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TG/88/7(proj.3)
ORIGINAL: English
DATE: 2017-05-04

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

COTTON

UPOV Code(s): GOSSY

Gossypium L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Spain
to be considered by the
Technical Working Party for Agricultural Crops
at its forty-sixth session, to be held in Hanover, Germany,
from 2017-06-19 to 2017-06-23

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Gossypium L.	Cotton	Cotonnier	Baumwolle	Algodón, Algodonero

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 *Gossypium* L.

2. Material Required

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

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

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

3 kg of delinted seed. In the case of hybrids an interspecific hybrid varieties, an additional 1 kg of seed of each component should be submitted, if requested.

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

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

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 Conditions for Conducting the Examination

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

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

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 500 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

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.

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 second 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. 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 For the assessment of uniformity of [indicated type of variety], a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 500 plants, 9 off-types are allowed.

4.2.3 The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction.

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) Plant: type of flowering (characteristic 1)
(b) Flower: color of petal (characteristic 2)
(c) Leaf: shape (characteristic 9)
(d) Leaf: presence of nectaries (characteristic 12)
(e) Boll: shape in longitudinal section (characteristic 18)
(f) Boll: time of opening (characteristic 24)

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 8.2

6 (a)-(c) See Explanations on the Table of Characteristics in Chapter 8.1

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.	**(*)**	**PQ**	**VG**	**(+)**		**61-65**			
		Plant: type of flowering							
		clustered						Armada, Alepo	1
		semi-clustered						Aphrica, DP411	2
		non-clustered						DP332, CS37	3
2.	**(*)**	**QL**	**VG**		**(a)**	**65**			
		Flower: color of petal		**Fleur: couleur du pétale**		**Blüte: Farbe des Blütenblatts**	**Flor: color del pétalo**		
		whitish						DP377, Select	1
		yellow						Armada, Intercott 670	2
3.		**QN**	**VG**		**(a)**	**65**			
		Flower: intensity of yellow color							
		light						Solera	3
		medium						Armada, Intercott 670	5
		dark							7
4.		**QN**	**VG**		**(a)**	**65**			
		Petal: intensity of spot							
		absent or very weak						ST405, Tosca	1
		weak							3
		medium						Intercott 701	5
		strong						Armada, Sevilla	7
		very strong						E1	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.	**(*)**	**PQ VG**	**(a)**	**65**			
		Flower: color of pollen					
		whitish				Solera, DP414	1
		medium yellow				Armada, Alepo	2
		dark yellow				Acalpi	3
6.		**QN VG/VS**	**(+) (a)**	**65**			
		Flower: position of stigma relative to anthers					
		clearly below				Carlota, CS37	1
		same level				DP377, DP411	2
		clearly above				Lanovia, ST478	3
7.		**QN VG**		**65-69**			
		Plant: density of foliage	**Plante : densité du feuillage**	**Pflanze: Dichte des Laubes**	**Planta: densidad del follaje**		
		sparse	faible	locker	escasa	Ourania	3
		medium	moyenne	mittel	media	Solera, E1	5
		dense	elevée	dicht	densa	Zeta 2	7
8.		**QN VG**	**(b)**	**65-69**			
		Leaf: intensity of green color					
		light				Corona	3
		medium				Aphrica, CT13	5
		dark				Armada, Lagiralda	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
9. (*)	**PQ VG**	**(+) (b)**	**65-69**			
	Leaf: shape	**Feuille: forme**	**Blatt: Form**	**Hoja: forma**		
	palmate				Solera, Alepo	1
	palmate to digitate				Intercott 195, Intercott 211	2
	digitate				Lacta, Roka	3
	lanceolate				LD Frego, DBB11 B2RF	4
10.	**QN VG**	**(+) (b)**	**65-69**			
	Leaf: size					
	small					3
	medium				DP377, Intercott 670	5
	large				Alepo, Lagiralda	7
11. (*)	**QN VG**	**(+) (b)**	**65-69**			
	Leaf: pubescense	**Feuille: pilosité**	**Blatt: Behaarung**	**Hoja: pubescencia**		
	absent or very weak				Claudia	1
	weak				Celia, DP466	3
	medium				Intercott 670, Flora	5
	strong				ST405, PRG9811	7
	very strong				Lanovia	9
12. (*)	**QL VG**	**(b)**	**65-69**			
	Leaf: presence of nectaries	**Feuille: présence de nectaires**	**Blatt: Vorhandensein von Nektarien**	**Hoja: presencia de nectarios**		
	absent				Guazuncho 3 INTA, DP 0935 B2R2	1
	present				DP396, ST488	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13.	**QN VG**	**(b)**	**65-79**			
	Stem: pubescence on upper part					
	absent or very weak				Alepo, Claudia	1
	weak				E1, Lydia	3
	medium				DP332, Fokion	5
	strong				Europa, ST478	7
	very strong					9
14.	**PQ VG**	**(+) (b)**	**65-79**			
	Stem: color					
	light green					1
	dark green				ST318, ST405	2
	light red				Solera, Alepo	3
	dark red					4
15.	**QN VG**	**(+)**	**71-75**			
	Bract: dentation					
	fine				E1, Intercott 701	3
	medium				Elsa, Intercott 670	5
	coarse				Roka, Prime1848	7
16.	**QN VG**		**71-75**			
	Bract: size					
	very small					1
	small				DP332, ST478	3
	medium				Solera, DP414	5
	large				E1, Alepo	7
	very large				Armada	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17.		**QN VG**		**71-75**			
		Boll: size	**Capsule : taille**	**Kapsel: Größe**	**Cápsula: tamaño**		
		very small					1
		small				Armada, Lanovia	3
		medium				Solera, E1	5
		large				Zeta 2	7
		very large				Intercott 701	9
18.	**(*)**	**PQ MS/VG**	**(+)**	**71-75**			
		Boll: shape in longitudinal section					
		circular				Prime1848, ST439	1
		narrow elliptic				ST478, DP399	2
		broad elliptic				Solera, Alepo	3
		ovate				Intercott 195, Intercott 211	4
19.		**QN VG**		**71-75**			
		Boll: pitting of surface					
		absent or very fine					1
		fine				Viky	3
		medium				Solera, DP414	5
		coarse				E1, Intercott 211	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.	**(*)**	**QN MS/VG**		**71-75**			
		Boll: length of peduncle					
		very short					1
		short				DP377, Solera	3
		medium				E1, Intercott 701	5
		long				Beky, Intercott 211	7
		very long				Armada	9
21.		**QN VG**	**(+)**	**71-75**			
		Boll: prominence of tip					
		weak				Carla	3
		medium				DP377, DP414	5
		strong				E1, Intercott 670	7
22.	**(*)**	**PQ VG**	**(+)**	**75-79**			
		Plant: shape	**Plante: forme**	**Pflanze: Form**	**Planta: forma**		
		cylindrical				Armada, Alepo	1
		conical	conique	kegelförmig	cónica	Fokion, Intercott 670	2
		globose				Solera, E1	3
23.	**(*)**	**QN MG/MS**		**79-89**			
		Plant: height	**Plante: hauteur**	**Pflanze: Höhe**	**Planta: altura**		
		very short	très courte	sehr niedrig	muy baja		1
		short	courte	niedrig	baja	Armada, DP419	3
		medium	moyenne	mittel	media	Solera, Alepo	5
		tall	haute	hoch	alta	Intercott 670, Intercott 701	7
		very tall	très haute	sehr hoch	muy alta	Tzortzina	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
24. (*)	**QN VG**	**(+)**	**80-81**			
	Boll: time of opening					
	very early					1
	early				ST318, ST402	3
	medium				Solera, Alepo	5
	late				DP332, Abaco	7
	very late				Vered 171	9
25.	**QN VG**		**85-89**			
	Boll: degree of opening					
	weak					3
	medium				Solera, Lagiralda	5
	strong				ST318, ST402	7
26.	**QN VG**		**99**			
	Seed: density of fuzz					
	absent or very sparse					1
	sparse				Lanovia, Sevilla	3
	medium				DP377, DP414	5
	dense				Acala sj-2	7
	very dense					9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27.	**PQ VG**		**99**			
	Seed: color of fuzz					
	white				Armada, Lagiralda	1
	light green				Solera, DP414	2
	light yellow					3
	light brown				Lanovia, Intercott 670	4
	grey				ST318, ST402	5
28.	**QN MG**	**(+)**	**99**			
	Seed: weight of 100 seeds					
	low				DP377, Solera	3
	medium				E1, Elsa	5
	high				Armada, Intercott 701	7
29.	**QN MG**	**(+)**	**99**			
	Boll: content of lint					
	very low				Europa	1
	low				Etna, Sevilla	3
	medium				Helena, Intercott 701	5
	high				ST318, ST405	7
	very high				Solera, DP414	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
30.	**(*)**	**QN** **MG**	**(c)**	**99**			
		Fiber: length					
		very short					1
		short					3
		medium				Solera, DP414	5
		long				DP332, Elsa	7
		very long				E1, Intercott 670	9
31.		**QN** **MG**	**(c)**	**99**			
		Fiber: strength					
		very weak					1
		weak					3
		medium				ST318, ST402	5
		strong				DP332, PRG9811	7
		very strong				Solera, Alepo	9
32.		**QN** **MG**	**(c)**	**99**			
		Fiber: elongation					
		very small				Celia, DP411	1
		small				Elsa, Fokion	3
		medium				Lanovia, Intercott 670	5
		large				Armada, Lagiralda	7
		very large				DP414, Etna	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33.		**QN MG**	**(c)**	**99**			
		Fiber: fineness					
		fine				Intercott 195, Intercott 701	3
		medium				E1, Lagiralda	5
		coarse				Solera, Alepo	7
34.		**QN MG**	**(c)**	**99**			
		Fiber: length uniformity					
		very low					1
		low					3
		medium				Lydia, Elina	5
		high				Alepo, Intercott 701	7
		very high				E1, Elsa	9
35.	**(*)**	**QL VG**		**99**			
		Fiber: color					
		white				Solera, Alepo	1
		not white					2

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

(a) Observations on the flower should be made on the first day of flowering in the morning.

(b) Observations on the leaf and on the stem should be made where leaves are fully extended. Color observations should be made early in the morning.

(c) These characteristics should be observed according to:

Standard Test Methods for Measurement of Cotton Fibres by High Volume Instruments (HVI) (Motion Control Fiber Information System). Designation D-4604-95

- Standard Test Methods for Measurement of Physical Properties of Cotton Fibers by High Volume Instruments (HVI). Designation D-5867-95
- Established by the American Society for Testing and Materials (ASTM)

8.2 Explanations for individual characteristics

Ad. 1: Plant: type of flowering

1
clustered

2
semi-clustered

3
non-clustered

Ad. 6: Flower: position of stigma relative to anthers

Observations shoud be made on the first flower of the lowest fruiting branch

1
clearly below

2
same level

3
clearly above

Ad. 9: Leaf: shape

1 palmate | 2 palmate to digitate | 3 digitate | 4 lanceolate

Ad. 10: Leaf: size

Observations should be made on the leaf from the fifth node from the top of the plant.

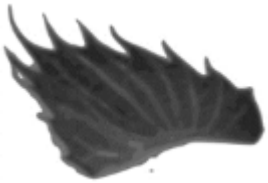
Ad. 11: Leaf: pubescense

To be observed on lower side

Ad. 14: Stem: color

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

Ad. 15: Bract: dentation

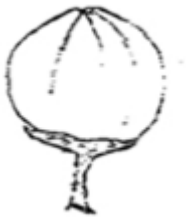


3
fine

5
medium

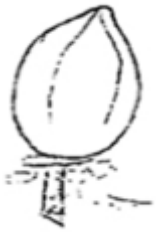
7
coarse

Ad. 18: Boll: shape in longitudinal section



1
circular

2
narrow elliptic



3
broad elliptic

4
ovate

Ad. 21: Boll: prominence of tip

3
weak

5
medium

7
strong

Ad. 22: Plant: shape

1
cylindrical

2
conical

3
globose

Ad. 24: Boll: time of opening

Time of opening is when 50% of the plants have at least one boll open.

Ad. 28: Seed: weight of 100 seeds

We take a sample of the seed obtained after being separated from the lint at the gin.

Ad. 29: Boll: content of lint

Content of lint in the boll is expressed in % excluding seeds.

8.3 *Growth Stages*

Growth stages

Decimal code for the growth stage

CODE	DESCRIPTION
Principal growth stage 0: Germination	
00	Dry seed
01	Beginning of seed imbibition
02	-
03	Seed imbibition complete
04	-
05	Radicle emerged from seed
06	Elongation of radicle
07	Hypocotyl with cotyledons breaking through seed coat
08	Hypocotyl with cotyledons growing towards soil surface
09	Emergence: hypocotyl with cotyledons breaking through soil surface ("crook stage")
Principal growth stage 1: Leaf development (Main shoot)	
10	Cotyledons completely unfolded
11	First true leaf unfolded[1]
12	2nd true leaf unfolded
13	3rd true leaf unfolded
1.	Stages continuous till ....
19	9 or more true leaves unfolded, no side shoots visible[2]
Principal growth stage 2: Formation of side shoots[3]	
20	-
21	First vegetative side shoot (2nd order) visible
22	2 vegetative side shoots (2nd order) visible
23	3 vegetative side shoot (2nd order) visible
2.	Stages continuous till ...
29	9 or more vegetative side shoots (2nd order) visible +

[1] Leaves are counted from the cotyledon node (= node 0)
[2] Side shoot development may occur earlier; if there is a vegetative side shoot continue with principal growth stage 2. If there is a reproductive side shoot (fruiting branch) continue with the principal growth stage 5
[3] Vegetative side shoots are counted from the cotyledon node

CODE	DESCRIPTION
Principal growth stage 3: Main stem elongation (Crop cover)	
30	-
31	Beginning of crop cover: 10% of plants meet between rows
32	20% of plants meet between rows
33	30% of plants meet between rows
34	40% of plants meet between rows
35	50% of plants meet between rows
36	60% of plants meet between rows
37	70% of plants meet between rows
38	80% of plants meet between rows
39	Canopy closure: 90% of the plants meet between rows
Principal growth stage 4: -----	
Principal growth stage 5: Inflorescence emergence (Main shoot)	
50	-
51	First flower buds detectable ("pin-head square")[4]
52	First flower buds visible ("match-head square")
53	-
54	-
55	Floral buds distinctly enlarged
56	-
57	-
58	-
59	Petals visible; flower buds still closed

[4] "pin-head square" or "match-head square" is the first square which forms at the first fruiting position of the first fruiting branch

CODE	DESCRIPTION
Principal growth stage 6: Flowering	
60	First flowers opened (sporadically within population)
61	Beginning of flowering ("Early bloom"): 5-6 blooms / 25 ft of row (=5-6 blooms / 7.5 meter of row)
62	-
63	-
64	-
65	Full flowering: ("Mid bloom"): 11 and more blooms / 25 ft of row = 11 and more blooms / 7.5 meter of row
66	-
67	Flowering finishing: majority of flowers faded ("Late bloom")
68	-
69	End of flowering -
Principal growth stage 7: Development of fruits and seeds	
70	-
71	About 10% of boils have attained their final size -
72	About 20% of boils have attained their final size
73	About 30% of boils have attained their final size
74	About 40% of boils have attained their final size
75	About 50% of boils have attained their final size
76	About 60% of boils have attained their final size
77	About 70% of boils have attained their final size
78	About 80% of boils have attained their final size
79	About 90% of boils have attained their final size
Principal growth stage 8: Ripening of fruits and seeds	
80	First open boils on the first fruiting branches
81	Beginning of boil opening: about 10% of boils open. Nodes Above White Flower (NAWF)-
82	About 20% of boils open
83	About 30% of boils open. Nodes Above Cracked Boil (NACB)-
84	About 40% of boils open
85	About 50% of boils open
86	About 60% of boils open -
87	About 70% of boils open
88	About 80% of boils open
89	About 90% of boils open

CODE	DESCRIPTION
Principal growth stage 9: Senescence	
90	-
91	About 10% of leaves discoloured or fallen
92	About 20% of leaves discoloured or fallen
93	About 30% of leaves discoloured or fallen
94	About 40% of leaves discoloured or fallen
95	About 50% of leaves discoloured or fallen
96	About 60% of leaves discoloured or fallen
97	Above ground parts of plants dead; plant dormant
98	-
99	Harvested product (boils and seeds)

9. Literature

Methods for Measurement of Cotton Fibres by High Volume Instruments (HVI).

American Society for Testing and Materials (ASTM) (1995), Standard Test Methods for Measurement of Physical Properties of Cotton Fibers by High Volume Instruments (Designation: D5867-95).

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Manual de identificación de Variedades Algodón, Ministerio de Agricultura, Pesca y Alimentación, Secretaria General de Agricultura y Alimentación, 1999, ES.

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

Munger p., H Bleiholder, H. Hess, R. Stauss, T. van den Boom and E. Weber. 1998. Phenological growth stages of the coton plant (Gossypium hirsutum l.) codification and description according to the BBCH scale. J. Agronomy & Crop Scince. 180: 143-149.

"Cotton. Origin, History, Tecnology and Production. "Ed C.W. Smith and J.T. Cothren. Wiley Series in Crop Science. John Wiley & Sons, Inc.. 1999. US.

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	*Gossypium* L.
1.2	Common name	Cotton

2. Applicant

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]

(please state parent varieties)

(……..……..…) x (……..……..…)

female parent male parent

(b) partially known cross [ ]

(please state known parent variety(ies))

(……..……..…) x (……..……..…)

female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]

(please state parent variety)

4.1.3 Discovery and development [ ]

(please state where and when discovered and how developed)

4.1.4 Other [ ]

(please provide details)

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) Cross-pollination [ ]
(i) Population [ ]
(c) Hybrid [ ]
(d) 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 (1)	**Plant: type of flowering**		
	clustered	Alepo, Armada	1 [ ]
	semi-clustered	Aphrica, DP411	2 [ ]
	non-clustered	CS37, DP332	3 [ ]
5.2 (2)	**Flower: color of petal**		
	whitish	DP377, Select	1 [ ]
	yellow	Armada, Intercott 670	2 [ ]
5.3 (5)	**Flower: color of pollen**		
	whitish	DP414, Solera	1 [ ]
	medium yellow	Alepo, Armada	2 [ ]
	dark yellow	Acalpi	3 [ ]
5.4 (9)	**Leaf: shape**		
	palmate	Alepo, Solera	1 [ ]
	palmate to digitate	Intercott 195, Intercott 211	2 [ ]
	digitate	Lacta, Roka	3 [ ]
	lanceolate	DBB11 B2RF, LD Frego	4 [ ]
5.5 (11)	**Leaf: pubescense**		
	absent or very weak	Claudia	1 [ ]
	weak	Celia, DP466	3 [ ]
	medium	Flora, Intercott 670	5 [ ]
	strong	PRG9811, ST405	7 [ ]
	very strong	Lanovia	9 [ ]
5.6 (12)	**Leaf: presence of nectaries**		
	absent	DP 0935 B2R2, Guazuncho 3 INTA	1 [ ]
	present	DP396, ST488	9 [ ]

	Characteristics	Example Varieties	Note
5.7 (18)	**Boll: shape in longitudinal section**		
	circular	Prime1848, ST439	1 [ ]
	narrow elliptic	DP399, ST478	2 [ ]
	broad elliptic	Alepo, Solera	3 [ ]
	ovate	Intercott 195, Intercott 211	4 [ ]
5.8 (20)	**Boll: length of peduncle**		
	very short		1 [ ]
	short	DP377, Solera	3 [ ]
	medium	E1, Intercott 701	5 [ ]
	long	Beky, Intercott 211	7 [ ]
	very long	Armada	9 [ ]
5.9 (22)	**Plant: shape**		
	cylindrical	Alepo, Armada	1 [ ]
	conical	Fokion, Intercott 670	2 [ ]
	globose	E1, Solera	3 [ ]
5.10 (23)	**Plant: height**		
	very short		1 [ ]
	short	Armada, DP419	3 [ ]
	medium	Alepo, Solera	5 [ ]
	tall	Intercott 670, Intercott 701	7 [ ]
	very tall	Tzortzina	9 [ ]
5.11 (24)	**Boll: time of opening**		
	very early		1 [ ]
	early	ST318, ST402	3 [ ]
	medium	Alepo, Solera	5 [ ]
	late	Abaco, DP332	7 [ ]
	very late	Vered 171	9 [ ]
5.12 (30)	**Fiber: length**		
	very short		1 [ ]
	short		3 [ ]
	medium	DP414, Solera	5 [ ]
	long	DP332, Elsa	7 [ ]
	very long	E1, Intercott 670	9 [ ]
5.13 (35)	**Fiber: color**		
	white	Alepo, Solera	1 [ ]
	not white		2 [ ]

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

6. Similar varieties and differences from these varieties

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

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Boll: time of opening*	*early*	*medium to late*

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

[End of document]