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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

SWEET POTATO *

UPOV Code: IPOMO_BAT

Ipomoea batatas (L.) Lam.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Ipomoea batatas (L.) Lam.	Sweet potato	Patate douce	Batate, Süßkartoffel	Camote, Batata

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

ASSOCIATED DOCUMENTS

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

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

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Ipomoea batatas* (L.) Lam.. However, additional characteristics may be needed in order to examine ornamental varieties.

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 medium size storage roots or in the form of cuttings.

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

50 storage roots or 150 cuttings.

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

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

3. Method of Examination

3.1 Number of Growing Cycles

The minimum duration of tests should normally be a single growing cycle.

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 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
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

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 50 plants, which should be divided between at least two 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 on single plants should be made on 30 plants or parts taken from each of 30 plants and any other observations made on all plants in the test.

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 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.

4.2 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 50 plants, 2 off-types are allowed.

4.3 Stability

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

4.3.2 Where appropriate, or in cases of doubt, stability may be 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 are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Plant: growth habit (characteristic 1)
(b) Stem: anthocyanin coloration of tip (characteristic 6)
(c) Leaf blade: lobes (characteristic 9)
(d) Storage root: shape (characteristic 19)
(e) Storage root: main color of skin (characteristic 22)
(f) Storage root: main color of flesh (characteristic 24)

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 Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3
QN: Quantitative characteristic – see Chapter 6.3
PQ: Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS: See Chapter 3.3.2

(a)-(e) See Explanations on the Table of Characteristics in Chapter 8.1
(+) See Explanations on the Table of Characteristics in Chapter 8.2

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. (*)	**VG**	**Plant: growth habit**	**Plante : port**	**Pflanze: Wuchsform**	**Planta: porte**		
QN	**(a)**	upright	dressé	aufrecht	erecto	Sinchunmi	1
		semi-upright	demi-dressé	halbaufrecht	semierecto	Younmi	3
		spreading	étalé	breitwüchsig	extendido	Yulmi	5
2.	**MS/ VG**	**Stem: length of primary shoots**	**Tige : longueur des rameaux primaires**	**Stiel: Länge der primären Seitentriebe**	**Tallo: longitud de los brotes principales**		
QN	**(a)**	short	courts	kurz	cortos	Sinchunmi	3
	(b)	medium	moyens	mittel	medianos	Koganesengan, Younmi	5
		long	longs	lang	largos	Zami	7
3.	**MS/ VG**	**Stem: length of internode**	**Tige : longueur de l'entre-nœud**	**Stiel: Länge des Internodiums**	**Tallo: longitud del entrenudo**		
QN	**(a)**	short	court	kurz	corto	Younmi	3
	(c)	medium	moyen	mittel	mediano	Koganesengan, Yulmi	5
		long	long	lang	largo	Shinhwangmi	7
4.	**MS/ VG**	**Stem: diameter of internode**	**Tige : diamètre de l'entre-nœud**	**Stiel: Durchmesser des Internodiums**	**Tallo: diámetro del entrenudo**		
QN	**(a)**	very small	très petit	sehr klein	muy pequeño	Zami	1
	(c)	small	petit	klein	pequeño	Sinchunmi	3
		medium	moyen	mittel	mediano	Koganesengan, Yulmi	5
		large	grand	groß	grande	Shinyulmi	7
		very large	très grand	sehr groß	muy grande	Chinmi	9
5.	**VG**	**Stem: anthocyanin coloration of internode**	**Tige : pigmentation anthocyanique de l'entre-nœud**	**Stiel: Anthocyanfärbung des Internodiums**	**Tallo: pigmentación antociánica del entrenudo**		
QN	**(a)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Yulmi	1
	(c)	medium	moyenne	mittel	media	Singeonmi	2
		strong	forte	stark	fuerte	Hayanmi	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6. (*) (+)	**VG**	**Stem: anthocyanin coloration of tip**	**Tige : pigmentation anthocyanique du sommet**	**Stiel: Anthocyanfärbung der Spitze**	**Tallo: pigmentación antociánica del extremo**		
QN	**(a)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Yulmi	1
	(b)	medium	moyenne	mittel	media	Sinjami	2
		strong	forte	stark	fuerte	Hayanmi	3
7.	**VG**	**Stem: anthocyanin coloration of node**	**Tige : pigmentation anthocyanique du nœud**	**Stiel: Anthocyanfärbung des Knotens**	**Tallo: pigmentación antociánica del nudo**		
QN	**(a)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Yulmi	1
	(b)	medium	moyenne	mittel	media	Norin 2	2
		strong	forte	stark	fuerte	Hayanmi, Koganesengan	3
8. (*)	**VG**	**Stem: pubescence of tip**	**Tige : pilosité du sommet**	**Stiel: Behaarung der Spitze**	**Tallo: pubescencia del extremo**		
QN	**(a)**	absent or sparse	absente ou faible	fehlend oder locker	ausente o laxa	Yulmi	1
	(b)	medium	moyenne	mittel	media	Koganesengan	2
		dense	forte	dicht	densa	Zami	3
9. (*) (+)	**MG**	**Leaf blade: lobes**	**Limbe : lobes**	**Blattspreite: Lappen**	**Limbo: lóbulos**		
QL	**(a)**	absent	absents	fehlend	ausente	Gokokuimo	1
		three lobes	trois lobes	drei Lappen	tres lóbulos	Benisengan	2
		five lobes	cinq lobes	fünf Lappen	cinco lóbulos	Koganesengan, Sinchunmi	3
		seven lobes	sept lobes	sieben Lappen	siete lóbulos	Benihayato	4

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
10. (*) (+)	**VG**	**Only varieties with leaf blade lobes absent: Leaf blade: shape**	**Seulement variétés avec limbe : lobes : absents : Limbe : forme**	**Nur Sorten mit Blattspreiten: Lappen fehlend: Blattspreite: Form**	**Sólo variedades que no presentan lóbulos en la hoja: Limbo: forma**		
PQ	**(a)**	cordate	cordiforme	herzförmig	cordiforme	Gokokuimo, Yulmi	1
	(d)	triangular	triangulaire	dreieckig	triangular	Beniotome	2
		reniform	réniforme	nierenförmig	reniforme	Kohkei 14	3
		circular	circulaire	kreisförmig	circular		4
11. (+)	**VG**	**Only varieties with leaf blade lobes present: Leaf blade: depth of lobing**	**Seulement variétés avec limbe : lobes : absents : Limbe : profondeur de découpure des bords**	**Nur Sorten mit Blattspreiten: Lappen vorhanden: Blattspreite: Tiefe der Lappung**	**Sólo variedades que presentan lóbulos en la hoja: Limbo: profundidad de las incisiones de los lóbulos**		
QN	**(a)**	very shallow	très peu profonde	sehr flach	muy poco profundas		1
	(d)	shallow	peu profonde	flach	poco profundas	Benihayato, Sinchunmi	3
		moderate	moyenne	mäßig	moderadamente profundas	Koganesengan	5
		deep	profonde	tief	profundas	Tsukumoaka	7
		very deep	très profonde	sehr tief	muy profundas		9
12.	**VG**	**Leaf blade: color (excluding anthocyanin coloration)**	**Limbe : couleur (sans la pigmentation anthocyanique)**	**Blattspreite: Farbe (ohne Anthocyanfärbung)**	**Limbo: color (excluyendo la pigmentación antociánica)**		
PQ	**(a)**	yellow green	vert-jaune	gelbgrün	verde amarillento	Serolane, Suio	1
	(d)	green	vert	grün	verde	Yulmi	2
		grey green	gris-vert	graugrün	gris-verde	Hayanmi	3
13.	**VG**	**Leaf blade: anthocyanin coloration of upper side**	**Limbe : pigmentation anthocyanique de la face supérieure**	**Blattspreite: Anthocyanfärbung der Oberseite**	**Limbo: pigmentación antociánica del haz**		
QN	**(a)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Yulmi	1
	(d)	medium	moyenne	mittel	media	Hayanmi	2
		strong	forte	stark	fuerte		3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
14. (+)	**VG**	**Leaf blade: extent of anthocyanin coloration on abaxial veins**	**Limbe : étendue de la pigmentation anthocyanique sur les nervures abaxiales**	**Blattspreite: Ausdehnung der Anthocyanfärbung an den abaxialen Adern**	**Limbo: extensión de la pigmentación antociánica en los nervios abaxiales**		
QN	**(a)**	absent or very small	absente ou très petite	fehlend oder sehr klein	ausente o muy pequeña		1
	(d)	small	petite	klein	pequeña	Koukei 14, Yulmi	3
		medium	moyenne	mittel	mediana	Beniaka, Norin 45	5
		large	grande	groß	grande	Hayanmi, Naeshirazu	7
		very large	très grande	sehr groß	muy grande	Koganesengan	9
15.	**VG**	**Leaf blade: intensity of anthocyanin coloration on abaxial veins**	**Limbe : intensité de la pigmentation anthocyanique sur les nervures abaxiales**	**Blattspreite: Intensität der Anthocyanfärbung an den abaxialen Adern**	**Limbo: intensidad de la pigmentación antociánica en los nervios abaxiales**		
QN	**(a)**	very weak	très faible	sehr gering	muy débil		1
	(d)	weak	faible	gering	débil	Norin 45	3
		medium	moyenne	mittel	media	Koganesengan	5
		strong	forte	stark	fuerte		7
		very strong	très forte	sehr stark	muy fuerte		9
16.	**VG**	**Young leaf blade: main color on upper side**	**Jeune limbe : couleur principale sur la face supérieure**	**Spreite des jungen Blattes: Farbe an der Oberseite**	**Limbo: color principal del haz**		
PQ		yellow green	vert-jaune	gelbgrün	verde amarillento	Beniwase	1
		light green	vert clair	hellgrün	verde claro	Koganesengan	2
		medium green	vert moyen	mittelgrün	verde medio	Norin 2	3
		dark green	vert foncé	dunkelgrün	verde gris		4
		light purple	pourpre clair	hellpurpurn	púrpura claro	Kyushu 14	5
		medium purple	pourpre moyen	mittelpurpurn	púrpura medio		6
		purplish brown	brun-pourpre	purpurbraun	marrón violáceo	Minamiyutaka	7
		light brown	brun clair	hellbraun	marrón claro		8
		dark brown	brun foncé	dunkelbraun	marrón oscuro		9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17. (*)	**VG**	**Petiole: anthocyanin coloration**	**Pétiole : pigmentation anthocyanique**	**Blattstiel: Anthocyanfärbung**	**Pecíolo: pigmentación antociánica**		
QN	**(a)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Yulmi	1
	(d)	weak	faible	gering	débil	Norin 45	3
		medium	moyenne	mittel	media	Hayanmi, Koganesengan	5
		strong	forte	stark	fuerte		7
18. (+)	**VG/ MS**	**Petiole: length**	**Pétiole : longueur**	**Blattstiel: Länge**	**Pecíolo: longitud**		
QN	**(a)**	very short	très court	sehr kurz	muy corto	Sinchunmi	1
	(d)	short	court	kurz	corto		3
		medium	moyen	mittel	medio	Koganesengan, Yulmi	5
		long	long	lang	largo		7
		very long	très long	sehr lang	muy largo	Shinmi	9
19. (*) (+)	**VG**	**Storage root: shape**	**Racine de réserve : forme**	**Speicherwurzel: Form**	**Raíz tuberosa: forma**		
PQ	**(e)**	ovate	ovale	eiförmig	oval		1
		elliptic	elliptique	elliptisch	elíptica		2
		obovate	obovale	verkehrt eiförmig	oboval	Geonmi	3
		oblong	oblongue	rechteckig	oblonga	Serolane	4
		irregular	irrégulière	unregelmäßig	irregular	Shinyulmi	5
20.	**MS**	**Storage root: ratio length/width**	**Racine de réserve : rapport longueur/largeur**	**Speicherwurzel: Verhältnis Länge/Breite**	**Raíz tuberosa: relación longitud/anchura**		
QN	**(e)**	moderately compressed	modérément compressé	mäßig zusammengedrückt	moderadamente comprimida	Norin 2	3
		medium	moyen	mittel	media	Geonmi	5
		moderately elongated	modérément allongé	mäßig länglich	moderadamente alargada	Yulmi	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21. (+)	**MS/ VG**	**Storage root: thickness of cortex relative to overall diameter**	**Racine de réserve : épaisseur du cortex par rapport au diamètre total**	**Speicherwurzel: Dicke der Rinde im Verhältnis zum Gesamtdurchmesser**	**Raíz tuberosa: grosor de la corteza en relación con el diámetro general**		
QN	**(e)**	thin	fin	dünn	delgada	Yulmi	3
		medium	moyen	mittel	media		5
		thick	épais	dick	gruesa	Shingeonmi	7
22. (*) (+)	**VG**	**Storage root: main color of skin**	**Racine de réserve : couleur principale de la peau**	**Speicherwurzel: Hauptfarbe der Schale**	**Raíz tuberosa: color principal de la piel**		
PQ	**(e)**	white	blanche	weiß	blanco	Joy White	1
		light beige	beige clair	hellbeige	beige claro	Chinmi, Koganesengan	2
		yellow	jaune	gelb	amarillo	Impilo	3
		orange	orange	orange	anaranjado	Benihayato, Serolane	4
		brownish orange	orange brunâtre	bräunlichorange	anaranjado amarronado	Khano	5
		pink	rose	rosa	rosa	Yulmi	6
		red	rouge	rot	rojo	Koukei 14, Shinhwangmi	7
		purple red	rouge-pourpre	purpurrot	rojo púrpura	Beniazuma, Phala	8
		light purple	pourpre clair	hellpurpurn	púrpura claro		9
		medium purple	pourpre moyen	mittelpurpurn	púrpura medio	Ayamurasaki, Zami	10
		brown	brune	braun	marrón	Happymi	11

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
23. (+)	**VG**	**Storage root: secondary color of skin**	**Racine de réserve : couleur secondaire de la peau**	**Speicherwurzel: Sekundärfarbe der Schale**	**Raíz tuberosa: color secundario de la piel**		
PQ	**(e)**	absent	absente	fehlend	ausente	Koganesengan	1
		white	blanche	weiß	blanco	Tamayutaka	2
		yellow	jaune	gelb	amarillo		3
		orange	orange	orange	anaranjado		4
		pink	rose	rosa	rosa	Koukei 14	5
		red	rouge	rot	rojo	Nakamurasaki	6
		purple	pourpre	purpurn	púrpura	Benikomachi	7
		brown	brune	braun	marrón	Koganesengan	8
24. (*) (+)	**VG**	**Storage root: main color of flesh**	**Racine de réserve : couleur de la chair**	**Speicherwurzel: Hauptfarbe des Fleisches**	**Raíz tuberosa: color principal de la pulpa**		
PQ	**(e)**	white	blanche	weiß	blanco	Hayanmi, Shirosengan	1
		beige	beige	beige	beige	Nakamurasaki, Koukei 14	2
		yellow	jaune	gelb	amarillo	Benikomachi, Yulmi	3
		orange	orange	orange	anaranjado	Benihayato, Hayatoimo, Juhwangmi	4
		purple	pourpre	purpurn	púrpura	Ayamurasaki, Borami	5
25.	**VG**	**Storage root: intensity of main color of flesh**	**Racine de réserve : intensité de la couleur principale de la chair**	**Speicherwurzel: Intensität der Hauptfarbe des Fleisches**	**Raíz tuberosa: intensidad del color principal de la pulpa**		
QN	**(e)**	light	claire	hell	claro	Borami, Hayatoimo, Yulmi	1
		medium	moyenne	mittel	medio	Jinhongmi, Shinwangmi, Zami	2
		dark	foncée	dunkel	oscuro	Juhwangmi, Shinyulmi, Sinjami	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
26. (+)	**VG**	**Storage root: secondary color of flesh**	**Racine de réserve : couleur secondaire de la chair**	**Speicherwurzel: Sekundärfarbe des Fleisches**	**Raíz tuberosa: color secundario de la pulpa**		
PQ	**(e)**	white	blanche	weiß	blanco		1
		light beige	beige clair	hellbeige	beige claro		2
		yellow	jaune	gelb	amarillo	Hayatoimo	3
		orange	orange	orange	anaranjado	Toka Toka Gold	4
		pink	rose	rosa	rosa		5
		red	rouge	rot	rojo		6
		red-purple	rouge-pourpre	rotpurpurn	rojo púrpura	Nakamurasaki, Owairaka Red	7
		purple	pourpre	purpurn	púrpura		8
27.	**VG**	**Storage root: depth of eyes**	**Racine de réserve : profondeur des yeux**	**Speicherwurzel: Tiefe der Augen**	**Raíz tuberosa: profundidad de los ojos**		
QN	**(e)**	shallow	peu profonde	flach	poco profundos	Beniaka	1
		medium	moyenne	mittel	medios	Koukei 14	2
		deep	profonde	tief	profundos	Kantou 80	3

8. Explanations on the Table of Characteristics

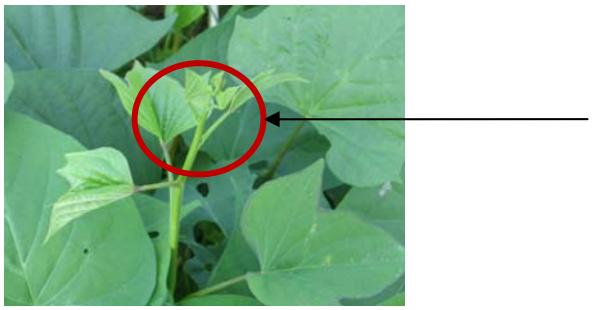
8.1 Explanations covering several characteristics

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

(a) Observations should be made after 90 days from planting.
(b) To be observed on the main stem
(c) Stem internodes and length and diameter of internode should be observed on an internode located in the middle third of the main stem.
(d) Observations to be made on fully developed leaves at the middle part of the main stem.
(e) Characteristics should be observed after harvest.

8.2. Explanations for individual characteristics

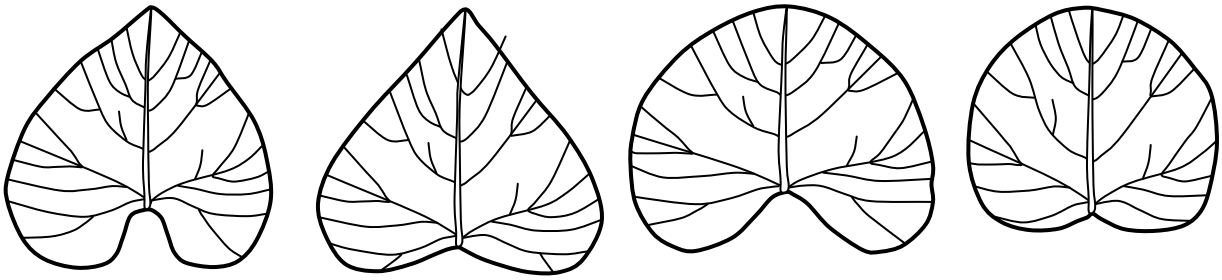
Ad. 6: Stem: anthocyanin coloration of tip



Ad. 9: Leaf blade: lobes

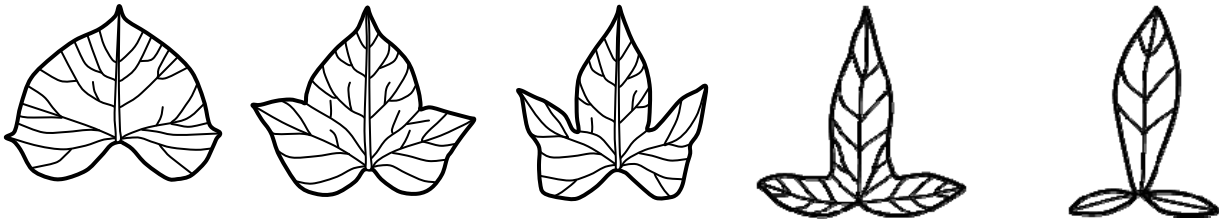
1	2	3	4
absent	three lobes	five lobes	seven lobes

Ad. 10: Only varieties with leaf blade lobes absent: Leaf blade: shape



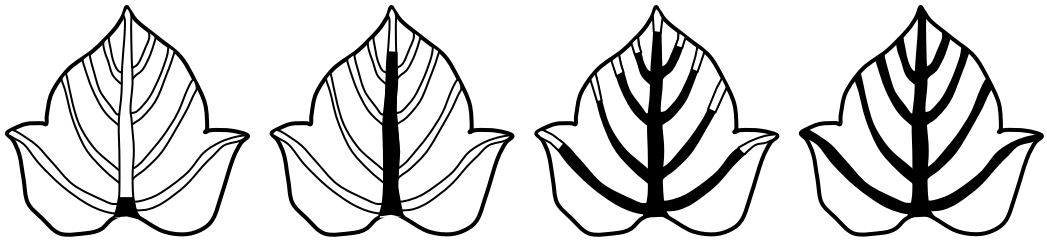
1	2	3	4
cordate	triangular	reniform	circular

Ad. 11: Only varieties with leaf blade lobes present: Leaf blade: depth of lobing



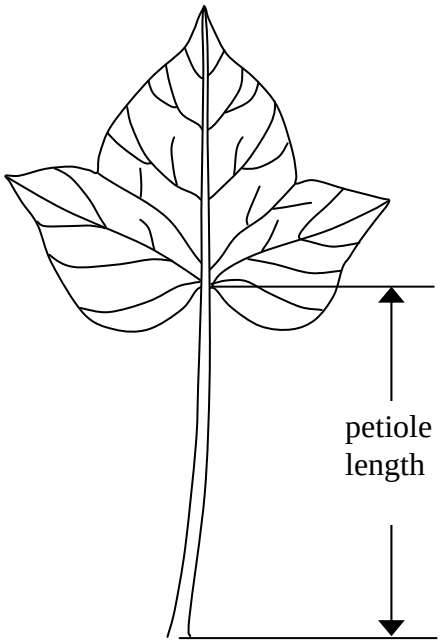
1	3	5	7	9
very shallow	shallow	moderate	deep	very deep

Ad. 14: Leaf blade: extent of anthocyanin coloration on abaxial veins

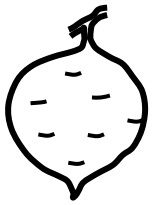
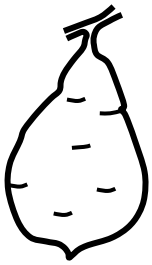


3	5	7	9
small	medium	large	very large

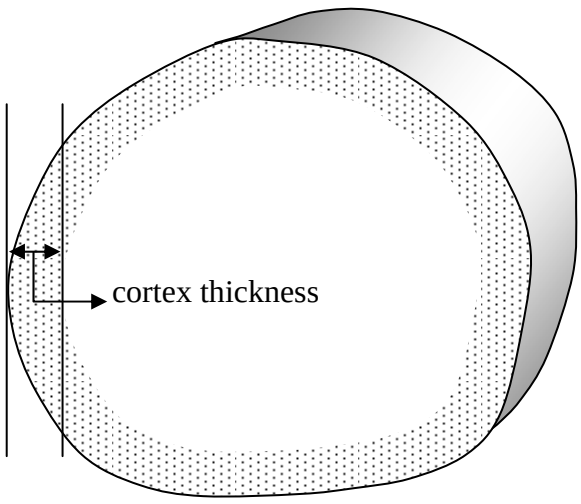
Ad. 18: Petiole: length



Ad. 19: Storage root: shape

		< position of broadest part >		
		below middle	at middle	above middle
< lateral outline >	rounded	 1 ovate	 2 elliptic	 3 obovate
	oblong	 4 oblong		
	irregular	 5 irregular		

Ad. 21: Storage root: thickness of cortex relative to overall diameter



Ad. 22: Storage root: main color of skin

The main color is the color which covers the largest area of skin.

Ad. 23: Storage root: secondary color of skin

The secondary color is the color with the second largest surface area of skin.

Ad. 24: Storage root: main color of flesh

The main color is the color with the largest surface area of storage root in cross section.

Ad. 26: Storage root: secondary color of flesh

The secondary color is the color with the second largest surface area of storage root in cross section.

9. Literature

NSMO, 2000: Test Guideline for Sweetpotato. National Seed Management Office/MAF, KR, p.12.

Mokpo experiment station/RDA. 2002: Production and Use of Sweetpotato. Mokpo experiment station/RDA, p. 214.

Zosimo Huaman. 1992: Morphologic Identification of Duplicates in Collections of Ipomoea batatas. CIP Research guide 36. CIP, p. 28.

Zosimo Huaman. 2002: Section 1.1 Systemic Botany and Morphology of the Sweetpotato plant. Sweetpotato Germplasm Management Training Manual. International Potato Center (CIP), p. 7.

Zosimo Huaman, 2006: Systmatic Botany and Morphology of the Sweetpotato Plant. Sweetpotato Germplasm Management (Ipomoea batatas). Training manual CIP. http://www.cipotato.org.

10. Technical Questionnaire

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

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

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

1. Subject of the Technical Questionnaire

1.1 Botanical name	*Ipomoea batatas* (L.) Lam.
1.2 Common name	Sweet potato

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	

Breeder (if different from applicant)

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

(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) cuttings [ ]

(b) *in vitro* propagation [ ]

(c) other (state method) [ ]

4.2.2 Seed [ ]

4.2.3 Other [ ]
(please provide details)

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

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

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

	Characteristics	Example Varieties	Note
5.1 (1)	**Plant: growth habit**		
	upright	Sinchunmi	1[ ]
	semi-upright	Younmi	3[ ]
	spreading	Yulmi	5[ ]
5.2 (6)	**Stem: anthocyanin coloration of tip**		
	absent or weak	Yulmi	1[ ]
	medium	Sinjami	2[ ]
	strong	Hayanmi	3[ ]
5.3 (9)	**Leaf blade: lobes**		
	absent	Gokokuimo	1[ ]
	three lobes	Benisengan	2[ ]
	five lobes	Koganesengan, Sinchunmi	3[ ]
	seven lobes	Benihayato	4[ ]
5.4 (19)	**Storage root: shape**		
	ovate		1[ ]
	elliptic		2[ ]
	obovate	Geonmi	3[ ]
	oblong	Serolane	4[ ]
	irregular	Shinyulmi	5[ ]

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

	Characteristics	Example Varieties	Note
5.5 (22)	**Storage root: main color of skin**		
	white	Joy White	1[ ]
	light beige	Chinmi, Koganesengan	2[ ]
	yellow	Impilo	3[ ]
	orange	Benihayato, Serolane	4[ ]
	brownish orange	Khano	5[ ]
	pink	Yulmi	6[ ]
	red	Koukei 14, Shinhwangmi	7[ ]
	purple red	Beniazuma, Phala	8[ ]
	light purple		9[ ]
	medium purple	Ayamurasaki, Zami	10[ ]
	brown	Happymi	11[ ]
5.6 (24)	**Storage root: main color of flesh**		
	white	Hayanmi, Shirosangan	1[ ]
	beige	Nakamuraski, Koukei 14	2[ ]
	yellow	Benikomachi, Yulmi	3[ ]
	orange	Benihayato, Hayatoimo, Juhwangmi	4[ ]
	purple	Ayamurasaki, Borami	5[ ]

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

6. Similar varieties and differences from these varieties

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

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Plant: growth habit*	*upright*	*semi-upright*

Comments:

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

7.3.1 Use

Food/Feed [ ] Ornamental [ ]

8. Authorization for release

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

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

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

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

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

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

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

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

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

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

……

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

Applicant’s name

Signature Date

[End of document]