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TG/80/7(proj.6)
ORIGINAL: English
DATE: 2020-05-08

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

SOYA BEAN*

UPOV Code(s):GLYCI_MAX

Glycine max (L.) Merr.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Argentina
to be considered by the
Technical Working Party for Agricultural Crops
at its forty-ninth session, to be held in Saskatoon, Canada,
from 2020-06-22 to 2020-06-26

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Glycine max (L.) Merr., *Soja hispida* Moench	Soya Bean, Soybean	Soja	Sojabohne	Soja

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Glycine max* (L.) Merr.

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of seed.

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

1 kg.

The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should be stated by the applicant.

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

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

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

3.1.2 The two independent growing cycles should be in the form of two separate plantings.

3.1.3 The testing of a variety may be conducted when the competent authority 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”.

3.3 Conditions for Conducting the Examination

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.3.2 The optimum stage of development for the assessment of each characteristic is indicated by a number in the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 300 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.

3.4.3 The assessment of the characteristic "plant growth type" should be carried out on at least 30 plants.

3.5 Additional Tests

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 Number of Plants or 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 of plants 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 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. color 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 these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 These Test Guidelines have been developed for the examination of self-pollinated varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

4.2.3 For the assessment of uniformity of self-pollinated varieties, 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.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be 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 maturity (characteristic 3)
(b) Plant: color of hairs on stem (characteristic 6)
(c) Flower: color (characteristic 12)
(d) Seed: color of hilum (characteristic 19)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

6.2.1 States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), 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

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

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

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

6.5 Legend

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 2	**3 4**	**5 6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

5 (+) See Explanations on the Table of Characteristics in Chapter 8.1

6 Not applicable

7 Growth stage key See Explanations on the Table of Characteristics in Chapter 8

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	**QN VG**		**10**			
	Hypocotyl: intensity of anthocyanin coloration					
	absent or very weak				Castetis, Davis, Oac Erin	1
	weak				Córdoba, Es Mentor, Essex, RGT Shouna	2
	medium					3
	strong					4
	very strong					5
2.	**QN MG**	**(+)**	**61**			
	Plant: time of beginning of flowering					
	very early				Adsoy, Carla, Paradis, Sito, Sultana, Trump	1
	very early to early				Arcade, Es Gladiator, Essor, Labrador, RGT Speeda, Sigalia	2
	early				Canton, Imari, Queen, Safrana, Sphera	3
	early to medium				Alaric, Ecudor, Kador, Niva, Steara	4
	medium				Williams	5
	medium to late					6
	late					7
	late to very late					8
	very late					9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
3.	**(*)**	**QN MG**	**(+)**	**89**			
		Time of maturity					
		Too extreme short (000)				Adsoy, Laulema, Sultana	1
		Extremly short (00)				Es Mentor, Sigalia	2
		Extremly short to Very short (0)				Es Gladiator, RGT Speeda	3
		Very short (I)				Goriziana, Isidor, RGT Sinfonía, Steara	4
		Short (II)				Ayelen 22, Blancas, Ecudor, Mitsuko	5
		Short to Medium (III)				Don Mario 3700	6
		Medium (IV)				CH 4308 RG	7
		Medium to Late (V)				Champaquí 5.7, Don Mario 5.2, Nidera A5209 RG	8
		Late (VI)				Don Mario 6.2I	9
		Very late (VII)				A 7118 RG, Don Mario 7.0I, RA 728, RA 732	10
		Late to Extremly late (VIII)				Nidera A 8087 RG	11
		Extremly late (IX)				A 9000RG	12
		Too extreme late (X)					13
4.	**(*)**	**QN VS**	**(+)**	**66-89**			
		Plant: growth type					
		determinate					1
		semi determinate				Es Mentor	2
		semi determinate to indeterminate				Isidor, SG Eider, Sigalia, Solena	3
		indeterminate				RGT Shouna	4
5.		**QN VG**	**(+)**	**66 80**			
		Plant: attitude of branches					
		erect				Sultana	1
		erect to semi erect				RGT Shouna	2
		semi erect					3
		semi erect to horizontal				Solena	4
		horizontal					5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	**(*)**	**PQ VG**	**(+)**	**65-85**			
		Plant: color of hairs on stem					
		light brown				Sirelia	1
		dark brown				Es Mentor	2
		grey				Es Gladiator, Oac Erin, Protéix	3
7.		**QN MS/VG**		**85**			
		Plant: height					
		short				Carla, Paradis, Spot	3
		short to medium				Essor, Trump	4
		medium				Alaric, Chandor, Sultana	5
		medium to tall				Es Mentor, Kador	6
		tall				RGT Shouna, Sigalia, Tirol, Toreador	7
8.		**QN VG**		**65**			
		Leaf: blistering					
		absent or very weak				Arpège, Bayou, Chandor	1
		weak				Kador, Quito	3
		medium				Imari, Paoki	5
		strong				Matador	7
		very strong					9
9.		**PQ VG**		**65**			
		Leaf: shape of the lateral leaflet					
		ovate				Es Gladiator, RGT Speeda	1
		trullate				Aldana, Sponsor	2
		lanceolate				Astafor, Crina F, Opaline	3
		elliptic				Córdoba, Es Mentor, RGT Shouna	4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10.		**QN VG**		**65**			
		Leaf: size of lateral leaflet					
		small				Arcade, Baron, Labrador, Trump	3
		medium				Alaric, Kushiro, Talon	5
		large				Williams	7
11.		**QN VG**		**65**			
		Leaf: intensity of green color					
		light				Arcade, Chandor, Junior	3
		medium				Alaric, Apache, Imari	5
		dark				Ardir, Cresir, Jedor, Spot	7
12.	**(*)**	**QL VG**		**66**			
		Flower: color					
		white				Blancas, Castetis, Don Mario 5.9I, Oac Erin	1
		violet				Córdoba, Es Mentor, RGT Shouna, SP 7X0	2
13.		**PQ VG**	**(+)**	**85**			
		Pod: color					
		light brown				A 3901 RG, Don Mario 7.0I, Geumjeongkong-2ho, NS 4009	1
		medium brown					2
		dark brown					3
		yellow brown					4
		ligth grey					5
		dark grey					6
		black				ALM 4650, AS 4402, Ayelen 22, Don Mario 6.2I	7
14.		**QN VG**		**89**			
		Seed: size					
		small				Alba, Astafor, Aurelia, Flusk GT 512, Oac Erin, Protina	3
		medium				Coraline, Ecudor, Goldor, Queen, Sigalia	5
		large				Cervin, Clédor, Isidor, Mondor, Obelix, Safrana	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15.	**PQ VG**		**89**			
	Seed: shape in longitudinal section					
	circular				Astafor, Ecudor, Es Gladiator, Es Mentor	1
	narrow oblate				RGT Shouna, Sigalia	2
	medium oblate				Gallec, Naya, Obelix, SY Elliot, SY Livius	3
	board oblate					4
16.	**PQ VG**	**(+)**	**89**			
	Seed: color of testa					
	green					1
	yellow green					2
	yellow				Córdoba, Es Mentor, Paoki, Queen, RGT Shouna	3
	red					4
	light brown					5
	medium brown					6
	dark brown					7
	purple					8
	black					9
17.	**QN VG**		**89**			
	Seed: glossiness					
	absent or weak				CH 4308 RG	1
	medium					2
	strong				RA 732	3
18.	**QL MG**	**(+)**	**89**			
	Seed: peroxidase reaction					
	absent				Bragg	1
	present				Hood, Hood 75	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19.	**(*)**	**PQ VG**		**89**			
		Seed: color of hilum					
		yellow				Es Mentor, Imari, Maple Arrow, Naya, Oac Erin, Talon	1
		light brown				Argenta, Astafor, Baron, Ecudor, Kingsoy, Opale, Santana	2
		dark brown				Aurélia, Fransoy 242, Léman, Solena, Sultana, Sunrise, Tourmaline	3
		grey				Annushka, Apache, Castetis, Major, RGT Stumpa, Spot	4
		black				Atlantic, Cantoya, Chandor, Isidor, Paoki, Queen, Sigalia	5
20.	**(*)**	**PQ VG**	**(+)**	**89**			
		Seed: imperfect hilum					
		absent					1
		imperfect yellow					2
		imperfect black				Choco, Folio, GI Hermine, Kador, Regir, Wells	3
21.		**QL VG**		**89**			
		Seed: color of hilum funicle					
		same as testa				Córdoba, Es Mentor, Queen, RGT Shouna	1
		different to testa				Amarok, Gieso, SY Livius	2

8.1 Explanations for individual characteristics

Ad. 2: Plant: time of beginning of flowering

Plant beginning to flower: Depending on the location, the stage of flowering is reaching when 10% (late sowing) or 50% of the plants show al least one open flower.

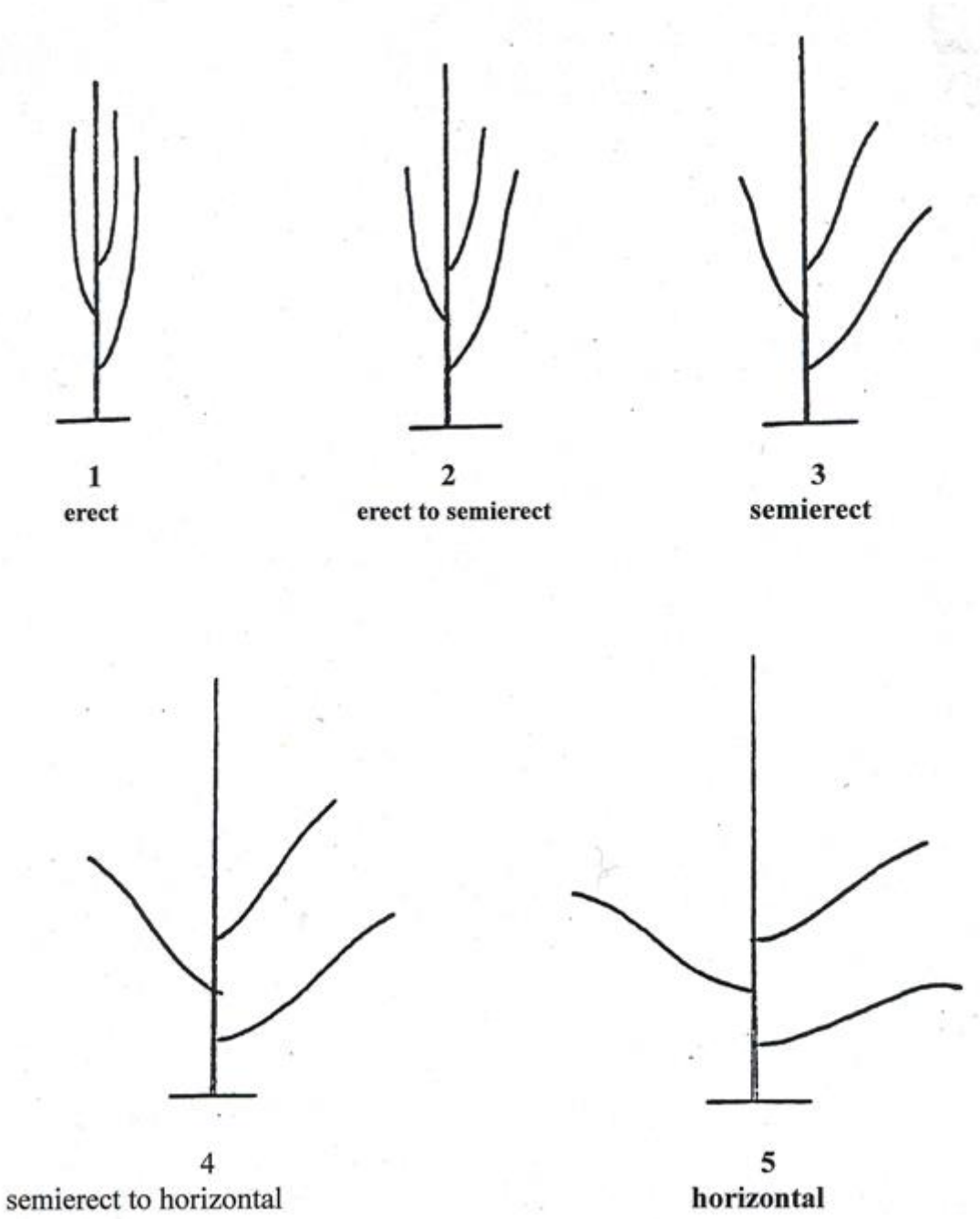
Ad. 3: Time of maturity

Full maturity (R8): Is reached when 95% of the pods of the plants have reached the maturity color and the grains less than 15% of humidity.

Ad. 4: Plant: growth type

Test design: this characteristic should preferably be evaluated in a special test with at least 2 replicates (preferably 3 or 4 replicates not more than 300 plants in total) of 30 plants each with approximately 9 cm between plants in the rows. Any edge effect should be avoided. - Plant material: the candidate and example varieties should be grown in groups according to their early flowering time: maturity (characteristic 15 or 16). - Observation: At the beginning of flowering (1 flower on any level of the main stem), the apex of the plant must be identified with a mark.
At maturity (free grains in the pod), the number of nodes between the brand and the top of the plant is counted. The average number by variety provides, in comparison with standard varieties, the state of expression of the characteristics.
In determinate cultivars: the terminal leaf is the same size as the lower leaves in R1, the main stem ends in a floral bud (the terminal cluster is long and with many flowers) and growth stops when the bud terminal flowers.
In indeterminated cultivars: the terminal leaf is smaller than the lower leaves in R1., The main stem ends in a vegetative bud, growth continues after flowering and the apical meristem remains vegetative and continues to differentiate nodes and leaves when flowers are being differentiated in the rest of the plant.
The semi-determined groups have intermediate characteristics with respect to the determined one, the semi-indeterminate one with respect to the indetermined one

Ad. 5: Plant: attitude of branches



Ad. 6: Plant: color of hairs on stem

Observation should be made on the middle third of the plant.

Ad. 13: Pod: color

Observation should be made on pods from the middle third of the plants, including pubescence. Observation should be made in bright daylight in comparison with other well-known varieties.

Ad. 16: Seed: color of testa

Observation should exclude hilum.

Ad. 18: Seed: peroxidase reaction

Seed: coloration due to peroxidase activity in seed coat

20 seeds per variety should be tested.

The seed coat of the seed should be removed carefully so that no piece of cotyledon remains. To facilitate this procedure, the seed should be placed in water for 2 hours.

The seed coat should be placed in a cell box or in tubes (one tube per seed) and 3 to 4 cm3 of 0,5% Guayacol or (other substance might be used as long as they yield the same result) solution should be added. The 0.5% Guayacol solution should be stored in the refrigerator for a period of not longer than 2 months. After having left it at room temperature for one day or more, it can no longer be used.

After 10 minutes waiting time, one drop of 0,1% H2O2 solution should be added.

The solution changes to dark red/brown color for a positive reaction or remains without color for a negative reaction. In order to check the 0,5% Guaycacol solution, it is advisable to include some seeds of a reference variety with a positive reaction. The recording of this reaction must be done not longer than 60 seconds after the H2O2 was added. It is very important that the observation must not be done longer than 60 seconds because it could lead to wrong results.

The cell box or the tubes could be softly shaken for a better reaction. For a better recording of the observation, the tubes or the cell box should be placed over a white surface.

Other standard methods might be used as long as they yield the same results.

Ad. 20: Seed: imperfect hilum

Imperfect black: dark center, surrounded by a brown halo
Imperfect yellow: dark yellow center, surrounded by light yellow halo

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

CODE 2- and 3 digit		DESCRIPTION
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 till ....
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 till ....
-	119	Trifoliolate leaf on the 19th node unfolded [1]
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 till ...
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 till ...
-	229	9th side shoot of 2nd order visible
-	2N1	First side shoot of Nth order visible
-	2N9	9th side shoot of Nth order visible

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

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)

[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.

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

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]
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]

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

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]

Principal growth stage 8: Ripening of fruits and seeds

1. 800 First pod ripe, beans final color, dry and hard
2. 801 Beginning of ripening; about 10% of pods are ripe, beans final color, dry and hard.[3] Beginning of pod and seed ripening [4]
3. 802 About 20% of pods are ripe; beans final color, dry and hard [3]
4. 803 About 30% of pods are ripe; beans final color, dry and hard [3]
5. 804 About 40% of pods are ripe; beans final color, dry and hard [3]
6. 805 Advanced ripening; about 50% of pods are ripe; beans final color, dry and hard.[3] Main period of pod and seed ripening [4]
7. 806 About 60% of pods are ripe; beans final color, dry and hard [3]
8. 807 About 70% of pods are ripe; beans final color, dry and hard [3]
9. 808 About 80% of pods are ripe; beans final color, dry and hard [3]
10. 809 Full maturity: approximately all pods are ripe; beans final color, dry and hard (= Harvest maturity) [3]

Majority of pods are ripe; beans final color, dry and hard [4]

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

90	900	-
91	901	About 10% of leaves discolored or fallen
92	902	About 20% of leaves discolored or fallen
93	903	About 30% of leaves discolored or fallen
94	904	About 40% of leaves discolored or fallen
95	905	About 50% of leaves discolored or fallen
96	906	About 60% of leaves discolored or fallen
97	907	Above ground parts of plants dead
98	908	-
99	909	Harvested product (seeds)

9. Literature

Taylor, B.H, Caviness C.E, MAY - JUNE 1982, Hilum color variation in soybean seed with Imperfect Black genotype, Crop Science Vol. 22.
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Buzzell and Buttery, 1969: Inheritance of peroxidase activity on soybean seed coats. Crop Sci., 9, 387-388.
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J.R Wilcox - 1987. Soybeans: Improvement, Production, and Uses.
Objective Description of variety. Soybean (Glycine max (L.) Merr.). US Department of Agriculture Agricultural Marketing Service Science and Technology Plant Variety Protection. Beltsville, MD.
Taxonomy: Usda Natural Resources Conservation Service, Plants database, clasification (https://plants.usda.gov/java/ClassificationServlet?source=display&classid=GLMA4).

10. Technical Questionnaire

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

	Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1	Botanical name	*Glycine max* (L.) Merr.
1.2	Common name	Soya Bean, Soybean

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]

(please state parent variety)

(……..……..…) x (……..……..…)

female parent male parent

4.1.2 Other [ ]
(Please provide details)

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]
(b) Other (please provide details) [ ]

4.2.2 Other [ ]
(Please provide details)

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

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (3)	**Time of maturity**		
	Too extreme short (000)	Adsoy, Laulema, Sultana	1 [ ]
	Extremly short (00)	Es Mentor, Sigalia	2 [ ]
	Extremly short to Very short (0)	Es Gladiator, RGT Speeda	3 [ ]
	Very short (I)	Goriziana, Isidor, RGT Sinfonía, Steara	4 [ ]
	Short (II)	Ayelen 22, Blancas, Ecudor, Mitsuko	5 [ ]
	Short to Medium (III)	Don Mario 3700	6 [ ]
	Medium (IV)	CH 4308 RG	7 [ ]
	Medium to Late (V)	Champaquí 5.7, Don Mario 5.2, Nidera A5209 RG	8 [ ]
	Late (VI)	Don Mario 6.2I	9 [ ]
	Very late (VII)	A 7118 RG, Don Mario 7.0I, RA 728, RA 732	10 [ ]
	Late to Extremly late (VIII)	Nidera A 8087 RG	11 [ ]
	Extremly late (IX)	A 9000RG	12 [ ]
	Too extreme late (X)		13 [ ]
5.2 (4)	**Plant: growth type**		
	determinate		1 [ ]
	semi determinate	Es Mentor	2 [ ]
	semi determinate to indeterminate	Isidor, SG Eider, Sigalia, Solena	3 [ ]
	indeterminate	RGT Shouna	4 [ ]
5.3 (6)	**Plant: color of hairs on stem**		
	light brown	Sirelia	1 [ ]
	dark brown	Es Mentor	2 [ ]
	grey	Es Gladiator, Oac Erin, Protéix	3 [ ]
5.4 (12)	**Flower: color**		
	white	Blancas, Castetis, Don Mario 5.9I, Oac Erin	1 [ ]
	violet	Córdoba, Es Mentor, RGT Shouna, SP 7X0	2 [ ]

	Characteristics	Example Varieties	Note
5.5 (17)	**Seed: glossiness**		
	absent or weak	CH 4308 RG	1 [ ]
	medium		2 [ ]
	strong	RA 732	3 [ ]
5.6 (18)	**Seed: peroxidase reaction**		
	absent	Bragg	1 [ ]
	present	Hood, Hood 75	9 [ ]
5.7 (19)	**Seed: color of hilum**		
	yellow	Es Mentor, Imari, Maple Arrow, Naya, Oac Erin, Talon	1 [ ]
	light brown	Argenta, Astafor, Baron, Ecudor, Kingsoy, Opale, Santana	2 [ ]
	dark brown	Aurélia, Fransoy 242, Léman, Solena, Sultana, Sunrise, Tourmaline	3 [ ]
	grey	Annushka, Apache, Castetis, Major, RGT Stumpa, Spot	4 [ ]
	black	Atlantic, Cantoya, Chandor, Isidor, Paoki, Queen, Sigalia	5 [ ]

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

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your	Characteristic(s) in which your candidate variety differs	Describe the expression of the characteristic(s) for the	Describe the expression of the characteristic(s) for **your**
Example	*Hypocotyl: anthocyanin coloration*	*absent or very weak*	*medium*

Comments:

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

[#]7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

9. Information on plant material to be examined or submitted for examination

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

Please provide details for where you have indicated “yes”.

.....

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

ANNEX

	Argentina	France		
Ch 1				
Hipocotyl: intesntiy of anthocyanin Coloration.				
1 absent o very weak	AGATA, INTA PARANA 661, PROT 12 FCA, K 4017, K6000, K 6501, K4001, K6970			
2 weak				
3 medium				
4 strong	INTA ALIM5.09, INTA PARANA 629			
5 very strong	K3717, K4616, K5102, K7102			
Ch 2				
Plant: time of beginning of flowering				
1 very early				
2 very early to early				
3 early				
4 early to medium				
5 medium				
6 medium to late				
7 late				
8 late to very late				
9 very late				
Ch 3				
Time of maturity				
000				
00				
0				
1				
2	NS 2632*			
3	DON MARIO 3810*, SY 3X5*, SP 3X1*, INTA PARANA 661, K3700, K3717, 3510B, E3782S			
4	DON MARIO 4210*, BIOCERES 4.51*, NS 4997*, K4001, K4017, K4616			
5	SY 5X1*, INTA PARANÁ 5500*, NS 5960*, AGATA, INTA ALIM5.09, INTA PARANA 629, K5102			
6	NS 6120 IPRO*, RA 655*, RA 659*, K6000, K6501, PROT 12 FCA			
7	SY COKER 7X3*, 7521 IPRO*, TUKUY*, K6970, K7102			
8	A 8000 RG*, 8473 RSF*, NIDERA A8900RG*, Famaillá 837, Famaillá 841			
9	A 9000 RG*, Famaillá 940, Menendé INTA			
10				
Ch 4				
Plant growth type				
1. determinate	A 5777 RG*, RA 538*, A 8000 RG*,	Genome,		

* classified as GMO in Argentina

	AGATA	Spot.		
2. semi determinate.	RA 625*. NS 6448*, RMO 75*, Inriville Federada Casilda INTA	Fiskbey V, Paradise.		
3. semi dterminate to indeterminate.				
4. indeterminate	A 4505 RG*, Don Mario 5.9I*, RA 728*, INTA ALIM5.09, INTA PARANA 629, INTA PARANA 661, K3700, K4001, K5102, K6970, K7102	Córdoba, Herta Pro, Sy Heliot.		
Ch 5				
Plant: attitude of branches.				
1. erect				
2erect to semi erect.				
3. semi erect.		Córdoba, Ecudor, ES Tenor, Rgt Symbala		
4. semi erect to horizontal.				
5. horizontal.				
Ch. 6				
Plant: colour hairs on the stem				
1 ligth brown	A 4505 RG*, ADM 4800*, DON MARIO 3700*, NS 4009*, K3717, K4616, K5102, PROT 12 FCA	Aurélia, ES Inventor, Elko, Rgt Sinema, Sy Eliot		
2 dark brown	A 3901 RG*, NIDERA A5209RG*, RA 728*, 45D115P, E3782S	Ecudor, Rgt Speeda, Sultana.		
3 grey	Ayelen 22*, AGATA, INTA ALIM5.09, INTA PARANA 629, K3700, K4001, K6000, K6501, K7102			
Ch 7				
Plant: height				
1 short				
3 short to médium				
5 medium		Friskeby V.		
7 medium to tall				
9 tall		Atlantic, ES Tibor, Herta pro, Merlin, Rgt Sforza.		
6		ES Minotor, Rgt Symbala, Sy Emily, Xena.		
7				

* classified as GMO in Argentina

Ch 8 Leaf: blistering				
1 absent o very weak				
2weak				
3 medium		Fiskeby, Laulema, Sigalia.		ES Gladiator, Isidor.
4 strong				
5 very strong		ES Advisor, Rgt Sinema. Violetta.		
Ch 9				
Leaf: shape of the lateral leaflet.				
Ovate	Conesa FA INTA, Rojas FA INTA			
Trullate	Cerrito FA INTA, Haydée FA INTA			
Lanceolate	Federada Casilda INTA	Rgt Straviata, ES Pallador		
Elliptic				
Ch. 10				
Leaf: Size of lateral leaflet.				
3 small		Abelina, Korus Laulema, Sultana, Sy Eliot, Viola		
5 medium				
7 large		Sigalia, Sirelia Ecudor, Mitsuko, Rgt Speeda.		
Ch. 11				
Leaf: intensity of green colour.				
3.light	Famaillá 940 INTA	Regina, Xena.	York	
5.medium	Rojas FA INTA, Conesa FA INTA	Laulema, Rgt Coraline, Málaga Sinfonia, Sultana.	Dare	.
7.dark	Haydée FA INTA	Sirelia, Nava.	Essex	
Ch. 13				
Pod: colour				
1.Light brown.	A 4505 RG*, NS 4009*, NIDERA A4412			

2. médium Brown.	Don Mario 7.0I*, NIDERA 4990 RG*, K5102, K6501, K7102	Herta Nava, Sultana Pro, Rgt Sforza, Sultana.		.
3.dark Brown.	A 3901 RG*	Ecudor		
4.yellow Brown.		Dekafast, Pr9m10, Violetta.		
5.light grey.				
6.dark grey.				
7.black.				
Ch 15				
Seed: shape in longuitudinal section				
1 circular	Federada I INTA			
2 narrow oblate				
3 medium oblate				
4 board oblate	Rojas FA INTA			
Ch 16				
Seed: colour of testa				
1 green				
2 yellow Green				
3 yellow	A 4505 RG*, INTA PARANÁ 5500*, BIOCERES 5.41*, AGATA, INTA ALIM5.09, INTA PARANA 629, INTA PARANA 661, K3700, K5102, K6000, K7102			
4 red				
5 ligth brown				
6 medium brown				
7 dark brown				
8 purple				
9 black				
Ch 17.				
Seed: glossiness				
1 absent or weak	AGATA, INTA ALIM5.09, INTA PARANA 629, K3700, K4001, K5102, K6501, K7102, PROT 12 FCA, 3510B, E3782S			
2 medium	K4616			
3 strong	INTA PARANA 661, K6000, K6970			
Ch 18				
Seed: peroxidase reaction				
1 absent	DON MARIO 3700*, INTA PARANÁ 5500*, INTA PARANA 629, INTA PARANA 661, K4001, K6000, K6970			
2 present	NS 4903*, SY 5X1*, K3700, K4017, K5102, K6501, K7102			
Ch 19				
Seed: colour of hilum				

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1.yelow	Don Mario 5.8*, INTA ALIM5.09, K3700, K6000, 3510B			
2.light Brown	RA 732*, AGATA, K4001			
3.dark Brown.	NK 48-00*, PROT 12 FCA			
4.grey.	Don Mario 5.2*, Atarita 570*, INTA PARANA 629			
5.black.	CH 4308 RG*, INTA PARANA 661, K3717, K4017, K4616, K5102, E3782S			
Ch 20				
Seed: imperfect hilum				
1.absent.				
2.imperfect yellow.		ES Director, Rgt Sphinxa.		
3.imperfect black.	NIDERA 8087 RG*, K7102			
Ch 21				
Seed: clour of hilum funicle				
1 same as testa				
2 different than testa		Fiskey V, Laulema.		

[End of document]

* classified as GMO in Argentina