

UPOV

TG/23/6

ORIGINAL: English

DATE: 2004-03-31

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

POTATO

(Solanum tuberosum L.)

*

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names: *

<i>Latin</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Solanum tuberosum L., S. tuberosum L. sensu lato</i>	Potato	Pomme de terre	Kartoffel	Papa, Patata

ASSOCIATED DOCUMENTS

These guidelines should be read in conjunction with document TG/1/3, “General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants” (hereinafter referred to as the “General Introduction”) and its associated “TGP” documents.

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

TABLE OF CONTENTS

1.	SUBJECT OF THESE TEST GUIDELINES.....	3
2.	MATERIAL REQUIRED	3
3.	METHOD OF EXAMINATION.....	3
3.1	Duration of Tests.....	3
3.2	Testing Place	3
3.3	Conditions for Conducting the Examination.....	3
3.4	Test Design	4
3.5	Number of Plants / Parts of Plants to be Examined.....	4
3.6	Additional Tests	4
4.	ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	4
4.1	Distinctness	4
4.2	Uniformity.....	5
4.3	Stability	5
5.	GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL	5
6.	INTRODUCTION TO THE TABLE OF CHARACTERISTICS	6
6.1	Categories of Characteristics.....	6
6.2	States of Expression and Corresponding Notes.....	6
6.3	Types of Expression	6
6.4	Example Varieties	6
6.5	Legend.....	6
7.	TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES.....	7
8.	EXPLANATIONS ON THE TABLE OF CHARACTERISTICS	18
9.	LITERATURE	27
10.	TECHNICAL QUESTIONNAIRE.....	28

1. Subject of these Test Guidelines

1.1 These Test Guidelines apply to all vegetatively propagated 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, within the size range 35 to 50 mm.

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

100 tubers for each year of testing.

2.4 The tubers supplied should be visibly healthy, not lacking in vigor or 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 *Duration of Tests*

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

3.2 *Testing Place*

The tests should normally be conducted at one place. If any characteristics of the variety, which are relevant for the examination of DUS, cannot be observed at that place, the variety may be tested at an additional place.

3.3 *Conditions for Conducting the Examination*

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

3.3.1 *Timing of the examination*

The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.3.

3.3.2 Type of observation

The recommended method of observing the characteristic is indicated by the following key in the second column of the Table of Characteristics:

MG: single measurement of a group of plants or parts of plants

VG: visual assessment by a single observation of a group of plants or parts of plants.

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 two or more replicates.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

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

Unless otherwise indicated, all observations should be made on 60 plants.

3.6 *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 minimum duration of tests recommended in Section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

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.

4.2 *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 1 % and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 60 plants, 2 off-types are allowed. In the case of a sample size of 6 plants, 1 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 tested, either by growing a further generation, or by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the previous 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 is 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) Flower corolla: intensity of anthocyanin coloration on inner side (characteristic 33)
- (c) Flower corolla: proportion of blue in anthocyanin coloration on inner side (characteristic 34)
- (d) Plant: time of maturity (characteristic 36)
- (e) Tuber: color of skin (characteristic 39)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

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*

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.

6.3 *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*

(*) Asterisked characteristic – see Section 6.1.2

QL Qualitative characteristic – see Section 6.3

QN Quantitative characteristic – see Section 6.3

PQ Pseudo-Qualitative characteristic – see Section 6.3

(a) – (d) See Explanations on the Table of Characteristics in Chapter 8, Section 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8, Section 8.2

Stage of development: see Section 3.3.1

MG-VG: see Section 3.3.2

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. VG (+)	Lightsprout: size	Germe: taille	Lichtkeim: Größe	Brote: tamaño		
QN	small	petit	klein	pequeño	Grata	3
	medium	moyen	mittel	medio	Diamant	5
	large	grand	groß	grande	Gloria	7
2. VG (* (+)	Lightsprout: shape	Germe: forme	Lichtkeim: Form	Brote: forma		
PQ	spherical	sphérique	kugelförmig	esférica	Albas	1
	ovoid	ovoïde	eiförmig	ovoïde	Marabel	2
	conical	conique	kegelförmig	cónica	Bintje	3
	broad cylindrical	cylindrique large	breit zylindrisch	cilíndrica ancha	Diamant	4
	narrow cylindrical	cylindrique étroit	schmal zylindrisch	cilíndrica estrecha		5
3. VG (* (+)	Lightsprout: intensity of anthocyanin coloration of base	Germe: intensité de la pigmentation anthocyanique de la base	Lichtkeim: Intensität der Anthocyanfärbung des Unterteils	Brote: intensidad de la pigmentación antociánica de la base		
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Estima	1
	weak	faible	gering	débil	Santé	3
	medium	moyenne	mittel	media	Grandifolia	5
	strong	forte	stark	fuerte	Granola	7
	very strong	très forte	sehr stark	muy fuerte	Red Duke of York	9
4. VG (* (+)	Lightsprout: proportion of blue in anthocyanin coloration of base	Germe: proportion de bleu dans la pigmentation anthocyanique de la base	Lichtkeim: Blauanteil der Anthocyanfärbung des Unterteils	Brote: proporción de azul en la pigmentación antociánica de la base		
QN	absent or low	absente ou faible	fehlend oder gering	ausente o baja	Desiree	1
	medium	moyenne	mittel	media	Pamina	2
	high	élevée	hoch	elevada	Agria	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.	VG	Lightsprout:	Germe: pubescence	Lichtkeim:	Brote: pubescencia	
(*)	(a)	pubescence of base	de la base	Behaarung des	de la base	
(+)			Unterteils			
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Santé	1
	weak	faible	gering	débil	Diamant	3
	medium	moyenne	mittel	media	Junior	5
	strong	forte	stark	fuerte	Duke of York, Rikea	7
	very strong	très forte	sehr stark	muy fuerte	Carmona	9
6.	VG	Lightsprout: size of	Germe: taille du	Lichtkeim: Größe	Brote: tamaño del	
(+)	(a)	tip in relation to	sommet par	des Oberteils im	extremo en relación	
		base	rapport à la base	Verhältnis zum	con la base	
			Unterteil			
QN	small	petit	klein	pequeño	Quinta	3
	medium	moyen	mittel	medio	King Edward, Ukama	5
	large	grand	groß	grande	Erntestolz	7
7.	VG	Lightsprout: habit	Germe: aspect du	Lichtkeim:	Brote: porte del	
(+)	(a)	of tip	sommet	Wuchsform des	extremo	
				Oberteils		
QN	closed	fermé	geschlossen	cerrado	Quinta	1
	intermediate	intermédiaire	mittel	intermedio	Rita	3
	open	ouvert	offen	abierto	Diamant	5
8.	VG	Lightsprout:	Germe:	Lichtkeim:	Brote:	
(+)	(a)	anthocyanin	pigmentation	Anthocyanfärbung	pigmentación	
		coloration of tip	anthocyanique du	des Oberteils	antociánica del	
			sommet		extremo	
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Estima	1
	weak	faible	gering	débil	Duke of York	3
	medium	moyenne	mittel	media	Spunta	5
	strong	forte	stark	fuerte	Agria	7
	very strong	très forte	sehr stark	muy fuerte	Red Duke of York	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
9.	VG	Lightsprout:	Germe: pubescence	Lichtkeim:	Brote: pubescencia	
(+)	(a)	pubescence of tip	du sommet	Behaarung des Oberteils	del extremo	
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil	Quinta	3
	medium	moyenne	mittel	media	Princess	5
	strong	forte	stark	fuerte	Elles	7
	very strong	très forte	sehr stark	muy fuerte		9
10.	VG	Lightsprout:	Germe: nombre de	Lichtkeim: Anzahl	Brote: número de	
(*)	(a)	number of root tips	radicelles	der Wurzelhöcker	radículas	
(+)						
QN	few	petit	gering	bajo	Estima, Sanira	3
	medium	moyen	mittel	medio	Binje	5
	many	grand	groß	alto	Belladonna	7
11.	VG	Lightsprout: length	Germe: longueur	Lichtkeim: Länge	Brote: longitud de	
(+)	(a)	of lateral shoots	des ramifications	der Seitentriebe	las ramificaciones	
QN	short	courtes	kurz	cortas	Producent	3
	medium	moyennes	mittel	medias	Estima, Princess	5
	long	longues	lang	largas	Spunta	7
12.	1	Plant: foliage	Plante: structure	Pflanze:	Planta: estructura	
(+)	VG	structure	du feuillage	Laubstruktur	del follaje	
QN	stem type	type à tiges	Stengeltyp	tipo ramificado	Agria, Estima	1
	intermediate type	type intermédiaire	Zwischentyp	tipo intermedio	Premiere	2
	leaf type	type à feuilles	Blatttyp	tipo foliar	Kennebec	3
13.	1	Plant: growth habit	Plante: port	Pflanze:	Planta: porte	
(*)	VG			Wuchsform		
(+)						
QN	upright	dressé	aufrecht	erecto	Quinta	3
	semi-upright	semi-dressé	halbaufrecht	semierecto	Desiree, Secura	5
	spreading	étalé	breitwüchsig	rastrero	Gloria	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
14. (*) (+)	1 VG	Stem: anthocyanin coloration	Tige: pigmentation anthocyanique	Stengel: Anthocyanfärbung	Tallo: pigmentación antociánica	
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Estima	1
	weak	faible	gering	débil	Atlantic	3
	medium	moyenne	mittel	media	Saturna	5
	strong	forte	stark	fuerte	Desiree	7
	very strong	très forte	sehr stark	muy fuerte	Red Duke of York	9
15. (+)	1 VG (b)	Leaf: outline size	Feuille: taille de la découpe	Blatt: Umrisgröße	Hoja: tamaño del contorno	
QN	small	petite	klein	pequeño	Kingston, Natalie	3
	medium	moyenne	mittel	medio	Grata	5
	large	grande	groß	grande	Kennebec	7
16. (+)	1 VG (b)	Leaf: openness	Feuille: ouverture	Blatt: Offenheit	Hoja: apertura	
QN	closed	fermée	geschlossen	cerrada	Likaria	1
	intermediate	intermédiaire	mittel	intermedia	Premiere	3
	open	ouverte	offen	abierta	Grandifolia	5
17. (+)	1 VG (b)	Leaf: presence of secondary leaflets	Feuille: présence de folioles secondaires	Blatt: Vorhandensein von sekundären Blattfiedern	Hoja: presencia de folíolos secundarios	
QN	weak	faible	gering	débil	Solara	3
	medium	moyenne	mittel	media	Grata	5
	strong	forte	stark	fuerte	Hercules	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18.	1	Leaf: green color	Feuille: couleur verte	Blatt: Grünfärbung	Hoja: color verde	
(+)	(c)					
QN	light	légère	hell	claro	Angela	3
	medium	moyenne	mittel	medio	Ulme	5
	dark	foncée	dunkel	oscuro	Spunta	7
19.	1	Leaf: anthocyanin coloration on midrib of upper side	Feuille: pigmentation anthocyanique sur la nervure médiane de la face supérieure	Blatt: Anthocyanfärbung an der Mittelrippe der Oberseite	Hoja: pigmentación antocianica del nervio central del haz	
(+)	(c)					
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Grata	1
	weak	faible	gering	débil	Russet Burbank	3
	medium	moyenne	mittel	media	Camilla	5
	strong	forte	stark	fuerte	Felicitas	7
	very strong	très forte	sehr stark	muy fuerte	Bildtstar, Roseval	9
20.	1	Second pair of lateral leaflets: size	Seconde paire de folioles latérales: taille	Zweites Paar Seitenblattfiedern: Größe	Segundo par de folíolos laterales: tamaño	
(+)	(b)					
QN	very small	très petite	sehr klein	muy pequeño	Inca Sun	1
	small	petite	klein	pequeño	Grata	3
	medium	moyenne	mittel	medio	Redstar	5
	large	grande	groß	grande	Binjtje	7
	very large	très grande	sehr groß	muy grande	Kennebec	9
21.	1	Second pair of lateral leaflets: width in relation to length	Seconde paire de folioles latérales: largeur par rapport à la longueur	Zweites Paar Seitenblattfiedern: Breite im Verhältnis zur Länge	Segundo par de folíolos laterales: anchura en relación con la longitud	
(+)	(c)					
QN	narrow	étroite	schmal	estrecha	Russet Burbank	3
	medium	moyenne	mittel	media	Desiree	5
	broad	large	breit	ancha	Agria	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22. (+)	1 VG (c)	Terminal and lateral leaflets: frequency of coalescence	Folioles terminales et latérales: fréquence de la coalescence	End- und Seitenblattfiedern: Häufigkeit von Verwachsungen	Folíolos terminales y laterales: frecuencia de la coalescencia	
QN	absent or very low	absente ou très faible	fehlend oder sehr gering	ausente o muy baja	Cherie	1
	low	faible	gering	baja	Bildtstar, Premiere	3
	medium	moyenne	mittel	media	Agria	5
	high	élevée	hoch	elevada	Romano	7
	very high	très élevée	sehr hoch	muy elevada	Riviera	9
23. (+)	1 VG (c)	Leaflet: waviness of margin	Foliole: ondulation du bord	Blattfieder: Randwellung	Folíolo: ondulación del borde	
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Umatilla Russet	1
	weak	faible	gering	débil	Grata	3
	medium	moyenne	mittel	media	Marabel	5
	strong	forte	stark	fuerte	Aiko	7
	very strong	très forte	sehr stark	muy fuerte	Sava	9
24. (+)	1 VG (c)	Leaflet: depth of veins	Foliole: profondeur des nervures	Blattfieder: Tiefe der Adern	Folíolo: profundidad de los nervios	
QN	shallow	peu profondes	flach	poco profundos	Pirol	3
	medium	moyennes	mittel	medios	Premiere	5
	deep	profondes	tief	profundos	Bernadette	7
25. (+)	1 VG (c)	Leaflet: glossiness of the upperside	Foliole: brillance de la face supérieure	Blattfieder: Glanz der Oberseite	Folíolo: brillo del haz	
QN	dull	mâte	matt	mate	Bildtstar, Salome	3
	medium	moyenne	mittel	medio	Grata	5
	glossy	brillante	glänzend	brillante	Christa	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
26.	1	Leaflet: pubescence of blade at apical rosette	Foliole: pubescence du limbe à la rosette apicale	Blattfieder: Behaarung der Blattspreite an der Spitzenrosette	Folíolo: pubescencia del haz en la roseta apical	
VG	(c)					
QL	absent	absente	fehlend	ausente	Zagadka	1
	present	présente	vorhanden	presente	Alena	9
27.	1	Flower bud: anthocyanin coloration	Bouton: pigmentation anthocyanique	Blütenknospe: Anthocyanfärbung	Botón floral: pigmentación antociánica	
(+)	VG					
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Grata	1
	weak	faible	gering	débil	Panda	3
	medium	moyenne	mittel	media	Quinta	5
	strong	forte	stark	fuerte	Ponto	7
	very strong	très forte	sehr stark	muy fuerte		9
28.	2	Plant: height	Plante: hauteur	Pflanze: Höhe	Planta: altura	
	VG					
QN	very short	très courte	sehr niedrig	muy corta	Mimi	1
	short	courte	niedrig	corta	Atica	3
	medium	moyenne	mittel	media	Leyla	5
	tall	haute	hoch	larga	Grata	7
	very tall	très haute	sehr hoch	muy larga	Tomba	9
29.	2	Plant: frequency of flowers	Plante: fréquence des fleurs	Pflanze: Häufigkeit von Blüten	Planta: frecuencia de flores	
(*)	VG					
QN	absent or very low	absente ou très faible	fehlend oder sehr gering	ausente o muy baja	Achat, King Edward	1
	low	faible	gering	baja	Walli	3
	medium	moyenne	mittel	media	Rita	5
	high	élevée	hoch	elevada	Aiko, Agria	7
	very high	très élevée	sehr hoch	muy elevada	Sibu	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
30. (+)	2 VG	Inflorescence: size	Inflorescence: taille	Blütenstand: Größe	Inflorescencia: tamaño	
QN	small	petite	klein	pequeña	Accent	3
	medium	moyenne	mittel	media	Grata	5
	large	grande	groß	grande	Karakter	7
31. (+)	2 VG	Inflorescence: anthocyanin coloration on peduncle	Inflorescence: pigmentation anthocyanique sur le pédoncule	Blütenstand: Anthocyanfärbung am Stiel	Inflorescencia: pigmentación antocianica del pedúnculo	
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Grata	1
	weak	faible	gering	débil	Aiko	3
	medium	moyenne	mittel	media	Saturna	5
	strong	forte	stark	fuerte	Desiree	7
	very strong	très forte	sehr stark	muy fuerte	Alhamra	9
32. (+)	2 VG	Flower corolla: size	Corolle de la fleur: taille	Blütenkrone: Größe	Corola de la flor: tamaño	
QN	small	petite	klein	pequeña	Sommergold	3
	medium	moyenne	mittel	media	Grata	5
	large	grande	groß	grande	Karida	7
33. (* (+)	2 VG (d)	Flower corolla: intensity of anthocyanin coloration on inner side	Corolle de la fleur: intensité de la pigmentation anthocyanique sur la face intérieure	Blütenkrone: Intensität der Anthocyanfärbung an der Innenseite	Corola de la flor: intensidad de la pigmentación antocianica de la cara interna	
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Grata	1
	weak	faible	gering	débil	Secura	3
	medium	moyenne	mittel	media	Ponto	5
	strong	forte	stark	fuerte	Artana, Pomeroy	7
	very strong	très forte	sehr stark	muy fuerte		9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
34. (*) (+)	2 VG (d)	Flower corolla: proportion of blue in anthocyanin coloration on inner side	Corolle de la fleur: proportion de bleu dans la pigmentation anthocyanique sur la face intérieure	Blütenkrone: Blauanteil der Anthocyanfärbung an der Innenseite	Corola de la flor: proporción de azul en la pigmentación antocianica de la cara interna	
QN	absent or low	absente ou faible	fehlend oder gering	ausente o baja	Granola	1
	medium	moyenne	mittel	media	Pamina	2
	high	forte	hoch	elevada	Rocket	3
35. (*) (+)	2 VG (d)	Flower corolla: extent of anthocyanin coloration on inner side	Corolle de la fleur: étendue de la pigmentation anthocyanique sur la face intérieure	Blütenkrone: Ausdehnung der Anthocyanfärbung an der Innenseite	Corola de la flor: extensión de la pigmentación antocianica de la cara interna	
QN	absent or very small	absente ou très petite	fehlend oder sehr gering	ausente o muy pequeña	Vitelotte Noir	1
	small	petite	gering	pequeña	Bildstar, Rosella	3
	medium	moyenne	mittel	media	Concurrent	5
	large	grande	groß	grande	Panda	7
	very large	très grande	sehr groß	muy grande	Ponto	9
36. (*) (+)	3 MG	Plant: time of maturity	Plante: époque de maturité	Pflanze: Zeitpunkt der Reife	Planta: época de madurez	
QN	very early	très précoce	sehr früh	muy temprana	Christa	1
	early	précoce	früh	temprana	Cilena	3
	medium	moyenne	mittel	media	Nicola	5
	late	tardive	spät	tardía	Aula	7
	very late	très tardive	sehr spät	muy tardía	Producent	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
37.	4	Tuber: shape	Tubercule: forme	Knolle: Form	Tubérculo: forma	
(*)	VG					
(+)						
QN	round	arrondie	rund	redondo	Grata	1
	short oval	oblongue courte	rundoval	ovalado corto	Aula	2
	oval	oblongue	oval	ovalado	Diamant	3
	long-oval	oblongue allongée	langoval	ovalado largo	Linda	4
	long	allongée	lang	alargado	Spunta	5
	very long	très allongée	sehr lang	muy alargado	Pompadour	6
38.	4	Tuber: depth of eyes	Tubercule: profondeur des yeux	Knolle: Augentiefe	Tubérculo: profundidad de los ojos	
(*)	VG					
(+)						
QN	very shallow	très peu profonds	sehr flach	muy poco profundos	Duke of York, Nadine	1
	shallow	peu profonds	flach	poco profundos	Agria	3
	medium	moyens	mittel	medios	Erntestolz	5
	deep	profonds	tief	profundos	Elles	7
	very deep	très profonds	sehr tief	muy profundos	Vitelotte Noir	9
39.	4	Tuber: color of skin	Tubercule: couleur de la peau	Knolle: Farbe der Schale	Tubérculo: color de la piel	
(*)	VG					
(+)						
PQ	light beige	beige clair	hellbeige	beige claro	Nadine	1
	yellow	jaune	gelb	amarillo	Agria, Quarta	2
	red	rouge	rot	rojo	Desiree	3
	red parti-colored	rouge panaché	rot gescheckt	parcialmente rojo	Cara	4
	blue	bleue	blau	azul	Vitelotte Noir	5
	blue parti-colored	bleu panaché	blau gescheckt	parcialmente azul	Kestrel	6
	reddish brown	brun rougeâtre	rötlich braun	marrón rojizo	Umatilla Russet	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
40. (*)	4 VG	Tuber: color of base of eye	Tubercule: couleur de la base de l'œil	Knolle: Farbe des Augengrundes	Tubérculo: color de la base del ojo	
PQ	white	blanche	weiß	blanco	Nadine	1
	yellow	jaune	gelb	amarillo	Agria	2
	red	rouge	rot	rojo	Quarta	3
	blue	bleue	blau	azul	Vitelotte Noir	4
41. (*)	4 VG	Tuber: color of flesh	Tubercule: couleur de la chair	Knolle: Farbe des Fleisches	Tubérculo: color de la pulpa	
PQ	white	blanche	weiß	blanco	Russet Burbank	1
	cream	crème	cremefarben	crema	Desiree, Estima	2
	light yellow	jaune clair	hellgelb	amarillo claro	Diamant	3
	medium yellow	jaune moyen	mittelgelb	amarillo medio	Bildtstar, Quarta	4
	dark yellow	jaune foncé	dunkelgelb	amarillo oscuro	Princess	5
	red	rouge	rot	rojo	Red Salad	6
	red parti-colored	rouge panaché	rot gescheckt	parcialmente rojo	Early Rose	7
	blue	bleue	blau	azul	Vitelotte Noir	8
	blue parti-colored	bleu panaché	blau gescheckt	parcialmente azul	Herd Laddie	9
42. (+)	4 VG	<u>Light beige and yellow skinned varieties only:</u> Tuber: anthocyanin coloration of skin in reaction to light	<u>Variétés à peau beige clair et jaune seulement:</u> Tubercule: pigmentation anthocyanique de la peau en réaction à la lumière	<u>Nur Sorten mit hellbeiger und gelber Schale:</u> Knolle: Anthocyanfärbung der Schale nach Lichteinfluß	<u>Variedades de piel beige claro y amarillo únicamente:</u> Tubérculo: pigmentación antocianica de la piel como reacción a la luz	
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Estima	1
	weak	faible	gering	débil	Diamant	3
	medium	moyenne	mittel	media	Charlotte	5
	strong	forte	stark	fuerte	Granola	7
	very strong	très forte	sehr stark	muy fuerte		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:

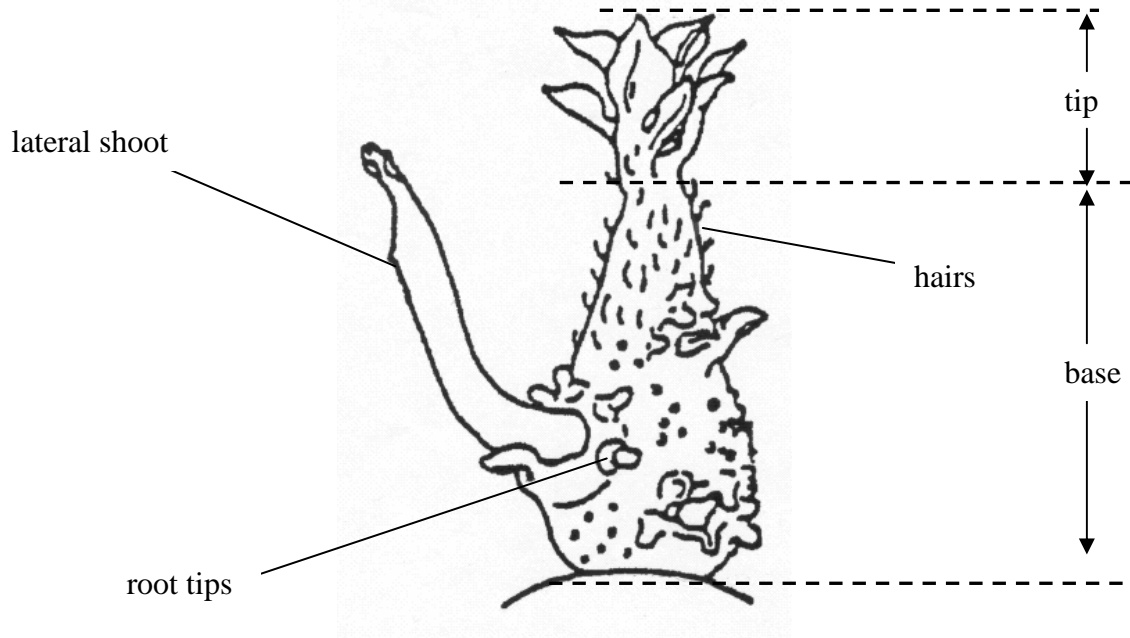
- (a) Lightsprout: All observations on the lightsprout should be made on a total of 6 tubers as a minimum according to the following method:

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 5 to 10 lux (approximately 8 bulbs per square meter, 25-40 cm above the tubers).

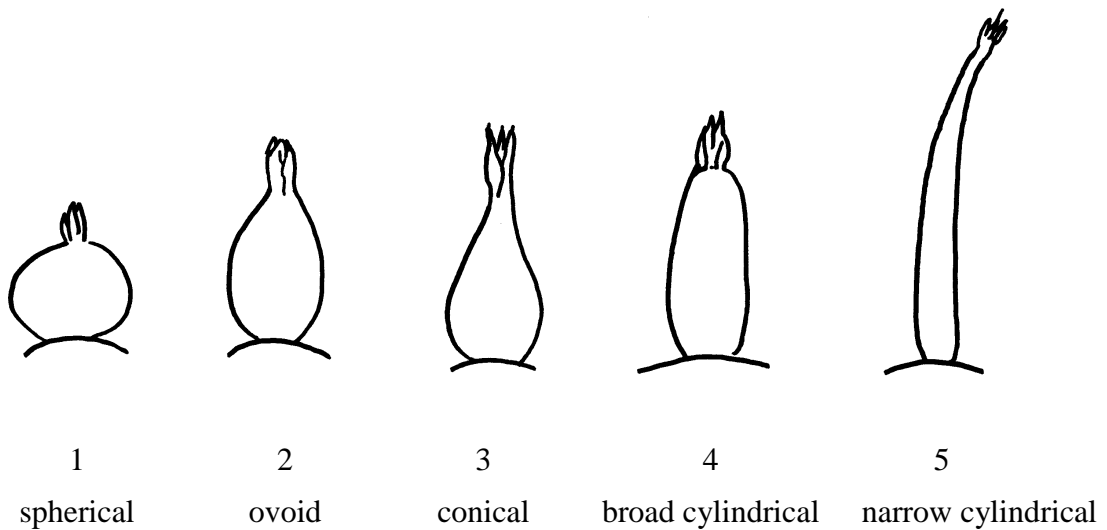
- (b) Leaf: All observations should be made on fully developed leaves from the center of the plant. One leaf from each of 20 plants should be picked from a main stem midway between the top and the bottom of the plant.
- (c) Leaf: All observations on the leaf should be made on fully developed leaves from the center of the plant.
- (d) Flower: All observations of flower color should be made on the inner side of freshly opened flowers.

8.2 Explanations for individual characteristics

Ads. 1 to 11: Lightsprout



Ad. 2: Lightsprout: shape



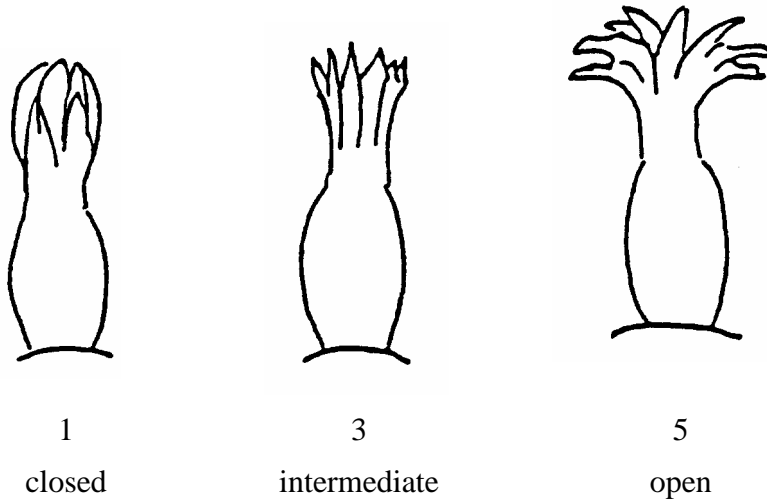
Ad. 3: Lightsprout: intensity of anthocyanin coloration of base

If the intensity of the anthocyanin coloration is “absent”, the lightsprout appears green.

Ads. 4: Lightsprout: proportion of blue in anthocyanin coloration of base,
and 34: Flower corolla: proportion of blue in anthocyanin coloration on inner side

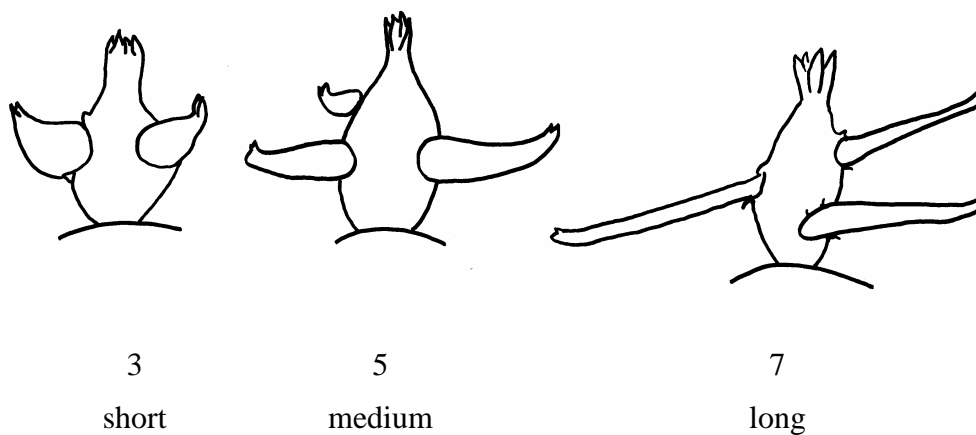
The color of anthocyanin results from a red and a blue component. If the proportion of blue is low the anthocyanin appears red-violet. If the proportion of blue is high the anthocyanin appears blue-violet.

Ad. 7: Lightsprout: habit of tip



The characteristic should be observed after about 10 weeks to obtain a good differentiation in the collection.

Ad. 11: Lightsprout: length of lateral shoots

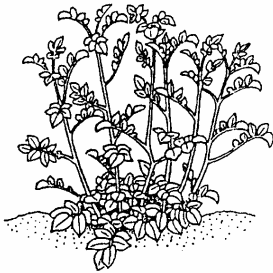


Ad. 12: Plant: foliage structure

Stem type: foliage open, stems clearly visible

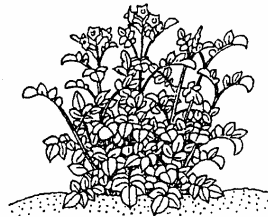
Intermediate type: foliage half open, stems partly visible

Leaf type: foliage closed, stems not, or hardly, visible



1

stem type



2

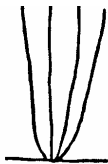
intermediate type



3

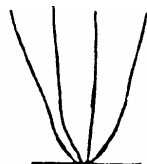
leaf type

Ad. 13: Plant: growth habit



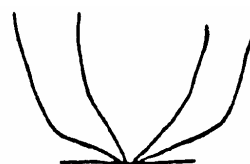
3

upright



5

semi-upright



7

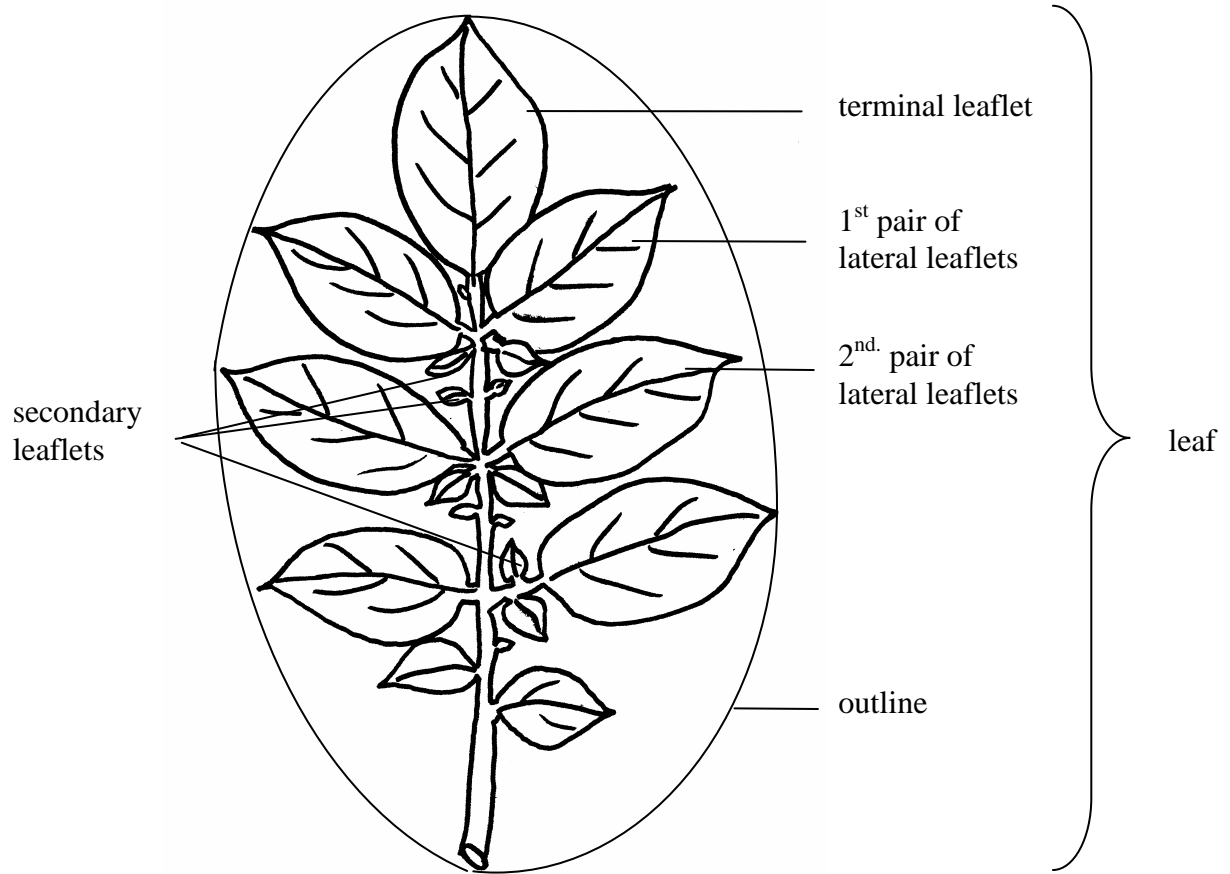
spreading

Ads. 14, 19, 27, 31, 35: Anthocyanin coloration

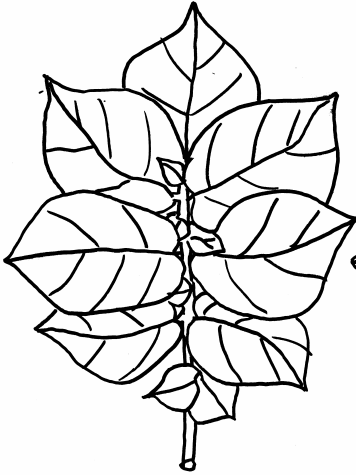
The extent of anthocyanin coloration should be observed in relation to the total area. Distribution and intensity should not be considered.

The extent of anthocyanin coloration of flower buds should be observed on fully developed buds before the corolla is visible.

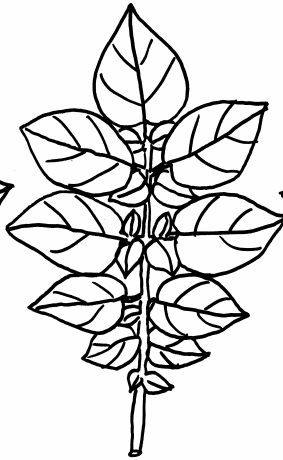
Ads. 15 to 25: Leaf characteristics



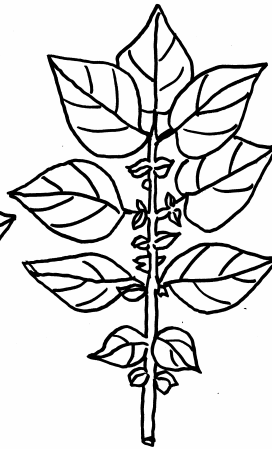
Ad. 16: Leaf: openness



1
closed

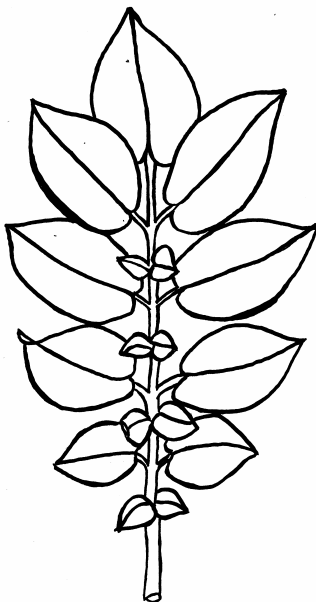


3
intermediate

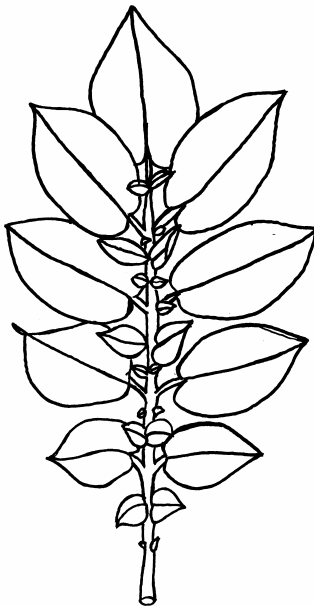


5
open

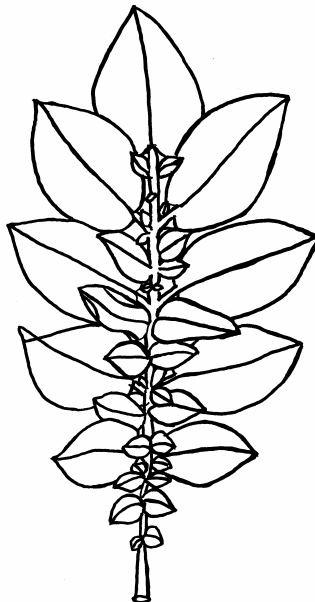
Ad. 17: Leaf: presence of secondary leaflets



3
weak



5
medium

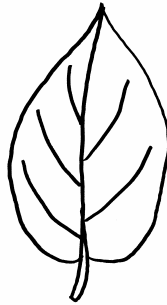


7
strong

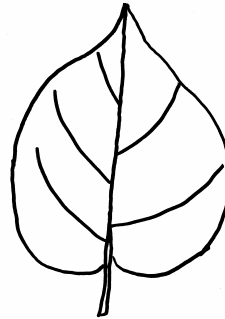
Ad. 21: Second pair of lateral leaflets: width in relation to length



3
narrow



5
medium



7
broad

Ad. 22: Terminal and lateral leaflets: frequency of coalescence

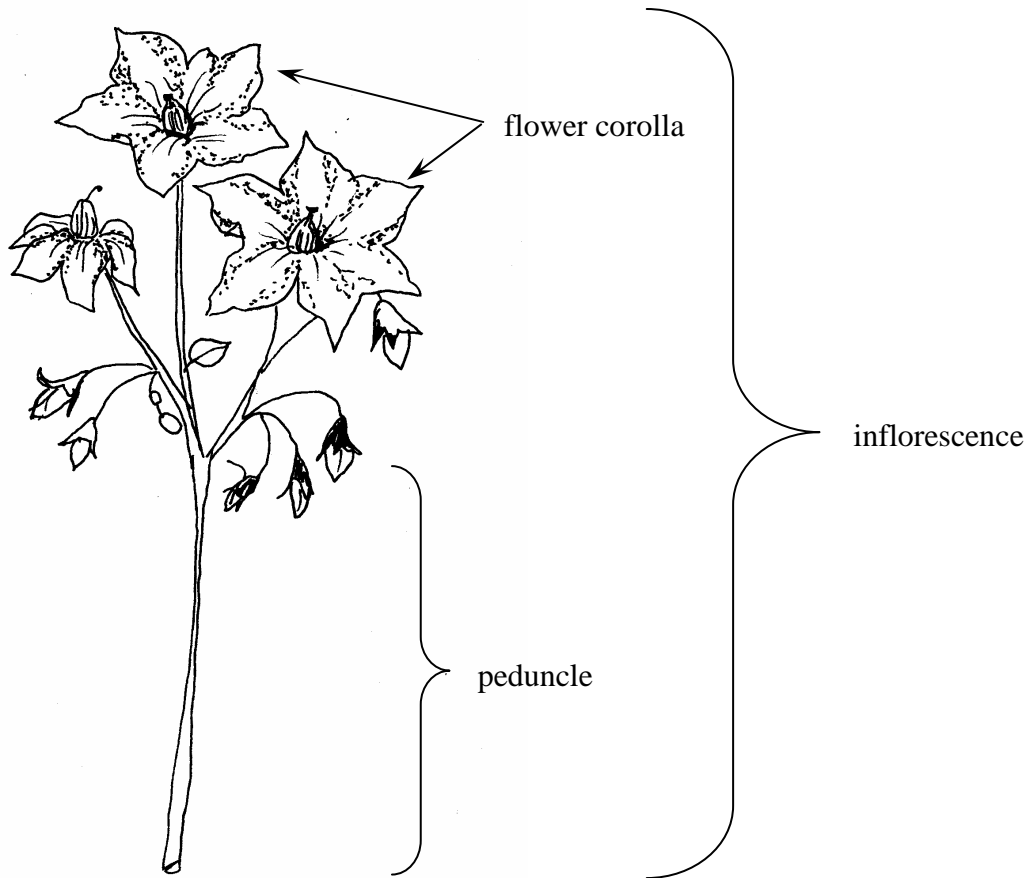


not coalescent



coalescent

Ads. 30–35: Inflorescence and flower characteristics



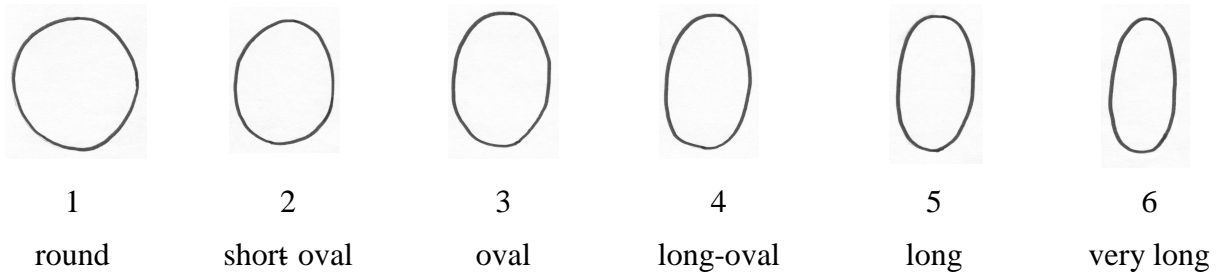
Ad. 33: Flower corolla: intensity of anthocyanin coloration on inner side

If the intensity of the anthocyanin coloration on the inner side is “absent”, the flower corolla appears white.

Ad. 36: Plant: time of maturity

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

Ad. 37: Tuber: shape



The predominant shape should be observed on the harvested material from each plot.

Ad. 42: Light beige and yellow skinned varieties only: Tuber: anthocyanin coloration of skin in reaction to light

The anthocyanin development in the skin of light beige and yellow skinned varieties should be assessed after 10 days of exposure to full daylight or after 150 hours of exposure to artificial light.

8.3 *Optimal Stage of Development for the Assessment of Characteristics*

- 1 = bud stage
- 2 = flowering stage
- 3 = ripening stage of tubers
- 4 = after harvest

9. Literature

Houwing, A., R. Suk and B. Ros, 1986: Generation of lightsprouts suitable for potato variety identification by means of artificial light. Acta Hort 182: 359-363

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights		
1. Subject of the Technical Questionnaire		
1.1 Latin 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)		
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

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)
- (b) partially known cross []
(please state known parent variety(ies))
- (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)

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:
-------------------------	-----------------	-------------------

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

Characteristics	Example Varieties	Note
5.1 Lightsprout: proportion of blue in anthocyanin coloration of base (4)		
absent or low	Desiree	1[]
medium	Pamina	2[]
high	Agria	3[]
5.2 Plant: frequency of flowers (29)		
absent or very low	Achat, King Edward	1[]
low	Walli	3[]
medium	Rita	5[]
high	Agria, Aiko	7[]
very high	Sibu	9[]
5.3 Flower corolla: intensity of anthocyanin coloration on inner side (33)		
absent or very weak	Grata	1[]
weak	Secura	3[]
medium	Ponto	5[]
strong	Artana, Pomeroy	7[]
very strong		9[]
5.4 Flower corolla: proportion of blue in anthocyanin coloration on inner side (34)		
absent or low	Granola	1[]
medium	Pamina	2[]
high	Rocket	3[]

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

Characteristics	Example Varieties	Note
5.5 Plant: time of maturity (36)		
very early	Christa	1[]
early	Cilena	3[]
medium	Nicola	5[]
late	Aula	7[]
very late	Producent	9[]
5.6 Tuber: shape (37)		
round	Grata	1[]
short-oval	Aula	2[]
oval	Diamant	3[]
long-oval	Linda	4[]
long	Spunta	5[]
very long	Pompadour	6[]
5.7 Tuber: color of skin (39)		
light beige	Nadine	1[]
yellow	Agria, Quarta	2[]
red	Desiree	3[]
red parti-colored	Cara	4[]
blue	Vitelotte Noir	5[]
blue parti-colored	Kestrel	6[]
reddish brown	Umatilla Russet	7[]

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

Characteristics	Example Varieties	Note
5.8 Tuber: color of base of eye (40)		
white	Nadine	1[]
yellow	Agria	2[]
red	Quarta	3[]
blue	Vitelotte Noir	4[]
5.9 Tuber: color of flesh (41)		
white	Russet Burbank	1[]
cream	Desiree, Estima	2[]
light yellow	Diamant	3[]
medium yellow	Bildtstar, Quarta	4[]
dark yellow	Princess	5[]
red	Red Salad	6[]
red parti-colored	Early Rose	7[]
blue	Vitelotte Noir	8[]
blue parti-colored	Herd Laddie	9[]

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

6. Similar varieties and differences from these varieties

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

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the similar variety(ies)	Describe the expression of the characteristic(s) for your candidate variety

Comments:

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

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

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

Yes [] No []

(If yes, please provide details)

7.2 Special conditions for the examination of the variety

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

Yes [] No []

7.2.2 If yes, please give details:

7.3 Other information

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.

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

9. Information on plant material to be examined.

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 or pesticide) | Yes [] | No [] |
| (c) Tissue culture | Yes [] | No [] |
| (d) Other factors | Yes [] | No [] |

Please provide details of 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]