



PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

Pisum sativum L.

PEA

UPOV Species Code: PISUM_SAT

Adopted on 11/03/2010

Entered into force on 12/03/2010

I SUBJECT OF THE PROTOCOL

The protocol describes the technical procedures to be followed in order to meet the requirements of Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on general UPOV Document TG/1/3 and UPOV Guideline TG/7/10 dated 1 April 2009 for the conduct of tests for Distinctness, Uniformity and Stability. This protocol applies to varieties of *Pisum sativum* L. sensu lato.

II SUBMISSION OF SEED AND OTHER PLANT MATERIAL

1 The Community Plant Variety Office (CPVO) is responsible for informing the applicant of:

- the closing date for the receipt of plant material;
- the minimum amount and quality of plant material required;
- the Examination Office to which material is to be sent.

A sub-sample of the material submitted for test will be held in the variety collection of the Examination Office as the definitive sample of the candidate variety.

The applicant is responsible for ensuring compliance with any customs and plant health requirements.

2. Final dates for receipt of documentation and material by the Examination Office

The final dates for receipt of requests, technical questionnaires and the final date or submission period for plant material will be decided by the CPVO and each Examination Office chosen.

The Examination Office is responsible for immediately acknowledging the receipt of requests for testing, and technical questionnaires. Immediately after the closing date for the receipt of plant material the Examination Office should inform the CPVO if no plant material has been received. However, if unsatisfactory plant material is submitted the CPVO should be informed as soon as possible.

3. Seed requirements

Information with respect to closing dates and submission requirements of plant material for the technical examination of varieties can be found on the CPVO web site (www.cpvo.europa.eu)-

Quality of seed: Should not be less than the standards laid down for certified seed in Annex II of Council Directive 2002/55/EC (vegetable peas) and Council Directive 66/401/EC (agricultural peas).

Seed Treatment:..... The plant material must not have undergone any treatment unless the CPVO and the Examination Office allow or request such treatment. If it has been treated, full details of the treatment must be given.

Labelling of sample: - Species
- File number of the application allocated by the CPVO
- Breeder's reference
- Examination reference (if known)
- Name of applicant
- The phrase "On request of the CPVO".
- In the case of a split sample, the quantity of seed being submitted¹.

III CONDUCT OF TESTS

1. Variety collection

A variety collection will be maintained for the purpose of establishing distinctness of the candidate varieties in test. A variety collection may contain both living material and descriptive information. A variety will be included in a variety collection only if plant material is available to make a technical examination.

Pursuant to Article 7 of Council Regulation (EC) No. 2100/94, the basis for a collection should be the following:

- varieties listed or protected at the EU level or at least in one of the EEA Member States;
- varieties protected in other UPOV Member States;
- any other variety in common knowledge.

The composition of the variety collection in each Examination Office depends on the environmental conditions in which the Examination Office is located.

Variety collections will be held under conditions which ensure the long term maintenance of each accession. It is the responsibility of Examination Offices to replace reference material which has deteriorated or become depleted. Replacement material can only be introduced if appropriate tests confirm conformity with the existing reference material. If any difficulties arise for the replacement of reference material Examination Offices must inform the CPVO. If authentic plant material of a variety cannot be supplied to an Examination Office the variety will be removed from the variety collection.

2. Material to be examined

Candidate varieties will be directly compared with other candidates for Community plant variety rights tested at the same Examination Office, and with appropriate varieties in the variety collection. When necessary an Examination Office may also include other candidates and varieties. Examination Offices should therefore make efforts to co-ordinate the work with other offices involved in DUS-testing of Peas. There should be at least an exchange of technical questionnaires for each candidate variety, and during the test period, Examination Offices should notify each other and the CPVO of candidate varieties which are likely to present problems in establishing distinctness. In order to solve particular problems Examination Offices may exchange plant material.

3. Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in the table of characteristics. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted. In the latter case, the CPVO should be informed. In addition the existence of some other regulation e.g. plant health, may make the observation of the characteristic impossible.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation (EC) No.874/2009, to insert additional characteristics and their expressions in respect of a variety.

4. Grouping of varieties

The varieties and candidates to be compared will be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety and which in their various states of expression are fairly evenly distributed throughout the collection. In the case of continuous grouping characteristics overlapping states of expression between adjacent groups is required to reduce the risks of incorrect allocation of candidates to groups. The characteristics that could be used for grouping are the following: (CPVO numbering; G for grouping in the table of characteristics)

- a) Plant: anthocyanin coloration (characteristic 1)
- b) Stem: length (characteristic 4)
- c) Stem: number of nodes up to and including first fertile node (characteristic 5)
- d) Leaf: leaflets (characteristic 8)
- e) Stipule: flecking (characteristic 19)
- f) Pod: parchment (characteristic 37)
- g) Excluding varieties with pod parchment: Pod: thickened wall (characteristic 38)
- h) Only varieties with Pod: thickened wall: absent: Pod: shape of distal part (characteristic 40)
- i) Pod: colour (characteristic 41)
- j) Immature seed: intensity of green colour (characteristic 45)
- k) Seed: type of starch grains (characteristic 47)
- l) Seed: colour of cotyledon (characteristic 50)
- m) Only varieties with plant anthocyanin coloration present: Seed: marbling of testa (characteristic 51)
- n) Only varieties with plant anthocyanin coloration present: Seed; violet or pink spots on testa (characteristic 52)
- o) Seed: hilum colour (characteristic 53)
- p) Resistance to *Fusarium oxysporum* f. sp. *pisii* (characteristic 56.1) (for vegetable varieties only)
- q) Resistance to *Erysiphe pisi* Syd. (characteristic 57) (for vegetable varieties only)

5. Trial designs and growing conditions

The minimum duration of tests will normally be two independent growing cycles. Tests will be carried out under conditions ensuring normal growth. The size of the plots will be such that plants or parts of plants may be removed for measuring and counting without prejudice to the observations which must be made up to the end of the growing period.

As a minimum, each test should include a total of 100 plants, divided between two or more replicates. All observations determined by measurement or counting should be made on 20 plants or parts of 20 plants.

6. Special tests

In accordance with Article 83(3) of Council Regulation (EC) No. 2100/94 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

Special tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characters listed in the protocol.

7. Standards for decisions

a) **Distinctness**

A candidate variety will be considered to be distinct if it meets the requirements of Article 7 of Council Regulation (EC) No. 2100/94.

If distinctness is assessed using the t-test least significant difference, or equivalent level in COYD, the difference between two varieties is clear if it occurs with the same sign at the 1% significance level or less ($p \leq 0.01$) in two consecutive or two out of three growing cycles.

If distinctness is assessed by the combined over years distinctness analysis (COYD) the difference between two varieties is clear if the respective characteristics are different at the 1% significance level or less ($p \leq 0.01$) in a test over either two or three years.

If the significance level or statistical methods proposed are not appropriate the method used should be clearly described.

b) **Uniformity**

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.

c) **Stability**

A candidate will be considered to be sufficiently stable when there is no evidence to indicate that it lacks uniformity.

Seed samples of further submissions included in any test must show the same expression of characteristics as the material originally supplied.

IV REPORTING OF RESULTS

After each recording season the results will be summarised and reported to the CPVO in the form of a UPOV model interim report in which any problems will be indicated under the headings distinctness, uniformity and stability. Candidates may meet the DUS standards after two growing periods but in some cases three growing periods may be required. When tests are completed the results will be sent by the Examination Office to the CPVO in the form of a UPOV model final report.

If it is considered that the candidate complies with the DUS standards, the final report will be accompanied by a variety description in the format recommended by UPOV. If not the reasons for failure and a summary of the test results will be included with the final report.

The CPVO must receive interim reports and final reports by the date agreed between the CPVO and the Examination Office.

Interim reports and final examination reports shall be signed by the responsible member of the staff of the Examination Office and shall expressly acknowledge the exclusive rights of disposal of CPVO.

V LIAISON WITH THE APPLICANT

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior permanent agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

VI ENTRY INTO FORCE

The present protocol enters into force on **12/03/2010**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the new TP. Technical examinations of candidate varieties are carried out according to the TP in force when the DUS test starts. The starting date of a DUS examination is considered to be the due date for the submission of plant material for the first growing period.

In cases where the CPVO requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process of being carried out at the moment of the request, such report can only be accepted if the technical examination has been carried out according to the CPVO TP which was in force at the moment when the technical examination started.

ANNEXES TO FOLLOW

ANNEX I

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Legend:

Note: For the CPVO numbered characteristics, all characteristics in the table are compulsory except disease resistances. For **vegetable peas only**: in the case of disease resistance characteristics, only those resistances marked with an asterisk (*) in the CPVO column are compulsory. The asterisks in the UPOV numbered characteristics are there for information purposes and denote those characteristics which should always be observed when a UPOV guideline is utilised.

In general for the assessment of resistance characteristics, the facilities of other Examination Offices or specialised institutions might be used, subject to previous arrangements.

Some characteristics may be discarded: if there are already phytosanitary restrictions.

- (+) See explanations on the Table of characteristics
- (a) – (d) See explanations on the table of characteristics
- G Grouping characteristic

Types of expression of characteristics:

- QL Qualitative characteristic
- QN Quantitative characteristic
- PQ Pseudo-qualitative characteristic

Type of observation 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

When a method of observation is attributed to a certain characteristic, the first differentiation is made depending if the action taken is a visual observation (V) or a measurement (M).

The second differentiation deals with the number of observations the expert attributes to each variety, thus the attribution of either G or S.

If a single observation of a group consisting of an undefined number of individual plants is appropriate to assess the expression of a variety, we talk about a visual observation or a measurement made on a group of plants, thus we attribute the letter G (either VG or MG). If the expert makes more than one observation on that group of plants, the decisive part is that we have at the end only one data entry per variety which means that we have to deal with G (e.g. measurement of plant length on a plot – MG, visual observation of green colour of leaves on a plot – VG).

If it is necessary to observe a number of individual plants to assess the expression of a variety, we should attribute the letter S (thus either VS or MS). Single plant data entries are kept per variety for further calculations like the variety mean (e.g. measurement of length of ears – MS, visual observation of growth habit of single plants in grasses – VS). The number of individual plants to be observed in such cases is stated in section III.5.

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ANNEX II

Technical Questionnaire

ANNEX I

TABLE OF CHARACTERISTICS TO BE USED IN DUS TEST AND PREPARATION OF DESCRIPTIONS

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note
1.	1. (*)	30-240	Plant: anthocyanin coloration		
(+)	(+)	VG	absent	Avola, Solara	1
QL G	QL		present	Pidgin, Rosakrone	9
2.	2.	30-240	Stem: anthocyanin coloration of axil		
QL	QL	VG	absent	Avola, Maro	1
			single ring	Assas, Tirabeque	2
			double ring	Caroubel	3
3.	3. (*)	30-199	Stem: fasciation		
(+)	(+)	VG	absent	Avola, Solara	1
QL	QL		present	Bikini, Rosakrone	9
4.	4.	240-250	Stem: length		
	(*)	MS	very short	Zephir	1
(+)	(+)		short	Nobel, Mini	3
QN	QN		medium	Calibra, Xantos	5
			long	Blauwschokker, Livia	7
G			very long	Mammoth Melting Sugar	9
5.	5.	210-240	Stem: number of nodes up to and including first fertile node		
	(*)	MS	very few	Kelvil	1
(+)	(+)		few	Smart, Zero4	3
QN	QN		medium	Markana, Susan	5
			many	Cooper	7
G			very many	Regina	9

¹ The optimum stage of observation is indicated by numbers. Explanations are given in Annex 1 in 'Explanations and Methods'.

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note			
6.	6. (*)	40-240 VG	Foliage: colour yellow green	Pilot	1			
				PQ	Avola, Paris, Progreta, Waverex	2		
					blue green	Polar	3	
7.	7.	40-240	<u>Only varieties with foliage colour: green (Char.6. state 2)</u> Foliage: intensity of colour					
				QN	Paris, Twinkle	3		
					medium	Lisa, Rondo	5	
			dark	Waverex	7			
8.	8. (*)	20-240	Leaf: leaflets					
				QL	absent	Hawk, Solara	1	
				G	present	Avola, Rhea	9	
9.	9. (+)	200-240	Leaf: maximum number of leaflets					
				(+)	MS/MG	few	Jof	3
				QN	QN	medium	Dark Skin Perfection, Finale	5
			many	Ultimo	7			
10.	10.	216-226	Leaflet: size					
				QN	MS/VG	very small	Payette	1
					(a)	small	Mini	3
						medium	Finale	5
						large	Alderman	7
			very large	Mammoth Melting Sugar	9			
11.	11.	216-226	Leaflet: length					
				QN	MS/VG	short	Eagle, Polar	3
					(a)	medium	Bohatyr, Dakota	5
			long	Delikata, Mammoth Melting Sugar	7			

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note
12.	12.	216-226	Leaflet: width		
QN	QN	MS/VG	narrow	Alouette, Grapis	3
		(a)	medium	Dakota, Irina	5
			broad	Adept, Tirabeque	7
13.	13.	216-226	Leaflet: position of broadest part		
(+)	(+)	MS/VG	at middle or slightly towards base	Nobel, Salome	1
QN	QN	(a)	moderately towards base	Columbia, Maro	2
			strongly towards base	Griffin, Progreta	3
14.	14.	30-240	Leaflet: dentation		
(+)	(+)	VG	absent or very weak	Progreta	1
QN	QN	(a)	weak	Snowflake	3
			medium	Cabree	5
			strong	Amos	7
			very strong	Sugar Star	9
15.	15.	216-226	Stipule: length		
	(*)	MS/VG	short	Eagle, Steffi	3
(+)	(+)	(b)	medium	Timo, Twinkle	5
QN	QN		long	Alderman, Rhea	7
16.	16.	216-226	Stipule: width		
	(*)	MS/VG	narrow	Eagle, Steffi	3
(+)	(+)	(b)	medium	Timo, Twinkle	5
QN	QN		broad	Mammoth Melting Sugar	7
17.	17.	216-226	Stipule: size		
QN	QN	MS/VG	small	Dakota, Zero4	3
		(b)	medium	Jackpot, Misty	5
			large	Beetle, Mammoth Melting Sugar	7

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note
18.	18	216-226	Stipule: length from axil to tip		
(+)	(+)	MS/VG	short	Fortress, Zero4	3
QN	QN	(b)	medium	Cabree, Orka	5
			long	Beetle, Mammoth Melting Sugar	7
19.	20.	200-240	Stipule: flecking		
(+)	(*) (+)				
QL	QL	VG	absent	Lisa, Tafila	1
G			present	Avola, Maro	9
20.	21.	200-240	Stipule: density of flecking		
(+)	(+)	VG	very sparse	Progeta	1
QN	QN		sparse	Backgammon, Waxwing	3
			medium	Accent, Ambassador	5
			dense	Avola, Zelda	7
			very dense	Oregon Sugar Pod	9
21.	22.	216-226	Petiole: length from axil to first leaflet or tendril		
(+)	(+)	MS/VG	short	Hellas, Keo	3
QN	QN		medium	Avola, Solara	5
			long	Saskia, Tafila	7
22.	23.	216-226	<u>Only varieties with leaflets absent:</u> Petiole: length from axil to last tendril		
(+)	(+)	MS/VG	short	Choucas, Frediro	3
QN	QN		medium	Alambo, Alezan	5
			long	Arosa, Calao	7

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note
23.	24.	214	Time of flowering		
	(*)	MG	very early	Tempo	1
(+)	(+)		early	Smart, Zero4	3
QN	QN		medium	Carlton, Waverex	5
			late	Cooper, Purser	7
			very late	Livioletta	9
24.	25.	216-226	<u>Only varieties with stem fasciation absent:</u> Plant: maximum number of flowers per node		
	(*)	MS/VG	one	Progress N°9, Tyla	1
(+)	(+)		two	Banff, Cooper	3
QN	QN		three	Ultimo, Zodiac	5
			four and more	Amesa, Calibra, Survivor	7
25.	26.	216-218	<u>Only varieties with plant anthocyanin coloration present:</u> Flower: colour of wing		
	(*)	VG	white with pink blush		1
PQ	PQ	(b)	pink	Rosakrone	2
			reddish purple	Assas	3
26.	27.	216-218	<u>Only varieties with plant anthocyanin coloration absent:</u> Flower: colour of standard		
(+)	(+)	VG	white	Gloton, Record	1
PQ	PQ	(b)	whitish cream	Cooper, Maro	2
			cream	Orcado	3
27.	28.	216-218	Flower: width of standard		
(+)	(+)	MS/VG	narrow	Eagle, Progreta	3
QN	QN	(b)	medium	Bikini, Cooper	5
			broad	Pilot, Tafila	7

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note			
28.	29.	216-218	Flower: shape of base of standard					
			(*)	VG	strongly raised	1		
			(+)	(b)	moderately raised	Progreta	3	
			QN	QN	level	Markado, Solara	5	
			moderately arched	Avola, Cooper	7			
			strongly arched	Bohatyr, Kennedy	9			
29.	31.	216-218	Flower: width of upper sepal					
			QN	QN	VG	narrow	Abador	3
					(b)	medium	Conservor	5
			broad	Kodiak	7			
30.	32.	212-240	Flower: shape of apex of upper sepal					
			(+)	(+)	VG	acuminate	Dawn	1
			PQ	PQ	(b)	acute	Kelvedon Wonder	2
			rounded	Kodiak	3			
31.	33.	218-245	Peduncle: length of spur					
			(+)	(+)	MS/VS	short	Cabro, Kirio	3
			QN	QN	(b)	medium	Metaxa, Rialto	5
			long	Alezan, Calao	7			
32.	34.	235-245	Peduncle: length from stem to first pod					
			(+)	(+)	MS/VG	short	Goblin, Orcado	3
			QN	QN	(c)	medium	Bohatyr, Maro	5
			long	Kabuki, Reveille	7			
33.	35.	235-245	Peduncle: length between first and second pods					
			(+)	(+)	MS/VS	short	Alize, Atila	3
			QN	QN	(c)	medium	Kirio	5
			long	Aladin	7			

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note
34.	36.	235-245	Peduncle: number of bracts		
(+)	(+)	MS	absent or few	Fauvette, Kirio	1
QN	QN	(b)	medium	Delta, Duez	2
			many	Eiffel, Goelan	3
35.	37.	240	Pod: length		
	(*)	MS/VG	very short	Cepia, Vermio	1
QN	QN	(c)	short	Progreta, Solara	3
			medium	Cooper, Jof	5
			long	Hurst Green Shaft, Protor	7
			very long	Tirabeque	9
36.	38.	240	Pod: width		
	(*)	MS/VG	very narrow	Claire	1
(+)	(+)	(c)	narrow	Picar, Ultimo	3
QN	QN		medium	Progreta, Solara	5
			broad	Finale, Kahuna	7
			very broad	Kennedy	9
37.	39.	310	Pod: parchment		
(+)	(*) (+)				
QL	QL	VG	absent or partial	Sugar Ann	1
G		(c)	entire	Avola, Solara	2
38.	40.	240	<u>Excluding varieties with pod parchment: entire:</u> Pod: thickened wall		
(+)	(*) (+)				
QL	QL	VG	absent	Nofila, Reuzensuiker	1
G		(c)	present	Cygnnet, Sugar Ann	9
39.	41.	240	<u>Only varieties with pod: thickened wall: absent:</u> Pod: shape of distal part		
(+)	(*) (+)				
QL	QL	VG	pointed	Jof, Oskar	1
G		(c)	blunt	Avola, Solara	2

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note			
40.	42.	240	Pod: curvature					
	(*)	VG	absent or very weak	Finale, Maro	1			
	(+)	(c)	weak	Eagle, Span	3			
	QN	QN	medium	Carlton, Hurst Green Shaft	5			
			strong	Delikata, Jof	7			
			very strong	Oskar	9			
41.	43.	230-240	Pod: colour					
	(*)	VG	yellow		1			
	(+)	(c)	green	Avola, Solara	2			
	PQ	PQ	blue green	Show Perfection	3			
			purple	Blauwschokker	4			
42.	44.	230-240	<u>Only varieties with pod colour green (Char. 43, state 2): intensity of green colour</u>					
			QN	QN	VG	light	Solara, Ultimo	3
					(c)	medium		5
			dark	Dark Skin Perfection, Hawaii	7			
43.	45. (*)	240-245	<u>Excluding varieties with pod parchment: entire: Pod: suture strings</u>					
			(+)	(+)	VG	absent	Nofila, Sugar Lace	1
			QL	QL	(c)	present	Crispi, Reuzensuiker	9
44.	46.	226	Pod: number of ovules					
			(*)	MS	few	De Grace, Phoenix	3	
			(+)	(c)	medium	Backgammon, Hawk	5	
			many	Karisma	7			
45.	47. (*)	230-240	Immature seed: intensity of green colour					
			(+)	(+)	VG	light	Arabelle, Solara, Ultimo	3
			QN	QN		medium		5
			dark	Dark Skin Perfection, Hawaii	7			

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note
46.	48.	320	Seed: shape		
(+)	(+)	VG	ellipsoid	Solara	1
PQ	PQ		cylindrical	Span, Timo	2
			rhomboid	Maro, Progreta	3
			irregular		4
47.	49. (* (+)	320	Seed: type of starch grains		
QL	QL	VG	simple	Adagio, Maro, Solara	1
G			compound	Avola, Polar	2
48.	50. (*	320	<u>Only varieties with seed shape: cylindrical; and type of starch grains: simple;</u> Seed: wrinkling of cotyledon		
(+)	(+)	VG	absent	Atila, Paris	1
QL	QL		present	Allsweet, Zorba	9
49.	51. (*	320	<u>Only varieties with seed: type of starch grains: compound;</u> Seed: intensity of wrinkling of cotyledon		
	(*)	VG	weak	Darfon, Zefier	3
QN	QN		medium	Ziggy	5
			strong	Oskar, Quad	7
			very strong		9
50.	52. (*	320	Seed: colour of cotyledon		
(+)	(+)	VG	green	Avola, Solara	1
PQ	PQ		yellow	Caractacus, Hardy	2
G			orange		3
51.	53. (*	320	<u>Only varieties with plant anthocyanin coloration present;</u> Seed: marbling of testa		
QL	QL	VG	absent	Rhea, Rif	1
G		(d)	present	Assas, Pidgin	9

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note
52.	54. (* (*)	320	Only varieties with plant anthocyanin coloration present: Seed: violet or pink spots on testa		
QL	QL	VG	absent	Pidgin, Rif	1
		(d)	faint	Assas, Susan	2
G			intense	Arvika, Rhea	3
53. (+)	55. (* (+)	320	Seed: hilum colour		
QL	QL	VG	same colour as testa	Avola, Solara	1
G		(d)	darker than testa	Nofila, Rif	2
54.	56.	320	Only varieties with plant anthocyanin coloration present: Seed: colour of testa		
PQ	PQ	VG	reddish brown	Rhea, Rosakrone	1
		(d)	brown	Pidgin	2
			brownish green	Lisa, Susan	3
55. (+)	57. (* (+)	320	Seed: weight		
		MG	very low	Ultimo	1
			low	Hawk, Iceberg	3
QN	QN		medium	Mammoth Melting Sugar, Phoenix	5
			high	Kennedy, Maro	7
			very high	Bamby, Kabuki	9
56. (+)	58. (+)	VG	Resistance to <i>Fusarium oxysporum</i> f. sp. <u>pisii</u>		
*56.1	58.1		Race 1		
QL	QL		absent	Eden, Mammoth Melting Sugar	1
G			present	Solara, Twinkle	9
56.2	58.2		Race 5		
QL	QL		absent	Legacy, Little Marvel	1
			present	Serge, Sundance	9

CPVO N°	UPOV N°	Stage ¹	Characteristics	Examples	Note
56.3	58.3		Race 6		
QL	QL		absent	Little Marvel, Serge	1
			present	Sundance	9
57. (+)	59. (+)	VG	Resistance to <i>Erysiphe pisi</i> Syd.		
QL	QL		absent	Cabro	1
G			present	Iceberg	9
58. (+)	60. (+)	VG	Resistance to <i>Ascochyta pisi</i>, Race C		
QL	QL		absent	Kelvedon Wonder	1
			present	Rondo	9

EXPLANATIONS AND METHODS

1 *Explanations covering several characteristics*

Characteristics containing the following key in the third 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.

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 starting point of the measurement is the first node with 'scale' leaves.

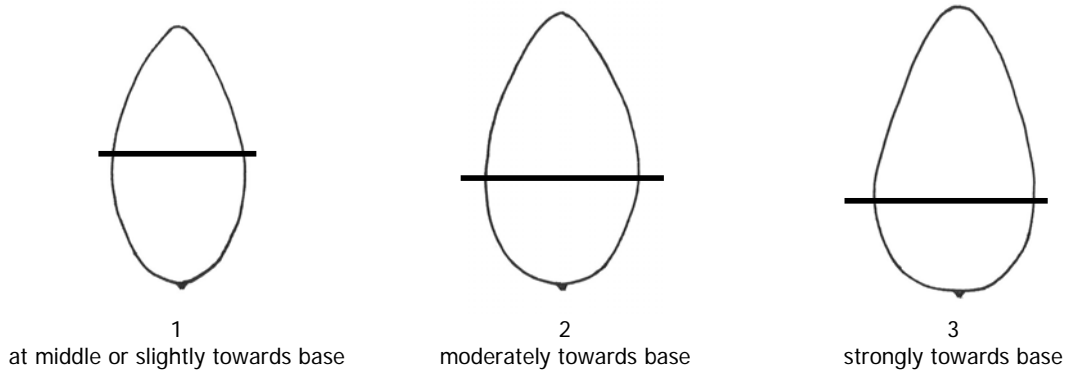
Ad. 5: Stem: number of nodes up to and including first fertile node

Only the main stem should be recorded. The starting point of the measurement is the first node with 'scale' leaves.

Ad. 9: Leaf: maximum number of leaflets

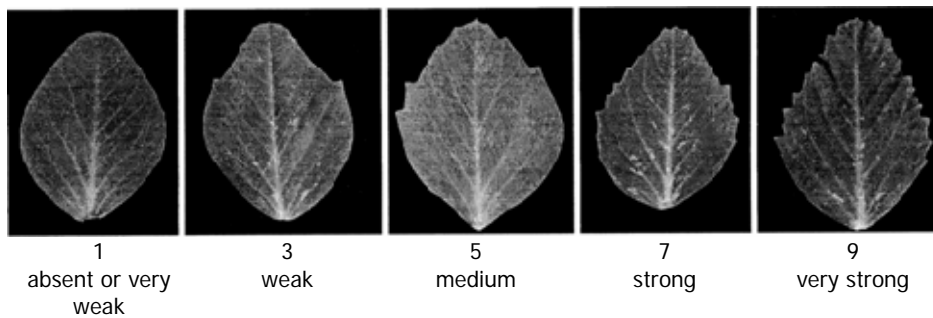
Assessment should be made over the whole plant.

Ad. 13: Leaflet: position of broadest part



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.

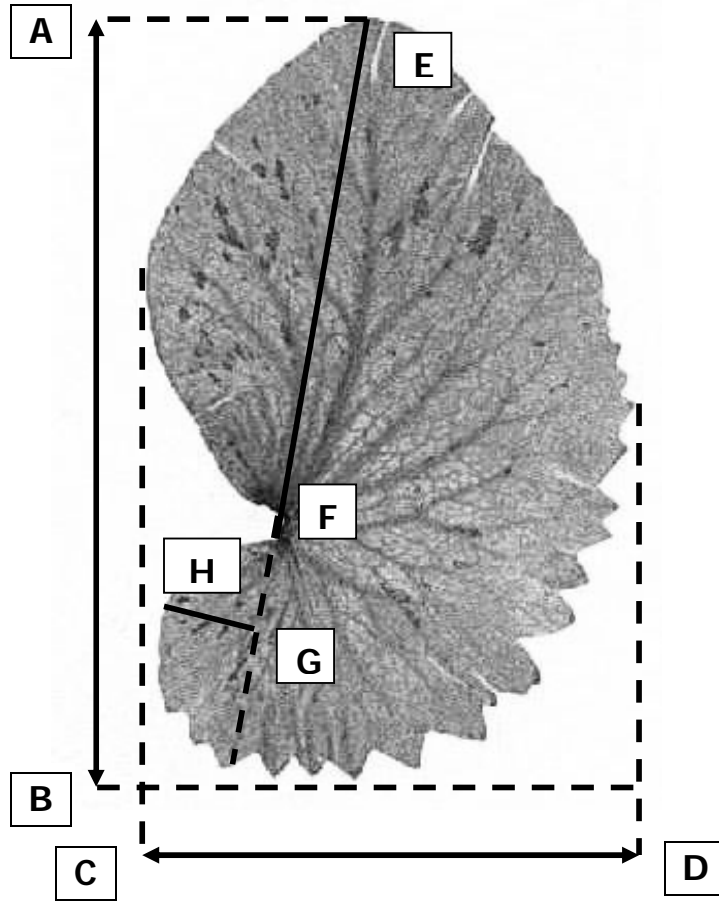


Ad. 15: Stipule: length

Ad. 16: Stipule: width

Ad. 18: Stipule: length from axil to tip

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



Stipule: length (15)

Stipule: width (16)

Stipule: length from axil to tip (18)

A - B

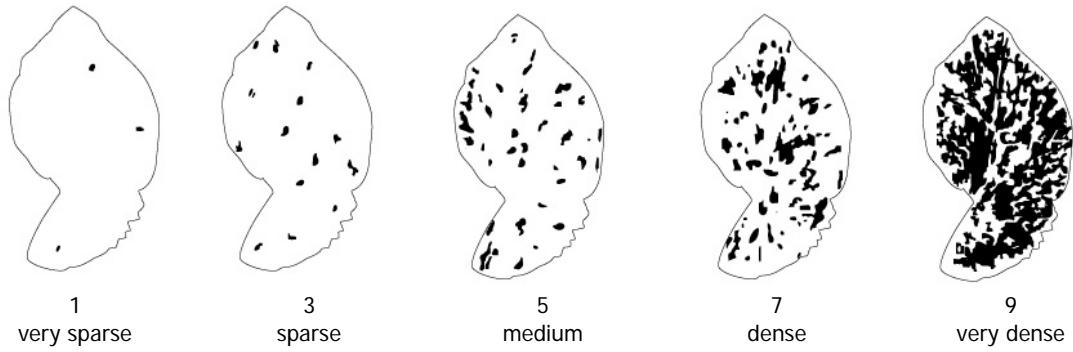
C - D

E - F

Ad. 19: Stipule: flecking

Ad. 20: 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.

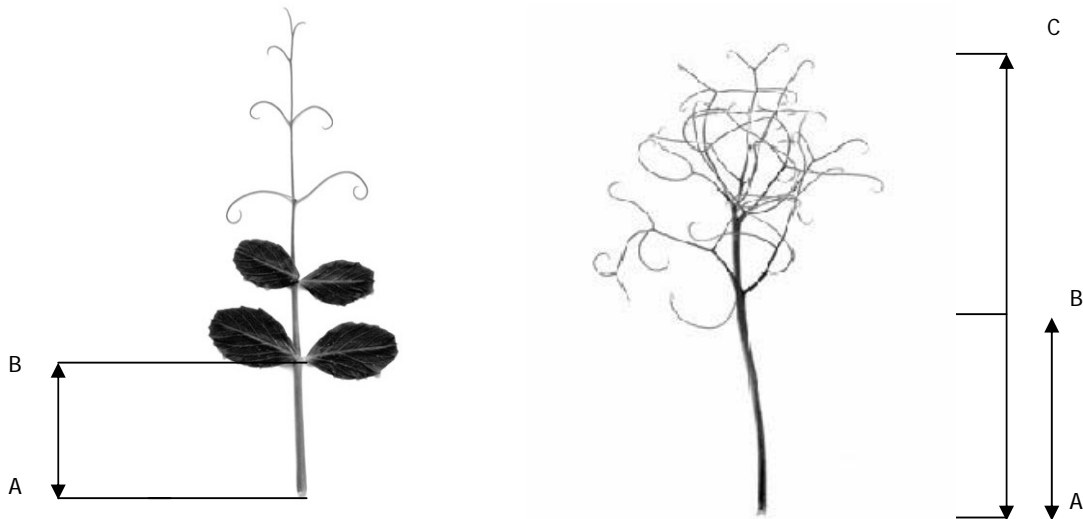


Ad. 22: Petiole: length from axil to first leaflet or tendril

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)
Total length of petiole including tendrils (23)

A - B
A - C



Ad. 23: Time of flowering

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

Ad. 24: 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. 26: Only varieties with plant anthocyanin coloration absent: Flower: colour of standard

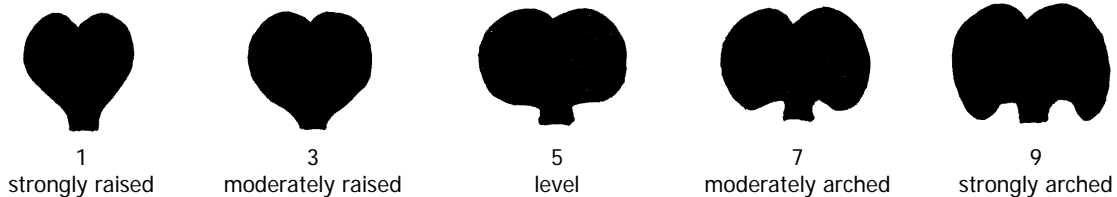
The colour of standard should be recorded on flowers which are fully opened and fresh.

Ad. 27: Flower: width of standard

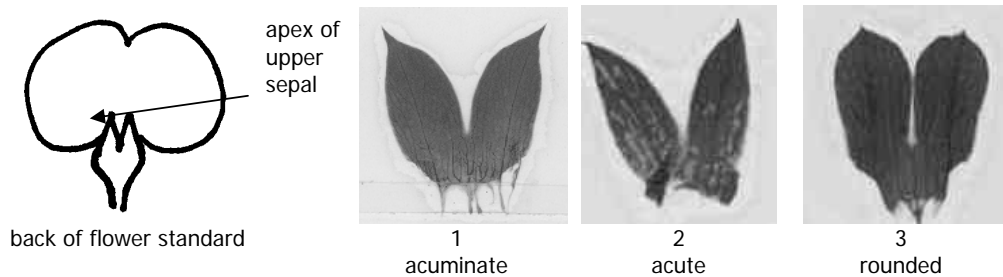
The standard should be detached from the flower and flattened on a hard, flat surface.

Ad. 28: Flower: shape of base of standard

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



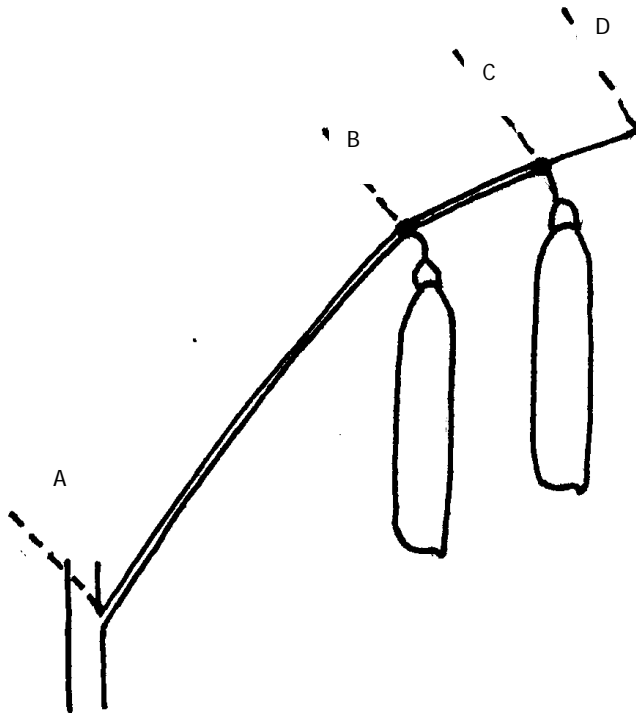
Ad. 30: Flower: shape of apex of upper sepal



Ad. 31: Peduncle: length of spur

Ad. 32: Peduncle: length from stem to first pod

Ad. 33: Peduncle: length between first and second pods



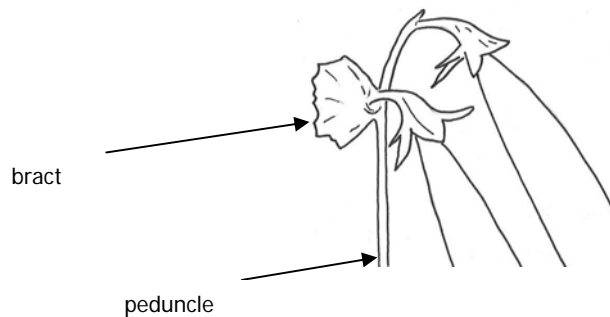
A – B = Peduncle: length from stem to first pod (34)

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

C – D = Peduncle: length of spur (33)

Ad. 34: Peduncle: number of bracts

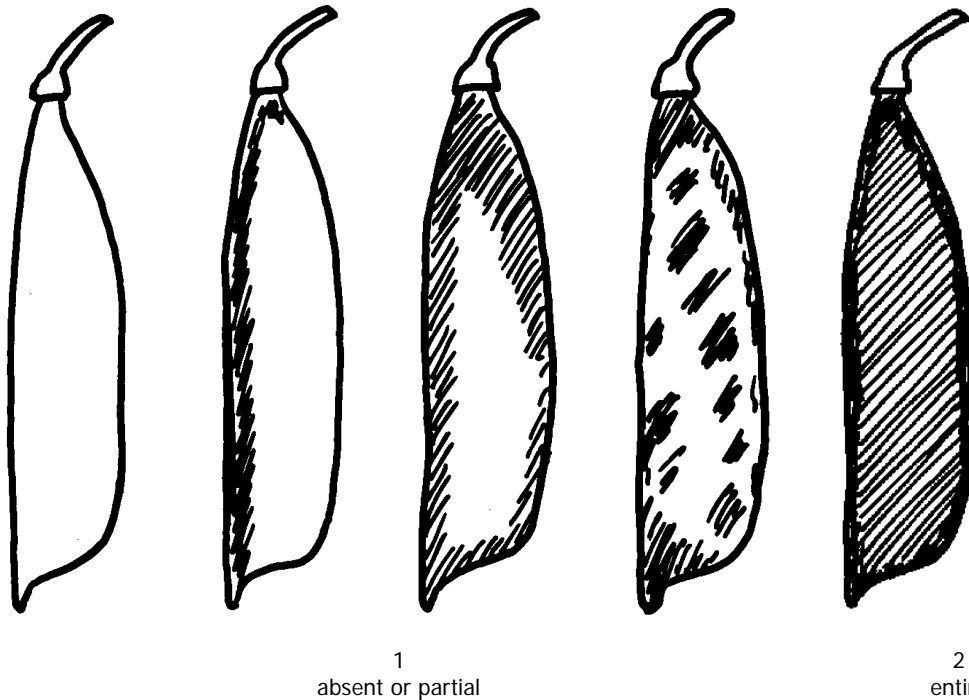
Bracts are modified leaves which occur on the peduncle. The number of bracts is calculated on the basis of averages across plants.



Ad. 36: Pod: width

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

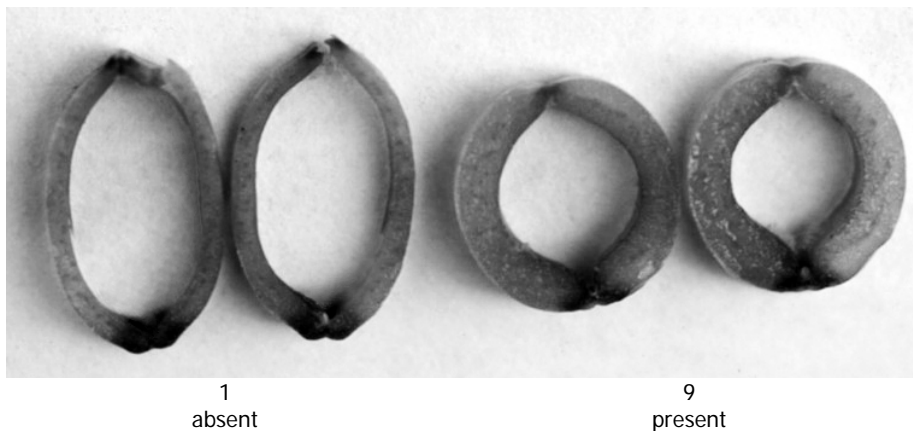
Ad. 37: Pod: parchment
(viewed on the inside of the pod wall)



- (1) 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.

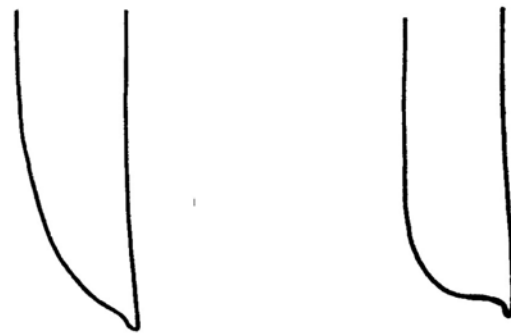
Ad. 38: Excluding varieties with pod parchment: entire: Pod: thickened wall

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.



Ad. 39: Only varieties with Pod: thickened wall: absent: Pod: shape of distal part

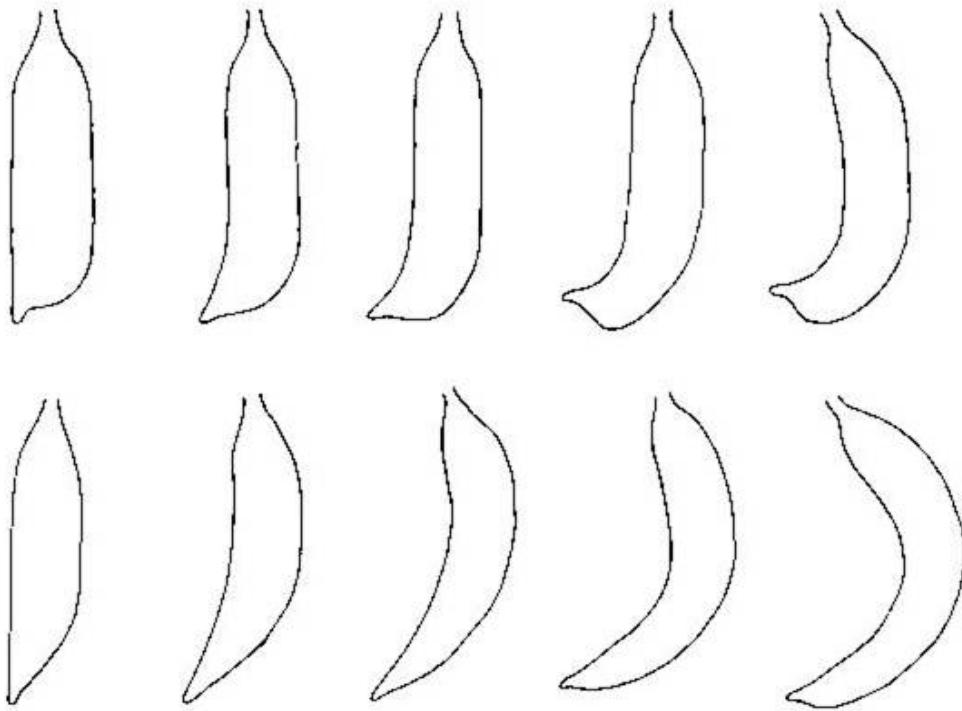
Observations should be made on several nodes of each plant when pods are fully developed, but before any senescence.



1
pointed

2
blunt

Ad. 40: Pod: curvature



1
absent or very
weak

3
weak

5
medium

7
strong

9
very strong

Ad. 41: Pod: colour

Green pods may be pale or dark, the colour is correlated with pale or dark immature seed colour. Blue green pods are dark and slightly bluish. The colour 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. 43: 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. 44: 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.

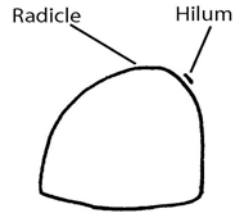
Ad. 45: Immature seed: intensity of green colour

Immature seed colour 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.

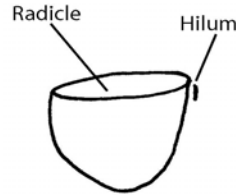
Ad. 46: Seed: shape

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.



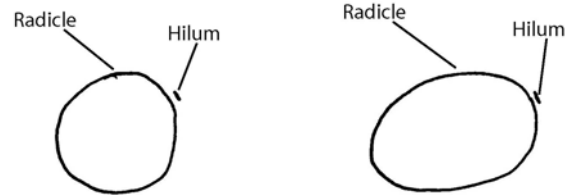
If the seed is rounded on the radicle surface only, it is an end seed growing nearest the peduncle end of the pod.



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

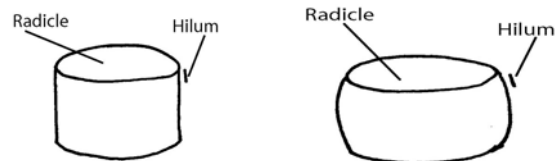
1. Ellipsoid

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



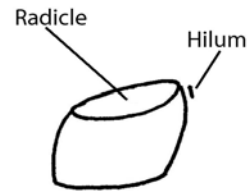
2. Cylindrical

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

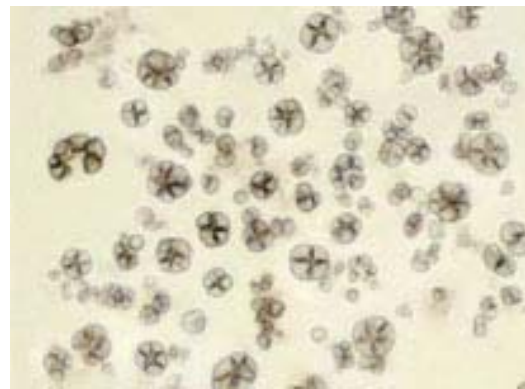
Seeds irregularly compressed; not one of the above shapes.

Ad. 47: Seed: type of starch grains

- (1) 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 centre of the grains may appear cross-shaped. In varieties with high sweetness, compound starch grains are very small and few in number.



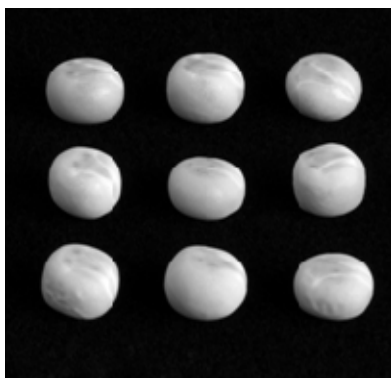
1
simple



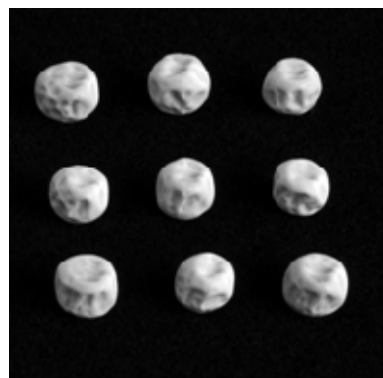
2
compound

Ad. 48: 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. 50: Seed: colour 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 colour from seeds making it difficult to determine cotyledon colour; cutting the seed in half enables the assessment of the internal colour which may be less affected.
- colour becomes dull with age, even if seed is stored in cold, dark conditions.
- colour 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. 53: Seed: hilum colour

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 colour 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 colour. It can be difficult to assess hilum colour if the testa tannins darken with age; assessment should therefore be made within nine months of seed harvest.

Ad. 55: Seed: weight

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

Ad. 56.1, 56.2, 56.3: Resistance to *Fusarium oxysporum* f. sp. *pisii*

Resistant and Susceptible varieties

Race 1: Eden, Mammoth Melting Sugar (susceptible = resistance absent (1))
Solara, Twinkle (resistant = resistance present (9))

Race 5: Little Marvel, Legacy (susceptible = resistance absent (1))
Serge, Sundance (resistant = resistance present (9))

Race 6: Little Marvel, Serge (susceptible = resistance absent (1))
Sundance (resistant = resistance present (9))

Isolates and isolate identity

Isolate identity is determined by testing against the host differential set described by Haglund and Kraft (1979). All isolates are derived from single spore cultures.

Isolates used in the test: Race 1: IPO culture collection no. 20379
Race 5: IPO culture collection no. 10279
Race 6: WSU culture type 6

Maintenance of isolates

Maintain in a refrigerator at 4°C as a soil culture (loam) and pass through a susceptible variety every 2-3 years. Isolate identity is determined by testing against a host differential set.

Source for isolates

Races 1 and 5
Research Institute for Plant Protection (IPO)
PO Box 9060
NL-6700 GW Wageningen
The Netherlands

Race 6
Washington State University (WSU),
Research and Extension Unit,
Mount Vernon, Washington 98273,
United States of America

Preparation of inoculum and assessment of disease

Cultures of the fungus are grown in liquid Czapek-Dox medium at 2°C in daylight conditions for 7 days. The liquid is continuously aerated by sterile air. The cultures are strained through muslin followed by centrifugation at 3,500 rpm for 10 minutes; the solution is diluted with distilled water to a concentration of 10⁶ spores/ml.

Inoculation and assessment of disease Test plants and controls are raised in 8 litres of 1:1 peat and sand mixture and adjusted to pH 5.0. 1 litre of spore suspension is used. Two replicates of 10 plants are grown for assessment; a third replicate is grown if any problems arise.

After 3 weeks, or 4 - 5 node stage, the basal third of the seedling roots can be cut and dipped into the inoculum for 3-5 seconds before being transplanted. Four weeks after inoculation, surviving seedlings are recorded as resistant.

Composition of the Czapek-Dox liquid medium

2.0 g	Sodium Nitrate
0.5 g	Potassium Chloride
1.0 g	Dipotassium Phosphate
0.5 g	Magnesium Sulphate
0.01 g	Ferrous Sulphate
30.0 g	Saccharose

The above mixture is added to 1 litre of distilled water and poured into a flask; the solution is sterilized in an autoclave at 115°C for 20 minutes.

Genetic background

A single dominant gene Fw confers resistance to Race 1.

Ad. 57: Resistance to *Erysiphe pisi* Syd. (Powdery Mildew)

Resistant and Susceptible varieties

Cabro (susceptible = resistance absent (1))

Iceberg (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. 58: Resistance to *Ascochyta pisi*, Race C (Ascochyta Leaf and Pod Spot)

Resistant and Susceptible varieties

Kelvedon Wonder (susceptible = resistance absent (1))

Rondo (resistant = resistance present (9))

Isolates and isolate identity

Isolate used in the test: Tezier Strain

Isolate identity is determined by testing against a host differential set.

Maintenance of isolates

Maintain on Mathur medium at ambient temperature. Isolate identity is determined by testing against a host differential set.

Source for isolates: GEVES SNES
Station Nationale d'Essais de Semences
Rue George Morel, B.P.24
49071 Beaucoz  Cedex France

Preparation of inoculum

Add 0.4% Tween 80 wetting agent to aid dispersal of spores. Remove hyphal fragments by straining solution through muslin. Concentration of 10^6 spores/ml

Inoculation and assessment of disease

Grow seedlings in glasshouse under natural daylength at 20°C and high humidity. Spray inoculum on young seedlings 10-15 days after emergence; mist spray 2 or 3 times per day for 15 minutes. Alternatively, inoculation can be made at the apex of enclosed leaves. This method does not require conditions of high humidity.

Plants are assessed about 5 days after inoculation. Infection is very clear when present: necrotic lesions are slightly sunken, brown and sharply delineated. Lesions are circular on pods and elongated on stems. Two replicates of 10 plants are grown; a third replicate is grown if any problems arise.

Genetic background

The expression of resistance to Race C (also known as BP2) is controlled by a single dominant gene Rap2. At least five pathotypes and four resistance alleles are known.

KEY FOR THE GROWTH STAGES

Key	General Description
0	<u>Germination</u>
00	Dry seed
10	<u>Seedling growth</u>
16	Young seedling with first scale leaf developed
18	Young seedling with second scale leaf developed
20	First pair of stipules at the third node fully opened
22	Stipules at the fourth node fully opened
25	Stipules at the fifth node fully opened
28	Stipules at the sixth node fully opened
30	<u>Vegetative growth</u>
31	Stipules at the seventh node fully opened
34	Stipules at the eighth node fully opened
40	Stipules at the tenth node fully opened
n	Stipules at the Nth node fully opened
200	<u>Reproductive stage</u>
200	Initiation of first flower
206	Development of first flower bud enclosed in stipules
208	Development and sometimes elongation of peduncle
210	Emergence of first flower bud from stipules
212	Emergence of standards from the calyx
214	Opening of the standards and emergence of the wings
216	Slight opening of the wings to show the keel
218	Standards usually fully opened
220	Standards beginning to crumple at the margins
222	Standards and wings showing signs of withering
224	Emergence of the first flat pod
226	Elongation of the flat pod with clearly visible ovules
230	Swelling of the ovules and slight swelling of the pod wall
235	Green seed rounded becoming slightly firm; pods almost fully swollen or developed
240	Green seed firm, becoming starchy; pods fully developed or swollen
245	Green seed becoming pale, testas tough; pod beginning to lose colour
250	Stem and lower foliage becoming yellowish
255	Seed drying and becoming yellowish green; pod becoming wrinkled
260	Lower foliage becoming dry at margins
265	Seed yellowish green; pods wrinkled, pale green
270	Lower foliage becoming dry and papery
275	Seed yellowish-white and rubbery; pods wrinkled and yellowish-green

Key	General Description
280	Stem drying out, becoming yellowish-green
285	Lowest pods yellowish-brown, dry and papery
290	Stem becoming stiff and brittle and appearing yellowish-white
300	Lower and middle nodes with dry papery foliage; lower pods dry and papery
305	All nodes with dry papery foliage; lower and middle pods dry and papery
310	All nodes with dry papery foliage and pods; seed drying but not hard
320	Hard dry seed

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ANNEX II



TECHNICAL QUESTIONNAIRE

to be completed in connection with an application for Community Plant Variety Rights
Please answer all questions. A question without any answer will lead to a non-attribution
of an application date. In cases where a field / question is not applicable, please state so.

1. **Botanical taxon:** Name of the genus, species or sub-species to which the variety belongs and common name

Pisum sativum L.

PEA

2. **Applicant(s):** Name(s) and address(es), phone and fax number(s), Email address, and where appropriate name and address of the procedural representative

3. **Variety denomination**

a) Where appropriate proposal for a variety denomination:

b) Provisional designation (breeder's reference):

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

4.1 Breeding, maintenance and reproduction of the variety

- (a)
- (i) hybrid []
 - (ii) open-pollinated variety []
 - (iii) parent line []
- (b)
- (i) seed propagated []
 - (ii) vegetatively propagated []
- (c) Other information on genetic origin and breeding method []

4.2 Method of propagation

- (a) Seed propagated varieties
- (i) Cross-pollination []
 - (ii) Hybrid
 - seed-propagated parents []
 - one vegetatively propagated and one seed-propagated parent []
 - two vegetatively propagated parents []
 - (iii) Other (please provide details) []
- (b) Vegetative propagated varieties
- (i) cuttings []
 - (ii) *in vitro* propagation []
 - (iii) other (state method) []

4.3 Geographical origin of the variety: the region and the country in which the variety was bred or discovered and developed

4.4 Shall the information on data relating to components of hybrid varieties including data related to their cultivation be treated as confidential?

[] YES [] NO

If yes, please give this information on the attached form for confidential information.

If no, please give information on data relating to components of hybrid varieties including data related to their cultivation:

Breeding scheme (indicate female component first)

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

	Characteristics	Example varieties	Note
5.1 (1)	Plant: anthocyanin coloration		
	absent	Avola, Solara	1 []
	present	Pidgin, Rosakrone	9 []
5.2 (4)	Stem: length		
	very short	Zephir	1 []
	short	Nobel, Mini	3 []
	medium	Calibra, Xantos	5 []
	long	Blauwschokker, Livia	7 []
	very long	Mammoth Melting Sugar	9 []
5.3 (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 []

	Characteristics	Example varieties	Note
5.4 (6)	Foliage: colour		
	yellow green	Pilot	1 []
	green	Avola, Paris, Progreta, Waverex	2 []
	blue green	Polar	3 []
5.5 (8)	Leaf: leaflets		
	absent	Hawk, Solara	1 []
	present	Avola, Rhea	9 []
5.6 (19)	Stipule: flecking		
	absent	Lisa, Tafila	1 []
	present	Avola, Maro	9 []
5.7 (23)	Time of flowering		
	very early	Tempo	1 []
	early	Smart, Zero4	3 []
	medium	Carlton, Waverex	5 []
	late	Cooper, Purser	7 []
	very late	Livioletta	9 []
5.8 (24)	<u>Only varieties with stem fasciation absent:</u> Plant: maximum number of flowers per node		
	one	Progress N°9, Tyla	1 []
	two	Banff, Cooper	3 []
	three	Ultimo, Zodiac	5 []
	four or more	Arnesa, Calibra, Survivor	7 []
5.9 (25)	<u>Only varieties with plant anthocyanin coloration present:</u> Flower: colour of wing		
	white with pink blush		1 []
	pink	Rosakrone	2 []
	reddish purple	Assas	3 []

Characteristics		Example varieties	Note
5.10 (28)	Flower: shape of base of standard		
	strongly raised		1 []
	moderately raised	Progreta	3 []
	level	Markado, Solara	5 []
	moderately arched	Avola, Cooper	7 []
	strongly arched	Bohatyr, Kennedy	9 []
5.11 (35)	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 []
5.12 (36)	Pod: width		
	very narrow	Claire	1 []
	narrow	Picar, Ultimo	3 []
	medium	Progreta, Solara	5 []
	broad	Finale, Kahuna	7 []
	very broad	Kennedy	9 []
5.13 (37)	Pod: parchment		
	absent or partial	Sugar Ann	1 []
	entire	Avola, Solara	2 []
5.14 (38)	<u>Excluding varieties with pod parchment: entire:</u> Pod: thickened wall		
	absent	Nofila, Reuzensuiker	1 []
	present	Cygnnet, Sugar Ann	9 []
5.15 (39)	<u>Only varieties with pod: thickened wall: absent:</u> Pod: shape of distal part		
	pointed	Jof, Oskar	1 []
	blunt	Avola, Solara	2 []

Characteristics		Example varieties	Note
5.16 (41)	Pod: colour		
	yellow		1 []
	green	Avola, Solara	2 []
	blue green	Show Perfection	3 []
	purple	Blauwschokker	4 []
5.17 (43)	<u>Excluding varieties with pod parchment: entire:</u> Pod: suture strings		
	absent	Nofia, Sugar Lace	1 []
	present	Crispi, Reuzensuiker	9 []
5.18 (44)	Pod: number of ovules		
	few	De Grace, Phoenix	3 []
	medium	Backgammon, Hawk	5 []
	many	Karisma	7 []
5.19 (45)	Immature seed: intensity of green colour		
	light	Arabelle, Solara, Ultimo	3 []
	medium		5 []
	dark	Dark Skin Perfection, Hawaiï	7 []
5.20 (47)	Seed: type of starch grains		
	simple	Adagio, Maro, Solara	1 []
	compound	Avola, Polar	2 []
5.21 (50)	Seed: colour of cotelydon		
	green	Avola, Solara	1 []
	yellow	Caractacus, Hardy	2 []
	orange		3 []
5.22 (51)	<u>Only varieties with plant anthocyanin coloration present:</u> Seed: marbling of testa		
	absent	Rhea, Rif	1 []
	present	Assas, Pidgin	9 []

Characteristics		Example varieties	Note
5.23 (52)	<u>Only varieties with plant anthocyanin coloration present:</u> Seed: violet or pink spots on testa		
	absent	Pidgin, Rif	1 []
	faint	Assas, Susan	2 []
	intense	Arvika, Rhea	3 []
5.24 (53)	Seed: hilum colour		
	same colour as testa	Avola, Solara	1 []
	darker than testa	Nofila, Rif	2 []
5.25 (55)	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 []
6. Similar varieties and differences from these varieties:			
Denomination of similar variety	Characteristic in which the similar variety is different ¹⁾	State of expression of similar variety	State of expression of candidate variety
<p>¹⁾ In the case of identical states of expressions of both varieties, please indicate the size of the difference</p>			

7. Additional information which may help to distinguish the variety

7.1 Resistance to pests and diseases

Resistance to disease

	Resistant	Susceptible	Not tested
<i>Fusarium Wilt</i> (Race 1) (Common Wilt)	[]	[]	[]
<i>Fusarium Wilt</i> (Race 5) (Common Wilt)	[]	[]	[]
<i>Fusarium Wilt</i> (Race 6) (Common Wilt)	[]	[]	[]
<i>Erysiphe pisi</i> Syd. Powdery mildew	[]	[]	[]
<i>Ascochyta pisi</i> (leaf and pod spot) Race C	[]	[]	[]

Resistance to other diseases
(please give details below)

7.2 Special conditions for the examination of the variety

[] YES, please specify

[] NO

7.4 Other information

Use:

Fresh market	[]
Canning	[]
Freezing	[]
Dry seed for human consumption	[]
Dry protein	[]
Forage	[]
Other (please specify)	[]

8. GMO-information required

The variety represents a Genetically Modified Organism within the meaning of Article 2(2) of Council Directive 2001/18/EC of 12/03/2001.

YES NO

If yes, please add a copy of the written attestation of the responsible authorities stating that a technical examination of the variety under Articles 55 and 56 of the Basic Regulation does not pose risks to the environment according to the norms of the above-mentioned Directive.

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) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| (b) Chemical treatment (e.g. growth retardant or pesticide) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| (c) Tissue culture | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| (d) Other factors | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Please provide details of where you have indicated "Yes":

I/we hereby declare that to the best of my/our knowledge the information given in this form is complete and correct.

Date

Signature

Name

[End of document]