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

Geneva

DRAFT

## POTATO

UPOV Code(s): SOLAN\_TUB

*Solanum tuberosum* L.

## GUIDELINES

## FOR THE CONDUCT OF TESTS

## FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*prepared by an expert from Germany**to be considered by**the Technical Committee at its fifty-eighth session**to be held in Geneva on October 24 and 25, 2022**Disclaimer: this document does not represent UPOV policies or guidance*

Alternative names:\*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Solanum tuberosum</i> L.	Potato	Pomme de terre	Kartoffel	Papa, Patata

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 *Solanum tuberosum* 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 tubers.
- 2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:
- 100 tubers for each growing cycle
- 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 concluded 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 60 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 lightsprout characteristics should be carried out on at least 5 tubers.

### 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 10 plants or parts of plants taken from each of 10 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 vegetatively propagated 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, a population standard of 1% and an acceptance probability of at least 95% should be applied. In case of a sample size of 60 plants, 2 off-types are allowed. In case of a sample size of 5 tubers, no off-type is 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) Lightsprout: proportion of blue in anthocyanin coloration of base (characteristic 4)
  - (b) Corolla: intensity of anthocyanin coloration on inner side (characteristic 27)
  - (c) Corolla: proportion of blue in anthocyanin coloration on inner side (characteristic 28)
  - (d) Plant: time of maturity (characteristic 31)
  - (e) Tuber: color of skin (characteristic 34)
- 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 All relevant states of expression are presented in the characteristic.

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)-(e) See Explanations on the Table of Characteristics in Chapter 8.1
- 7 Growth stage key See Explanations on the Table of Characteristics in Chapter 8.3

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	(a)				
	<b>Lightsprout: size</b>	<b>Germe : taille</b>	<b>Lichtkeim: Größe</b>	<b>Brote: tamaño</b>			
	very small	très petite	sehr klein	muy pequeño			1
	very small to small	très petite à petite	sehr klein bis klein	muy pequeño a pequeño			2
	small	petite	klein	pequeño	Laura		3
	small to medium	petite à moyenne	klein bis mittel	pequeño a medio			4
	medium	moyenne	mittel	medio	Diamant, Victoria		5
	medium to large	moyenne à grande	mittel bis groß	de medio a grande			6
	large	grand	groß	grande	Solist		7
	large to very large	grande à très grande	groß bis sehr groß	grande a muy grande			8
	very large	très grande	sehr groß	muy grande			9
2. (*)	PQ	VG	(+)	(a)			
	<b>Lightsprout: shape of base</b>	<b>Germe : forme de la base</b>	<b>Lichtkeim: Form der Basis</b>	<b>Brote: forma de la base</b>			
	globose	globuleuse	kugelförmig	globose	Albatros		1
	ovoid	ovoïde	eiartig	ovoïde	Laura		2
	conic	conique	kegelförmig	cónica	Bintje, Solist		3
	broad cylindrical	cylindrique large	breit zylindrisch	cilíndrica ancha	Diamant, Innovator		4
	narrow cylindrical	cylindrique étroite	schmal zylindrisch	cilíndrica estrecha	Cecile		5
3. (*)	QN	VG	(a), (b)				
	<b>Lightsprout: anthocyanin coloration of base</b>	<b>Germe : pigmentation anthocyanique de la base</b>	<b>Lichtkeim: Anthocyanfärbung der Basis</b>	<b>Brote: pigmentación antocianica de la base</b>			
	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Estima		1
	very weak to weak	très faible à faible	sehr gering bis gering	muy débil a débil			2
	weak	faible	gering	débil	Solist		3
	weak to medium	faible à moyenne	gering bis mittel	débil a media			4
	medium	moyenne	mittel	media	Arielle		5
	medium to strong	moyenne à forte	mittel bis stark	media a fuerte			6
	strong	forte	stark	fuerte	Abbot, Victoria		7
	strong to very strong	forte à très forte	stark bis sehr stark	fuerte a muy fuerte			8
	very strong	très forte	sehr stark	muy fuerte	Agria, Red Emmalie		9



	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
4. (*)	QN	VG	(+)	(a)				
	Lightsprout: proportion of blue in anthocyanin coloration of base	Germe : proportion de bleu dans la pigmentation anthocyanique de la base	Lichtkeim: Blauanteil der Anthocyanfärbung der Basis	Brote: proporción de azul en la pigmentación antociánica de la base				
	absent or low	absente ou faible	fehlend oder gering	ausente o baja	Arielle, Solist, Victoria	1		
	medium	moyenne	mittel	media	Abbot	2		
	high	élevée	hoch	alta	Agria, Purple Majesty	3		
5. (*)	QN	VG	(+)	(a)				
	Lightsprout: pubescence of base	Germe : pubescence de la base	Lichtkeim: Behaarung der Basis	Brote: pubescencia de la base				
	absent or very sparse	absente ou très lâche	fehlend oder sehr locker	ausente o muy laxa	Slaney	1		
	very sparse to sparse	très lâche à lâche	sehr locker bis locker	muy laxa a laxa		2		
	sparse	lâche	locker	laxa	Goldmarie	3		
	sparse to medium	lâche à moyenne	locker bis mittel	laxa a media		4		
	medium	moyenne	mittel	media	Albatros, Laura	5		
	medium to dense	moyenne à dense	mittel bis dicht	media a densa		6		
	dense	dense	dicht	densa	Abbot	7		
	dense to very dense	dense à très dense	dicht bis sehr dicht	densa a muy densa		8		
	very dense	très dense	sehr dicht	muy densa	Oxania	9		
6.	QN	VG	(+)	(a)				
	Lightsprout: size of tip in relation to base	Germe : taille du sommets par rapport à la base	Lichtkeim: Größe der Spitze im Verhältnis zur Basis	Brote: tamaño de la punta en relación con la base				
	very small	très petite	sehr klein	muy pequeño		1		
	very small to small	très petite à petite	sehr klein bis klein	muy pequeño a pequeño		2		
	small	petite	klein	pequeño	Laura	3		
	small to medium	petite à moyenne	klein bis mittel	pequeño a medio		4		
	medium	moyenne	mittel	medio	Albatros, King Edward	5		
	medium to large	moyenne à grande	mittel bis groß	medio a grande		6		
	large	grand	groß	grande	Abbot	7		
	large to very large	grande à très grande	groß bis sehr groß	grande a muy grande		8		
	very large	très grande	sehr groß	muy grande		9		

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7.	QN	VG	(+)	(a)				
	<b>Lightsprout: habit of tip</b>		<b>Germe : aspect du sommet</b>		<b>Lichtkeim: Wuchsform der Spitze</b>	<b>Brote: porte de la punta</b>		
	closed		fermé		geschlossen	cerrado	Laura	1
	closed to intermediate		fermé à intermédiaire		geschlossen bis mittel	cerrado a intermedio		2
	intermediate		intermédiaire		mittel	intermedio	Arielle	3
	intermediate to open		intermédiaire à ouvert		mittel bis offen	intermedio a abierto		4
	open		ouvert		offen	abierto	Diamant, Solist	5
8.	QN	VG		(a), (b)				
	<b>Lightsprout: anthocyanin coloration of tip</b>		<b>Germe : pigmentation anthocyannique du sommet</b>		<b>Lichtkeim: Anthocyanfärbung der Spitze</b>	<b>Brote: pigmentación antociánica de la punta</b>		
	absent or very weak		absente ou très faible		fehlend oder sehr gering	ausente o muy débil	Estima, Innovator	1
	very weak to weak		très faible à faible		sehr gering bis gering	muy débil a débil		2
	weak		faible		gering	débil	Solist	3
	weak to medium		faible à moyenne		gering bis mittel	débil a media		4
	medium		moyenne		mittel	media	Laura, Spunta	5
	medium to strong		moyenne à forte		mittel bis stark	medio a fuerte		6
	strong		forte		stark	fuerte	Agria	7
	strong to very strong		forte à très forte		stark bis sehr stark	fuerte a muy fuerte		8
	very strong		très forte		sehr stark	muy fuerte	Blaue St. Galler	9
9.	QN	VG	(+)	(a)				
	<b>Lightsprout: pubescence of tip</b>		<b>Germe : pubescence du sommet</b>		<b>Lichtkeim: Behaarung der Spitze</b>	<b>Brote: pubescencia de la punta</b>		
	absent or very sparse		absente ou très lâche		fehlend oder sehr locker	ausente o muy escaso	Goldmarie	1
	very sparse to sparse		très lâche à lâche		sehr locker bis locker	muy laxa a laxa		2
	sparse		lâche		locker	laxa	Laura	3
	sparse to medium		lâche à moyenne		locker bis mittel	laxa a media		4
	medium		moyenne		mittel	media	Albatros	5
	medium to dense		moyenne à dense		mittel bis dicht	media a densa		6
	dense		dense		dicht	densa	Abbot	7
	dense to very dense		dense à très dense		dicht bis sehr dicht	densa a muy densa		8
	very dense		très dense		sehr dicht	muy densa	Camilla	9

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10. (*)	QN	VG	(a)				
	<b>Lightsprout: number of root tips</b>	<b>Germe : nombre de racinelles</b>	<b>Lichtkeim: Anzahl Wurzelhöcker</b>	<b>Brote: número de radículas</b>			
	very few	très petit	sehr gering	muy bajo			1
	very few to few	très petit à petit	sehr gering bis gering	muy bajo a bajo			2
	few	petit	gering	bajo	Estima, Solist		3
	few to medium	petit à moyen	gering bis mittel	bajo a medio			4
	medium	moyen	mittel	medio	Arielle, Bintje		5
	medium to many	moyen à élevé	mittel bis groß	medio a alto			6
	many	élevé	groß	alto	Innovator		7
	many to very many	élevé à très élevé	groß bis sehr groß	alto a muy alto			8
	very many	très élevé	sehr groß	muy alto			9
11.	QN	VG	(+)	(a)			
	<b>Lightsprout: length of lateral shoots</b>	<b>Germe : longueur des ramifications latérales</b>	<b>Lichtkeim: Länge der Seitentriebe</b>	<b>Brote: longitud de las ramificaciones laterales</b>			
	very short	très courte	sehr kurz	muy corta			1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta			2
	short	courte	kurz	corta	Laura, Producent		3
	short to medium	courte à moyenne	kurz bis mittel	corta a media			4
	medium	moyenne	mittel	media	Estima, Princess		5
	medium to long	moyenne à longue	mittel bis lang	media a larga			6
	long	longue	lang	larga	Spunta		7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga			8
	very long	très longue	sehr lang	muy larga			9
12.	QN	VG	(+)		51-69		
	<b>Plant: foliage structure</b>	<b>Plante : structure du feuillage</b>	<b>Pflanze: Laubstruktur</b>	<b>Planta: estructura del follaje</b>			
	stem type	type à tiges	Stängeltyp	tipo ramificado	Agria, Estima		1
	intermediate type	type intermédiaire	Zwischentyp	tipo intermedio	Premiere		2
	leaf type	type à feuilles	Blatttyp	tipo foliar	Kennebec		3

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13. (*)	QN	VG	(+)		51-69			
	<b>Plant: growth habit</b>		<b>Plante : port</b>		<b>Pflanze: Wuchsform</b>	<b>Planta: hábito de crecimiento</b>		
	upright		dressé		aufrecht	erecto	Victoria	1
	upright to semi-upright		dressé à demi-dressé		aufrecht bis halbaufrecht	erecto a semierecto		2
	semi-upright		demi-dressé		halbaufrecht	semierecto	Desiree, Secura	3
	semi-upright to spreading		demi-dressé à étalé		halbaufrecht bis breitwüchsig	semierecto a extendido		4
	spreading		étalé		breitwüchsig	extendido	Solist	5
14. (*)	QN	VG	(+)	(b)	51-69			
	<b>Stem: intensity of anthocyanin coloration</b>		<b>Tige : intensité de la pigmentation anthocyanique</b>		<b>Stängel: Intensität der Anthocyanfärbung</b>	<b>Tallo: intensidad de la pigmentación antocianica</b>		
	absent or very weak		absente ou très faible		fehlend oder sehr gering	ausente o muy débil	Estima	1
	very weak to weak		très faible à faible		sehr gering bis gering	muy débil a débil		2
	weak		faible		gering	débil	Victoria	3
	weak to medium		faible à moyenne		gering bis mittel	débil a media		4
	medium		moyenne		mittel	media	Laura, Saturna	5
	medium to strong		moyenne à forte		mittel bis stark	media a fuerte		6
	strong		forte		stark	fuerte	Desiree	7
	strong to very strong		forte à très forte		stark bis sehr stark	fuerte a muy fuerte		8
	very strong		très forte		sehr stark	muy fuerte	Blaue St. Galler, Vitelotte Noir	9
15.	QN	VG		(c)	51-69			
	<b>Leaf: outline size</b>		<b>Feuille : taille de la découpe</b>		<b>Blatt: Umrissgröße</b>	<b>Hoja: tamaño del contorno</b>		
	very small		très petite		sehr klein	muy pequeño		1
	very small to small		très petite à petite		sehr klein bis klein	muy pequeño a pequeño		2
	small		petite		klein	pequeño	King Edward	3
	small to medium		petite à moyenne		klein bis mittel	pequeño a mediano		4
	medium		moyenne		mittel	medio	Laura	5
	medium to large		moyenne à grande		mittel bis groß	medio a grande		6
	large		grande		groß	grande	Kennebec	7
	large to very large		grande à très grande		groß bis sehr groß	grande a muy grande		8
	very large		très grande		sehr groß	muy grande		9

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16.	QN	VG	(+)	(c)	51-69			
	<b>Leaf: openness</b>		<b>Feuille : ouverture</b>		<b>Blatt: Offenheit</b>	<b>Hoja: apertura</b>		
	closed		fermée		geschlossen	cerrada	Albatros	1
	closed to intermediate		fermée à intermédiaire		geschlossen bis mittel	cerrada a intermedia		2
	intermediate		intermédiaire		mittel	intermedia	Premiere, Solist	3
	intermediate to open		intermédiaire à ouverte		mittel bis offen	intermedia a abierta		4
	open		ouverte		offen	abierta	Goldmarie	5
17.	QN	VG	(+)	(c)	51-69			
	<b>Leaf: presence of secondary leaflets</b>		<b>Feuille : présence de folioles secondaires</b>		<b>Blatt: Vorhandensein von sekundären Blattfiedern</b>	<b>Hoja: presencia de folíolos secundarios</b>		
	very weak		très faible		sehr gering	muy débil		1
	very weak to weak		très faible à faible		sehr gering bis gering	muy débil a débil		2
	weak		faible		gering	débil	Goldmarie	3
	weak to medium		faible à moyenne		gering bis mittel	débil a media		4
	medium		moyenne		mittel	media	Solist	5
	medium to strong		moyenne à forte		mittel bis stark	media a fuerte		6
	strong		forte		stark	fuerte	Victoria	7
	strong to very strong		forte à très forte		stark bis sehr stark	fuerte a muy fuerte		8
	very strong		très forte		sehr stark	muy fuerte		9
18.	QN	VG	(+)		51-69			
	<b>Leaf: green color</b>		<b>Feuille : couleur verte</b>		<b>Blatt: Grünfärbung</b>	<b>Hoja: color verde</b>		
	very light		très claire		sehr hell	muy claro		1
	very light to light		très claire à claire		sehr hell bis hell	muy claro a claro		2
	light		claire		hell	claro	Solist	3
	light to medium		claire à moyenne		hell bis mittel	claro a medio		4
	medium		moyenne		mittel	medio	Kuras, Victoria	5
	medium to dark		moyenne à foncée		mittel bis dunkel	medio a oscuro		6
	dark		foncée		dunkel	oscuro	Spunta	7
	dark to very dark		foncée à très foncée		dunkel bis sehr dunkel	oscuro a muy oscuro		8
	very dark		très foncée		sehr dunkel	muy oscuro		9

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19.	QN	VG	(+)	(b), (c)	51-69			
	<b>Leaf: intensity of anthocyanin coloration of midrib</b>		<b>Feuille : intensité de la pigmentation anthocyanique de la nervure médiane</b>		<b>Blatt: Intensität der Anthocyanfärbung der Mittelrippe</b>	<b>Hoja: intensidad de la pigmentación antocianica del nervio central</b>		
	absent or very weak		absente ou très faible		fehlend oder sehr gering	ausente o muy débil	Solist	1
	very weak to weak		très faible à faible		sehr gering bis gering	muy débil a débil		2
	weak		faible		gering	débil	Russet Burbank	3
	weak to medium		faible à moyenne		gering bis mittel	débil a media		4
	medium		moyenne		mittel	media	Laura	5
	medium to strong		moyenne à forte		mittel bis stark	media a fuerte		6
	strong		forte		stark	fuerte	Romanze	7
	strong to very strong		forte à très forte		stark bis sehr stark	fuerte a muy fuerte		8
	very strong		très forte		sehr stark	muy fuerte	Bildtstar , Roseval	9
20.	QN	VG	(+)	(c)	51-69			
	<b>Second pair of lateral leaflets: width in relation to length</b>		<b>Seconde paire de folioles latérales: largeur par rapport à la longueur</b>		<b>Zweites Paar Seitenblatffiedern: Breite im Verhältnis zur Länge</b>	<b>Segundo par de folíolos laterales: anchura en relación con la longitud</b>		
	very narrow		très étroite		sehr schmal	muy estrecha		1
	very narrow to narrow		très étroite à étroite		sehr schmal bis schmal	muy estrecha a estrecha		2
	narrow		étroite		schmal	estrecha	Innovator, Russet Burbank	3
	narrow to medium		étroite à moyenne		schmal bis mittel	estrecha a media		4
	medium		moyenne		mittel	media	Desiree	5
	medium to broad		moyenne à large		mittel bis breit	media a ancha		6
	broad		large		breit	ancha	Cayenne	7
	broad to very broad		large à très large		breit bis sehr breit	ancha a muy ancha		8
	very broad		très large		sehr breit	muy ancha		9
21.	QN	VG	(+)		51-69			
	<b>Terminal and lateral leaflets: frequency of coalescence</b>		<b>Folioles terminales et latérales: fréquence de la coalescence</b>		<b>End- und Seitenblatffiedern: Häufigkeit von Verwachsungen</b>	<b>Folíolos terminales y laterales: frecuencia de la coalescencia</b>		
	absent or very low		absente ou très faible		fehlend oder sehr gering	ausente o muy baja	Courage	1
	low		faible		gering	baja		2
	medium		moyenne		mittel	media	Goldmarie	3
	high		élevée		hoch	alta		4
	very high		très élevée		sehr hoch	muy alta	Cardinia	5

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22.	QN	VG	(+)	(b)	55			
	<b>Flower bud: intensity of anthocyanin coloration</b>		<b>Bouton : intensité de la pigmentation anthocyanique</b>		<b>Blütenknospe: Intensität der Anthocyanfärbung</b>	<b>Botón floral: intensidad de la pigmentación antociánica</b>		
	absent or very weak		absente ou très faible		fehlend oder sehr gering	ausente o muy débil	Solist	1
	very weak to weak		très faible à faible		sehr gering bis gering	muy débil a débil		2
	weak		faible		gering	débil	Pompadour	3
	weak to medium		faible à moyenne		gering bis mittel	débil a media		4
	medium		moyenne		mittel	media	Victoria	5
	medium to strong		moyenne à forte		mittel bis stark	media a fuerte		6
	strong		forte		stark	fuerte	Osprey	7
	strong to very strong		forte à très forte		stark bis sehr stark	fuerte a muy fuerte		8
	very strong		très forte		sehr stark	muy fuerte	Blaue St. Galler, Cayenne	9
23. (*)	QN	VG	(+)		60-69			
	<b>Plant: frequency of inflorescences</b>		<b>Plante : fréquence des inflorescences</b>		<b>Pflanze: Häufigkeit von Blütenständen</b>	<b>Planta: frecuencia de inflorescencias</b>		
	absent or very low		absente ou très faible		fehlend oder sehr gering	ausente o muy baja	King Edward	1
	very low to low		très faible à faible		sehr gering bis gering	muy baja a baja		2
	low		faible		gering	baja	Arielle	3
	low to medium		faible à moyenne		gering bis mittel	de baja a media		4
	medium		moyenne		mittel	media	Laura	5
	medium to high		moyenne à élevée		mittel bis stark	media a alta		6
	high		élevée		stark	alta	Agria, Innovator	7
	high to very high		élevée à très élevée		stark bis sehr stark	alta a muy alta		8
	very high		très élevée		sehr stark	muy alta	Euroresa	9
24.	QN	VG	(+)	(d)	60-69			
	<b>Inflorescence: size</b>		<b>Inflorescence : taille</b>		<b>Blütenstand: Größe</b>	<b>Inflorescencia: tamaño</b>		
	very small		très petite		sehr klein	muy pequeño		1
	very small to small		très petite à petite		sehr klein bis klein	muy pequeño a pequeño		2
	small		petite		klein	pequeño	Estima, Solist	3
	small to medium		petite à moyenne		klein bis mittel	pequeño a medio		4
	medium		moyenne		mittel	medio	Goldmarie	5
	medium to large		moyenne à grande		mittel bis groß	medio a grande		6
	large		grande		groß	grande	Innovator, Victoria	7
	large to very large		grande à très grande		groß bis sehr groß	grande a muy grande		8
	very large		très grande		sehr groß	muy grande		9

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25.	QN	VG	(b), (d)	60-69			
	<b>Peduncle: intensity of anthocyanin coloration</b>		<b>Pédoncule : intensité de la pigmentation anthocyanique</b>	<b>Blütenstandsstiel: Intensität der Anthocyanfärbung</b>	<b>Pedúnculo: intensidad de la pigmentación antocianica</b>		
	absent or very weak		absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Estima, Solist	1
	very weak to weak		très faible à faible	sehr gering bis gering	muy débil a débil		2
	weak		faible	gering	débil	Victoria	3
	weak to medium		faible à moyenne	gering bis mittel	débil a media		4
	medium		moyenne	mittel	media	Saturna	5
	medium to strong		moyenne à forte	mittel bis groß	media a fuerte		6
	strong		forte	groß	fuerte	Desiree	7
	strong to very strong		forte à très forte	groß bis sehr groß	fuerte a muy fuerte		8
	very strong		très forte	sehr groß	muy fuerte	Blaue St. Galler	9
26.	QN	VG	(d)	60-69			
	<b>Corolla: size</b>		<b>Corolle : taille</b>	<b>Krone: Größe</b>	<b>Corola: tamaño</b>		
	very small		très petite	sehr klein	muy pequeño		1
	very small to small		très petite à petite	sehr klein bis klein	muy pequeño a pequeño		2
	small		petite	klein	pequeño	Sommergold	3
	small to medium		petite à moyenne	klein bis mittel	pequeño a medio		4
	medium		moyenne	mittel	medio	Laura	5
	medium to large		moyenne à grande	mittel bis groß	medio a grande		6
	large		grande	groß	grande	Innovator	7
	large to very large		grande à très grande	groß bis sehr groß	grande a muy grande		8
	very large		très grande	sehr groß	muy grande	Roseval	9
27. (*)	QN	VG	(b), (d)	60-69			
	<b>Corolla: <u>intensity</u> of anthocyanin coloration on inner side</b>		<b>Corolle : <u>intensité</u> de la pigmentation anthocyanique sur la face interne</b>	<b>Krone: <u>Intensität</u> der Anthocyanfärbung an der Innenseite</b>	<b>Corola: <u>intensidad</u> de la pigmentación antocianica de la cara interna</b>		
	absent or very weak		absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Solist	1
	very weak to weak		très faible à faible	sehr gering bis gering	muy débil a débil		2
	weak		faible	gering	débil	Laura, Pirol, Secura	3
	weak to medium		faible à moyenne	gering bis mittel	débil a medio		4
	medium		moyenne	mittel	medio	Osprey, Quadriga	5
	medium to strong		moyenne à forte	mittel bis groß	medio a fuerte		6
	strong		forte	groß	fuerte	Courage	7
	strong to very strong		forte à très forte	groß bis sehr groß	fuerte a muy fuerte		8
	very strong		très forte	sehr groß	muy fuerte	Ramona	9



	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
28. (*)	QN	VG	(+)	(d)	60-69			
	<b>Corolla: proportion of blue in anthocyanin coloration on inner side</b>		<b>Corolle : proportion de bleu dans la pigmentation anthocyanique sur la face interne</b>		<b>Krone: Blauanteil der Anthocyanfärbung an der Innenseite</b>	<b>Corola: proporción de azul en la pigmentación antocianica de la cara interna</b>		
	absent or low		absente ou faible		fehlend oder gering	ausente o baja	Laura, Osprey	1
	medium		moyenne		mittel	media	Courage, Secura	2
	high		forte		hoch	alta	Pirol, Quadriga	3
29. (*)	QN	VG		(d)	60-69			
	<b>Corolla: <u>extent</u> of anthocyanin coloration on inner side</b>		<b>Corolla : <u>étendue</u> de la pigmentation anthocyanique sur la face interne</b>		<b>Corolla: <u>Ausdehnung</u> der Anthocyanfärbung an der Innenseite</b>	<b>Corola: <u>extensión</u> de la pigmentación antocianica de la cara interna</b>		
	absent or very small		absente ou très petite		fehlend oder sehr klein	ausente o muy pequeña	Vitelotte Noir	1
	very small to small		très petite à petite		sehr klein bis klein	muy pequeña a pequeña		2
	small		petite		klein	pequeña	Laura	3
	small to medium		petite à moyenne		klein bis mittel	pequeña a media		4
	medium		moyenne		mittel	media	Pirol	5
	medium to large		moyenne à grande		mittel bis groß	media a grande		6
	large		grande		groß	grande	Bildtstar	7
	large to very large		grande à très grande		groß bis sehr groß	grande a muy grande		8
	very large		très grande		sehr groß	muy grande	Courage	9
30.	QN	VG			65-69			
	<b>Plant: height</b>		<b>Plante : hauteur</b>		<b>Pflanze: Höhe</b>	<b>Planta: altura</b>		
	very short		très courte		sehr niedrig	muy corta	Mimi	1
	short		courte		niedrig	corta		2
	medium		moyenne		mittel	media	Arielle, Leyla	3
	tall		haute		hoch	alta		4
	very tall		très haute		sehr hoch	muy alta	Agria, Pirol	5

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31. (*)	QN	MG	(+)		97			
	<b>Plant: time of maturity</b>		<b>Plante : époque de maturité</b>		<b>Pflanze: Zeitpunkt der Reife</b>	<b>Planta: época de madurez</b>		
	very early		très précoce		sehr früh	muy temprana	Leyla, Solist	1
	very early to early		très précoce à précoce		sehr früh bis früh	muy temprana a temprana		2
	early		précoce		früh	temprana	Princess	3
	early to medium		précoce à moyenne		früh bis mittel	temprana a media		4
	medium		moyenne		mittel	media	Laura	5
	medium to late		moyenne à tardive		mittel bis spät	media a tardía		6
	late		tardive		spät	tardía	Euroresa	7
	late to very late		tardive à très tardive		spät bis sehr spät	tardía a muy tardía		8
	very late		très tardive		sehr spät	muy tardía	Kuras, Producent	9
32. (*)	QN	MS/VG	(+)	(e)	99			
	<b>Tuber: shape</b>		<b>Tubercule : forme</b>		<b>Knolle: Form</b>	<b>Tubérculo: forma</b>		
	round		arrondie		rund	redonda	Kuras	1
	short-oval		oblongue courte		rundoval	ovalada corta	Courage	2
	oval		oblongue		oval	ovalada	Diamant, Ramona	3
	long-oval		oblongue allongée		langoval	ovalada larga	Innovator	4
	long		allongée		lang	alargada	Spunta	5
	very long		très allongée		sehr lang	muy alargada	Pompadour	6
33.	QN	VG		(e)	99			
	<b>Tuber: depth of eyes</b>		<b>Tubercule : profondeur des yeux</b>		<b>Knolle: Augentiefe</b>	<b>Tubérculo: profundidad de los ojos</b>		
	very shallow		très peu profonde		sehr flach	muy poco profunda	Nadine	1
	very shallow to shallow		très peu profonde à peu profonde		sehr flach bis flach	muy poco profunda a poco profunda		2
	shallow		peu profonde		flach	poco profunda	Agria, Innovator	3
	shallow to medium		peu profonde à moyenne		flach bis mittel	poco profunda a media		4
	medium		moyenne		mittel	media	Courage	5
	medium to deep		moyenne à profonde		mittel bis tief	media a profunda		6
	deep		profonde		tief	profunda	Kuras, Sommergold	7
	deep to very deep		profonde à très profonde		tief bis sehr tief	profunda a muy profunda		8
	very deep		très profonde		sehr tief	muy profunda	Vitelotte Noir	9

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
34. (*)	PQ	VG	(e)	99			
	<b>Tuber: color of skin</b>		<b>Tubercule : couleur de la peau</b>	<b>Knolle: Farbe der Schale</b>	<b>Tubérculo: color de la piel</b>		
	light yellow brown		brun-jaune clair	hellgelbbraun	marrón amarillento claro	Nadine	1
	yellow		jaune	gelb	amarillo	Agria, Solist	2
	orange brown		brun orangé	orangebraun	marrón anaranjado	Karo, Velur	3
	light red		rouge clair	hellrot	rojo claro	Bildtstar	4
	medium red		rouge moyen	mittelrot	rojo medio	Laura	5
	dark red		rouge foncé	dunkelrot	rojo oscuro	Romanze	6
	red parti-colored		rouge panaché	rot gescheckt	parcialmente rojo	Cara	7
	blue violet		violet-bleu	blauviolett	violeta azulado	Blaue St. Galler, Vitelotte Noir	8
	blue violet parti-colored		violet-bleu panaché	blauviolett gescheckt	parcialmente violeta azulado	Catriona, Kestrel	9
35.	QN	VG	(e)	99			
	<b>Tuber: texture of skin</b>		<b>Tubercule : texture de la peau</b>	<b>Knolle: Textur der Haut</b>	<b>Tubérculo: textura de la piel</b>		
	smooth		lisse	glatt	suave	Laura	1
	medium		moyenne	mittel	media	Solist	2
	rough		rugueuse	rauh	áspera	Ivory Russet, Russet Burbank	3
36. (*)	PQ	VG	(+)	(e)	99		
	<b>Tuber: color of base of eye</b>		<b>Tubercule : couleur de la base de l'œil</b>	<b>Knolle: Farbe des Augengrundes</b>	<b>Tubérculo: color de la base del ojo</b>		
	white		blanc	weiß	blanco	Nadine	1
	yellow		jaune	gelb	amarillo	Agria, Solist	2
	red		rouge	rot	rojo	Quarta, Romanze	3
	blue		bleu	blau	azul	Double Fun, Vitelotte Noir	4

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
37.	(*)	PQ	VG	(+)	(e)	99		
		Tuber: color of flesh		Tubercule : couleur de la peau		Knolle: Farbe des Fleisches	Tubérculo: color de la pulpa	
		white		blanc		weiß	blanco	Kuras, Russet Burbank1
		yellowish white		blanc jaunâtre		gelblichweiß	blanco amarillento	Desiree, Estima2
		light yellow		jaune clair		hellgelb	amarillo claro	Diamant, Solist3
		medium yellow		jaune moyen		mittelgelb	amarillo medio	Bildtstar , Quarta4
		dark yellow		jaune foncé		dunkelgelb	amarillo oscuro	Laura, Princess5
		red		rouge		rot	rojo	Red Emmalie6
		red parti-colored		rouge panaché		rot gescheckt	parcialmente rojo	Early Rose7
		blue violet		bleu violet		blauviolett	violeta azulado	Purple Majesty8
		blue violet parti-colored		bleu violet panaché		blauviolett gescheckt	parcialmente violeta azulado	Double Fun9

## 8. Explanations on the Table of Characteristics

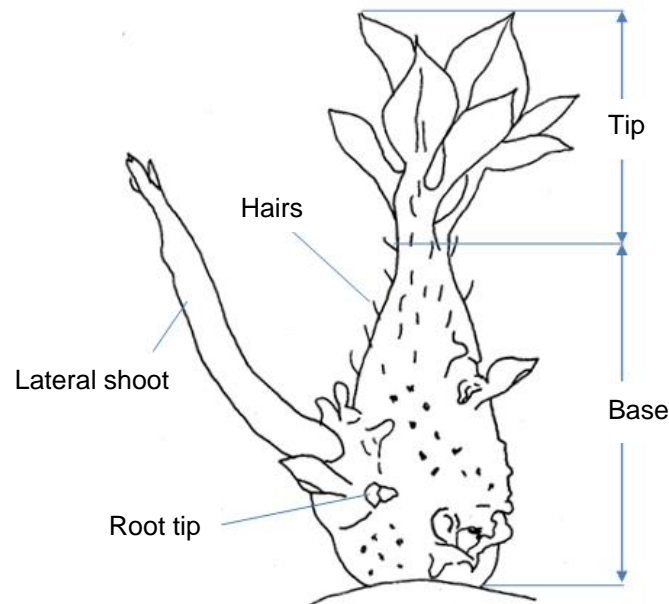
### 8.1 *Explanations covering several characteristics*

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

- (a) Observations should be made on lightsprouts grown according to the following method:  
The spectrum and the intensity of the light source are the most important factors for the expression of lightsprouts characteristics. This spectrum is defined by the type of lamps and the voltage used. When extremes of temperature are avoided, the influence of the temperature on the speed of development is small. A good expression of the characteristics is obtained when the lightsprouts are grown in a light-sealed cabinet at room temperature under continuous light provided by small incandescent bulbs (6V AC/0.05 A) giving an intensity of 7 to 11 lux (approximately 8 bulbs per square meter, 20-30 cm above the tubers).

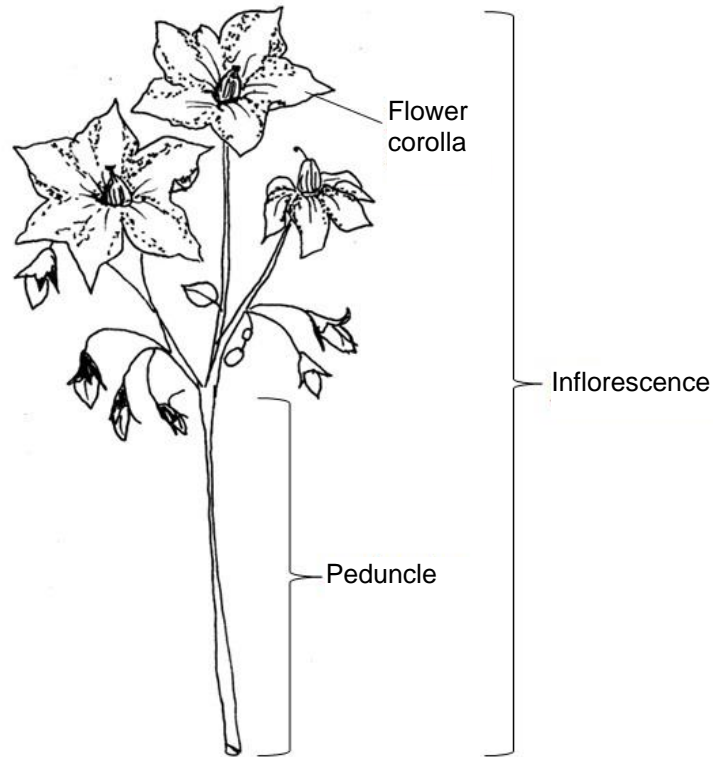
Observations should be made in a room with indirect day light when the characteristics 7 (habit of tip) and 11 (length of lateral shoots) have reached their maximum differentiation. Example varieties should be used to determine the optimal stage for observations.

The development of lightsprouts depends on the time of test after harvest. Development increases with age of tubers. If the test is started already about 100 days after harvest, the appropriate stage for observations might be reached only after about 14 weeks due to dormancy and/or slow development. If the test is started later, the appropriate stage for observations might be reached after a shorter period.



- (b) The intensity of the anthocyanin coloration should be observed. The extent and the distribution should not be considered.
- (c) Observations should be made on fully developed leaves from the center of the plant. One leaf from each of 10 plants should be picked from a main stem midway between the top and the bottom of the plant.

(d)

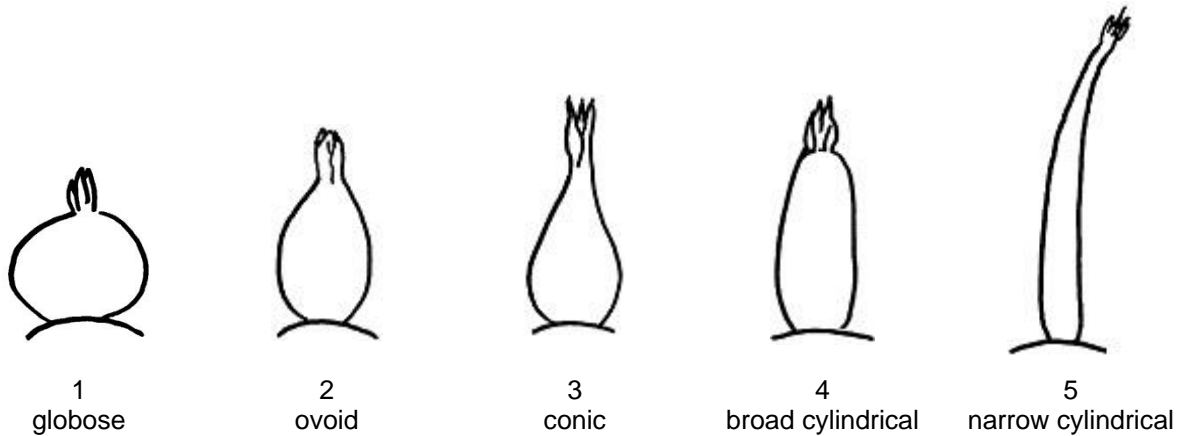


Observations of flower color should be made on the inner side of freshly opened flowers, the best moment is early in the morning.

- (e) Observations should be made within two weeks after harvest. Tubers should be shielded from sunlight as this may have an effect on the color.

## 8.2 Explanations for individual characteristics

### Ad. 2: Lightsprout: shape of base



### Ad. 4: Lightsprout: proportion of blue in anthocyanin coloration of base

The color of anthocyanin results from a red and a blue component. If the proportion of blue is low the anthocyanin appears red-violet. If the proportion of blue is high the anthocyanin appears blue-violet.

### Ad. 5: Lightsprout: pubescence of base

It is recommended to use a magnifier.

Pubescence is not always evenly distributed over the lightsprout. The total amount of pubescence of the base should be averaged over the total area of the lightsprout base.

### Ad. 6: Lightsprout: size of tip in relation to base

The size of the tip should be examined in relation to the size of the base. The following table provides the note that would correspond to the ratio of the size of tip to size of base.

note	ratio size of tip : size of base
1	10:90
2	20:80
3	30:70
4	40:60
5	50:50
6	60:40
7	70:30
8	80:20
9	90:10

Ad. 7: Lightsprout: habit of tip



1  
closed



3  
intermediate



5  
open

Ad. 9: Lightsprout: pubescence of tip

It is recommended to use a magnifier.

Pubescence is not always evenly distributed over the lightsprout. The total amount of pubescence of the tip should be averaged over the total area of the lightsprout tip.

Ad. 11: Lightsprout: length of lateral shoots



3  
short



5  
medium



7  
long

Ad. 12: Plant: foliage structure

Stem type: foliage open, stems clearly visible  
Intermediate type: foliage half open, stems partly visible  
Leaf type: foliage closed, stems not or hardly visible



1  
stem type



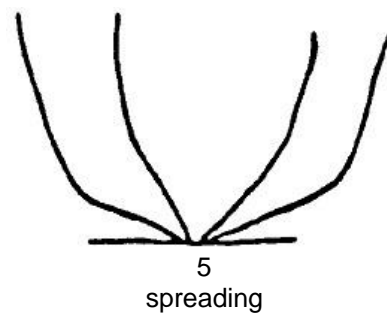
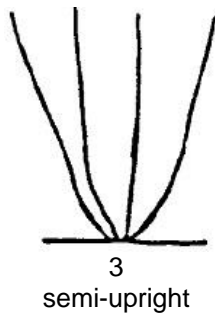
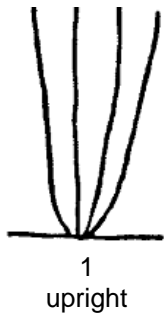
2  
intermediate type



3  
leaf type



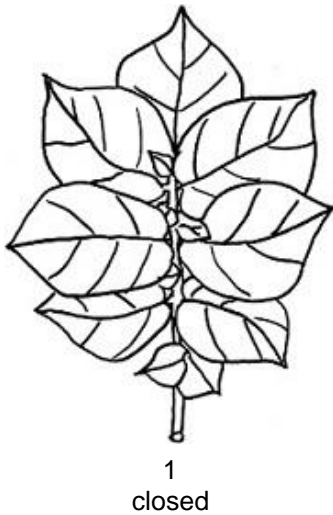
Ad. 13: Plant: growth habit



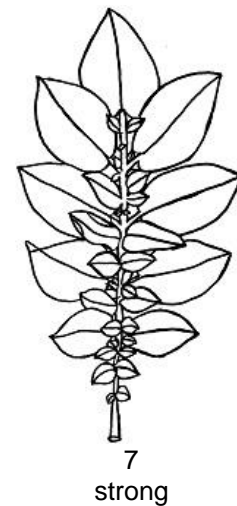
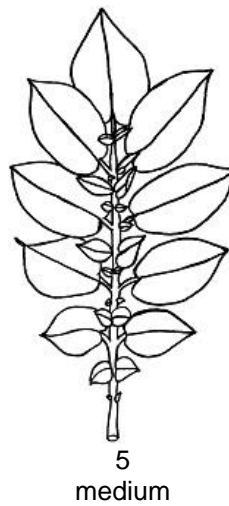
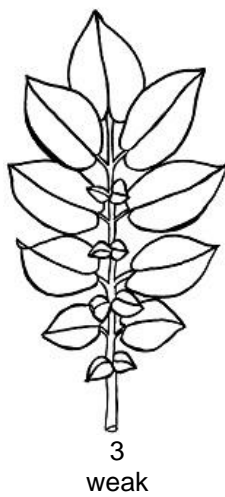
Ad. 14: Stem: intensity of anthocyanin coloration

Observations should be made on the lower three quarters of the stems.

Ad. 16: Leaf: openness



Ad. 17: Leaf: presence of secondary leaflets



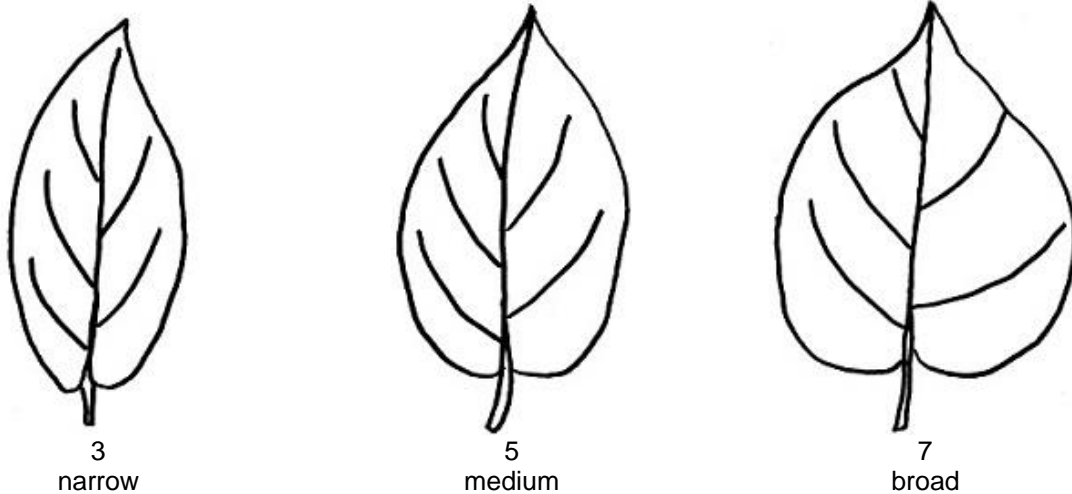
Ad. 18: Leaf: green color

Observations should be made on fully developed leaves in the center of the plant, preferably not in direct sunlight.

Ad. 19: Leaf: intensity of anthocyanin coloration of midrib

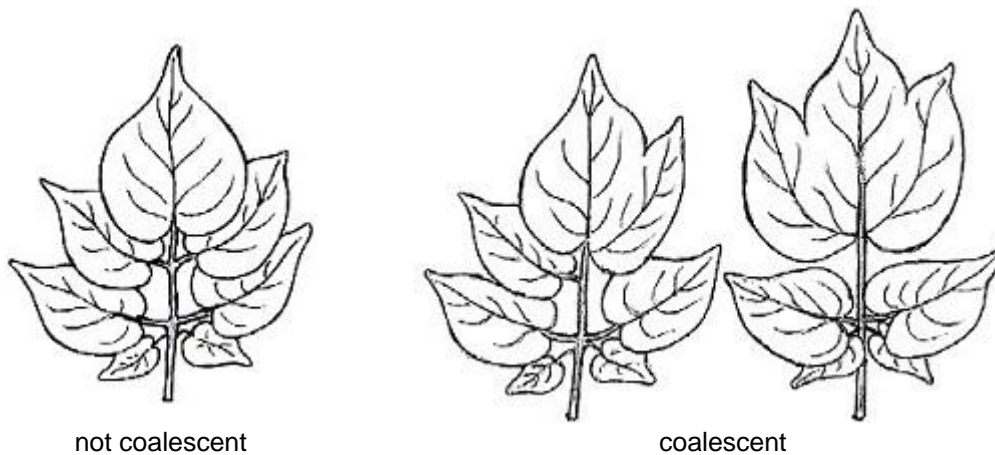
Observations should be made on the upper side of the leaf.

Ad. 20: Second pair of lateral leaflets: width in relation to length



Ad. 21: Terminal and lateral leaflets: frequency of coalescence

Observations should be made on fully developed leaves on the whole plant.



Ad. 22: Flower bud: intensity of anthocyanin coloration

The observations should be made on fully developed buds before the corolla is visible.

Ad. 23: Plant: frequency of inflorescences

During the flowering period the plots are observed several times and the frequency is scored. The highest score reached is noted as the final state of expression.

Ad. 24: Inflorescence: size

The general impression of the whole plot is observed.

Ad. 28: Corolla: proportion of blue in anthocyanin coloration on inner side

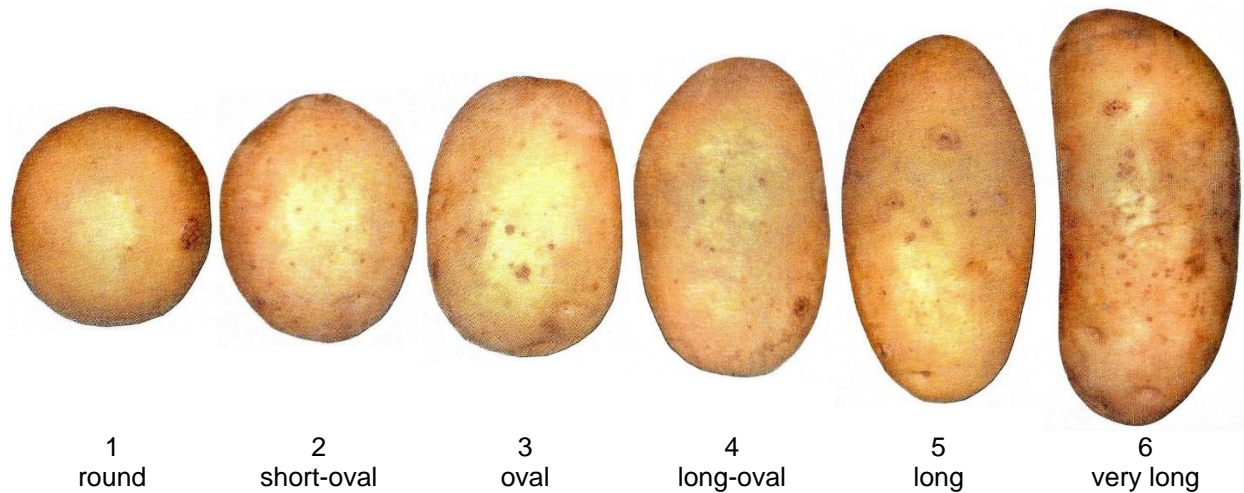
The color of anthocyanin results from a red and a blue component. If the proportion of blue is low the anthocyanin appears red-violet. If the proportion of blue is high the anthocyanin appears blue-violet.

Ad. 31: Plant: time of maturity

Time of maturity is reached when 80% of the leaves are dead.

Ad. 32: Tuber: shape

The shape is defined by length to width ratio. The predominant shape should be observed.



Ad. 36: Tuber: color of base of eye

Not applicable for varieties with particolored skin (note 7 and 9 in characteristic 34: Tuber: color of skin).

Ad. 37: Tuber: color of flesh

Observations should be made on freshly cut tubers. Already a few minutes after cutting the tuber, the flesh may be discolored.

8.3 *Phenological growth stages and BBCH-identification keys of potato* (Meier et al., 1997)

Codes		Description
2digit	3digit	
<b>Principal growth stage 0: Sprouting/Germination</b>		
...		
<b>Principal growth stage 1: Leaf development</b>		
...		
<b>Principal growth stage 2: Formation of basal side shoots below and above soil surface</b>		
(main stem)		
...		
<b>Principal growth stage 3: Main stem elongation (crop cover)</b>		
...		
<b>Principal growth stage 4: Tuber formation</b>		
...		
<b>Principal growth stage 5: Inflorescence (cyme) emergence</b>		
51	501	First individual buds (1–2 mm) of first inflorescence visible (main stem)
55	505	Buds of first inflorescence extended to 5 mm
59	509	First flower petals of first inflorescence visible
...		
<b>Principal growth stage 6: Flowering</b>		
60	600	First open flowers in population
61	601	Beginning of flowering about 10% of flowers in the first inflorescence open (main stem)
...		
65	605	Full flowering: 50% of flowers in the first inflorescence open
...		
68	608	80% of flowers in the first inflorescence open
69	609	End of flowering in the first inflorescence
...		
<b>Principal growth stage 7: Development of fruit</b>		
...		
<b>Principal growth stage 8: Ripening of fruit and seed</b>		
...		
<b>Principal growth stage 9: Senescence</b>		
91	901	Beginning of leaf yellowing
93	903	Most of the leaves yellowish
95	905	50% of the leaves brownish
97	907	Leaves and stem dead, stems bleached and dry
99	909	Harvested product

9. Literature

Meier, U. (ed.), 1997: Growth stages of mono- and dicotyledonous plants / Entwicklungsstadien mono- und dikotyler Pflanzen / Estadios de las plantas mono- y dicotiledóneas / Stades phénologiques des mono- et dicotylédones cultivées: BBCH-Monograph. Blackwell Wissenschaftsverlag, Berlin, Wien.

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)
--	---

TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights	
1. Subject of the Technical Questionnaire	
1.1 Botanical name	<input type="text" value="Solanum tuberosum L."/>
1.2 Common name	<input type="text" value="Potato"/>
2. Applicant	
Name	<input type="text"/>
Address	<input type="text"/>
Telephone No.	<input type="text"/>
Fax No.	<input type="text"/>
E-mail address	<input type="text"/>
Breeder (if different from applicant)	<input type="text"/>
3. Proposed denomination and breeder's reference	
Proposed denomination (if available)	<input type="text"/>
Breeder's reference	<input type="text"/>

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 variety)	
	(.....)	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)	
	<div></div>	
4.1.3	Discovery and development	[ ]
	(please state where and when discovered and how developed)	
	<div></div>	
4.1.4	Other	[ ]
	(Please provide details)	
	<div></div>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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4.2 Method of propagating the variety

4.2.1 Vegetative propagation

- (a) Tuber ☐
- (b) Other (state method) ☐

4.2.2 Other ☐  
(Please provide details)



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 Lightsprout: proportion of blue in anthocyanin coloration of base (4)</b>		
absent or low	Arielle, Solist, Victoria	1 [ ]
medium	Abbot	2 [ ]
high	Agria, Red Emmalie	3 [ ]
<b>5.2 Plant: frequency of inflorescences (23)</b>		
absent or very low	King Edward	1 [ ]
very low to low		2 [ ]
low	Arielle	3 [ ]
low to medium		4 [ ]
medium	Laura	5 [ ]
medium to high		6 [ ]
high	Agria, Innovator	7 [ ]
high to very high		8 [ ]
very high	Euroresa	9 [ ]
<b>5.3 Corolla: <u>intensity</u> of anthocyanin coloration on inner side (27)</b>		
absent or very weak	Solist	1 [ ]
very weak to weak		2 [ ]
weak	Laura, Pirol, Secura	3 [ ]
weak to medium		4 [ ]
medium	Osprey, Quadriga	5 [ ]
medium to strong		6 [ ]
strong	Courage	7 [ ]
strong to very strong		8 [ ]
very strong	Ramona	9 [ ]
<b>5.4 Corolla: proportion of blue in anthocyanin coloration on inner side (28)</b>		
absent or low	Laura, Osprey	1 [ ]
medium	Courage, Secura	2 [ ]
high	Pirol, Quadriga	3 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
<b>5.5 Plant: time of maturity</b> <b>(31)</b>		
very early	Leyla, Solist	1 [ ]
very early to early		2 [ ]
early	Princess	3 [ ]
early to medium		4 [ ]
medium	Laura	5 [ ]
medium to late		6 [ ]
late	Euroresa	7 [ ]
late to very late		8 [ ]
very late	Kuras, Producent	9 [ ]
<b>5.6 Tuber: shape</b> <b>(32)</b>		
round	Kuras	1 [ ]
short-oval	Courage	2 [ ]
oval	Diamant, Ramona	3 [ ]
long-oval	Innovator	4 [ ]
long	Spunta	5 [ ]
very long	Pompadour	6 [ ]
<b>5.7 Tuber: color of skin</b> <b>(34)</b>		
light yellow brown	Nadine	1 [ ]
yellow	Agria, Solist	2 [ ]
orange brown	Karo, Velur	3 [ ]
light red	Bildtstar	4 [ ]
medium red	Laura	5 [ ]
dark red	Romanze	6 [ ]
red parti-colored	Cara	7 [ ]
blue violet	Blaue St. Galler, Vitelotte Noir	8 [ ]
blue violet parti-colored	Catriona, Kestrel	9 [ ]
<b>5.8 Tuber: color of base of eye</b> <b>(36)</b>		
white	Nadine	1 [ ]
yellow	Agria, Solist	2 [ ]
red	Quarta, Romanze	3 [ ]
blue	Double Fun, Vitelotte Noir	4 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
<b>5.9 Tuber: color of flesh</b> <b>(37)</b>		
white	Kuras, Russet Burbank	1 [ ]
yellowish white	Desiree, Estima	2 [ ]
light yellow	Diamant, Solist	3 [ ]
medium yellow	Bildtstar, Quarta	4 [ ]
dark yellow	Laura, Princess	5 [ ]
red	Red Emmalie	6 [ ]
red parti-colored	Early Rose	7 [ ]
blue violet	Purple Majesty	8 [ ]
blue violet parti-colored	Double Fun	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>Tuber: shape</i>	<i>short-oval</i>	<i>long-oval</i>
Comments:			

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		

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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<p>8. Authorization for release</p> <p>(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?</p> <p>Yes [ ] No [ ]</p> <p>(b) Has such authorization been obtained?</p> <p>Yes [ ] No [ ]</p> <p>If the answer to (b) is yes, please attach a copy of the authorization.</p>																		
<p>9. Information on plant material to be examined or submitted for examination</p> <p>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.</p> <p>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:</p> <table border="0"><tr><td>(a)</td><td>Microorganisms (e.g. virus, bacteria, phytoplasma)</td><td>Yes [ ]</td><td>No [ ]</td></tr><tr><td>(b)</td><td>Chemical treatment (e.g. growth retardant, pesticide)</td><td>Yes [ ]</td><td>No [ ]</td></tr><tr><td>(c)</td><td>Tissue culture</td><td>Yes [ ]</td><td>No [ ]</td></tr><tr><td>(d)</td><td>Other factors</td><td>Yes [ ]</td><td>No [ ]</td></tr></table> <p>Please provide details for where you have indicated "yes".</p> <p>.....</p>			(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 [ ]
(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 [ ]															
<p>10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:</p> <p>Applicant's name <input type="text"/></p> <p>Signature <input type="text"/> Date <input type="text"/></p>																		

[End of document]