



PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

***Vicia sativa* L.**

COMMON VETCH

UPOV Code: VICIA_SAT

Adopted on 19/04/2016

Entry into force on 01/03/2016

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CPVO-TP/032/1

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1. SUBJECT OF THE PROTOCOL AND REPORTING

1.1 Scope of the technical protocol

This Technical Protocol applies to all varieties of *Vicia sativa* L.

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 documents agreed by the International Union for the Protection of New Varieties of Plants (UPOV), such as the General Introduction to DUS (UPOV Document TG/1/3 http://www.upov.int/export/sites/upov/resource/en/tg_1_3.pdf), its associated TGP documents (<http://www.upov.int/tgp/en/>) and the relevant UPOV Test Guideline TG/032/07 dated 20/03/2013 (<http://www.upov.int/edocs/tgdocs/en/tg032.pdf>) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **01.03.2016**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the Technical Protocol. 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 submitting of plant material for the first test period.

In cases where the Office requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process to be carried out at the moment of this 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.

1.3 Reporting between Examination Office and CPVO and Liaison with Applicant

1.3.1 Reporting between Examination Office and CPVO

The Examination Office shall deliver to the CPVO a preliminary report ("the preliminary report") no later than two weeks after the date of the request for technical examination by the CPVO.

The Examination Office shall also deliver to the CPVO a report relating to each growing period ("the interim report") and, when the Examination Office considers the results of the technical examination to be adequate to evaluate the variety or the CPVO so requests, a report relating to the examination ("the final report").

The final report shall state the opinion of the Examination Office on the distinctness, uniformity and stability of the variety. Where it considers those criteria to be satisfied, or where the CPVO so requests, a description of the variety shall be added to the report. If a report is negative the Examination Office shall set out the detailed reasons for its findings.

The interim and the final reports shall be delivered to the CPVO as soon as possible and no later than on the deadlines as laid down in the designation agreement.

1.3.2 Informing on problems in the DUS test

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.

1.3.3 Sample keeping in case of problems

If the technical examination has resulted in a negative report, the CPVO shall inform the Examination Office as soon as possible in case that a representative sample of any relevant testing material shall be kept.

2. MATERIAL REQUIRED

2.1 Plant material requirements

Information with respect to the agreed closing dates and submission requirements of plant material for the technical examination of varieties can be found on <http://cpvo.europa.eu/applications-and-examinations/technical-examinations/submission-of-plant-material-s2-publication> in the special issue S2 of the Official Gazette of the Office. General requirements on submission of samples are also to be found following the same link.

2.2 Informing the applicant of plant material requirements

The CPVO informs the applicant that

- he is responsible for ensuring compliance with any customs and plant health requirements.
- the plant material supplied should be visibly healthy, not lacking in vigour, nor affected by any important pest or disease.
- 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.

2.3 Informing about problems on the submission of material

The Examination Office shall report to the CPVO immediately in cases where the test material of the candidate variety has not arrived in time or in cases where the material submitted does not fulfil the conditions laid down in the request for material issued by the CPVO.

In cases where the examination office encounters difficulties to obtain plant material of reference varieties the CPVO should be informed.

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" http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf.

3.3 Conditions for Conducting the Examination

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination. In this sense, the trial should be carried out with some physical support to ensure the correct training of the plant. (UPOV-TG text).

The optimum stage of development for the assessment of each characteristic is indicated by a number in the third column of the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.2.

3.4 Test design

- 3.4.1 Each test should be designed to result in a total of at least 200 plants, which should be divided between at least 2 replicates.
- 3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 Additional tests

In accordance with Article 83(3) of Council Regulation 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, an additional test may be undertaken providing that a technically acceptable test procedure can be devised.

Additional 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.

3.6 Constitution and maintenance of a variety collection

The process for the constitution and the maintenance of a variety collection can be summarized as follows:

Step 1: Making an inventory of the varieties of common knowledge

Step 2: Establishing a collection ("variety collection") of varieties of common knowledge which are relevant for the examination of distinctness of candidate varieties

Step 3: Selecting the varieties from the variety collection which need to be included in the growing trial or other tests for the examination of distinctness of a particular candidate variety.

3.6.1 Forms of variety collection

The variety collection shall comprise variety descriptions and living plant material, thus a living reference collection. The variety description shall be produced by the EO unless special cooperation exists between EOs and the CPVO. The descriptive and pictorial information produced by the EO shall be held and maintained in a form of a database

3.6.2 Living Plant Material

The EO shall collect and maintain living plant material of varieties of the species concerned in the variety collection.

3.6.3 Range of the variety collection

The living variety collection shall cover at least those varieties that are suitable to climatic conditions of a respective EO.

3.6.4 Making an inventory of varieties of common knowledge for inclusion in the variety collection

The inventory shall take into account the list of protected varieties and the official, or other, registers of varieties, in particular:

The inventory shall include varieties protected under National PBR (UPOV contracting parties) and Community PBR, varieties registered in the Common Catalogue, the OECD list, the Conservation variety list and varieties in trade or in commercial registers for those species not covered by a National or the Common Catalogue.

3.6.5 Maintenance and renewal/update of a living variety collection

The EO shall maintain seeds in conditions which will ensure germination and viability, periodical checks, and renewal as required. For the renewal of existing living material the identity of replacement living plant material shall be verified by conducting side-by-side plot comparisons between the material in the collection and the new material.

4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY

The prescribed procedure is to assess distinctness, uniformity and stability in a growing trial.

4.1 Distinctness

4.1.1 General recommendations

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 9 'Examining Distinctness' (http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf) prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in this Technical Protocol.

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 Technical Protocols are familiar with the recommendations contained in the UPOV-General Introduction to DUS prior to making decisions regarding distinctness.

Decision standards

4.1.3.1 If distinctness is assessed using the 2 x 1% criterion, the varieties need to be significantly different in the same direction at the 1% level in at least two out of three years in one or more measured characteristics. The tests in each year are based on Student's two-tailed t-test of the differences between variety means with standard errors estimated using the residual mean square from the analysis of the variety x replicate plot means.

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

4.1.4 Number of plants/parts of plants to be examined

Unless otherwise indicated, for the purposes of distinctness, 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, disregarding any off-type plants.

4.1.5 Method of observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the third column of the Table of Characteristics (see document TGP/9 "Examining Distinctness", Section 4 "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

Type of observation: visual (V) or measurement (M)

"Visual" observation (V) is an observation made on the basis of the expert's judgment. For the purposes of this document, "visual" observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. colour charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colourimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, "G" provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness."

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 10 'Examining Uniformity' (http://www.upov.int/edocs/tgpdocs/en/tgp_10.pdf) prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in this Technical Protocol:

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 200 plants, 5 off-types are allowed. In the case of a sample size of 100 plants or parts of plants, 3 off-types are allowed.

The recommended sample size for the assessment of uniformity is indicated by the following key in the table of characteristics:

A sample size of 100 plants/parts of plants
B sample size of 200 plants.

For "A" characteristics, where the sample size is 100 plants, the assessment of uniformity can be done in 2 steps. In a first step, 20 plants or parts of plants are observed. If no off-types are observed, the variety is declared to be uniform. If 1 to 3 off-types are observed, an additional sample of 80 plants or parts of plants must be observed.

4.3 Stability

- 4.3.1 It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 11 'Examining Stability' (http://www.upov.int/edocs/tgpdocs/en/tgp_11.pdf).

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 further examined by testing a new seed stock to ensure that it exhibits the same characteristics as those shown by the initial 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) Time of beginning of flowering (characteristic 4)
- b) Stipule: anthocyanin colouration of nectaries (characteristic 9)
- c) Seed: ground colour of testa (characteristic 16)
- d) Seed: brown ornamentation (characteristic 17)
- e) Seed: blue-black ornamentation (characteristic 19)
- f) Seed: colour of cotyledons (characteristic 21)

- 5.4 If other characteristics than those from the TP are used for the selection of varieties to be included into the growing trial, the EO shall inform the CPVO and seek the prior consent of the CPVO before using these characteristics.

6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS

6.1 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 or by specific legislation on plant health. In the latter case, the CPVO should be informed.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N°874/2009, to insert additional characteristics and their expressions in respect of a variety.

States of expression and corresponding notes

In the case of qualitative and pseudo-qualitative characteristics, all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2 Example Varieties

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

6.3 Legend

For the CPVO N° column:

G	Grouping characteristic	– see Chapter 5
QL	Qualitative characteristic	
QN	Quantitative characteristic	
PQ	Pseudo-qualitative characteristic	
(+)	See Explanations on the Table of Characteristics in Chapter 8.1	

For the UPOV N° column:

The numbering of the characteristics is provided as a reference to the ad hoc UPOV guideline.

(*)	UPOV Asterisk characteristic – Characteristics that are important for the international harmonization of variety descriptions.
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For the column "stage, method":

10 – 89	See Explanations on the Table of Characteristics in Chapter 8.2
MG, MS, VG, VS	Method of observation – see Chapter 4.1.5
A	Sample size 100 plants – see Chapter 3.4
B	Sample size 200 plants – see Chapter 3.4

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1. (+) QN	1. (*)	12 VG/M S B	Seedling: ratio length/width of leaflet of second primary leaf		
			very low		1
			low	Ebena	3
			medium	Candy	5
			high	Prontivesa	7
		very high	Aneto	9	
2. QN	2.	11-13 VG B	Seedling: anthocyanin colouration on base of stem		
			absent or very weak	Cobra	1
			weak		3
			medium	Ina, Prontivesa	5
			strong	Nacre	7
		very strong		9	
3. QN	3.	51-59 VG B	Plant: intensity of green colour of foliage		
			light	Acisreina	1
			medium	Kwarta	3
		dark		5	
4. (+) QN G	4. (*)	MG B	Time of beginning of flowering		
			very early	Barvicos, Piedade	1
			early	Labari	3
			medium	Ina, Pepite, Rada	5
			late	Kwarta	7
		very late	Berninova, Jaga	9	

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
5.	5. (*)	60-69	Stem: hairiness of upper internodes		
(+)		VG	absent or very weak	Neska	1
QN		B	weak	Prontivesa	3
			medium		5
			strong	Candy, Kwartá	7
			very strong	Berninova, Caravelle, Hanka	9
6.	6.	60-69	Stem: anthocyanin colouration on leaf axil		
QN		VG	absent or very weak	Acisreina, Fama, Kwartá, Pepite	1
		B	weak	Candy, Caravelle	3
			medium	Castilla, Rada, Trafic	5
			strong	Miranda, Nacre	7
			very strong		9
7.	7. (*)	60-69	Leaf: shape of apex		
(+)		VG	convex	Corail, Trafic	1
			convex to straight		2
PQ		B	straight	Aneto, Candy, Fama, Kwartá, Prontivesa	3
			straight to concave		4
			concave	Nacre	5
8.	8.	60-69	Leaf: width of leaflet		
(+)		VG/MS	narrow	Prontivesa	3
QN		B	medium	Hanka, Libia, Pepite	5
			wide	Acisreina	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
9.	9. (*)	60-69	Stipule: anthocyanin colouration of nectaries		
QN		VG	absent or very weak	Albaflor, Jade	1
		B	weak	Alcaraz, Melissa, Prontivesa	3
			medium	Aneto, Castilla	5
			strong	Labari, Libia, Nacre	7
G			very strong		9
10.	10. (*)	60-65	Flower: colour of standard		
PQ		VG	white	Albaflor	1
		B	pink		2
			light violet	Miranda, Piedade	3
			medium violet	Labari, Nacre	4
			dark violet	Castilla, Prontivesa	5
11.	11. (*)	71-79	Pod: hairiness		
QN		VG	absent or very weak	Amelia, Spinelle	1
		B	weak	Alcaraz, Granit	3
			medium	Barvicos, Miranda, Topaze	5
			strong	Kwarta	7
			very strong	Ina	9
12.	12.	71-79	Pod: length (excluding beak)		
QN		VG/MS	short	Acisreina, Berninova	3
		B	medium	Ebena, Fama	5
			long	Miranda, Prontivesa	7
13.	13.	71-79	Pod: width		
(+)		VG/MS	narrow	Acisreina	3
QN		B	medium	Ebena, Kwarta	5
			wide	Labari, Prontivesa	7

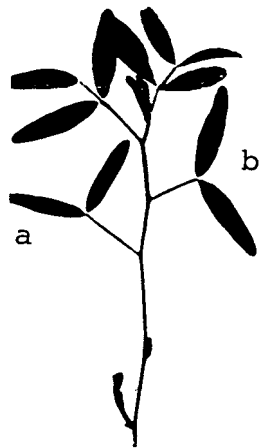
CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
14.	16. (*)	89-99	Seed: weight		
(+)		MG	very low	Berninova, Carole	1
QN			low	Ina	3
			medium	Aneto, Rada	5
			high	Castilla	7
			very high	Labari, Prontivesa	9
15.	17.	89-99	Seed: shape		
(+)		VG	circular	Aneto, Ina	1
PQ		A	slightly irregular	Acisreina	2
			very irregular	Castilla	3
16.	18. (*)	89-99	Seed: ground colour of testa		
(+)		VG	whitish	Ina	1
PQ		A	greyish green	Acisreina, Ebena, Nacre	2
			greyish brown	Candy	3
G			brown	Kwarta	4
17.	19. (*)	89-99	Seed: brown ornamentation		
(+)		VG	absent	Albaflor, Albina, Fama, Ina	1
PQ		A	speckles	Cumbre	2
			blotches	Candy, Pepite	3
G			speckles and blotches	Labari, Prontivesa	4
18.	20. (*)	89-99	Seed: area of brown ornamentation		
QN		VG	very small		1
		A	small	Achilleas	3
			medium	Neska	5
			large	Acisreina, Prontivesa	7
			very large		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
19.	21. (*)	89-99	Seed: blue-black ornamentation		
(+)		VG	absent	Albaflor, Albina, Fama, Ina, Kwarta, Nacre	1
PQ		A	spots		2
			blotches	Ebena, Castilla, Prontivesa	3
G			spots and blotches	Acisreina, Pepite	4
20.	22. (*)	89-99	Seed: area of blue-black ornamentation		
QN		VG	very small		1
		A	small	Prontivesa	3
			medium	Acisreina	5
			large		7
			very large	Ebena	9
21.	23. (*)	89-99	Seed: colour of cotyledons		
QL		VG	greyish brown	Acisreina, Castilla, Labari, Prontivesa	1
G		A	orange	Aneto, Ina, Kwarta	2

8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

8.1 Explanations for individual characteristics

Ad. 1: Seedling: ratio length/width of leaflet of second primary leaf



a: first primary leaf

b: second primary leaf



1
very low



3
low



5
medium



7
high



9
very high

Ad. 4: Time of beginning of flowering

Time of beginning of flowering is when 30% of plants have at least one flower open.

Ad. 5: Stem: hairiness of upper internodes

The observations should be made on upper third of plant.

Ad. 7: Leaf: shape of apex

The observations should be made on middle third of plant.



1
convex



3
straight



5
concave

Ad. 8: Leaf: width of leaflet

The observations should be made on middle third of plant.

Ad. 13: Pod: width

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

Ad. 14: Seed: weight

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

Ad. 15: Seed: shape

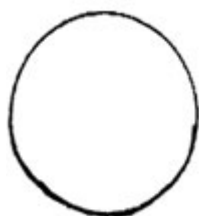
Seeds which grow nearest the peduncle end or the distal end of the pod ('end seeds') should be excluded before shape is assessed.

The observations should be made from an upper view on spread out seeds on a flat surface. Seeds should be placed with the line between hilum and radicle parallel to the surface.

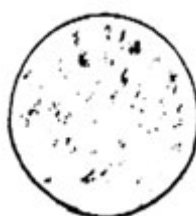
Ad. 16: Seed: ground colour of testa

The ground colour of the testa may be obscured by a very strong expression of the blue-black.

Ad. 17: Seed: brown ornamentation



1
absent



2
speckles

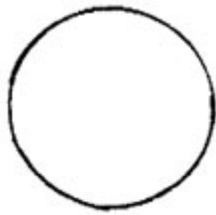


3
blotches

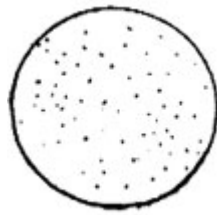


4
speckles and blotches

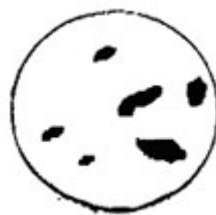
Ad. 19: Seed: blue-black ornamentation



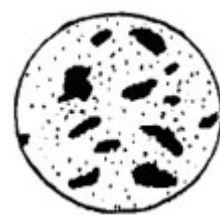
1
absent



2
spots



3
blotches



4
spots and blotches

8.2 Phenological growth stages of common vetch adapted from BBCH of pea (Meier, U., 1997)

Principal growth stage 0: Germination

- 00 - Dry seed
- 01 - Beginning of seed imbibition
- 03 - Seed imbibition complete
- 05 - Radicle emerged from seed
- 07 - Shoot breaking through seed coat
- 08 - Shoot growing towards soil surface; hypocotyl arch visible
- 09 - Emergence: shoot breaks through soil surface

Principal growth stage 1: Leaf development

- 10 - Pair of scale leaves visible
- 11 - First true leaf unfolded
- 12 - 2 leaves unfolded
- 13 - 3 leaves unfolded
- 1. - Stages continuous till . . .
- 19 - 9 or more leaves unfolded

Principal growth stage 3: Stem elongation (Main shoot)

- 30 - Beginning of stem elongation
- 31 - 1 visibly extended internode
- 32 - 2 visibly extended internodes
- 33 - 3 visibly extended internodes
- 3. - Stages continuous till . . .
- 39 - 9 or more visibly extended internodes

Principal growth stage 5: Inflorescence emergence

- 51 - First flower buds visible outside leaves
- 55 - First separated flower buds visible outside leaves but still closed
- 59 - First petals visible, flowers still closed

Principal growth stage 6: Flowering

- 60 - First flowers open (sporadically within the population)
- 61 - Beginning of flowering: 10% of flowers open
- 62 - 20% of flowers open
- 63 - 30% of flowers open
- 64 - 40% of flowers open
- 65 - Full flowering: 50% of flowers open
- 67 - Flowering declining
- 69 - End of flowering

Principal growth stage 7: Development of fruit

- 71 - 10% of pods have reached typical length
- 72 - 20% of pods have reached typical length
- 73 - 30% of pods have reached typical length
- 74 - 40% of pods have reached typical length
- 75 - 50% of pods have reached typical length
- 76 - 60% of pods have reached typical length
- 77 - 70% of pods have reached typical length
- 79 - Pods have reached typical size (green ripe); seeds fully formed

Principal growth stage 8: Ripening of fruit and seed

- 81 - 10% of pods ripe, seeds final colour, dry and hard
- 82 - 20% of pods ripe, seeds final colour, dry and hard
- 83 - 30% of pods ripe, seeds final colour, dry and hard
- 84 - 40% of pods ripe, seeds final colour, dry and hard
- 85 - 50% of pods ripe, seeds final colour, dry and hard
- 86 - 60% of pods ripe, seeds final colour, dry and hard
- 87 - 70% of pods ripe, seeds final colour, dry and hard
- 88 - 80% of pods ripe, seeds final colour, dry and hard
- 89 - Fully ripe: all pods dry and brown. Seeds dry and hard (dry ripe)

Principal growth stage 9: Senescence

- 97 - Plants dead and dry
- 99 - Harvested product

9. LITERATURE

Meier, U., 1997: Growth stages of mono- and dicotyledonous plants: BBCH-Monograph. Federal Biological Research Center for Agriculture and Forestry (Ed.). Blackwell Wissenschafts-Verlag, Berlin, Wien.

10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference: CPVO-TQ/032/1.