagle, Polar	3
		medium	moyenne	mittel	medio	Bohatyr, Dakota	5
		long	longue	lang	largo	Delikata, Mammoth Melting Sugar	7
12.	**216-226 MS/ VG**	**Leaflet: width**	**Foliole: largeur**	**Blattfieder: Breite**	**Folíolo: anchura**		
QN	**(a)**	narrow	étroite	schmal	estrecho	Alouette, Grapis	3
		medium	moyenne	mittel	medio	Dakota, Irina	5
		broad	large	breit	ancho	Adept, Tirabeque	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13. (+)	**216-226 MS/ VG**	**Leaflet: position of broadest part**	**Foliole : position de la partie la plus large**	**Blattfieder: Position des breitesten Teils**	**Folíolo: posición de la parte más ancha**		
QN	**(a)**	at middle or slightly towards base	au milieu ou légèrement vers la base	in der Mitte oder leicht zur Basis hin	en el centro o ligeramente hacia la base	Nobel, Salome	1
		moderately towards base	plus ou moins vers la base	mäßig zur Basis hin	moderadamente hacia la base	Columbia, Maro	2
		strongly towards base	fortement vers la base	stark zur Basis hin	fuertemente hacia la base	Griffin, Progreta	3
14. (+)	**30-240 VG**	**Leaflet: dentation**	**Foliole : dentelure**	**Blattfieder: Zähnung**	**Folíolo: indentación**		
QN	**(a)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Progreta	1
		weak	faible	gering	débil	Snowflake	3
		medium	moyenne	mittel	media	Cabree	5
		strong	forte	stark	fuerte	Amos	7
		very strong	très forte	sehr stark	muy fuerte	Sugar Star	9
15. (*) (+)	**216-226 MS/ VG**	**Stipule: length**	**Stipule: longueur**	**Nebenblatt: Länge**	**Estípula: longitud**		
QN	**(b)**	short	courte	kurz	corta	Eagle, Steffi	3
		medium	moyenne	mittel	media	Timo, Twinkle	5
		long	longue	lang	larga	Alderman, Rhea	7
16. (*) (+)	**216-226 MS/ VG**	**Stipule: width**	**Stipule: largeur**	**Nebenblatt: Breite**	**Estípula: anchura**		
QN	**(b)**	narrow	étroite	schmal	estrecha	Eagle, Steffi	3
		medium	moyenne	mittel	media	Timo, Twinkle	5
		broad	large	breit	ancha	Mammoth Melting Sugar	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17.	**216-226 MS/ VG**	**Stipule: size**	**Stipule: taille**	**Nebenblatt: Größe**	**Estípula: tamaño**		
QN	**(b)**	small	petite	klein	pequeña	Dakota, Zero4	3
		medium	moyenne	mittel	media	Jackpot, Misty	5
		large	grande	groß	grande	Beetle, Mammoth Melting Sugar	7
18. (+)	**216-226 MS/ VG**	**Stipule: length from axil to tip**	**Stipule : longueur de l'aisselle à la pointe**	**Nebenblatt: Länge zwischen der Achsel und der Spitze**	**Estípula: longitud desde la axila hasta la punta**		
QN	**(b)**	short	courte	kurz	corta	Fortress, Zero4	3
		medium	moyenne	mittel	media	Cabree, Orka	5
		long	longue	lang	larga	Beetle, Mammoth Melting Sugar	7
19. (+)	**216-226 VG/ MS**	**Stipule: length of lobe below axil**	**Stipule : longueur du lobe en dessous de l'aisselle**	**Nebenblatt: Länge des Lappens unter der Achsel**	**Estípula: longitud del lóbulo bajo la axila**		
QN	**(b)**	absent or very short	absente ou très courte	fehlend oder sehr kurz	ausente o muy corto		1
		short	courte	kurz	corto	Dakota, Ramrod	3
		medium	moyenne	mittel	medio	Kahuna, Twinkle	5
		long	longue	lang	largo	Eden, Quantum	7
20. (*) (+)	**200-240 VG**	**Stipule: flecking**	**Stipule: macules**	**Nebenblatt: Marmorierung**	**Estípula: moteado**		
QL		absent	absentes	fehlend	ausente	Lisa, Tafila	1
		present	présentes	vorhanden	presente	Avola, Maro	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21. (+)	**200-240 VG**	**Stipule: density of flecking**	**Stipule : densité des macules**	**Nebenblatt: Dichte der Marmorierung**	**Estípula: densidad del moteado**		
QN		very sparse	très lâche	sehr locker	muy laxa	Progreta	1
		sparse	lâche	locker	laxa	Backgammon, Waxwing	3
		medium	moyenne	mittel	media	Accent, Ambassador	5
		dense	dense	dicht	densa	Avola, Zelda	7
		very dense	très dense	sehr dicht	muy densa	Oregon Sugar Pod	9
22. (+)	**216-226 MS/ VG**	**Petiole: length from axil to first leaflet or tendril**	**Pétiole: longueur de l'aisselle à la première foliole ou vrille**	**Blattstiel: Länge von der Achsel zur ersten Blattfieder oder Ranke**	**Pecíolo: longitud desde la axila hasta el primer folíolo o zarcillo**		
QN		short	courte	kurz	corta	Hellas, Keo	3
		medium	moyenne	mittel	media	Avola, Solara	5
		long	longue	lang	larga	Saskia, Tafila	7
23. (+)	**216-226 MS/ VG**	**<u>Only varieties with leaflets absent</u>: Petiole: length from axil to last tendril**	**<u>Variétés sans folioles seulement</u> : Pétiole : longueur de l'aisselle à la dernière vrille**	**<u>Nur Sorten ohne Blattfiedern:</u> Blattstiel: Länge von der Achsel zur letzten Ranke**	**<u>Sólo variedades sin folíolos</u>: Pecíolo: longitud desde la axila hasta el último zarcillo**		
QN		short	courte	kurz	corta	Choucas, Fredrio	3
		medium	moyenne	mittel	media	Alambo, Alezan	5
		long	longue	lang	larga	Arosa, Calao	7
24. (*) (+)	**214 MG**	**Time of flowering**	**Époque de floraison**	**Zeitpunkt der Blüte**	**Época de floración**		
QN		very early	très précoce	sehr früh	muy temprana	Tempo	1
		early	précoce	früh	temprana	Smart, Zero4	3
		medium	moyenne	mittel	media	Carlton, Waverex	5
		late	tardive	spät	tardía	Cooper, Purser	7
		very late	très tardive	sehr spät	muy tardía	Livioletta	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
25. (*) (+)	**216-226 MS/ VG**	**Only varieties with stem fasciation absent: Plant: maximum number of flowers per node**	**Variétés sans fasciation de la tige uniquement : Plante : nombre maximal de fleurs par nœud**	**Nur Sorten ohne Verbänderung des Stengels: Pflanze: maximale Anzahl Blüten pro Knoten**	**Sólo variedades sin fasciación del tallo: Planta: número máximo de flores por nudo**		
QN		one	une	eine	una	Progress No. 9, Tyla	1
		two	deux	zwei	dos	Banff, Cooper	3
		three	trois	drei	tres	Ultimo, Zodiac	5
		four or more	quatre ou plus	vier oder mehr	cuatro o más	Arnesa, Calibra, Survivor	7
26. (*)	**216-218 VG**	**Only varieties with plant anthocyanin coloration present: Flower: color of wing**	**Variétés avec pigmentation anthocyanique de la plante uniquement : Fleur : couleur de l'aile**	**Nur Sorten mit Anthocyanfärbung der Pflanze: Blüte: Farbe des Flügels**	**Sólo variedades con pigmentación antociánica de la planta: Flor: color del ala**		
PQ	**(b)**	white with pink blush	rose pâle	blassrosa	blanco rosáceo		1
		pink	rose	rosa	rosa	Rosakrone	2
		reddish purple	pourpre rougeâtre	rötlich purpur	púrpura rojizo	Assas	3
27. (+)	**216-218 VG**	**Only varieties with plant anthocyanin coloration absent: Flower: color of standard**	**Variétés sans pigmentation anthocyanique de la plante uniquement : Fleur : couleur de l'étendard**	**Nur Sorten ohne Anthocyanfärbung der Pflanze: Blüte: Farbe der Fahne**	**Sólo variedades sin pigmentación antociánica de la planta: Flor: color del estandarte**		
PQ	**(b)**	white	blanc	weiß	blanco	Gloton, Record	1
		whitish cream	blanc à crème	weiß bis cremefarben	crema blanquecino	Cooper, Maro	2
		cream	crème	cremefarben	crema	Orcado	3
28. (+)	**216-218 MS/ VG**	**Flower: width of standard**	**Fleur: largeur de l'étendard**	**Blüte: Breite der Fahne**	**Flor: anchura del estandarte**		
QN	**(b)**	narrow	étroite	schmal	estrecho	Eagle, Progreta	3
		medium	moyenne	mittel	medio	Bikini, Cooper	5
		broad	large	breit	ancho	Pilot, Tafila	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29. (*) (+)	**216-218 VG**	**Flower: shape of base of standard**	**Fleur : forme de la base de l'étendard**	**Blüte: Form des Fahnengrunds**	**Flor: forma de la base del estandarte**		
QN	**(b)**	strongly raised	fortement cunéiforme	stark keilförmig	fuertemente cuneiforme		1
		moderately raised	modérément cunéiforme	mäßig keilförmig	moderadamente cuneiforme	Progreta	3
		level	droite	gerade	recto	Markado, Solara	5
		moderately arched	modérément arquée	mäßig zweilappig	moderadamente arqueado	Avola, Cooper	7
		strongly arched	fortement arquée	stark zweilappig	fuertemente arqueado	Bohatyr, Kennedy	9
30. (+)	**216-218 VG**	**Flower: undulation of standard**	**Fleur : ondulation de l'étendard**	**Blüte: Wellung der Fahne**	**Flor: ondulación del estandarte**		
QN	**(b)**	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Ultimo, Woody	1
		weak	faible	gering	débil	Cooper, Dakota	3
		medium	moyenne	mittel	media	Ibiza, Kodiak	5
		strong	forte	stark	fuerte	Koka, Reveille	7
		very strong	très forte	sehr stark	muy fuerte	Téléphone nain, Télévision	9
31.	**216-218 VG**	**Flower: width of upper sepal**	**Fleur: largeur du sépale supérieur**	**Blüte: Breite des oberen Kelchblatts**	**Flor: anchura del sépalo superior**		
QN	**(b)**	narrow	étroite	schmal	estrecho	Abador	3
		medium	moyenne	mittel	medio	Conservor	5
		broad	large	breit	ancho	Kodiak	7
32. (+)	**212-240 VG**	**Flower: shape of apex of upper sepal**	**Fleur : forme du sommet du sépale supérieur**	**Blüte: Form der Spitze des oberen Kelchblatts**	**Flor: forma del ápice del sépalo superior**		
PQ	**(b)**	acuminate	acuminé	mit aufgesetzter Spitze	acuminado	Dawn	1
		acute	aigu	spitz	agudo	Kelvedon Wonder	2
		rounded	arrondi	abgerundet	redondeado	Kodiak	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
33. **(+)**	**218-245 MS/ VS**	**Peduncle: length of spur**	**Pédoncule : longueur de l'éperon**	**Blütenstandsstiel: Länge des Bukettriebs**	**Pedúnculo: longitud del espolón**		
QN	**(b)**	short	courte	kurz	corto	Cabro, Kirio	3
		medium	moyenne	mittel	medio	Metaxa, Rialto	5
		long	longue	lang	largo	Alezan, Calao	7
34. **(+)**	**235-245 MS/ VG**	**Peduncle: length from stem to first pod**	**Pédoncule : longueur de la tige à la première gousse**	**Blütenstandsstiel: Länge vom Stengel bis zur ersten Hülse**	**Pedúnculo: longitud desde el tallo hasta la primera vaina**		
QN	**(c)**	short	courte	kurz	corta	Goblin, Orcado	3
		medium	moyenne	mittel	media	Bohatyr, Maro	5
		long	longue	lang	larga	Kabuki, Reveille	7
35. **(+)**	**235-245 MS/ VS**	**Peduncle: length between first and second pods**	**Pédoncule : longueur entre les première et deuxième gousses**	**Blütenstandsstiel: Länge zwischen der ersten und der zweiten Hülse**	**Pedúnculo: longitud entre la primera y la segunda vaina**		
QN	**(c)**	short	courte	kurz	corta	Alize, Atila	3
		medium	moyenne	mittel	media	Kirio	5
		long	longue	lang	larga	Aladin	7
36. **(+)**	**235-245 MS**	**Peduncle: number of bracts**	**Pédoncule : nombre de bractées**	**Blütenstandsstiel: Anzahl Deckblätter**	**Pedúnculo: número de brácteas**		
QN	**(b)**	absent or few	aucuns ou rares	fehlend oder gering	nulo o bajo	Fauvette, Kirio	1
		medium	moyennes	mittel	medio	Delta, Duez	2
		many	nombreuses	groß	alto	Eiffel, Goelan	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
37. (*)	**240 MS/ VG**	**Pod: length**	**Gousse: longueur**	**Hülse: Länge**	**Vaina: longitud**		
QN	**(c)**	very short	très courte	sehr kurz	muy corta	Cepia, Vermio	1
		short	courte	kurz	corta	Progreta, Solara	3
		medium	moyenne	mittel	media	Cooper, Jof	5
		long	longue	lang	larga	Hurst Green Shaft, Protor	7
		very long	très longue	sehr lang	muy larga	Tirabeque	9
38. (*) (+)	**240 MS/ VG**	**Pod: width**	**Gousse : largeur**	**Hülse: Breite**	**Vaina: anchura**		
QN	**(c)**	very narrow	très étroite	sehr schmal	muy estrecha	Claire	1
		narrow	étroite	schmal	estrecha	Picar, Ultimo	3
		medium	moyenne	mittel	media	Progreta, Solara	5
		broad	large	breit	ancha	Finale, Kahuna	7
		very broad	très large	sehr breit	muy ancha	Kennedy	9
39. (*) (+)	**310 VG**	**Pod: parchment**	**Gousse: parchemin**	**Hülse: Pergament-schicht**	**Vaina: pergamino**		
QL	**(c)**	absent or partial	absent ou partiel	fehlend oder partiell vorhanden	ausente o parcial	Sugar Ann	1
		entire	complet	vollständig vorhanden	completo	Avola, Solara	2
40. (*) (+)	**240 VG**	**Excluding varieties with pod parchment: entire: Pod: thickened wall**	**A l'exclusion des variétés avec gousse : parchemin : complet : Gousse : paroi épaisse**	**Außer Sorten mit Hülse: Pergament-schicht: vollständig vorhanden: Hülse: verdickte Wand**	**Excluyendo las variedades con vaina: pergamino: completo: Vaina: valva gruesa**		
QL	**(c)**	absent	absente	fehlend	ausente	Nofila, Reuzensuiker	1
		present	présente	vorhanden	presente	Cygnet, Sugar Ann	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
41. (*) (+)	**240 VG**	**Only varieties with Pod: thickened wall absent: Pod: shape of distal part**	**Seulement variétés avec Gousse : paroi épaisse : absente : Gousse : forme de la partie distale**	**Nur Sorten mit Hülse: verdickte Wand: fehlend: Hülse: Form des distalen Teils**	**Sólo variedades con Vaina: valva gruesa: ausente: Vaina: forma de la parte distal**		
QL	**(c)**	pointed	pointue	zugespitzt	puntiaguda	Jof, Oskar	1
		blunt	tronquée	stumpf	roma	Avola, Solara	2
42. (*) (+)	**240 VG**	**Pod: curvature**	**Gousse : courbure**	**Hülse: Krümmung**	**Vaina: curvatura**		
QN	**(c)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Finale, Maro	1
		weak	faible	gering	débil	Eagle, Span	3
		medium	moyenne	mittel	media	Carlton, Hurst Green Shaft	5
		strong	forte	stark	fuerte	Delikata, Jof	7
		very strong	très forte	sehr stark	muy fuerte	Oskar	9
43. (*) (+)	**230-240 VG**	**Pod: color**	**Gousse: couleur**	**Hülse: Farbe**	**Vaina: color**		
PQ	**(c)**	yellow	jaune	gelb	amarillo		1
		green	verte	grün	verde	Avola, Solara	2
		blue green	vert bleu	blaugrün	verde azulado	Show Perfection	3
		purple	pourpre	purpur	púrpura	Blauwschokker	4
44.	**230-240 VG**	**Only varieties with pod color green (Char. 43: state 2): intensity of green color**	**Seulement variétés avec gousse de couleur verte (char. 43, niveau 2) : intensité de la couleur verte**	**Nur Sorten mit Grünfärbung der Hülse (Merkmal 43, Stufe 2): Intensität der grünen Farbe**	**Sólo variedades con vaina de color verde (car. 43: estado 2): intensidad del color verde**		
QN	**(c)**	light	claire	hell	claro	Solara, Ultimo	3
		medium	moyenne	mittel	medio		5
		dark	foncée	dunkel	oscuro	Dark Skin Perfection, Hawaii	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
45. (*) (+)	**240-245 VG**	**Excluding varieties with pod parchment: entire: Pod: suture strings**	**A l'exclusion des variétés avec gousse : parchemin : complet : Gousse : fils de la suture**	**Außer Sorten mit Hülse: Pergamentschicht: vollständig vorhanden: Hülse: Fäden der Naht**	**Excluyendo las variedades con vaina: pergamino: completo: Vaina: hilos de la sutura**		
QL	**(c)**	absent	absents	fehlend	ausentes	Nofila, Sugar Lace	1
		present	présents	vorhanden	presentes	Crispi, Reuzensuiker	9
46. (*) (+)	**226 MS**	**Pod: number of ovules**	**Gousse: nombre d'ovules**	**Hülse: Anzahl Samenanlagen**	**Vaina: número de óvulos**		
QN	**(c)**	few	faible	gering	bajo	De Grace, Phoenix	3
		medium	moyen	mittel	medio	Backgammon, Hawk	5
		many	élevé	groß	alto	Karisma	7
47. (*) (+)	**230-240 VG**	**Immature seed: intensity of green color**	**Graine immature: intensité de la couleur verte**	**Unreifer Samen: Intensität der grünen Farbe**	**Semilla inmadura: intensidad del color verde**		
QN		light	claire	hell	claro	Solara, Ultimo	3
		medium	moyenne	mittel	medio		5
		dark	foncée	dunkel	oscuro	Dark Skin Perfection, Hawaii	7
48. (+)	**320 VG**	**Seed: shape**	**Graine: forme**	**Samen: Form**	**Semilla: forma**		
PQ		ellipsoid	ovoïde	eiförmig	elipsoide	Solara	1
		cylindrical	cylindrique	zylindrisch	cilíndrica	Span, Timo	2
		rhomboid	rhomboïde	rhomboid	romboidal	Maro, Progreta	3
		irregular	irrégulier	unregelmäßig	irregular		4
49. (*) (+)	**320 VG**	**Seed: type of starch grains**	**Graine: type de grains d'amidon**	**Samen: Typ des Stärkekorns**	**Semilla: tipo de granos de almidón**		
QL		simple	simple	einfach	simples	Adagio, Maro, Solara	1
		compound	composé	zusammengesetzt	compuestos	Avola, Polar	2

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
50. (*) (+)	**320 VG**	**Only varieties with seed shape: cylindrical; and type of starch grain: simple: Seed: wrinkling of cotyledon**	**Seulement variétés avec forme cylindrique de la graine; et type de grain d'amidon : simple : Graine : rides sur les cotylédons**	**Nur Sorten mit Samenform: zylindrisch, und Typ des Stärkekorns: einfach: Samen: Schrumpfung des Keimblatts**	**Sólo variedades con forma de semilla: cilíndrica; y tipo de grano de almidón: simple: Semilla: corrugación del cotiledón**		
QL		absent	absentes	fehlend	ausente	Atila, Paris	1
		present	présentes	vorhanden	presente	Allsweet, Zorba	9
51. (*)	**320 VG**	**Only varieties with seed: type of starch grains: compound: Seed: intensity of wrinkling of cotyledon**	**Seulement variétés avec graine : type de grains d'amidon : composé : Graine : intensité des rides sur les cotylédons**	**Nur Sorten mit Samen: Typ des Stärkekorns: zusammengesetzt: Samen: Stärke der Schrumpfung des Keimblatts**	**Sólo variedades con semilla: tipo de grano de almidón: compuesto: Semilla: intensidad de la corrugación del cotiledón**		
QN		weak	faible	gering	débil	Darfon, Zefier	3
		medium	moyenne	mittel	media	Ziggy	5
		strong	forte	stark	fuerte	Oskar, Quad	7
		very strong	très forte	sehr stark	muy fuerte		9
52. (*) (+)	**320 VG**	**Seed: color of cotyledon**	**Graine: couleur des cotylédons**	**Samen: Farbe des Keimblatts**	**Semilla: color del cotiledón**		
PQ		green	verts	grün	verde	Avola, Solara	1
		yellow	jaunes	gelb	amarillo	Caractacus, Hardy	2
		orange	oranges	orange	naranja	Oliver	3
53. (*)	**320 VG**	**Only varieties with plant anthocyanin coloration present: Seed: marbling of testa**	**Variétés avec pigmentation anthocyanique de la plante seulement : Graine: marbrure des téguments**	**Nur Sorten mit Anthocyanfärbung der Pflanze: Samen: Marmorierung der Samenschale**	**Sólo variedades con pigmentación antociánica de la planta: Semilla: jaspeado del tegumento**		
QL	**(d)**	absent	absente	fehlend	ausente	Rhea, Rif	1
		present	présente	vorhanden	presente	Assas, Pidgin	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
54. (*)	**320 VG**	**Only varieties with plant anthocyanin coloration present: Seed: violet or pink spots on testa**	**Variétés avec pigmentation anthocyanique de la plante seulement : Graine: taches violettes ou roses sur les téguments**	**Nur Sorten mit Anthocyanfärbung der Pflanze: Samen: violette oder rosa Punktierung auf der Samenschale**	**Sólo variedades con pigmentación antociánica de la planta: Semilla: manchas violetas o rosas en el tegumento**		
QL	**(d)**	absent	absentes	fehlend	ausentes	Pidgin, Rif	1
		faint	faibles	gering	débiles	Assas, Susan	2
		intense	intenses	intensiv	intensas	Arvika, Rhea	3
55. (*) (+)	**320 VG**	**Seed: hilum color**	**Graine: couleur du hile**	**Samen: Farbe des Nabels**	**Semilla: color del hilio**		
QL	**(d)**	same color as testa	même couleur que les téguments	gleiche Farbe wie die Samenschale	del mismo color que el tegumento	Avola, Solara	1
		darker than testa	plus foncée que les téguments	dunkler als die Samenschale	más oscuro que el tegumento	Nofila, Rif	2
56.	**320 VG**	**Only varieties with plant anthocyanin coloration present: Seed: color of testa**	**Variétés avec pigmentation anthocyanique de la plante seulement : Graine: couleur du tégument**	**Nur Sorten mit Anthocyanfärbung der Pflanze: Samen: Farbe der Samenschale**	**Sólo variedades con pigmentación antociánica de la planta: Semilla: color del tegumento**		
PQ	**(d)**	reddish brown	brun rougeâtre	rötlichbraun	marrón rojizo	Rhea, Rosakrone	1
		brown	brun	braun	marrón	Pidgin	2
		brownish green	vert brunâtre	bräunlichgrün	verde amarronado	Lisa, Susan	3
57. (*) (+)	**320 MG**	**Seed: weight**	**Graine: poids**	**Samen: Gewicht**	**Semilla: peso**		
QN		very low	très faible	sehr niedrig	muy bajo	Ultimo	1
		low	faible	niedrig	bajo	Hawk, Iceberg	3
		medium	moyen	mittel	medio	Mammoth Melting Sugar, Phoenix	5
		high	élevé	hoch	alto	Kennedy, Maro	7
		very high	très élevé	sehr hoch	muy alto	Bamby, Kabuki	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
58.	**VG**	**Resistance to *Fusarium oxysporum* f. sp. *pisi***	**Résistance à *Fusarium oxysporum* f. sp. *pisi***	**Resistenz gegen *Fusarium oxysporum* f. sp. *pisi***	**Resistencia a *Fusarium oxysporum* f. sp. *pisi***		
(+)		**Race 1**	**Race 1**	**Pathotyp 1**	**Raza 1**		
QL		absent	absente	fehlend	ausente	Bartavelle	1
		present	présente	vorhanden	presente	New Era, Nina	9
59.	**VG**	**Resistance to *Erysiphe pisi* Syd.**	**Résistance à *Erysiphe pisi* Syd.**	**Resistenz gegen *Erysiphe pisi* Syd.**	**Resistencia a *Erysiphe pisi* Syd.**		
(+)							
QL		absent	absente	fehlend	ausente	Cabro	1
		present	présente	vorhanden	presente	Stratford, Vivaldi	9
60.	**VG**	**Resistance to *Ascochyta pisi*,**	**Résistance à *Ascochyta pisi*,**	**Resistenz gegen *Ascochyta pisi*,**	**Resistencia a *Ascochyta pisi*,**		
(+)		**Race C**	**Race C**	**Pathotyp C**	**Raza C**		
QL		absent	absente	fehlend	ausente	Crecerelle, Kelvedon Wonder	1
		present	présente	vorhanden	presente	Madonna, Nina, Rondo	9

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) Leaflet: Unless otherwise indicated, all observations should be made on the first leaflet at the second flowering node.
(b) Stipule, flower and peduncle: Unless otherwise indicated, all observations should be made at the second flowering node
(c) Pod: Unless otherwise indicated, all observations should be made at the second fertile node
(d) Seed of varieties with plant anthocyanin coloration present contain tannins in the testa, which may darken with age, obscuring the expression of other seed characteristics. Recording of these seed characteristics should be carried out within nine months of harvest; assessment is easiest under conditions of bright natural daylight.

8.2 Explanations for individual characteristics

Ad. 1: Plant: anthocyanin coloration

The anthocyanin coloration should be recorded as present if anthocyanin occurs in one or more of the following: seed, foliage, stem, axil, flower or pod.

Ad. 3: Stem: fasciation

Fasciated stems may be ribbed and flattened up to a width of 3 cm; several apical growing points often result in multiple flowers or pods at the top of the plant.

multiple flowers

ribbed stems

Ad. 4: Stem: length

Only the main stem should be recorded. The observations should be made on harvested plants when seed is green and fully developed. The measurement should include the first two nodes with 'scale' leaves.

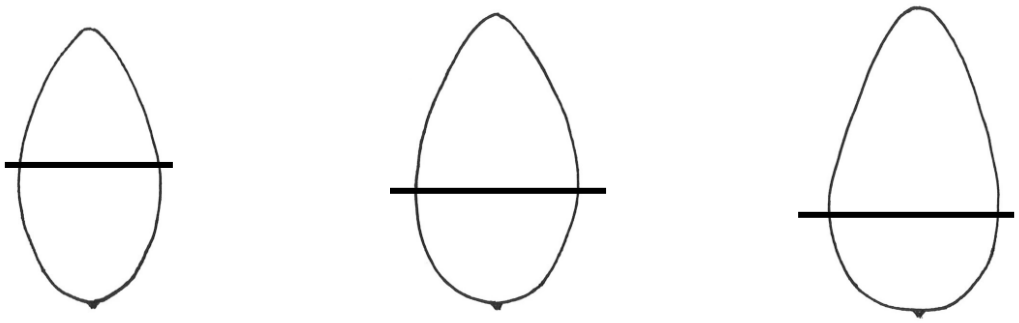
Ad. 5: Stem: number of nodes up to and including first fertile node

Only the main stem should be recorded. The first two nodes, which have 'scale' leaves, should be included in all node counts.

Ad. 9: Leaf: maximum number of leaflets

Assessment should be made over the whole plant.

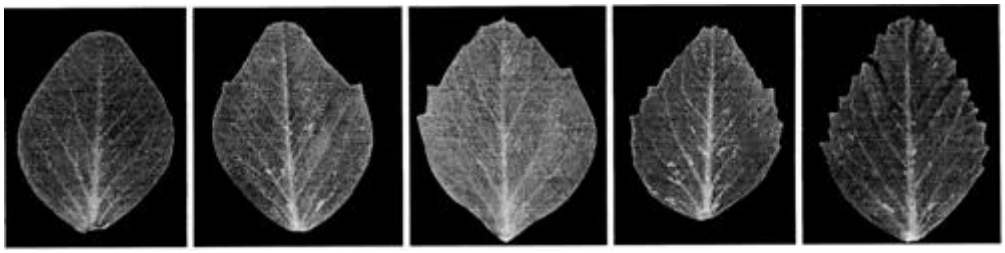
Ad. 13: Leaflet: position of broadest part



1	2	3
at middle or slightly towards base	moderately towards base	strongly towards base

Ad. 14: Leaflet: dentation

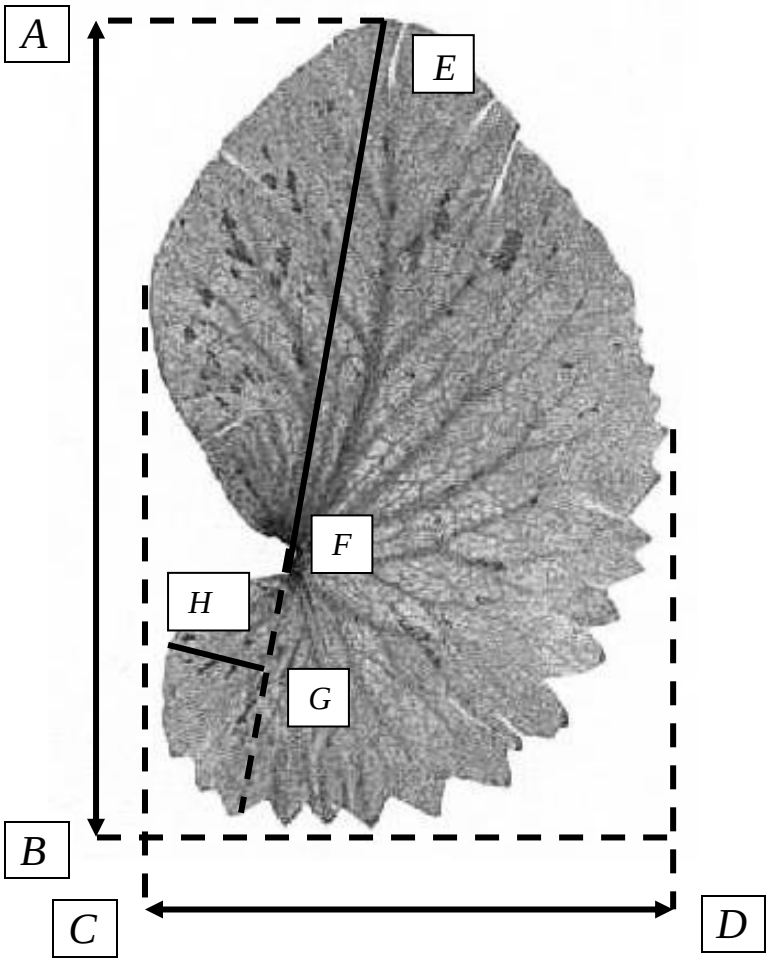
The maximum expression should be recorded; observations should only be made on the main stem (excluding aerial and basal branches), and above node six.



1	3	5	7	9
absent or very weak	weak	medium	strong	very strong

Ad. 15: Stipule: length
Ad. 16: Stipule: width
Ad. 18: Stipule: length from axil to tip
Ad. 19: Stipule: length of lobe below axil

Observations should be made on stipules which have been detached from the plant and flattened.



Stipule: length (15)	A - B
Stipule: width (16)	C - D
Stipule: length from axil to tip (18)	E - F
Stipule: length of lobe below axil (19)	G - H
(perpendicular to the line E – G)	

Ad. 20: Stipule: flecking
Ad. 21: Stipule: density of flecking

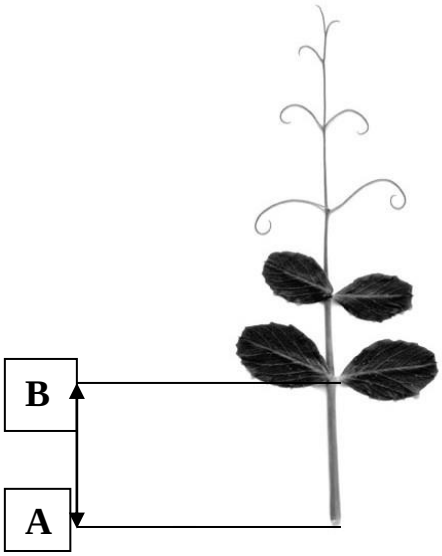
Assessment should be made on the main stem only. The presence of flecking on any stipule on the main stem means that flecking is present. It should be ensured that foliage at the lowest nodes has not senesced before assessment. The plant should have at least eight nodes, since flecking in some varieties may not be expressed at lower nodes.

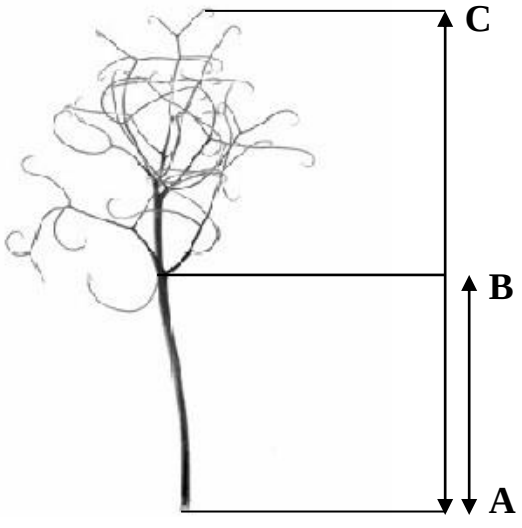
The density of flecking should be observed on the part of the plant with most flecking.

1	3	5	7	9
very sparse	sparse	medium	dense	very dense

Ad. 22: Petiole: length from axil to first leaflet or tendril
Ad. 23: Only varieties with leaflets absent: Petiole: length from axil to last tendril

Petiole length from axil to the first leaflet or tendril (22)	A - B
Total length of petiole including tendrils (23)	A - C





Ad. 24: Time of flowering

The time of flowering is when 30% of plants have at least one flower open.

Ad. 25: Only varieties with stem fasciation absent: Plant: maximum number of flowers per node

Assessment should be made over all flowering nodes on the main stem of the plant. A count is made of the maximum number of flowers at any node on each plant examined. An average is then calculated for the total number of plants examined per plot.

As flower set is dependent on temperature and available soil moisture, it is not unusual to record mean flower numbers between 1, 2 and 3 flowers. Mean values within 0.2 of a whole number should be rounded to that number for descriptive purposes e.g. mean 1.2 will be one flowered (note 1) and 1.8 will be two flowered note 3). All other mean values will fall into the intermediate states e.g. 1.3 or 1.7 will be one to two flowered (note 2).

Ad. 27: Only varieties with plant anthocyanin coloration absent: Flower: color of standard

The color of standard should be recorded on flowers which are fully opened and fresh.

Ad. 28: Flower: width of standard

The standard should be detached from the flower and flattened on a hard, flat surface.

Ad. 29: Flower: shape of base of standard

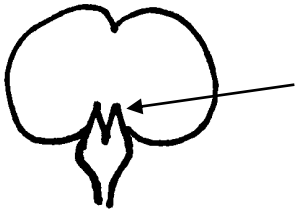
The standard should be detached and flattened on a hard, flat surface.

1	3	5	7	9
strongly raised	moderately raised	level	moderately arched	strongly arched

Ad. 30: Flower: undulation of standard

The maximum expression on the plant should be recorded. Flowers recorded should be fully opened and not senescing.

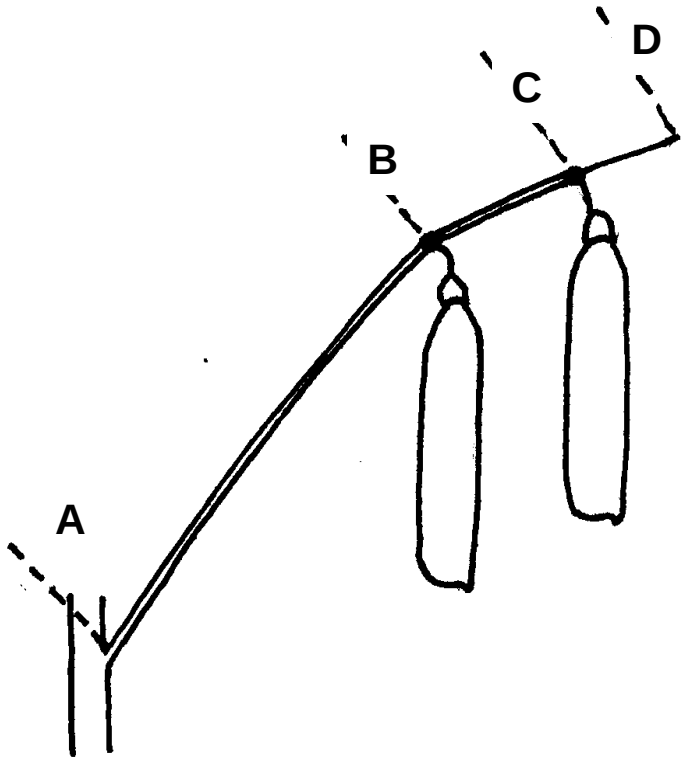
Ad. 32: Flower: shape of apex of upper sepal



back of flower standard

1 acuminate | 2 acute | 3 rounded

Ad. 33: Peduncle: length of spur
Ad. 34: Peduncle: length from stem to first pod
Ad. 35: Peduncle: length between first and second pods



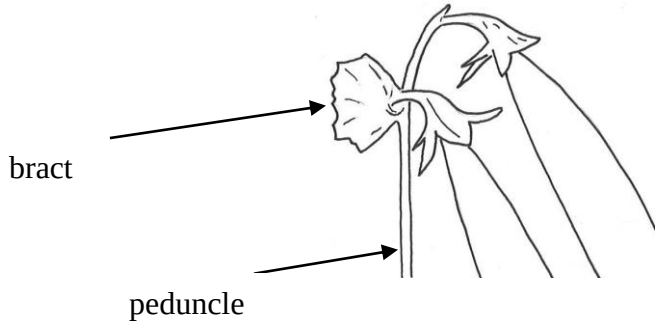
A – B = Peduncle: length from stem to first pod (34)

B – C = Peduncle: length between first and second pods (35)

C – D = Peduncle: length of spur (33)

Ad. 36: Peduncle: number of bracts

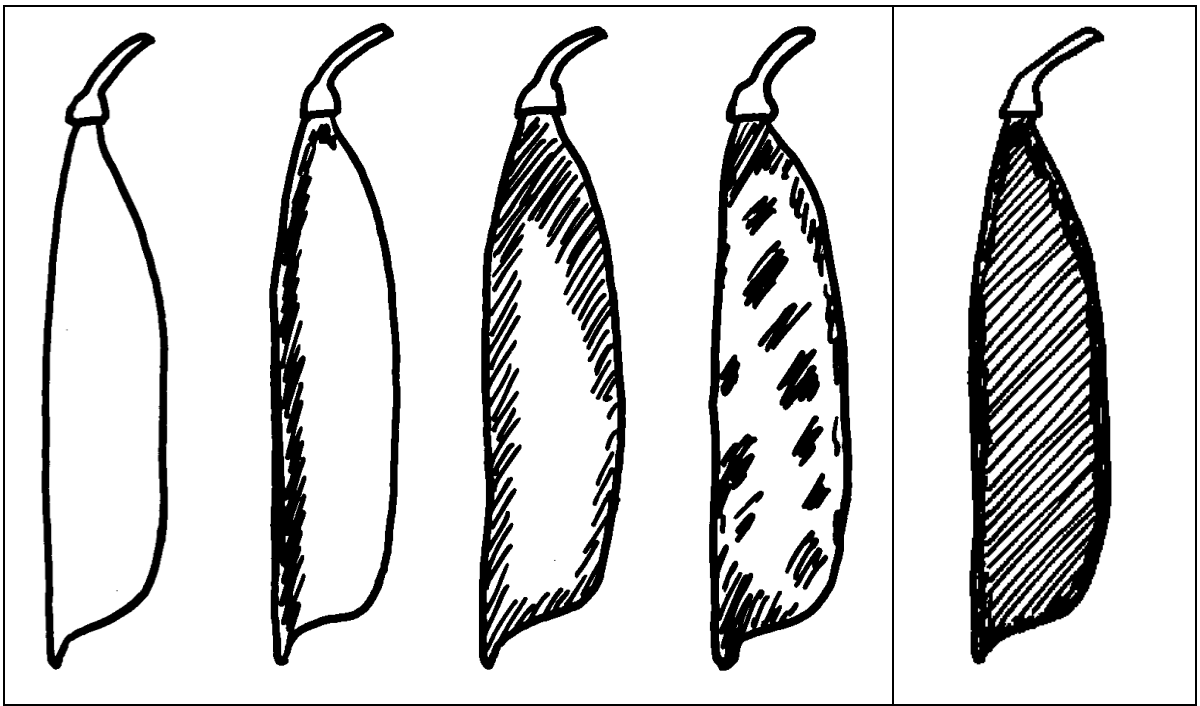
Bracts are modified leaves which occur on the peduncle. The number of bracts is calculated on the basis of averages across plants.



Ad. 38: Pod: width

The observations should be made on well developed green pods; the width is assessed from suture to suture on unopened pods.

Ad. 39: Pod: parchment
(viewed on the inside of the pod wall)



1 absent or partial	2 entire

(l) The observations should be made on dry pods with the exception of 'Snap Peas'. Snap Peas (Sugar Peas with thickened pod walls) are best recorded when green, in order to minimize fungal infection which can prevent observation of the parchment.

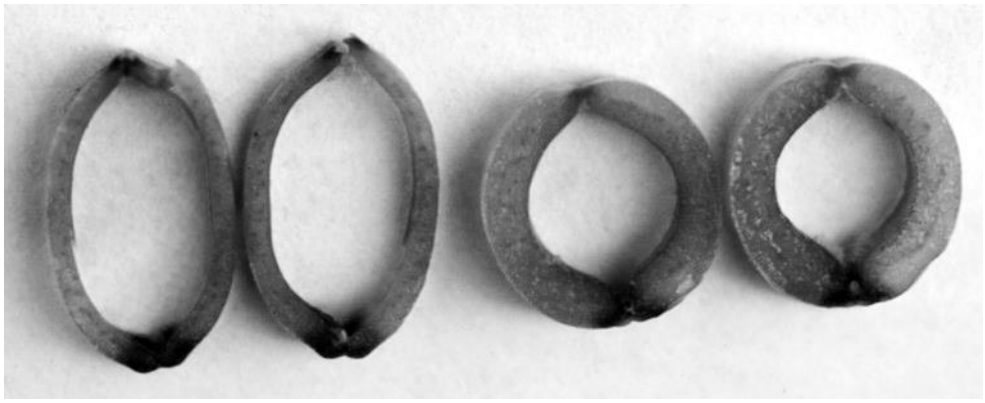
(2) The pod should be opened along the suture without damaging the edges of the two sides of the pod. The distribution of sclerenchyma, which makes up the parchment, may

either be observed by staining (a drop of Phloroglucinol dissolved in Ethanol followed by a drop of concentrated (37%) Hydrochloric Acid), or by reflecting light (preferably daylight) on the inside of the pod wall.

(3) In the case of varieties with the state "entire", the parchment will occur as a thick layer in all pods.

Ad. 40: Excluding varieties with pod parchment: entire: Pod: thickened wall

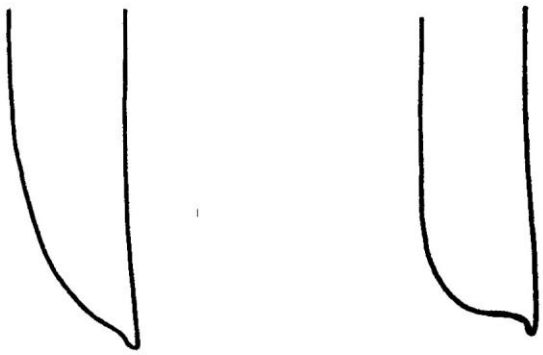
The observations should be made on well developed pods not showing any signs of senescence. Unopened harvested pods should be cut in cross section to examine pod wall thickness.



1 absent | 9 present

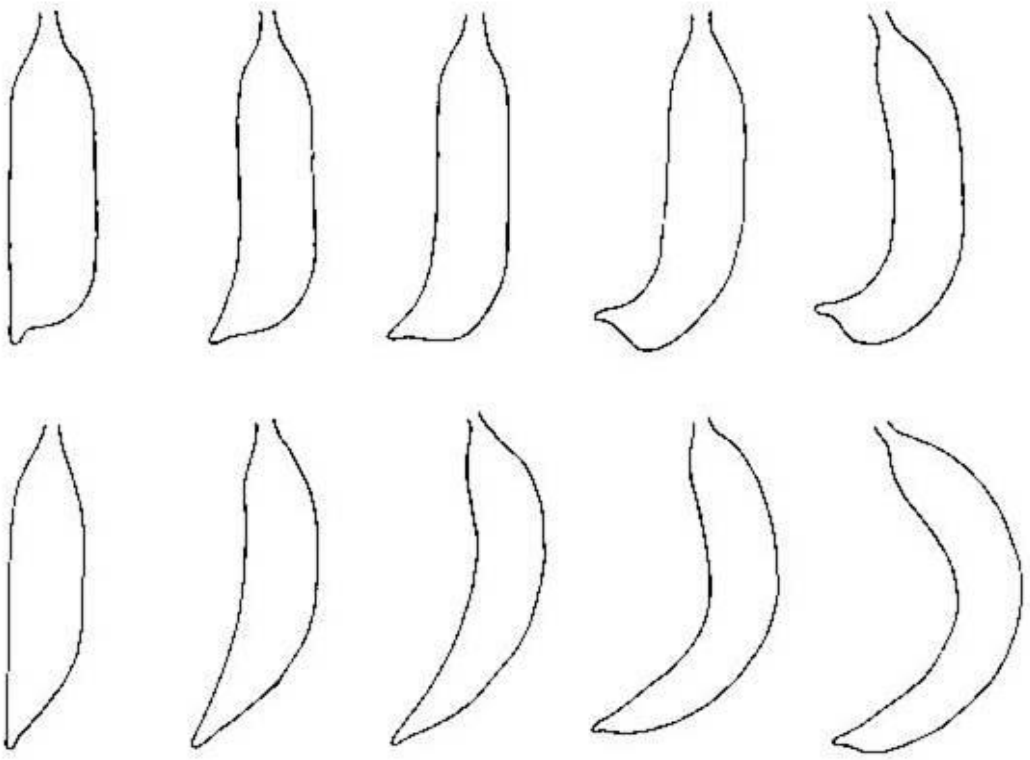
Ad. 41: Only varieties with Pod: thickened wall: absent: Pod: shape of distal part

Observations should be made on several nodes of each plant when pods are fully developed, but before any senescence.



1 pointed | 2 blunt

Ad. 42: Pod: curvature



1	3	5	7	9
absent or very weak	weak	medium	strong	very strong

Ad. 43: Pod: color

Green pods may be pale or dark, the color is correlated with pale or dark immature seed color.

Blue green pods are dark and slightly bluish. The color develops with time, and may be more accentuated in hotter, drier conditions.

Purple pods may be entirely purple or partially purple; occasionally the amount and distribution of anthocyanin may vary within the plant.

Ad. 45: Excluding varieties with pod parchment: entire: Pod: suture strings

When temperatures exceed 20° C, the formation of suture strings is delayed. Observations should be made on fully developed pods.

Varieties with rudimentary suture strings are considered as state “absent”.

Ad. 46: Pod: number of ovules

The number of ovules is best recorded when the pods are flat. The number of ovules should be observed before seed development.

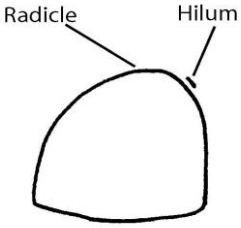
Ad. 47: Immature seed: intensity of green color

Immature seed color in some varieties with green cotyledons may appear creamy white before the seed is fully developed. Observations should be made on fully developed, fresh seed in a side-by-side comparison with example varieties.

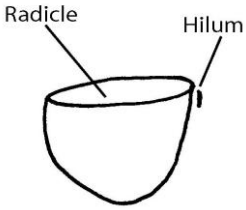
Ad. 48: Seed: shape

Seeds which grow nearest the peduncle end or the distal end of the pod ('end seeds') are rounded on the radicle or the distal (opposite to the radicle) surfaces and should be excluded before shape is assessed. 'Golf ball' and other irregular dimpling should be ignored.

Orientate the seed so that the hilum is at the upper right hand side with radicle on top.



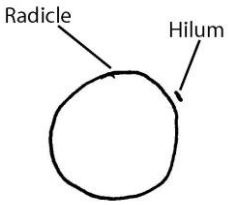
If the seed is rounded on the radicle surface only, it is an end seed growing nearest the peduncle end of the pod.

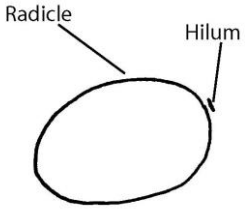


If the seed is rounded on the distal surface only, it is an end seed growing nearest the distal end of the pod.

1. Ellipsoid

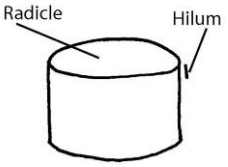
Seeds with no, or very weak, compression on the radicle and/or the distal surfaces

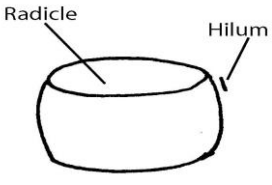




2. Cylindrical

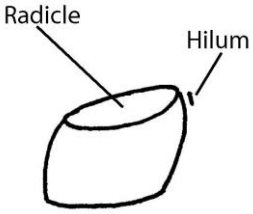
Seeds compressed on the radicle and distal surfaces. Square to rectangular or with rounded sides in longitudinal section.





3. Rhomboid

Seeds irregularly compressed on the radicle and distal surfaces, but also irregularly compressed on the abaxial surfaces.



4. Irregular

Seeds irregularly compressed; not one of the above shapes.

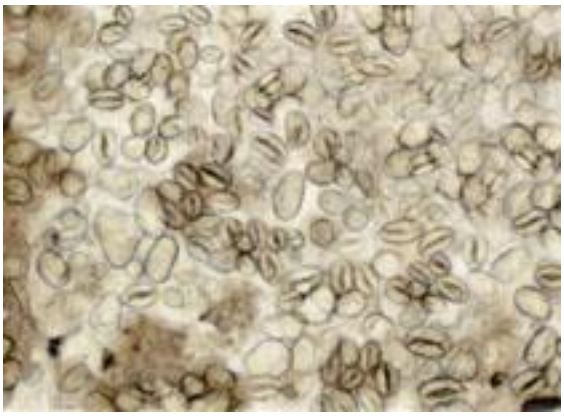
Ad. 49: Seed: type of starch grains

(l) Following the removal of the testa, fine fragments of tissue should be extracted from the cotyledon and placed on a microscope slide. A droplet of water is added to the extracted tissue and another microscope slide is placed on top. The tissue and water mixture is then squashed gently between the two slides. Too much pressure during squashing results in fragmentation of the grains, too little pressure will not provide a layer thin enough for examination.

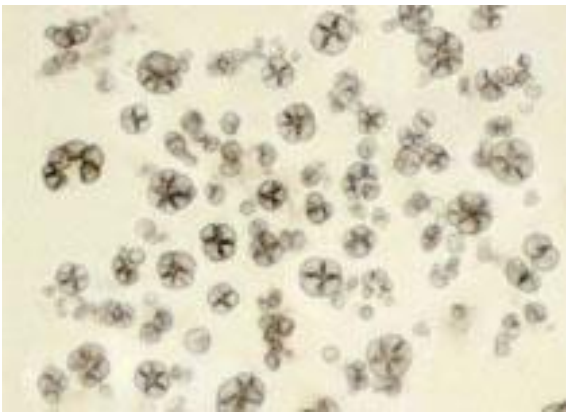
(2) A microscope with transmitted light, using X16 eye-pieces and either X10 or X40 objectives, is most suitable for examination. For examination of compound grains the larger objectives will be required.

(3) Simple grains resemble wheat seeds or coffee beans in shape, often with what looks like a suture line running along their length.

(4) Compound grains look irregularly star-shaped and appear to be made of a number of segments. The center of the grains may appear cross-shaped. In varieties with high sweetness, compound starch grains are very small and few in number.



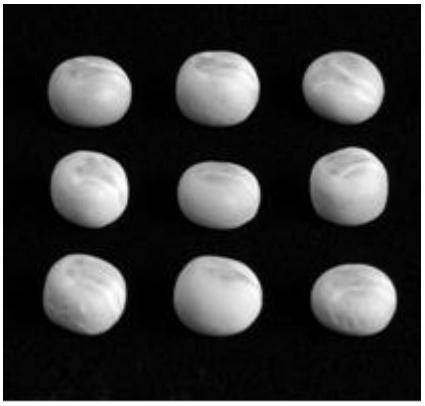
1
simple



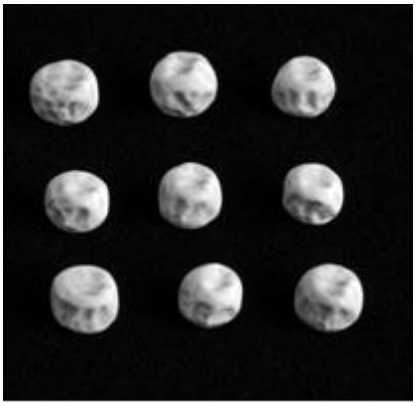
2
compound

Ad. 50: Only varieties with seed shape: cylindrical; and type of starch grain: simple: Seed: wrinkling of cotyledon

'Golf ball' and large dimples should be ignored in the assessment of cotyledon wrinkling.



1
absent



9
present

Ad. 52: Seed: color of cotyledon

Following the removal of the testa, the seed is cut along the line of the cotyledon suture. Assessment of both external (abaxial) and internal (adaxial) surfaces of the cotyledon may be necessary. Immature seeds should be excluded from the assessment.

The expression varies with environmental conditions:

- bleaching, caused by sunlight or chemical changes in the plant, can remove color from seeds making it difficult to determine cotyledon color; cutting the seed in half enables the assessment of the internal color which may be less affected.
- color becomes dull with age, even if seed is stored in cold, dark conditions.
- color can darken in the presence of high amounts of Tragacanth oil occurring on the underside of the testa. This fades as the seed ages. Seeds with tannin may darken with age.
- orange cotyledons can be difficult to determine without reference to an example variety.

Ad. 55: Seed: hilum color

The hilum area should be lightly polished with a cloth before recording, to remove any loose tissue present. In varieties with plant anthocyanin present, the testa will contain tannins which vary in color from reddish brown to brown to brownish green. Where the hilum color is darker than the testa, melanin pigment is expressed as a black or dark brown color. It can be difficult to assess hilum color if the testa tannins darken with age; assessment should therefore be made within nine months of seed harvest.

Ad. 57: Seed: weight

Seed weight should be measured on at least two samples of 100 seeds. Immature and infected seeds should be excluded.

Ad. 58: Resistance to *Fusarium oxysporum* f. sp. *pisi* race 1 (Near wilt)

1.	Pathogen	*Fusarium oxysporum* f. sp. *pisi* (race 1)
2.	Quarantine status	no
3.	Host species	Pea – *Pisum sativum* L.
4.	Source of inoculum	GEVES[1] (FR), INIA[2] (ES) or SASA[3] (GB)
5.	Isolate	*Fusarium oxysporum* f. sp. *pisi* race 1 strain MATREF 04-02-01-01 (the test protocol has been validated with this isolate/race)
6.	Establishment isolate identity	genetically defined pea controls (See ISF website: http://www.worldseed.org)

Differentials host	
susceptible:	M410, Bartavelle, Little Marvel
resistant:	New Era, Mini 93, Dark Skin Perfection, Vantage, WSU 23, New Season, WSU 31, 74SN5, Sundance II, Grant

7.	Establishment pathogenicity	Test on susceptible plants
8.	Multiplication inoculum	
8.1	Multiplication medium	Multiplication on agar medium: malt Agar or PDA for example
8.4	Inoculation medium	Multiplication on agar medium: water for scraping agar plates. Multiplication on liquid medium: Potato Dextrose Broth, Kerrs broth or Czapek-Dox (3 to 7 days old aerated culture) for example.
8.6	Harvest of inoculum	see 10.1
8.7	Check of harvested inoculum	see 10.2
8.8	Shelflife/viability inoculum	between 4 and 8 hours, keep cool to prevent germination of spores. Viability of spores should be more than 3 years if stored at -20°C.
9.	Format of the test	
9.1	Number of plants per genotype	At least 20 plants and 5 non inoculated plants per variety.
9.2	Number of replicates	-
9.3	Control varieties	Susceptible controls: Bartavelle Resistant controls: New Era and Nina

[1] matref@geves.fr / www.geves.fr

[2] resistencias@inia.es

[3] restest@sasa.gov.scot

9.5	Test facility	Climate room or greenhouse.
9.6	Temperature	20-25°C
9.7	Light	12 hours or longer
9.9	Special measures	It is important to compare the inoculated plants with the negative non inoculated control plants of the same sample. This allows interpretation of symptoms of root rot, senescence or 'wilting' caused by the stress of having roots cutted and not caused by *F. oxysporum* infection.
10.	Inoculation	
10.1	Preparation inoculum	For agar plates, remove hyphen fragments by filtering solution through muslin. For liquid medium, filter through muslin.
10.2	Quantification inoculum	10^6 spores/ml
10.3	Plant stage at inoculation	seeds or 2 weeks old seedlings (2-3 node stage).
10.4	Inoculation method	For seeds: sowing in contaminated substrate (soil based substrate), 750 ml of suspension of spores at 10^6 sp/ml for 5 l of substrate. For 2 weeks seedlings: Sowing in a mix of vermiculite + soil or soil based substrate Cut the apical 2/3 of the roots with scissors, dip the root of the seedling in the spores suspension for 1 to 5 minutes and transplant in clean soil based substrate in a new tray.
10.7	Final observations	28 days post-inoculation.
11.	Observations	
11.1	Method	Visual
11.2	Observation scale	susceptible: Class 2: Range from most of the plant wilted/dried but still alive, to plants brown and dead with stem collapsed. resistant: Class 0: No symptoms or equivalent to negative control, 1 or 2 wilted/dried lower leaves and slight reduction in growth compared to negative control of same variety are acceptable. Class 1: Range from a few chlorotic or wilted/dried leaves not present on, or more than on the negative control, up to many leaves with symptoms of senescence or wilting, some leaf drop, upper part of the plant still green and growing.

		 
Class 0 resistant	Class 1 resistant	Class 2 susceptible

		Varieties with the same or higher level of resistance as New Era will be interpreted as resistant. Varieties with a lower level of resistance than New Era will be interpreted as susceptible. Nina will be highly resistant, Bartavelle will be highly susceptible. New Era expresses weak symptoms and variation can occur in these weak symptoms depending on the agressivity of the test conditions.
11.3	Validation of test	evaluation of variety resistance should be calibrated with results of resistant and susceptible controls.
12.	Interpretation of data in terms of UPOV characteristic states	
	absent [1]	susceptible
	present [9]	resistant
13.	Critical control points	Each lab has to define the best method of inoculation in its lab depending on controls results. Inoculation by sowing in contaminated soil can in some cases lead to germination problems. No conclusion can be done in this case, and the test should be repeated.

Ad. 59: Resistance to *Erysiphe pisi* Syd. (Powdery Mildew)

Resistant and Susceptible varieties
Cabro (susceptible = resistance absent (1))
Stratford, Vivaldi (resistant = resistance present (9))

Isolates and isolate identity
No isolates are maintained as infection is natural. There are no known races.

Genetic background
Two recessive genes confer resistance: er1 and er2

er1 er2 = resistant
Er1 Er2 = susceptible

Er1 er2 = susceptible
er1 Er2 = susceptible

Assessment of disease
Infected foliage surfaces are white and powdery. Tissue beneath the infected areas may turn purplish followed by the production of black fruiting structures. Badly infected tissue remains soft and fails to dry out naturally.

In resistant plants, infection is absent or localized in very small patches (pustules). Infestation may overtake resistant plants during senescence.

Ad. 60: Resistance to *Ascochyta pisi*, Race C

1.	Pathogen	*Ascochyta pisi*
2.	Quarantine status	no
3.	Host species	Pea – *Pisum sativum* L.
4.	Source of inoculum	GEVES[4] (FR) or SASA[5] (GB)
5.	Isolate	*Ascochyta pisi* race C strain 21A.13. (the test protocol has been validated with this isolate)[6].
6.	Establishment isolate identity	genetically defined pea controls (Physiological races of *A. pisi* and differentials, adapted from Gallais et Bannerot, 1992)

Physiological race (Dr Hubbeling) Strain	C Tézier 21A.13
Gullivert	S
Rondo	R
Finale	R
Kelvedon Wonder	S
Dark Skin Perfection	S
Arabal, Cobri, Starcovert, Sucovert, Vitalis	S

R = resistant; S = susceptible

7.	Establishment pathogenicity	test on susceptible plants
8.	Multiplication inoculum	
8.1	Multiplication medium	V8 agar or Mathur medium or Potato Dextrose Agar or a synthetic medium.
8.4	Inoculation medium	water, option: add Tween 80 (wetting agent to aid dispersal of spores, e.g. 0.4%)
8.6	Harvest of inoculum	see 10.1
8.7	Check of harvested inoculum	see 10.2
8.8	Shelflife/viability inoculum	between 4 and 8 hours, keep cool to prevent spores' germination
9.	Format of the test	
9.1	Number of plants per genotype	at least 20 plants and 5 non inoculated plants per variety
9.2	Number of replicates	-
9.3	Control varieties	
	Susceptible	Crecerelle, Kelvedon Wonder
	Resistant	Nina and Madonna or Rondo

[4] matref@geves.fr / www.geves.fr

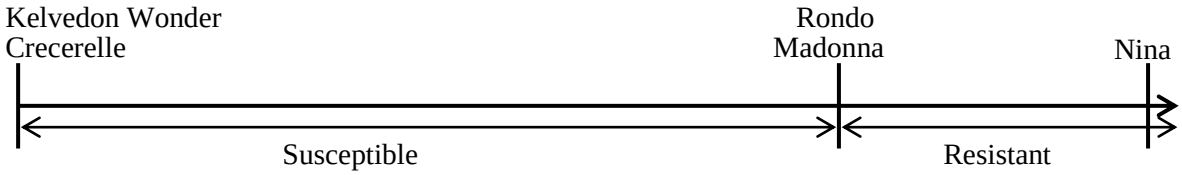
[5] restest@sasa.gov.scot

[6] Harmores 2 CPVO project

9.4	Test design	-
9.5	Test facility	climate room or greenhouse
9.6	Temperature	20°C
9.7	Light	12 hours or longer
9.8	Season	-
9.9	Special measures	high humidity or watering by spraying 2 or 3 times per day
10.	Inoculation	
10.1	Preparation inoculum	remove hyphen fragments by straining solution through muslin
10.2	Quantification inoculum	10^6 spores/mL (to adapt depending conditions of tests)
10.3	Plant stage at inoculation	2 weeks old seedlings (i.e. 2-3 node stage)
10.4	Inoculation method	spraying on green leaves without surface moisture
10.5	First observation	-
10.6	Second observation	-
10.7	Final observations	10-18 days post-inoculation
11.	Observations	
11.1	Method	visual
11.2	Observation scale	Class 0: no symptoms Class 1: few small superficial necrosis Class 2: bigger darker and deep necrosis Class 3: necrosis on all parts of the plant or serious symptoms surrounding the stem Madonna, Nina and Rondo will be resistant controls; varieties with same level of resistance as Madonna/Rondo and/or Nina will be interpreted as resistant. Crecerelle and Kelvedon Wonder will be susceptible controls, varieties with a lower level of resistance than Nina as well as Madonna/Rondo will be interpreted as susceptible.

Class 0:	Class 1:
	

Class 2: 	Details on Class 2: 
Class 3 : 	Details on Class 3 



11.3	Validation of test	evaluation of variety resistance should be calibrated with results of resistant and susceptible controls
11.4	Off-types	-
12.	Interpretation of data in terms of UPOV characteristic states	
	absent [1] present [9]	susceptible (classes 2 and 3) resistant (classes 0 and 1)
13.	Critical control points	-

KEY FOR THE GROWTH STAGES
CLE POUR LES STADES DE CROISSANCE
SCHLÜSSEL FÜR DIE ENTWICKLUNGSSTADIEN
CLAVE PARA LOS ESTADOS DE DESARROLLO

Key Clé Schlüssel Clave	General Description	Description générale	Allgemeine Beschreibung	Descripción general
0	Germination	Germination	Keimung	Germinación
00	Dry seed	Graine sèche	Trockenkorn	Semilla seca
10	Seedling growth	Croissance de la plantule	Wachstum des Keimlings	Desarrollo de las plántulas
16	Young seedling with first scale leaf developed	Jeune plantule avec première feuille à écailles développée	Junger Keimling mit ersten entwickelten Schuppenblättern	Plántula joven con la primera hoja escamosa desarrollada
18	Young seedling with second scale leaf developed	Jeune plantule avec deuxième feuille à écailles développée	Junger Keimling mit zweiten entwickelten Schuppenblättern	Plántula joven con la segunda hoja escamosa desarrollada
20	First pair of stipules at the third node fully opened	Première paire de stipules au niveau du troisième noeud complètement ouverte	Erstes Paar Nebenblätter am dritten Knoten voll geöffnet	Primer par de estípulas en el nivel del tercer nudo completamente abiertas
22	Stipules at the fourth node fully opened	Stipules au niveau du quatrième noeud complètement ouverts	Nebenblätter am vierten Knoten voll geöffnet	Estípulas en el nivel del cuarto nudo completamente abiertas
25	Stipules at the fifth node fully opened	Stipules au niveau du cinquième noeud complètement ouverts	Nebenblätter am fünften Knoten voll geöffnet	Estípulas en el nivel del quinto nudo completamente abiertas
28	Stipules at the sixth node fully opened	Stipules au niveau du sixième noeud complètement ouverts	Nebenblätter am sechsten Knoten voll geöffnet	Estípulas en el nivel del sexto nudo completamente abiertas
30	Vegetative growth	Croissance végétative	Vegetatives Wachstum	Crecimiento vegetativo
31	Stipules at the seventh node fully opened	Stipules au niveau du septième noeud complètement ouverts	Nebenblätter am siebenten Knoten voll geöffnet	Estípulas en el nivel del séptimo nudo completamente abiertas
34	Stipules at the eighth node fully opened	Stipules au niveau du huitième noeud complètement ouverts	Nebenblätter am achten Knoten voll geöffnet	Estípulas en el nivel del octavo nudo completamente abiertas
40	Stipules at the tenth node fully opened	Stipules au niveau du dixième noeud complètement ouverts	Nebenblätter am zehnten Knoten voll geöffnet	Estípulas en el nivel del décimo nudo completamente abiertas
n	Stipules at the Nth node fully opened	Stipules au niveau du N-ième noeud complètement ouverts	Nebenblätter am N-ten Knoten voll geöffnet	Estípulas en el nivel del enésimo nudo completamente abiertas
200	Reproductive stage	Stade de reproduction	Generatives Stadium	Estadio reproductivo
200	Initiation of first flower	Apparition de la première fleur	Beginn der ersten Blüte	Aparición de la primera flor
206	Development of first flower bud enclosed in stipules	Développement de la première fleur, mais à l'intérieur des stipules	Entwicklung der ersten in Nebenblätter eingeschlossenen Blütenknospe	Desarrollo de la primera yema floral, cubierta por hojas escamosas
208	Development and sometimes elongation of peduncle	Développement et parfois allongement du pédoncule	Entwicklung und manchmal Verlängerung des Blüten-standstiels	Desarrollo y, en ocasiones, elongación del pedúnculo

Key Clé Schlüssel Clave	General Description	Description générale	Allgemeine Beschreibung	Descripción general
210	Emergence of first flower bud from stipules	Apparition du premier bourgeon à fleurs hors des stipules	Erscheinen der ersten Blütenknospe aus den Nebenblättern	Aparición de la primera yema floral fuera de las hojas escamosas
212	Emergence of standards from the calyx	Apparition des étendards hors du calice	Erscheinen der Fahne aus dem Kelch	Aparición de los estandartes fuera del cáliz
214	Opening of the standards and emergence of the wings	Ouverture des étendards et apparition des ailes	Oeffnen der Fahne und Erscheinen der Flügel	Apertura de los estandartes y aparición de las alas
216	Slight opening of the wings to show the keel	Légère ouverture des ailes découvrant la carène	Leichtes Oeffnen der Flügel und Erscheinen des Kieles	Ligera apertura de las alas para mostrar la quilla
218	Standards usually fully opened	Etendards généralement complètement ouverts	Fahnen normalerweise voll geöffnet	Estandartes normalmente abiertos por completo
220	Standards beginning to crumple at the margins	Etendards commençant à se friper sur les bords	Fahnen beginnen am Rand zu kräuseln	Los estandartes comienzan a arrugarse en los bordes
222	Standards and wings showing signs of withering	Etendards et ailes présentant des signes de flétrissure	Fahnen und Flügel weisen Zeichen des Welkens auf	Los estandartes y las alas presentan signos de marchitez
224	Emergence of the first flat pod	Apparition de la première gousse aplatie	Erscheinen der ersten flachen Hülse	Aparición de la primera vaina plana
226	Elongation of the flat pod with clearly visible ovules	Allongement de la gousse aplatie avec des ovules nettement visibles	Verlängerung der flachen Hülse mit deutlich sichtbaren Samenanlagen	Elongación de la vaina plana con los óvulos claramente visibles
230	Swelling of the ovules and slight swelling of the pod wall	Gonflement des ovules et léger renflement de la paroi de la gousse	Schwellen der Samenanlagen und leichtes Schwellen der Hülsenwand	Hinchazón de los óvulos y ligera hinchazón de la valva de la vaina
235	Green seed rounded becoming slightly firm; pods almost fully swollen or developed	Graine verte arrondie devenant légèrement ferme; gousses presque entièrement formées ou développées	Grüner rundlicher Samen wird leicht fest; Hülse fast vollkommen geschwollen oder entwickelt	La semilla verde redondeada se hace ligeramente firme; vainas casi completamente hinchadas o desarrolladas
240	Green seed firm, becoming starchy; pods fully developed or swollen	Graine verte ferme, devenant amylacée; gousses pleinement développées ou gonflées	Grüner Samen fest; wird leicht stärkehaltig; Hülsen voll entwickelt oder geschwollen	Semilla verde firme, volviéndose almidonada; vainas completamente desarrolladas o hinchadas
245	Green seed becoming pale, testas tough; pod beginning to lose color	Graine verte devenant pâle, téguments épais; gousse commençant à se décolorer	Grüner Samen wird blass, Samenschale fest; Hülse beginnt Farbe zu verlieren	La semilla verde se vuelve pálida, tegumentos endurecidos; la vaina comienza a perder color
250	Stem and lower foliage becoming yellowish	Tige et feuillage inférieur devenant jaunâtre	Stengel und niedrige Blätter werden gelblich	El tallo y el follaje inferior amarillean
255	Seed drying and becoming yellowish green; pod becoming wrinkled	Dessèchement de la graine devenant vert jaunâtre; gousse commençant à se rider	Samen trocknet und wird gelblichgrün; Hülse wird schrumpfig	La semilla se seca y se vuelve verde amarillenta; la vaina comienza a arrugarse
260	Lower foliage becoming dry at margins	Feuillage inférieur devenant sec sur les bords	Untere Blätter werden am Rand trocken	El follaje inferior se seca en los bordes
265	Seed yellowish green; pods wrinkled, pale green	Graine vert jaunâtre; gousses ridées vert pâle	Samen gelblichgrün; Hülsen schrumpfig, blassgrün	Semillas verdes amarillentas; vainas arrugadas de color verde pálido

Key Clé Schlüssel Clave	General Description	Description générale	Allgemeine Beschreibung	Descripción general
270	Lower foliage becoming dry and papery	Feuillage inférieur devenant sec et semblable à du papier	Untere Blätter werden trocken und papierartig	Follaje inferior seco y apergaminado
275	Seed yellowish-white and rubbery; pods wrinkled and yellowish-green	Graine blanc jaunâtre et caoutchouteuse; gousse ridée et de couleur vert jaunâtre	Samen gelblichweiss und gummiartig; Hülsen schrumpfig und gelblichgrün	Semilla blanca amarillenta y de consistencia gomosa; vainas arrugadas y verdes amarillentas
280	Stem drying out, becoming yellowish green	Dessèchement de la tige devenant vert jaunâtre	Stengel trocknet aus, wird gelblichgrün	Tallo seco, adquiriendo un color verde amarillento
285	Lowest pods yellowish-brown, dry and papery	Gousses inférieures de couleur brun jaunâtre, sèches et semblables à du papier	Unterste Hülsen gelblich-braun, trocken und papierartig	Las vainas inferiores de color marrón amarillento, secas y apergaminadas
290	Stem becoming stiff and brittle and appearing yellowish-white	Tige devenant érigée et fragile, et de couleur blanc jaunâtre	Stengel wird steif und zerbrechlich und erscheint gelblichweiss	El tallo se vuelve rígido y frágil y de color blanco amarillento
300	Lower and middle nodes with dry papery foliage; lower pods dry and papery	Feuillage sec et semblable à du papier sur tous les noeuds inférieurs et médians; gousses inférieures sèches et semblables à du papier	Untere und mittlere Knoten mit trockenen, papierartigen Blättern; untere Hülsen trocken und papierartig	Follaje seco y apergaminado en los nudos medios e inferiores; vainas inferiores secas y apergaminadas
305	All nodes with dry papery foliage; lower and middle pods dry and papery	Feuillage sec et semblable à du papier sur tous les noeuds; gousses inférieures et médianes sèches et semblables à du papier	Alle Knoten mit trockenen, papierartigen Blättern; untere und mittlere Hülsen trocken und papierartig	Follaje seco y apergaminado en todos los nudos; vainas medias secas y apergaminadas
310	All nodes with dry papery foliage and pods; seed drying but not hard	Feuillage et gousses secs et semblables à du papier sur tous les noeuds; graine se desséchant, mais non dure	Alle Knoten mit trockenen, papierartigen Blättern und Hülsen; Samen trocknet, ist aber noch nicht hart	Follaje y vainas secos y apergaminados en todos los nudos; la semillas se secan, pero no están duras
320	Hard dry seed	Graine dure et sèche	Harter trockener Samen	Semillas duras y secas

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	*Pisum sativum* L.
1.2 Common name	Pea

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 Breeding scheme

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

[#] 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 (1)	**Plant: anthocyanin coloration**		
	absent	Avola, Solara	1 [ ]
	present	Pidgin, Rosakrone	9 [ ]
5.2 (3)	**Stem: fasciation**		
	absent	Avola, Solara	1 [ ]
	present	Bikini, Rosakrone	9 [ ]
5.3 (4)	**Stem: length**		
	very short	Zephyr	1 [ ]
	short	Nobel, Mini	3 [ ]
	medium	Calibra, Xantos	5 [ ]
	long	Blauwschokker, Livia	7 [ ]
	very long	Mammoth Melting Sugar	9 [ ]
5.4 (5)	**Stem: number of nodes up to and including first fertile node**		
	very few	Kelvil	1 [ ]
	few	Smart, Zero4	3 [ ]
	medium	Markana, Susan	5 [ ]
	many	Cooper	7 [ ]
	very many	Regina	9 [ ]

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

	Characteristics	Example Varieties	Note
5.5 (6)	**Foliage: color**		
	yellow green	Pilot	1 [ ]
	green	Avola, Paris, Progreta, Waverex	2 [ ]
	blue green	Polar	3 [ ]
5.6 (8)	**Leaf: leaflets**		
	absent	Hawk, Solara	1 [ ]
	present	Avola, Rhea	9 [ ]
5.7 (20)	**Stipule: flecking**		
	absent	Lisa, Tafila	1 [ ]
	present	Avola, Maro	9 [ ]
5.8 (24)	**Time of flowering**		
	very early	Tempo	1 [ ]
	early	Smart, Zero4	3 [ ]
	medium	Carlton, Waverex	5 [ ]
	late	Cooper, Purser	7 [ ]
	very late	Livioletta	9 [ ]
5.9 (25)	**<u>Only varieties with stem fasciation absent</u>: Plant: maximum number of flowers per node**		
	one	Progress No. 9, Tyla	1 [ ]
	two	Banff, Cooper	3 [ ]
	three	Ultimo, Zodiac	5 [ ]
	four or more	Arnesa, Calibra, Survivor	7 [ ]

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

	Characteristics	Example Varieties	Note
5.10 (26)	**<u>Only varieties with plant anthocyanin coloration present</u>: Flower: color of wing**		
	white with pink blush		1 [ ]
	pink	Rosakrone	2 [ ]
	reddish purple	Assas	3 [ ]
5.11 (29)	**Flower: shape of base of standard**		
	strongly raised		1 [ ]
	moderately raised	Progreta	3 [ ]
	level	Markado, Solara	5 [ ]
	moderately arched	Avola, Copper	7 [ ]
	strongly arched	Bohatyr, Kennedy	9 [ ]
5.12 (37)	**Pod: length**		
	very short	Cepia, Vermio	1 [ ]
	short	Progreta, Solara	3 [ ]
	medium	Copper, Jof	5 [ ]
	long	Hurst Green Shaft, Protor	7 [ ]
	very long	Tirabeque	9 [ ]
5.13 (38)	**Pod: width**		
	very narrow	Claire	1 [ ]
	narrow	Picar, Ultimo	3 [ ]
	medium	Progreta, Solara	5 [ ]
	broad	Finale, Kahuna	7 [ ]
	very broad	Kennedy	9 [ ]
5.14 (39)	**Pod: parchment**		
	absent or partial	Sugar Ann	1 [ ]
	entire	Avola, Solara	2 [ ]

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

	Characteristics	Example Varieties	Note
5.15 (40)	**<u>Excluding varieties with pod parchment: entire:</u> Pod: thickened wall**		
	absent	Nofila, Reuzensuiker	1 [ ]
	present	Cygnet, Sugar Ann	9 [ ]
5.16 (41)	**<u>Only varieties with Pod: thickened wall: absent:</u> Pod: shape of distal part**		
	pointed	Jof, Oskar	1 [ ]
	blunt	Avola, Solara	2 [ ]
5.17 (42)	**Pod: curvature**		
	absent or very weak	Finale, Maro	1 [ ]
	weak	Eagle, Span	3 [ ]
	medium	Carlton, Hurst Green Shaft	5 [ ]
	strong	Delikata, Jof	7 [ ]
	very strong	Oskar	9 [ ]
5.18 (43)	**Pod: color**		
	yellow		1 [ ]
	green	Avola, Solara	2 [ ]
	blue green	Show Perfection	3 [ ]
	purple	Blauwschokker	4 [ ]
5.19 (45)	**<u>Excluding varieties with pod parchment: entire:</u> Pod: suture strings**		
	absent	Nofila, Sugar Lace	1 [ ]
	present	Crispi, Reuzensuiker	9 [ ]
5.20 (46)	**Pod: number of ovules**		
	few	De Grace, Phoenix	3 [ ]
	medium	Backgammon, Hawk	5 [ ]
	many	Karisma	7 [ ]

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

	Characteristics	Example Varieties	Note
5.21 (47)	**Immature seed: intensity of green color**		
	light	Solara, Ultimo	3 [ ]
	medium		5 [ ]
	dark	Dark Skin Perfection, Hawaii	7 [ ]
5.22 (49)	**Seed: type of starch grains**		
	simple	Adagio, Maro, Solara,	1 [ ]
	compound	Avola, Polar	2 [ ]
5.23 (52)	**Seed: color of cotyledon**		
	green	Avola, Solara	1 [ ]
	yellow	Caractacus, Hardy	2 [ ]
	orange	Oliver	3 [ ]
5.24 (53)	**Only varieties with plant anthocyanin coloration present:** **Seed: marbling of testa**		
	absent	Rhea, Rif	1 [ ]
	present	Assas, Pidgin	9 [ ]
5.25 (54)	**Only varieties with plant anthocyanin coloration present:** **Seed: violet or pink spots on testa**		
	absent	Pidgin, Rif	1 [ ]
	faint	Assas, Susan	2 [ ]
	intense	Arvika, Rhea	3 [ ]
5.26 (55)	**Seed: hilum color**		
	same color as testa	Avola, Solara	1 [ ]
	darker than testa	Nofila, Rif	2 [ ]

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

	Characteristics	Example Varieties	Note
5.27 (57)	**Seed: weight**		
	very low	Ultimo	1 [ ]
	low	Hawk, Iceberg	3 [ ]
	medium	Mammoth Melting Sugar, Phoenix	5 [ ]
	high	Kennedy, Maro	7 [ ]
	very high	Bamby, Kabuki	9 [ ]

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	*Time of flowering*	*early*	*medium*

Comments:

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

[#]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

Use

fresh market	[ ]
canning	[ ]
freezing	[ ]
dry seed for human consumption	[ ]
dry protein	[ ]
forage	[ ]
other (please specify)	[ ]

……..

Resistance to disease

	Resistant	Susceptible	Not tested
Fusarium oxysporum f. sp. *pisi* (Race 1) (Common Wilt)	[ ]	[ ]	[ ]
Erysiphe pisi Syd. (Powdery mildew)	[ ]	[ ]	[ ]
Ascochyta pisi (leaf and pod spot) Race C	[ ]	[ ]	[ ]

Resistance to other diseases
(please give details below)

……

[#] 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:

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.

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]