CPVO · OCVV
Community Plant Variety Office
Office Communautaire des Variétés Végétales

PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

Glycine max (L.) Merr.

SOYA BEAN

UPOV Code: GLYCI_MAX

Adopted on 28/01/2026

Entry into force on 01/02/2026

CPVO-TP/080/2 based on the version 5 of the CPVO-TP/template

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CPVO-TP/080/2

1. SUBJECT OF THE PROTOCOL AND REPORTING

1.1 Scope of the technical protocol

This Technical Protocol applies to all varieties of ***Glycine max*** **(L.) Merrill.**

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/080/7 dated 25/10/2022 (https://www.upov.int/edocs/tgdocs/en/tg080.pdf) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **01.02.2026**. 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 growing cycle.

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 four weeks after the date of the request for technical examination by the CPVO and in any case preferably before the submission period of the plant material.

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

In cases where the Examination Office identifies issues during the course of the technical examination that may lead to a negative report, the Examination Office shall inform the CPVO and in urgent cases the applicant/holder as soon as such issues become obvious.

1.3.3 Sample keeping in case of problems

As far as feasible the Examination Office shall keep a representative sample of any relevant testing material of the candidate variety and reference variety(ies) if the technical examination has resulted in a negative report. As soon as possible, the CPVO shall inform the Examination Office when the material can be destroyed.

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 https://public.plantvarieties.eu/publication in the special issue S2/S3 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 submission of plant 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 in writing.

3. METHOD OF EXAMINATION

3.1 Number of growing cycles

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

The testing of a variety may be concluded when the entrusted examination office can determine with certainty the outcome of the test.

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.

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

Each test should be designed to result in a total of at least 300 plants, which should be divided between at least two replicates.

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 Special tests for additional characteristics

In accordance with Article 23 of Implementing Rules N° 874/2009 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 characteristics 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 common knowledge varieties that are suitable to grow in the 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 include varieties protected under National and Community PBR, varieties registered in the Common Catalogue, the OECD list, the Conservation variety list.

The inventory shall take into account the list of varieties which are the subject of an on-going application for protection or official registration (candidate varieties).

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.

Living material in variety collections representing varieties for which a DUS test was carried out at that EO shall be renewed after verification in a side-by-side comparison. In case where no living material is available anymore in the collection, such verification could be done with any other test that has proven to give similar results 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.

If distinctness is assessed using the 2 x 1% criterion, the difference between two varieties is clear if the respective characteristics are significantly different in the same direction at the 1% level in at least two out of three years. 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 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 ($p<0.01$) in a test over either two or three years.

If the significance level or statistical methods prescribed are 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.

In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 1.

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, colorimeter, 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

4.2.1 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 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:

4.2.2 For the assessment of uniformity, a population standard of 0,5 % and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 300 plants, 4 off-types are allowed. In the case of a sample size of 60 plants, 1 off-type is allowed.

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.pd)

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 ORGANISATION 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 organise the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

a) Plant: colour of hairs on main stem (characteristic 10)

b) Flower: colour (characteristic 11)

c) Time of maturity (characteristic 12)

d) Seed: coloration of hilum (characteristic 20)

5.4 If characteristics other than those mentioned in the list of grouping characteristics and/or from the table of characteristics and/or from the Technical Questionnaire – sections 5 and 7. 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.

5.5 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the UPOV-General Introduction to DUS and document TGP/9 "Examining Distinctness".

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.

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. All relevant states of expression are presented in the characteristic.

Further explanation of the presentation of states of expression and notes is provided in UPOV document TGP/7 "Development of Test Guidelines".

6.3 Example Varieties

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

6.4 Legend

For column 'CPVO N°':

G	Grouping characteristic	-see Chapter 5
QL	Qualitative characteristic	
QN	Quantitative characteristic	
PQ	Pseudo-qualitative characteristic	
(+)	Explanations for individual characteristics	-see Chapter 8.1

For column 'UPOV N°':

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

(*)	UPOV Asterisked characteristic	-Characteristics that are important for the international harmonization of variety descriptions.

For column 'Stage, method':

MG, MS, VG, VS		-see Chapter 4.1.5
00-99	Explanations on growth stages	-see Chapter 8.2

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1. (+)	**19.**	**00**	**Seed: peroxidase reaction**		
QL		**VG/VS**	absent	Artemis, RGT Starbela	1
			present	Avatar, Isidor, Obelix	9
2. (+)	**1.**	**10**	**Hypocotyl: intensity of anthocyanin coloration**		
QN		**VG**	absent or very weak	Befine, Ekam, ES Competitor	1
			weak	ES Indicator, P007A67, Simpol	2
			medium	NS Kraljica, RGT Sigma, Wapiti	3
			strong	Ancagua, Ranger, Pro Taranaki	4
			very strong	Successor	5
3. (+)	**2.**	**61**	**Time of beginning of flowering**		
QN		**MG**	very early	Ambella, Artemis, Suza, Wapiti	1
			very early to early	Amma, Elba, , RGT Starbela	2
			early	Dame Junko, EM Sole, RGT Straviata	3
			early to medium	Avatar, ES Pallador, P26A10	4
			medium		5
			medium to late		6
			late		7
			late to very late		8
			very late		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
4.	**3.**	**65**	**Leaf: blistering**		
QN		**VG**	absent or very weak		1
			very weak to weak	ES Connector	2
			weak	LID Constructor, NS Altis	3
			weak to medium	LID Diamantor, Orka	4
			medium	Elba, Sankara	5
			medium to strong	Alambix	6
			strong		7
			strong to very strong		8
			very strong		9
5. (+)	**4. (*)**	**65**	**Leaf: shape of lateral leaflet**		
PQ		**VG**	lanceolate	ES Pallador, RGT Straviata, Successor	1
			triangular	Basak, Xena	2
			ovate with acute apex	Elba, LID Constructor, RGT Sigma	3
			ovate with rounded apex	ES Indicator, Magnolia PZO, PRO Taranaki	4
6.	**5.**	**65**	**Leaf: size of lateral leaflet**		
QN		**VG**	very small		1
			very small to small		2
			small	Abelina, LID Constructor, Magnolia PZO, Stapelia	3
			small to medium	Obelix, PRO Taranaki, Sussex	4
			medium	Amma, Dakota, GL Lilas, RGT Sicilia	5
			medium to large		6
			large		7
			large to very large		8
			very large		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
7.	**6.**	**65**	**Leaf: intensity of green colour**		
QN		**VG**	very light		1
			very light to light		2
			light		3
			light to medium	NS Altis, Wapiti	4
			medium	Befine, Magnolia PZO, PRO Taranaki	5
			medium to dark	Artemis, Basak, ES Mentor	6
			dark	Amma, Arnold, RGT Straviata	7
			dark to very dark		8
			very dark		9
8. (+)	**7. (*)**	**60-89**	**Plant: growth type**		
QN		**MS/VG**	determinate	Befine, Dame Junko	1
			semi-determinate	Magnolia PZO, PRO Taranaki, Stapelia	2
			indeterminate	Australia, Avatar, ES Pallador	3
9. (+)	**8.**	**66-80**	**Plant: attitude of branches**		
QN		**VG**	erect	Arnold, Ceres PZO, Orka	1
			erect to semi-erect	Avatar, LID constructor, Sankara	2
			semi-erect	Artesia, ES Pallador, PRO Taranaki, Sussex	3
			semi-erect to horizontal	ES Indicator, RGT Starbela, Vineta PZO	4
			horizontal		5
10. (+)	**9. (*)**	**65-85**	**Plant: colour of hairs on main stem**		
PQ		**VG**	light brown	Amma, RGT Sicilia, SU Ademira	1
			dark brown	RGT Sigma, Sankara, Simpol	2
G			grey	Elba, ES Pallador, NS Kraljica	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
11.	**10. (*)**	**66**	**Flower: colour**		
QL		**VG**	white	Befine, Ekam, Sonali	1
G			violet	Avatar, GL Lilas, RGT Sicilia	2
12. (+)	**11. (*)**		**Time of maturity**		
QN		**MG**	very early	Ambella, Laulema, Nawiko, Paradis	1
			very early to early	Antigua, Obelix, RGT Sigma, Stepa	2
			early	Artemis, Ceres PZO, RGT Sphinxa, SU Ademira	3
			early to medium	ES Mentor, Simpol, Suza, Yakari	4
			medium	ES Tribor Kristian, RGT Starbela, RGT Sicilia	5
			medium to late	Artesia, Avatar, ES Pallador, RGT Speeda	6
			late	Elba, ES Indicator, RGT Straviata	7
			late to very late	Ecudor, ES Inventor, P26A10	8
G			very late		9
13.	**12.**	**85**	**Plant: height**		
QN		**MS/VG**	very short	Befine	1
			very short to short	Dame Junko	2
			short	LID Diamantor, Nawiko	3
			short to medium	Adelfia, ES Favor, RGT Straviata	4
			medium	Arnold, Magnolia PZO, NS Kraljica	5
			medium to tall	Auricula, Avatar, SU Cutena	6
			tall	EM Sole, Orka	7
			tall to very tall		8
			very tall		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
14. (+)	**13. (*)**	**85-89**	**Pod: colour**		
PQ		**VG**	light brown	ES Favor, RGT Sicilia, Wapiti	1
			medium brown	Ranger, RGT Sigma, RGT Starbela	2
			dark brown	Adelfia, Obelix, RGT Straviata	3
			light grey	Cypress, NS Altis, P11A50	4
			medium grey	Elba, SU Cutena, XB03J19	5
			dark grey	Albenga, ES Pallador, P26A10	6
			black		7
15. (+)	**14.**	**85-89**	**Pod: grey coloration of seed convexities**		
QN		**VG**	absent or very weak	Magnolia PZO, Sankara, Suza	1
			weak	Arnold, RGT Sigma,	2
			medium	Ranger, RGT Straviata, SU Ademira	3
			strong	ES Pallador, SU Cutena, Talisse	4
			very strong		5
16.	**15.**	**89**	**Seed: 1000 seed weight**		
QN		**MG**	very low		1
			very low to low		2
			low	ES Pallador, Nawiko, Wapiti	3
			low to medium	Arnold, Basak, Orka	4
			medium	Adelfia, ES Indicator, PRO Taranaki	5
			medium to high	Gerlinde, P26A10, Talisse	6
			high	Isidor, Obelix	7
			high to very high	Befine, Dame Junko	8
			very high	Dame Hanae	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
17. (+)	**16.**	**89**	**Seed: shape**		
PQ		**VG**	spheric	Amma, ES Pallador, GL Lilas, RGT Straviata	1
			spheric flattened	Arnold, Avatar	2
			elongated	Artemis, Orka, Yakari	3
			elongated flattened		4
18. (+)	**17. (*)**	**89**	**Seed: colour of testa**		
PQ		**VG**	green		1
			yellow green	Befine, Dame Junko	2
			yellow	Lid Diamantor, RGT Straviata, Talisse	3
			red		4
			light brown		5
			medium brown		6
			dark brown		7
			purple		8
			black	Brigitte	9
19. (+)	**18. (*)**	**89**	**Seed: glossiness**		
QN		**VG**	absent or weak	Adelfia, RGT Sigma, RGT Starbela	1
			medium	ES Favor, SU Cutena	2
			strong	Basak, Ceres PZO	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
20. (+)	**20. (*)**	**89**	**Seed: coloration of hilum**		
PQ		**VG**	imperfect yellow	P007A67, PRO Taranaki, Stapelia	1
			yellow	SU Ademira, Suza, Talisse	2
			light brown	Befine, Ecudor, P26A10	3
			red brown		4
			dark brown	Artemis, Basak, RGT Sigma, Simpol	5
			grey	Lid Constructor, Lid Diamantor, Yakari	6
			imperfect black	Elba, GL Hermine	7
			black	Amma, Avatar, GL Lilas, Magnolia PZO	8
21. (+)	**21.**	**89**	**Seed: colour of hilum funicle**		
QL		**VG**	same as testa	Artemis, Basak, Suza, Yakari	1
			different to testa	Laulema, SU Ademira	2

8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

8.1 Explanations for individual characteristics

Ad. 1: Seed: peroxidase reaction

The coloration due to peroxidase activity in the seed coat should be observed on 20 seeds.

The seed should be placed in water for 2 hours before the seed coat is removed carefully. No piece of cotyledons should remain on the removed seed coat.

The seed coat should be placed in a cell box or in tubes (one tube per seed) and 0,5 mL (around 10 drops) of 0.5% guaiacol (synonym: 2-methoxyphenol) solution should be added. The 0.5% guaiacol solution should be stored in a refrigerator for max. 2 months. After one day at room temperature, it can no longer be used.

After 10 minutes, one drop of 0.1% H2O2 solution should be added.

The solution changes to dark red/brown colour for a positive reaction or remains without colour for a negative reaction. In order to check the 0.5% Guayacol solution, some seeds of a reference variety with a positive reaction should be included. The reaction with H2O2 must be recorded within 60 seconds. Later observations can lead to wrong results.

The cell box or the tubes could be softly shaken for a better reaction. The cell box or the tubes should be placed on a white background for observation.

Any alternative method may be used if it gives the same result.

Ad. 2: Hypocotyl: intensity of anthocyanin coloration

Germinate 20 seeds in substrate. Observations should be made three to five days after emergence. Any alternative method may be used if it gives the same result.

Ad. 3: Time of beginning of flowering

Time of beginning of flowering is reached when 10% of plants show at least one open flower.

Ad. 5: Leaf: shape of lateral leaflet

1 lanceolate | 2 triangular | 3 ovate with acute apex | 4 ovate with rounded apex

Ad. 8: Plant: growth type

Observation to be done at the beginning of flowering time (1 flower at any level of the main stem), the apex of the plant should be identified with a mark. At maturity (free kernels in the pod), the number of nodes between the mark and the top of the plant is counted. The average number of nodes per variety, in comparison with the example varieties, allows for the appropriate rating of this characteristic.

Determinate varieties:

- The main stem ends in a floral bud (the terminal cluster is long and with many flowers).
- The growth stops with the flowering of the terminal bud.
- The size of the terminal leaf is the same as the lower leaves in growth stage 60.

Semi-determinate varieties:

- The main stem ends in a floral bud (the terminal cluster is short and with few flowers).
- The growth stops with the flowering of the terminal bud.
- The size of the terminal leaf is smaller than the lower leaves in growth stage 60.

Indeterminate varieties:

- The main stem ends in a vegetative bud.
- The growth continues after flowering.
- The apical meristem remains vegetative and continues to differentiate nodes and leaves when flowers are being differentiated in the rest of the plant.
- The terminal leaf is smaller than the lower leaves in growth stage 60.

In case of doubt, MS method should be preferred.

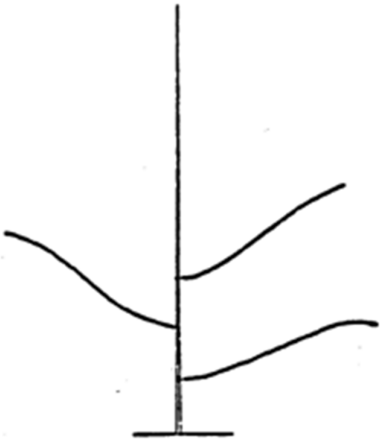
Ad. 9: Plant: attitude of branches

1
erect

2
erect to semi-erect

3
semi-erect

4
semi-erect to horizontal



5
horizontal

Ad. 10: Plant: colour of hairs on main stem

Observations should be made on the middle third of the main stem.

Ad. 12: Time of maturity

Time of maturity is reached when 90% of plants have reached growth stage 80.

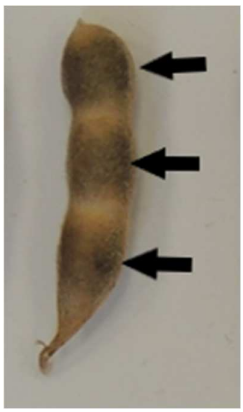
Ad. 14: Pod: colour

Observations should be made on pods from the middle third of the plants, including pubescence and excluding grey coloration of the seed convexities.

Observations should be made in bright daylight in comparison with other example varieties.

Ad. 15: Pod: grey coloration of seed convexities

Observations should be made on the seed convexities of the pod (shown with black arrows).



Ad. 17: Seed: shape

1	2	3	4
spheric	spheric flattened	elongated	elongated flattened

Ad. 18: Seed: colour of testa

Observations should exclude hilum.

See Ad. 21

Ad. 19: Seed: glossiness

A sample of 20 seeds should be illuminated with a focus of no more than 75 watts and the brightness or opacity is observed with the naked eye.

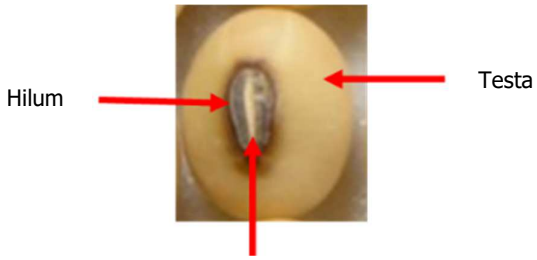
Ad. 20: Seed: coloration of hilum

Imperfect yellow: dark yellow centre, surrounded by light yellow halo.

Imperfect black: black centre, surrounded by a brown halo.

See Ad. 21.

Ad. 21: Seed: colour of hilum funicle



Courtesy of the Canadian Food Inspection Agency

8.2 Explanations on growth stages

Phenological Growth Stages and BBCH-Identification Keys of the Soybean *

CODE		DESCRIPTION
2- and 3 digit		
Principal growth stage 0: Germination		
00	000	Dry seed
01	001	Beginning of seed imbibition
02	002	-
03	003	Seed imbibition complete
04	004	-
05	005	Radicle emerged from seed
06	006	Elongation of radicle; formation of root hairs
07	007	Hypocotyl with cotyledons breaking through seed coat
08	008	Hypocotyl reaches the soil surface; hypocotyl arch visible
09	009	Emergence: hypocotyl with cotyledons emerged above soil surface ("cracking stage")
Principal growth stage 1: Leaf development (Main shoot)		
10	100	Cotyledons completely unfolded
11	101	First pair of true leaves unfolded (unifoliolate leaves on the first node)
12	102	Trifoliolate leaf on the 2nd node unfolded
13	103	Trifoliolate leaf on the 3rd node unfolded
1.	10.	States continuous until ....
19	109	Trifoliolate leaf on the 9th node unfolded. No side shoots visible [1]
-	110	Trifoliolate leaf on the 10th node unfolded [1]
-	111	Trifoliolate leaf on the 11th node unfolded [1]
-	112	Trifoliolate leaf on the 12th node unfolded [1]
-	113	Trifoliolate leaf on the 13th node unfolded [1]
-	11.	Stages continuous until ....
-	119	Trifoliolate leaf on the 19th node unfolded [1]

* Reproduced with the kind permission of the authors of: "Growth Stages of Mono- and Dicotyledonous Plants" (see Literature, Meier, Uwe (Editor), 1997)

[1] The side shoot development may occur earlier; in this case continue with the principal growth stage 2

CODE		DESCRIPTION
2- and 3 digit		
Principal growth stage 2: Formation of side shoots		
20	200	-
21	201	First side shoot visible
22	202	2nd side shoot of first order visible
23	203	3rd side shoot of first order visible
2.	20.	Stages continuous until ...
29	209	9 or more side shoots of first order visible (2 digit) 9th side shoot of first order visible (3 digit)
-	210	10th side shoot of first order visible
-	221	First side shoot of 2nd order visible
-	22.	Stages continuous until ...
-	229	9th side shoot of 2nd order visible
-	2N1	First side shoot of Nth order visible
-	2N9	9th side shoot of Nth order visible
Principal growth stage 3: [2]		
Principal growth stage 4: Development of harvestable vegetative plant parts – Main shoot -		
40	400	-
41	401	-
42	402	-
43	403	-
44	404	-
45	405	-
46	406	-
47	407	-
48	408	-
49	409	Harvestable vegetative plant parts have reached final size (Cutting of soybean plants for feeding purposes)
Principal growth stage 5: Inflorescence emergence (Main shoot)		
50	500	-
51	501	First flower buds visible
52	502	-
53	503	-
54	504	-
55	505	First flower buds enlarged
56	506	-
57	507	-
58	508	-
59	509	First flower petals visible; flower buds still closed

[2] The stem elongation of the soybean plant (Principal growth stage 3) proceeds parallel to the leaf development. Therefore, a coding in the principal growth stage 3 has been omitted.

CODE		DESCRIPTION
2- and 3 digit		
Principal growth stage 6: Flowering (Main shoot)		
60	600	First flowers opened (sporadically in population)
61	601	Beginning of flowering about 10% of flowers open [3] Beginning of flowering [4]
62	602	About 20% of flowers open [3]
63	603	About 30% of flowers open [3]
64	604	About 40% of flowers open [3]
65	605	Full flowering: about 50% of flowers open [3] Main period of flowering [4]
66	606	About 60% of flowers open [3]
67	607	Flowering declining [3]
68	608	-
69	609	End of flowering: first pods visible (approximately 5 mm length) [3]
Principal growth stage 7: Development of fruits and seeds		
70	700	First pod reached final length (15-20 mm)
71	701	About 10% of pods have reached final length (15-20 mm) [3] Beginning of pod development [4]
72	702	About 20% of pods have reached final length (15-20 mm) [3]
73	703	About 30% of pods have reached final length (15-20 mm) [3] Beginning of pod filling [4]
74	704	About 40% of pods have reached final length (15-20 mm) [3]
75	705	About 50% of pods have reached final length (15-20 mm) Continuation of pod filling.[3] Main period of pod development Continuation of pod filling [4]
76	706	-
77	707	About 70% of pods have reached final length (15-20 mm): advanced pod filling. [3] Advanced pod filling [4]
78	708	-
79	709	Approximately all pods have reached final length (15-20 mm). Seeds filling the cavity of the majority of pods [3,4]

[3] This definition refers to determinate varieties
[4] This definition refers to indeterminate varieties
[3] This definition refers to determinate varieties
[4] This definition refers to indeterminate varieties

CODE		DESCRIPTION
2- and 3 digit		
Principal growth stage 8: Ripening of fruits and seeds		
80	800	First pod ripe, beans final colour, dry and hard
81	801	Beginning of ripening; about 10% of pods are ripe, beans final colour, dry and hard.[3] Beginning of pod and seed ripening [4]
82	802	About 20% of pods are ripe; beans final colour, dry and hard [3]
83	803	About 30% of pods are ripe; beans final colour, dry and hard [3]
84	804	About 40% of pods are ripe; beans final colour, dry and hard [3]
85	805	Advanced ripening; about 50% of pods are ripe; beans final colour, dry and hard.[3] Main period of pod and seed ripening [4]
86	806	About 60% of pods are ripe; beans final colour, dry and hard [3]
87	807	About 70% of pods are ripe; beans final colour, dry and hard [3]
88	808	About 80% of pods are ripe; beans final colour, dry and hard [3]
89	809	Full maturity: approximately all pods are ripe; beans final colour, dry and hard (= Harvest maturity) [3] Majority of pods are ripe; beans final colour, dry and hard [4]
Principal growth stage 9: Senescence		
90	900	-
91	901	About 10% of leaves discoloured or fallen
92	902	About 20% of leaves discoloured or fallen
93	903	About 30% of leaves discoloured or fallen
94	904	About 40% of leaves discoloured or fallen
95	905	About 50% of leaves discoloured or fallen
96	906	About 60% of leaves discoloured or fallen
97	907	Above ground parts of plants dead
98	908	-
99	909	Harvested product (seeds)

9. LITERATURE

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10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO/TQ-080/2 – *Glycine max* (L.) Merr. – soya bean

Link to e-TQ:
https://online.plantvarieties.eu/backOfficeFormQuestions?viewFormId=17777&viewFormType=TQ&viewFormLang=EN&speciesIds=GLY01&status=1,2&order=formName