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## INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

### OPIUM/SEED POPPY

UPOV Code: PAPAV\_SOM

*Papaver somniferum* L.

### GUIDELINES

#### FOR THE CONDUCT OF TESTS

#### FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:\*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Papaver somniferum</i> L.	Opium/Seed Poppy	Œillette, Pavot	Mohn, Schlafmohn	Adormidera, Amapola, Opio

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](http://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 *Papaver somniferum* L. In the case of ornamental varieties, in particular, it may be necessary to use additional characteristics or additional states of expression to those included in the Table of Characteristics in order to examine Distinctness, Uniformity and Stability.

## 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:

100g of seed.

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 8.1.

### 3.4 *Test Design*

Each test should be designed to result in a total of at least 200 plants, which should be divided between at least 2 replicates.

### 3.5 *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 / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 20 plants or parts taken from each of 20 plants and any other observations made on all plants in the test, disregarding any off-type plants.

###### 4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the 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, a population standard of 2% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 200 plants, 7 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 or plant 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) Leaf: white spots (characteristic 2)
- (b) Petal: color (characteristic 10)
- (c) Petal: marking (characteristic 11)
- (d) Capsule: shape in longitudinal section (characteristic 18)
- (e) Capsule: dehiscence (characteristic 23)
- (f) Seed: color (characteristic 27)
- (g) Capsule: morphine content (characteristic 29)

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*

- (\*) Asterisk characteristic – see Chapter 6.1.2
- QL Qualitative characteristic – see Chapter 6.3
- QN Quantitative characteristic – see Chapter 6.3
- PQ Pseudo-qualitative characteristic – see Chapter 6.3
- MG, MS, VG, VS – see Chapter 4.1.5
- (a)-(e) See Explanations on the Table of Characteristics in Chapter 8.1
- (+) See Explanations on the Table of Characteristics in Chapter 8.2.

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>1. (*)</b>	<b>VG Leaf: hairiness</b>	<b>Feuille : pilosité</b>	<b>Blatt: Behaarung</b>	<b>Hoja: vellosidad</b>		
<b>QL (a)</b>	absent	absente	fehlend	ausente	Korona, Morwin, Rubin, Zeno 2002	1
	present	présente	vorhanden	presente	Major, Opal, Sokol	9
<b>2. (*) (+)</b>	<b>VG Leaf: white spots</b>	<b>Feuille : taches blanches</b>	<b>Blatt: weiße Flecken</b>	<b>Hoja: manchas blancas</b>		
<b>QL (a)</b>	absent	absentes	fehlend	ausentes	Botond, Buddha, Major	1
	present	présentes	vorhanden	presentes	Kozmosz, Orel, Racek, Sokol	9
<b>3. (+)</b>	<b>VG Leaf: color</b>	<b>Feuille : couleur</b>	<b>Blatt: Farbe</b>	<b>Hoja: color</b>		
<b>PQ (a)</b>	yellowish green	vert jaunâtre	gelblich grün	verde amarillento		1
	green	verte	grün	verde	Buddha, Zeno Morphex	2
	bluish green	vert bleuâtre	bläulich grün	verde azulado	Leila, Morwin, Zeno 2002	3
<b>4. (+)</b>	<b>VG Leaf: waxiness</b>	<b>Feuille : glaucescence</b>	<b>Blatt: Bereifung</b>	<b>Hoja: cerosidad</b>		
<b>QN (a)</b>	weak	faible	gering	débil	Zeno Morphex	1
	medium	moyenne	mittel	media	Morwin	2
	strong	forte	stark	fuerte	Kozmosz	3
<b>5. (+)</b>	<b>VG Leaf: depth of incisions of margin</b>	<b>Feuille : profondeur des incisions du bord</b>	<b>Blatt: Tiefe der Randeinschnitte</b>	<b>Hoja: profundidad de las incisiones del borde</b>		
<b>QN (a)</b>	absent or shallow	absents ou peu profonds	fehlend oder flach	ausente o superficial	Korona, Mieszko, Morwin	1
	medium	moyens	mittel	medio	Aristo, Major, Opal, Zeno Morphex	2
	deep	profonds	tief	profundo	Agat, Kozmosz, Malsar	3
<b>6. (+)</b>	<b>VG/MS Main stem: length</b>	<b>Tige principale : longueur</b>	<b>Hauptstängel: Länge</b>	<b>Tallo principal: longitud</b>		
<b>QN (e)</b>	short	courte	kurz	corto	Minoán, Tebona	3
	medium	moyenne	mittel	medio	Postomi	5
	long	longue	lang	largo	Botond, Lazur, Major, Redy	7
<b>7. (*) (+)</b>	<b>VG Stem: anthocyanin coloration</b>	<b>Tige : pigmentation anthocyanique</b>	<b>Stängel: Anthocyanfärbung</b>	<b>Tallo: pigmentación antociánica</b>		
<b>QL (d)</b>	absent	absente	fehlend	ausente	Kozmosz, Major, Orel, Sokol	1
	present	présente	vorhanden	presente	Botond, Korona, Lazur, Malsar, Redy	9



	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
<b>8.</b>	<b>VG</b>	<b>Stem: hairiness</b>	<b>Tige : pilosité</b>	<b>Stängel: Behaarung</b>	<b>Tallo: velloidad</b>		
<b>(+)</b>							
<b>QN</b>	<b>(c)</b>	absent or weak	nulle ou très faible	fehlend oder sehr gering	ausente o débil	Botond, Lazur, Morwin, Zeno 2002	1
		medium	moyenne	mittel	media	Buddha, Postomi, Sokol	2
		strong	forte	stark	fuerte	Agat, Edel-Weiss, Edel-Rot, Orel, Racek	3
<b>9.</b>	<b>VG</b>	<b>Flower bud: anthocyanin coloration</b>	<b>Bourgeon floral : pigmentation anthocyanique</b>	<b>Blütenknospen: Anthocyanfärbung</b>	<b>Botón floral: pigmentación antociánica</b>		
<b>(*)</b>							
<b>(+)</b>							
<b>PQ</b>	<b>(b)</b>	absent	absente	fehlend	ausente	Buddha	1
		in ring at base only	anneau autour de la base uniquement	nur Ring an der Basis	anillo en la base solamente	Botond	2
		in ring at base and on bud	anneau autour de la base et du bourgeon	an Knospe und Ring an Basis	anillo en la base y en el botón	Minoán	3
<b>10.</b>	<b>VG</b>	<b>Petal: color</b>	<b>Pétale : couleur</b>	<b>Blütenblatt: Farbe</b>	<b>Pétalo: color</b>		
<b>(*)</b>							
<b>PQ</b>	<b>(c)</b>	white	blanc	weiß	blanco	Botond, Korona, Major, Sokol	1
		light pink	rose clair	hellrosa	rosa claro	Agat	2
		medium pink	rose moyen	mittelrosa	rosa medio	Albín, Rosemarie, Rubin	3
		dark pink	rose foncé	dunkelrosa	rosa oscuro	Edel-Rot	4
		red	rouge	rot	rojo	Danish Flag	5
		light violet	violet clair	hellviolett	violeta claro	Kozmosz	6
		medium violet	violet moyen	mittelviolett	violeta medio	Leila	7
		dark violet	violet foncé	dunkelviolett	violeta oscuro	Zeno 2002	8
<b>11.</b>	<b>VG</b>	<b>Petal: marking</b>	<b>Pétale : ornementation</b>	<b>Blütenblatt: Zeichnung</b>	<b>Pétalo: mancha</b>		
<b>(*)</b>							
<b>(+)</b>							
<b>PQ</b>	<b>(c)</b>	none	aucune	fehlend	ninguna	TMO1, Afyon 95, Ofis 96	1
		blotch	tache	Fleck	mancha	Botond, Malsar, Rosemarie, Sokol	2
		band	en bande	Streifen	en banda		3
		radial stripes	stries rayonnantes	radiale Streifen	franjás radiales		4
<b>12.</b>	<b>VG</b>	<b>Petal: color of marking</b>	<b>Pétale : couleur de l'ornementation</b>	<b>Blütenblatt: Farbe der Zeichnung</b>	<b>Pétalo: color de la mancha</b>		
<b>(*)</b>							
<b>PQ</b>	<b>(c)</b>	white	blanche	weiß	blanco	Danish Flag	1
		red	rouge	rot	rojo		2
		light violet	violet clair	hellviolett	violeta claro	KP Albakomp, Mieszkoi, Rubin	3
		medium violet	violet moyen	mittelviolett	violeta medio	Lazur, Morwin	4
		dark violet	violet foncé	dunkelviolett	violeta oscuro	Gerlach, Major, Leila, Zeno 2002	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
<b>13. (+)</b>	<b>VG</b>	<b>Petal: extension of marking from base</b>	<b>Pétale : extension de l'ornementation depuis la base</b>	<b>Blütenblatt: Ausdehnung der Zeichnung von der Basis</b>	<b>Pétalo: extensión de la mancha de la base</b>		
<b>QN</b>	<b>(c)</b>	below widest part	en dessous de la partie la plus large	unter breitestem Teil	por debajo de la parte más ancha	Rubin	1
		up to widest point	jusqu'au point le plus large	bis zum breitesten Punkt	hasta el punto más ancho	Florian, Zeno	2
		above widest part	au-dessus de la partie la plus large	über breitestem Teil	por encima de la parte más ancha	Leila	3
<b>14. (*) (+)</b>	<b>VG</b>	<b>Petal: incisions</b>	<b>Pétale : incisions</b>	<b>Blütenblatt: Einschnitte</b>	<b>Pétalo: incisiones</b>		
<b>QL</b>	<b>(c)</b>	absent	absentes	fehlend	ausentes	Agat, Botond, Korona, Major	1
		present	présentes	vorhanden	presentes	Danish Flag	9
<b>15. (*)</b>	<b>VG</b>	<b>Filament: color</b>	<b>Filament : couleur</b>	<b>Staubfaden: Farbe</b>	<b>Filamento: color</b>		
<b>PQ</b>	<b>(c)</b>	white	blanc	weiß	blanco	Botond, Korona	1
		light violet	violet clair	hellviolett	violeta claro		2
		dark violet	violet foncé	dunkelviolett	violeta oscuro	Zeno 2002	3
<b>16.</b>	<b>VG</b>	<b>Capsule: waxiness</b>	<b>Capsule : glaucescence</b>	<b>Kapsel: Bereifung</b>	<b>Cápsula: cerosidad</b>		
<b>QN</b>	<b>(d)</b>	absent or weak	absente ou très faible	fehlend oder sehr gering	ausente o débil	Gerlach, Opal	1
		medium	moyenne	mittel	media	Edel-Rot, Edel-Weiss	2
		strong	forte	stark	fuerte	Botond, Morwin, Kozmosz, Zeno 2002	3
<b>17.</b>	<b>VG</b>	<b>Capsule: anthocyanin coloration</b>	<b>Capsule : pigmentation anthocyanique</b>	<b>Kapsel: Anthocyanfärbung</b>	<b>Cápsula: pigmentación antociánica</b>		
<b>QL</b>	<b>(d)</b>	absent	absente	fehlend	ausente	Botond	1
		present	présente	vorhanden	presente	Minoán	9
<b>18. (*) (+)</b>	<b>VG</b>	<b>Capsule: shape in longitudinal section</b>	<b>Capsule : forme en section longitudinale</b>	<b>Kapsel: Form im Längsschnitt</b>	<b>Cápsula: forma en sección longitudinal</b>		
<b>PQ</b>	<b>(e)</b>	ovate	ovale	eiförmig	oval	Major, Opal	1
		oblate	aplatie	breitrund	oblata	Botond	2
		cylindrical	cylindrique	zylindrisch	cilíndrica	Kék Gemoná, Korona	3
		round	circulaire	kreisförmig	circular	Postomi	4
		elliptic	elliptique	elliptisch	elíptica	Minoán	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>19. VG (*) (+)</b>	<b>Capsule: shape of base</b>	<b>Capsule : forme de la base</b>	<b>Kapsel: Form der Basis</b>	<b>Cápsula: forma de la base</b>		
<b>PQ (e)</b>	pointed	pointue	spitz	puntiaguda	Agat, Minoán	1
	truncate	tronquée	flach	truncada	Albín, Morwin, Opal, Sokol	2
	depressed	déprimée	eingesenkt	deprimida	Botond, Edel-Rot, Korona, Lazur, Redy	3
<b>20. VG/MS (+)</b>	<b>Capsule: length</b>	<b>Capsule : longueur</b>	<b>Kapsel: Länge</b>	<b>Cápsula: longitud</b>		
<b>QN (e)</b>	short	courte	kurz	corta	Botond	3
	medium	moyenne	mittel	media	Bergam, Edel-Rot, Kék Duna, Lazur, Tebona	5
	long	longue	lang	larga		7
<b>21. VG/MS (+)</b>	<b>Capsule: diameter</b>	<b>Capsule : diamètre</b>	<b>Kapsel: Durchmesser</b>	<b>Cápsula: diámetro</b>		
<b>QN (e)</b>	small	petit	klein	pequeño	Minoán, Orfeus, Tebona	3
	medium	moyen	mittel	medio	Leila, Zeno Plus	5
	large	large	groß	grande		7
<b>22. VG (+)</b>	<b>Capsule: ribbing</b>	<b>Capsule : côtes</b>	<b>Kapsel: Rippung</b>	<b>Cápsula: acostillado</b>		
<b>QN (e)</b>	absent or shallow	nulles ou très faibles	fehlend oder sehr gering	ausente o débil	KP Albakomp	1
	medium	moyennes	mittel	medio	Bergam, Korona, Lazur, Morwin	2
	deep	fortes	stark	profundo	Gerlach, Zeno Plus	3
<b>23. VG (*) (+)</b>	<b>Capsule: dehiscence</b>	<b>Capsule : déhiscence</b>	<b>Kapsel: Dehiscenz</b>	<b>Cápsula: dehiscencia</b>		
<b>QL (e)</b>	indehiscent	indéhiscence	indehiszent	indehiscence	Botond, Kék Gemona, Major	1
	dehiscent	déhiscence	dehiszent	dehiscence	Edel-Rot, Edel-Weiss	2
<b>24. VG (*) (+)</b>	<b>Stigmatic disc: shape</b>	<b>Disque stigmatique : forme</b>	<b>Stigmatische Scheibe: Form</b>	<b>Disco estigmático: forma</b>		
<b>PQ (e)</b>	erect	dressé	aufrecht	erecto	Edel-Rot, Redy	1
	semi-erect	demi-dressé	halbaufrecht	semierecto	Albín, Botond, Mieszko, Orel, Racek	2
	horizontal	horizontal	waagrecht	horizontal	Lazur, Morwin, Tebona, Zeno Morphex	3
	declined	décliné	geneigt	en declive		4
	decumbent	décombant	kriechend	decumbente	Rubin, Zeta	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
<b>25.</b>	<b>VG/ MS</b>	<b>Stigmatic disc: number of carpels</b>	<b>Disque stigmatique : nombre de carpelles</b>	<b>Narbenscheibe: Anzahl Fruchtblätter</b>	<b>Disco estigmático: número de cárpelos</b>		
<b>QN</b>	<b>(e)</b>	few	faible	gering	bajo	Alfa, Postomi, Tebona	3
		medium	moyen	mittel	medio	Buddha, Rosemarie, Kék Duna, Zeno 2002	5
		many	grand	groß	alto	Sokol	7
<b>26. (*) (+)</b>	<b>VG</b>	<b>Stigmatic disc: apex of carpels</b>	<b>Disque stigmatique : somet des carpelles</b>	<b>Narbenscheibe: Spitze der Fruchtblätter</b>	<b>Disco estigmático: ápice de los cárpelos</b>		
<b>PQ</b>	<b>(e)</b>	pointed	pointu	spitz	puntiagudo	Madrigal	1
		rounded	arrondi	abgerundet	redondeado	Korona, Leila, Morwin	2
		truncate	tronqué	abgestumpft	truncado	Agat, Albín, Bergam, Major, Mieszko, Orfeus	3
<b>27. (*)</b>	<b>VG</b>	<b>Seed: color</b>	<b>Semence : couleur</b>	<b>Samen: Farbe</b>	<b>Semilla: color</b>		
<b>PQ</b>	<b>(e)</b>	white	blanche	weiß	blanco	Albín, KP Albakomp, Orel, Racek, Sokol	1
		yellowish brown	brun jaunâtre	gelblich braun	marrón amarillento		2
		brown	brune	braun	marrón	Redy	3
		pink	rose	rosa	rosa		4
		grey	grise	grau	gris	Edel-Rot, Edel-Weiss, Florian	5
		light bluish	bleuâtre clair	hell bläulich	azulado claro	Minoán	6
		medium bluish	bleuâtre moyen	mittel bläulich	azulado medio	Agat, Morwin, Opal	7
		dark bluish	bleuâtre foncé	dunkel bläulich	azulado oscuro	Botond, Buddha, Madrigal	8
<b>28. (+)</b>	<b>MG</b>	<b>Time of flowering</b>	<b>Époque de floraison</b>	<b>Zeitpunkt der Blüte</b>	<b>Época de la floración</b>		
<b>QN</b>		very early	très précoce	sehr früh	muy temprana	Leila, Morwin	1
		early	précoce	früh	temprana	Zeno 2002	3
		medium	moyenne	mittel	media	Edel-Weiss, Korona	5
		late	tardive	spät	tardía	Botond, Lazur	7
		very late	très tardive	sehr spät	muy tardía		9
<b>29. (+)</b>	<b>MG</b>	<b>Capsule: morphine content</b>	<b>Capsule : teneur en morphine</b>	<b>Kapsel: Morphingehalt</b>	<b>Cápsula: contenido en morfina</b>		
<b>QN</b>	<b>(e)</b>	very low	très faible	sehr gering	muy bajo	Mieszko, Zeno Morphex	1
		low	faible	gering	bajo	Albín, Redy	3
		medium	moyenne	mittel	medio	Bergam, Major, Opal	5
		high	forte	hoch	alto	Postomi	7
		very high	très forte	sehr hoch	muy alto	Botond, Buddha	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
<b>30.</b>	<b>MG</b>	<b>Capsule: codeine content</b>	<b>Capsule : teneur en codéine</b>	<b>Kapsel: Kodeingehalt</b>	<b>Cápsula: contenido en codeína</b>		
<b>(+)</b>							
<b>QN</b>	<b>(e)</b>	low	faible	gering	bajo	Rubin, Zeno 2002	1
		medium	moyenne	mittel	medio	Bergam, Maratón	3
		high	forte	hoch	alto	Botond, Tebona	5
<b>31.</b>	<b>MG</b>	<b>Capsule: thebaine content</b>	<b>Capsule : teneur en thébaïne</b>	<b>Kapsel: Thebaingehalt</b>	<b>Cápsula: contenido en tebaina</b>		
<b>(+)</b>							
<b>QN</b>	<b>(e)</b>	low	faible	gering	bajo	Leila, Kozmosz, Maratón	1
		medium	moyenne	mittel	medio	Kék Gemona, Tebona	3
		high	forte	hoch	alto		5
<b>32.</b>	<b>MG</b>	<b>Capsule: narcotine content</b>	<b>Capsule : teneur en narcotine</b>	<b>Kapsel: Narkotingehalt</b>	<b>Cápsula: contenido en narcotina</b>		
<b>(+)</b>							
<b>QN</b>	<b>(e)</b>	none or very low	nulle ou très faible	fehlend oder sehr gering	ninguno o muy bajo	Maratón, Opal, Tebona	1
		low	faible	gering	bajo	Kozmosz	3
		medium	moyenne	mittel	medio		5
		high	forte	hoch	alto	Kék Gemona	7
		very high	très forte	sehr hoch	muy alto	Korona	9

## 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 seedlings should be made at 10-12 true leaves stage (prior to internode elongation).
- (b) Observations on the flower bud should be made at hook stage of pedicel.
- (c) Observations on stem and petal should be made at full blossom.
- (d) Observations on stem and capsule should be made 10-14 days after the petals drop down on the main stem.
- (e) Observations should be made on mature, dry capsule of main stem.

### 8.2 *Explanations for individual characteristics*

Ad. 2: Leaf: white spots

Ad. 3: Leaf: color

Ad. 4: Leaf: waxiness

The observations of white spots, color and waxiness should be made on the upper side of the leaf.

Ad. 5: Leaf: depth of incisions of margin



1  
absent or shallow

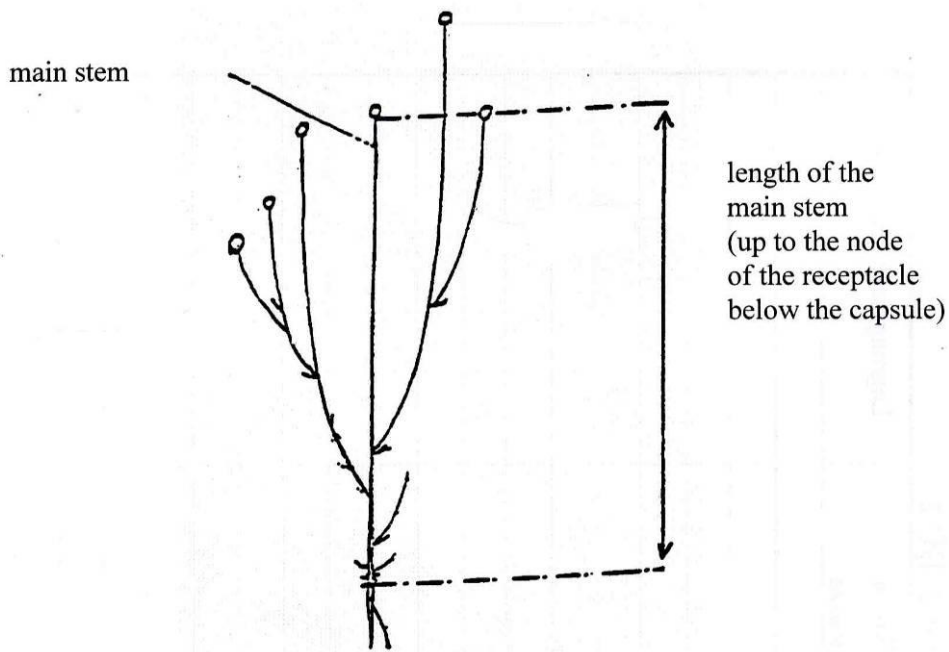


2  
medium



3  
deep

Ad. 6: Main stem: length



Ad. 7: Stem: anthocyanin coloration

Ad. 8: Stem: hairiness

The observation of anthocyanin coloration and hairiness should be made between the capsule and the upper stem leaf.

Ad. 9: Flower bud: anthocyanin coloration



1  
absent

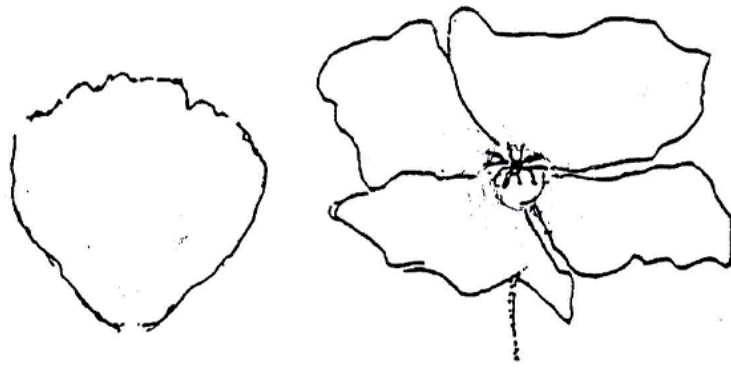


2  
in ring at base only

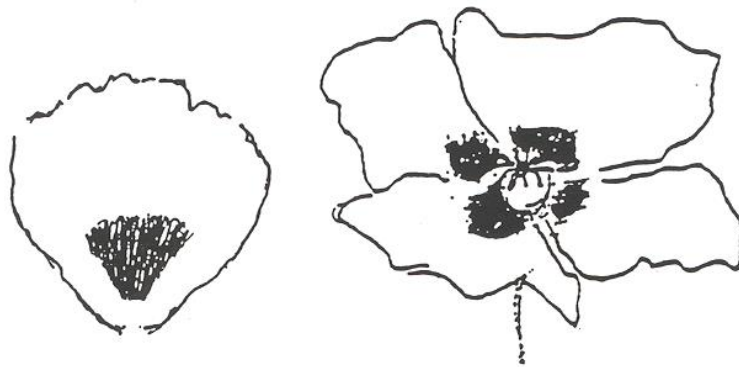


3  
in ring at base and on bud

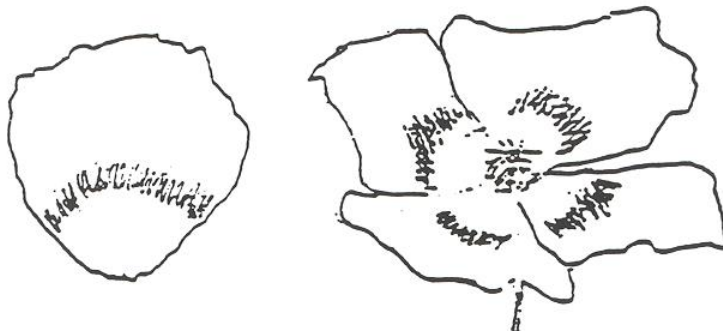
Ad. 11: Petal: marking



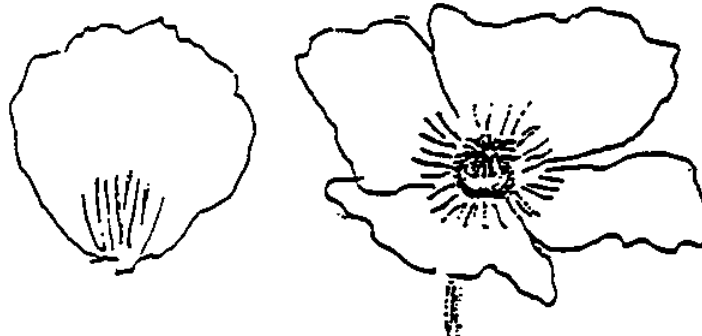
1  
none



2  
blotch



3  
band



4  
radial stripes



Ad. 13: Petal: extension of marking from base

The measurement should be made at the widest point of petal.



1  
below widest part



2  
up to widest point



3  
above widest part

Ad. 14: Petal: incisions








1  
absent



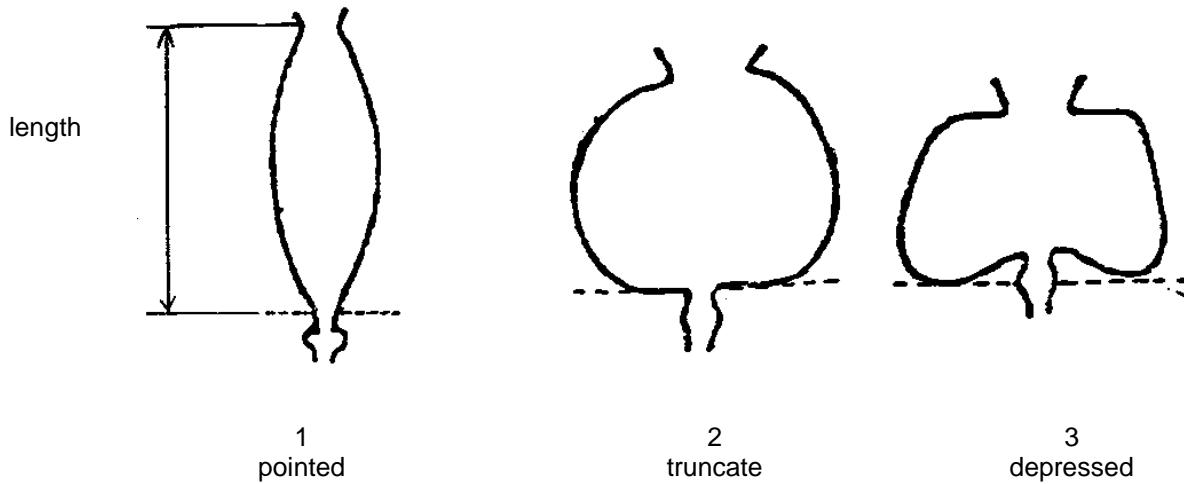
9  
present

Ad. 18: Capsule: shape in longitudinal section

		← broadest part →	
		below middle	at middle
narrow (high) ↑ width (ratio length/width) ↓ broad (low)			 5 elliptic
	 1 ovate		
			 4 round
			 3 cylindrical
			 2 oblate

Ad. 19: Capsule: shape of base

Ad. 20: Capsule: length



Ad. 22: Capsule: ribbing

For the observation of ribbing, the capsule should be touched.

Ad. 23: Capsule: dehiscence

For the observation of dehiscence the capsule should be held upside-down and shaken. If seeds do not fall out, the capsule is indehiscent (1). If seeds fall out, the capsule is dehiscent (2).

Ad. 24: Stigmatic disc: shape



1  
erect



2  
semi-erect



3  
horizontal



4  
declined



5  
decumbent



1  
erect



2  
semi-erect



3  
horizontal

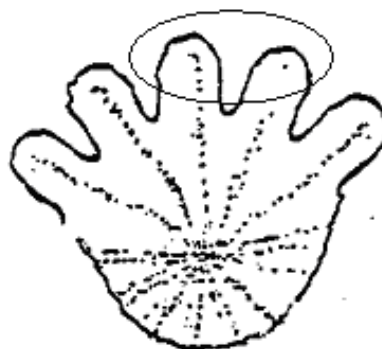


5  
decumbent

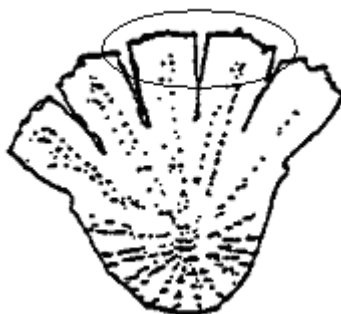
Ad. 26: Stigmatic disc: apex of carpels



1  
pointed



2  
rounded



3  
truncate

Ad. 28: Time of flowering

The time of flowering is when 10% of the plants have the first flower open on the main stem.

Ad. 29: Capsule: morphine content  
Ad. 30: Capsule: codeine content  
Ad. 31: Capsule: thebaine content  
Ad. 32: Capsule: narcotine content

## **Sampling**

The sample should be made from dry, ripe capsules with 1-2cm stems and 40 capsules should be picked from 2 replicates (20 pieces/replicate). The capsules should be crushed, mixed and from it 100g (without seed) should be used for alkaloid determination.

### **1. Scope**

Determination of Morphine, Codeine, Thebaine and Narcotine content in poppy capsule for qualification purposes.

Limit Of Detection (LOD): 10mg/kg/component

Limit Of Quantitation (LOQ): 50mg/kg/component

### **2. Principle**

The sample is extracted with methanol containing 1ml of cc hydrochloric acid/litre. The alkaloid content of the extract is determined by HPLC-MS system using RP C18 column. External standards are used for qualitative and quantitative determination.

### **3. Procedure**

#### **3.1. Sample preparation**

The receipt sample is weighted and dried to air-dry condition, and ground using 0,5mm sieve.

#### **3.2. Extraction and clean-up**

Weigh 0.2g of ground sample and add 100 ml methanol-HCl solution (1 ml cc HCl/litre methanol). Keep in ultrasonic bath 30 minutes. Filter and inject this solution to the HPLC column.

#### **3.3. HPLC measurement**

The determination of the alkaloid content is performed by MS detection (SIM mode) after separation using reversed phase C18 column.

#### *HPLC conditions*

The HPLC conditions advised are listed below, but any other conditions can be used if those give suitable results.

*Chromatographic column:* NUCLEODUR C-18 Gravity 150\*4.6mm\*5µm or equivalents.

#### *Mobile phase*

A eluent: HPLC grade methanol

B eluent: 2g Ammonium-acetate/litre HPLC grade water

Gradient: 0-4 min. 70% B

4-14 min. 10% B-ig linear gradient

14-20 min. 10% B

Post time: 5 min.

#### *Flow rate*

0.9cm<sup>3</sup>/min.

#### *Detector*

MS SIM APCI: 2-20 perc: 286.0 AMU Positive  
300.0 AMU Positive  
312.0 AMU Positive  
340.0 AMU Positive  
414.0 AMU Positive

*Injected volume:* 2µl

For qualitative and quantitative determination used analytical grade standard solutions in HCL-methanol (1ml cc HCl/litre methanol) solvent. Calibrate according to ESTD method.

## 9. Literature

Bernáth, J., Dános, B., Veres, T., Tétényi, P., 1988: Variation and alkaloid production in poppy ecotypes: Responses to different environments. *Biochemical Systematics and Ecology* 16 (2): pp. 171-178

Bernáth, J., 1998: *Poppy, The Genus Papaver*, Harwood Academic Publishers, NL

Dittbrenner, A., Mock, H.-P., Börner, A., Lohwasser, U., 2009: Variability of alkaloid content in *Papaver somniferum* L.. *Journal of Applied Botany and Food Quality* 82. Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, DE, pp. 103-107

Günther, K.F., 1975: Beiträge zur Morphologie der Papaveraceae. *Flora* 164: pp. 415-418.

Kodaira, H., and Spector, S., 1988: Transformation of thebaine to orpavine, codeine and morphine by rat liver, kidney and brain microsomes. *Proc. Natl. Acad. Sci. USA* 85: pp.1267-1271

Hammer, K., 1981: Probleme der Klassifikation von *Papaver somniferum*, *Kulturpflanze* 29: pp. 287-296.

Schijfsma, L., Hoesbergen, M. and Nijdam, F.E., 1960: A Study of the Colour and Other Characters of the Seed in Some Varieties of Oil Seed Poppy. *Euphytica* 9: pp. 127-140.

ST/SOA/SER. Y./33 UN Method No. 33, Dec. 16, 1977: Determination of Phenanthrene Alkaloids in *Papaver Somniferum* Capsules and *Papaver Bracteatum* Plant Tissue By High Performance Liquid Chromatography.

Tétényi, P., 1997: Opium Poppy (*Papaver somniferum*) Botany and Horticulture. *Horticultural Reviews*, 19: pp. 373-408

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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	Application date: (not to be filled in by the applicant)
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TECHNICAL QUESTIONNAIRE  
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 Botanical name

1.2 Common name

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:
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#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:
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4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

- |     |                          |     |
|-----|--------------------------|-----|
| (a) | Self-pollination         | [ ] |
| (b) | Cross-pollination        |     |
|     | (i) population           | [ ] |
|     | (ii) synthetic variety   | [ ] |
| (c) | Hybrid                   | [ ] |
| (d) | Other                    | [ ] |
|     | (please provide details) |     |

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TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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
<b>5.1 Leaf: white spots (2)</b>		
absent	Botond, Buddha, Major	1[ ]
present	Kozmosz, Orel, Racek, Sokol	9[ ]
<b>5.2 Petal: color (10)</b>		
white	Botond, Korona, Major, Sokol	1[ ]
light pink	Agat	2[ ]
medium pink	Albín, Rosemarie, Rubin	3[ ]
dark pink	Edel-Rot	4[ ]
red	Danish Flag	5[ ]
light violet	Kozmosz	6[ ]
medium violet	Leila	7[ ]
dark violet	Zeno 2002	8[ ]
<b>5.3 Petal: marking (11)</b>		
none	TMO1, Afyon 95, Ofis 96	1[ ]
blotch	Botond, Malsar, Rosemarie, Sokol	2[ ]
band		3[ ]
radial stripes		4[ ]
<b>5.4 Capsule: shape in longitudinal section (18)</b>		
ovate	Major, Opal	1[ ]
oblate	Botond	2[ ]
cylindrical	Kék Gemona, Korona	3[ ]
round	Postomi	4[ ]
elliptic	Minoán	5[ ]
<b>5.5 Capsule: dehiscence (23)</b>		
indehiscent	Botond, Kék Gemona, Major	1[ ]
dehiscent	Edel-Rot, Edel-Weiss	2[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
<b>5.6 Seed: color</b> <b>(27)</b>		
white	Albín, KP Albakomp, Orel, Racek, Sokol	1[ ]
yellowish brown		2[ ]
brown	Redy	3[ ]
pink		4[ ]
grey	Edel-Rot, Edel-Weiss, Florian	5[ ]
light bluish	Minoán	6[ ]
medium bluish	Agat, Morwin, Opal	7[ ]
dark bluish	Botond, Buddha, Madrigal	8[ ]
<b>5.7 Capsule: morphine content</b> <b>(29)</b>		
very low	Mieszko, Zeno Morphex	1[ ]
very low to low		2[ ]
low	Albín, Redy	3[ ]
low to medium		4[ ]
medium	Bergam, Major, Opal	5[ ]
medium to high		6[ ]
high	Postomi	7[ ]
high to very high		8[ ]
very high	Botond, Buddha	9[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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 <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety
<i>Example</i>	<i>Petal: color of marking</i>	<i>medium violet</i>	<i>dark violet</i>

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<p>Comments:</p>
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TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#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

7.3.1 Resistance to pests and diseases

7.3.2 Special conditions for the examination of the variety

(a) Growing season:

- spring [ ]

- autumn [ ]

(b) Other conditions

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.

# 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:
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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]