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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

WATERMELON

(*Citrullus lanatus* (Thunb.) Matsum. et
Nakai)

*

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>Citrullus lanatus</i> (Thunb.) Matsum. et Nakai, <i>Citrullus vulgaris</i> Schrad.	Watermelon	Pastèque	Wassermelone	Sandía

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.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Citrullus lanatus* (Thunb.) Matsum. et Nakai.

2. Material Required

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

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

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

1,200 seeds.

2.4 The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority.

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 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 35 plants in the open or 20 plants in the greenhouse, 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 20 plants or parts taken from each of 20 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 2% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 35 plants or 20 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 seed stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

4.3.3 The stability of a hybrid variety may, in addition to an examination of the hybrid variety itself, also be assessed by examination of the uniformity and stability of its parent lines.

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) Ploidy (characteristic 1)
- (b) Fruit: weight (characteristic 19)
- (c) Fruit: shape in longitudinal section (characteristic 20)
- (d) Fruit: ground color of skin (characteristic 21)
- (e) Fruit: stripes (characteristic 30)
- (f) Fruit: width of stripes (characteristic 33)
- (g) Fruit: main color of flesh (characteristic 36)
- (h) Seed: ground color of testa (characteristic 41).

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*

(*) Asterisk 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

MG Single measurement of a group of plants or parts of plants – see Section 3.3.1

MS Measurement of a number of individual plants or parts of plants – see Section 3.3.1

VG Visual assessment by a single observation of a group of plants or parts of plants – see Section 3.3.1

VS Visual assessment by observation of individual plants or parts of plants – see Section 3.3.1

(a) – (c) 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.

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

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. VS (*)	Ploidy	Ploïdie	Ploidie	Ploidía		
QL	diploid	diploïde	diploid	diploïde	Sugar Baby, Yamato 3	2
	triploid	triploïde	triploid	triploïde	Kimiwa Red Seedless, Kôyô Seedless, Pepsin	3
2. VG (+)	Cotyledon: shape	Cotylédon: forme	Keimblatt: Form	Cotiledón: forma		
PQ	narrow elliptic	elliptique étroit	schmal elliptisch	elíptica estrecha	Kahô, Topgun	1
	medium elliptic	elliptique moyen	mittel elliptisch	elíptica media	Crimson Sweet, Farao, Napsugár, Sweet Favorite, Yamato 3,	2
	broad elliptic	elliptique large	breit elliptisch	elíptica ancha	Kanro, Oasis, Rubin, Scarlet Trio	3
3. MS/ VG	Cotyledon: size	Cotylédon: taille	Keimblatt: Größe	Cotiledón: tamaño		
QN	small	petit	klein	pequeño	Crimson Glory, Kanro, Rapid, Rocio	3
	medium	moyen	mittel	medio	Granit, Crisby, Panni Sugar Suika, Yamato 3,	5
	large	grand	groß	grande	Candida, Farao, Kurobe, Royal flesh hybrid	7
4. VG	Cotyledon: intensity of green color	Cotylédon: intensité de la couleur verte	Keimblatt: Intensität der Grünfärbung	Cotiledón: intensidad del color verde		
QN	light	faible	hell	claro	À graine rouge à confire à chair verte, Shin Kurobe 7	3
	medium	moyenne	mittel	medio	Yamato 3	5
	dark	forte	dunkel	oscuro	Kahô	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
5.	VG	Cotyledon: spots	Cotylédon: taches	Keimblatt: Flecken	Cotiledón: manchas		
QL	absent	absentes	fehlend	ausentes	Yamato 3	1	
	present	présentes	vorhanden	presentes	Okan	9	
6.	MS	Plant: length of internode	Plante: longueur de l'entre-nœud	Pflanze: Internodienlänge	Planta: longitud del entrenudo		
QN	short	court	kurz	corto	Fumin, Tsurunashi Asahi	3	
	medium	moyen	mittel	medio	Crimstar, Panonia, Yamato 3,	5	
	long	long	lang	largo	Charleston Gray, Crimson Sweet, Kanro	7	
7.	MS/ VG	Leaf blade: length (on the 3rd leaf when fully developed)	Limbe: longueur (sur la 3^{ème} feuille à complet développement)	Blattspreite: Länge (am 3. Blatt wenn voll entwickelt)	Limbo: longitud (de la 3^a hoja completamente desarrollada)		
QN	(a)	short	court	kurz	corto	Kanro 3	3
		medium	moyen	mittel	medio	Sugar Baby, Yamato	5
		long	long	lang	largo	À graine rouge à confire à chair verte, Sweet Siberian	7
8.	MS/ VG	Leaf blade: width (as for 7)	Limbe: largeur (comme pour 7)	Blattspreite: Breite (wie unter 7)	Limbo: anchura (como para 7)		
QN	(a)	narrow	étroit	schmal	estrecho	Ogon, Striped Blue Limber	3
		medium	moyen	mittel	medio	Candida, Sugar Baby, Yamato 3	5
		broad	large	breit	ancho	Fabiola, Sanpaku	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
9.	MS	Leaf blade: ratio length/width (as for 7)	Limbe: rapport longueur/largeur (comme pour 7)	Blattspreite: Verhältnis Länge/Breite (wie unter 7)	Limbo: relación entre la longitud y la anchura (como para 7)		
QN	(a)	small	petit	klein	pequeña	Kanro	3
		medium	moyen	mittel	media	Sugar Baby, Yamato 3	5
		large	grand	groß	grande	Kurobe	7
10.	VG	Leaf blade: color	Limbe: couleur	Blattspreite: Farbe	Limbo: color		
PQ	(a)	yellow-green	vert-jaune	gelbgrün	verde amarillento	Baby Fun, Okan	1
		green	vert	grün	verde	Yamato 3	2
		grey-green	vert-gris	graugrün	verde grisáceo	Candida, Sugar Baby	3
11.	VG	Leaf blade: intensity of color	Limbe: intensité de la couleur	Blattspreite: Intensität der Farbe	Limbo: intensidad del color		
QN	(a)	light	claire	hell	claro	Giant Flesh	3
		medium	moyenne	mittel	medio	Yamato 3	5
		dark	foncée	dunkel	oscuro	Kurobe	7
12.	VG	Leaf blade: degree of primary lobing	Limbe: degré de la découpe primaire du bord	Blattspreite: Stärke der Lappung erster Ordnung	Limbo: grado de lobulado primario		
(*)							
(+)							
QN	(a)	weak	faible	gering	débil	Rapid	3
		medium	moyenne	mittel	medio	Fumin	5
		strong	forte	stark	fuerte	Panonia, Panni	7
13.	VG	Leaf blade: degree of secondary lobing	Limbe: degré de la découpe secondaire du bord	Blattspreite: Stärke der Lappung zweiter Ordnung	Limbo: grado de lobulado secundario		
(+)							
QN	(a)	weak	faible	gering	débil	Daisen	3
		medium	moyenne	mittel	medio	Sugar Baby	5
		strong	forte	stark	fuerte	Fumin	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
14.	VG	Leaf blade: blistering (on 10th to 15th leaf)	Limbe: cloûre (de la 10^{ème} à la 15^{ème} feuille)	Blattspreite: Blasigkeit (vom 10. bis 15. Blatt)	Limbo: abullonado (de la 10^a a la 15^a hoja)	
QN	(a)	weak	faible	gering	débil	Tabata 3
		medium	moyenne	mittel	medio	Yamato 3 5
		strong	forte	stark	fuerte	Klondike Striped II 7
15.	VG (*)	Leaf blade: marbling	Limbe: marbrures	Blattspreite: Marmorierung	Limbo: jaspeado	
QN	(a)	absent or weak	absentes ou faibles	fehlend oder gering	ausente o muy débil	Sugar Baby, Yamato 3 1
		medium	moyennes	mittel	medio	Okan, Taiyô 2
		strong	fortes	stark	fuerte	3
16.	MS/ VG	Petiole: length	Pétiote: longueur	Blattstiel: Länge	Pecíolo: longitud	
QN		short	court	kurz	corto	Sugar Baby, Yamato 3 3
		medium	moyen	mittel	medio	Kahô, Panonia 5
		long	long	lang	largo	Charleston Gray, Kurobe 7
17.	VG	Ovary: size (at the time of flowering)	Ovaire: taille (à l'époque de la floraison)	Fruchtknoten: Größe (zum Zeitpunkt der Blüte)	Ovario: tamaño (en el momento de la floración)	
QN		small	petit	klein	pequeño	Kahô 3
		medium	moyen	mittel	mediano	Fumin 5
		large	grand	groß	grande	Ogon 7
18.	VG	Ovary: pubescence	Ovaire: pilosité	Fruchtknoten: Behaarung	Ovario: pubescencia	
QN		weak	faible	gering	débil	Rapid 3
		medium	moyenne	mittel	media	Panonia, Yamato 3 5
		strong	forte	stark	fuerte	Kahô 7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
19. MS (* (*)	Fruit: weight (1 st mature fruit)	Fruit: poids (1 ^{er} fruit mûr)	Frucht: Gewicht (1. reife Frucht)	Fruto: peso (1 ^{er} fruto maduro)		
QN	(b) very low	très petit	sehr niedrig	muy pequeño	Colocynthis	1
	very low to low	très petit à petit	sehr niedrig bis niedrig	muy pequeño a pequeño	Mini	2
	low	petit	niedrig	pequeño	Angela	3
	low to medium	petit à moyen	niedrig bis mittel	prequeño a medio	Pasión	4
	medium	moyen	mittel	medio	Boston, Sugar Baby	5
	medium to high	moyen à grand	mittel bis hoch	medio a grande	Panonia	6
	high	grand	hoch	grande	Fabiola	7
	high to very high	grand à très grand	hoch bis sehr hoch	grande a muy grande	Crimson Sweet	8
	very high	très grand	sehr hoch	muy grande	Florida Giant	9
20. VG (* (+)	Fruit: shape in longitudinal section	Fruit: forme en section longitudinale	Frucht: Form im Längsschnitt	Fruto: forma en sección longitudinal		
PQ	(b) circular	circulaire	kreisförmig	circular	Kanro, Sugar Baby	1
	broad elliptic	elliptique large	breit elliptisch	elíptico ancho	Fumin, Gray Belle, Yellow Baby, Zorba	2
	elliptic	elliptique	elliptisch	elíptico	Congo, Kurobe, Picnic	3
	elongated elliptic	elliptique allongé	länglich elliptisch	elíptico alargado	Charleston Gray	4
21. VG (* (+)	Fruit: ground color of skin	Fruit: couleur du fond de l'épiderme	Frucht: Grundfarbe der Schale	Fruto: color de fondo de la epidermis		
QL	(b) yellow	jaune	gelb	amarillo	Okan, Taiyô	1
	green	vert	grün	verde	Fabiola, Sugar Baby, Sugar Belle	2

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
22. (*) (+)	VG	Fruit: intensity of ground color of skin	Fruit: intensité de la couleur du fond de l'épiderme	Frucht: Intensität der Grundfarbe der Schale	Fruto: intensidad del color de fondo de la epidermis		
QN	(b)	very light	très claire	sehr hell	muy claro	Fumin	1
		very light to light	très claire à claire	sehr hell bis hell	muy claro a claro	Crimson Sweet	2
		light	claire	hell	claro	Estella Rocha, Sweet Favorite, Yamato 3	3
		light to medium	claire à moyenne	hell bis mittel	claro a medio		4
		medium	moyenne	mittel	medio	Asahi Yamato, Lucky Sweet, Rodeo	5
		medium to dark	moyenne à foncée	mittel bis dunkel	medio a oscuro	Sweet Marvel	6
		dark	foncée	dunkel	oscuro	Benimusume, Resistant	7
		dark to very dark	foncée à très foncée	dunkel bis sehr dunkel	oscuro a muy oscuro	Sugar Baby, Panni	8
		very dark	très foncée	sehr dunkel	muy oscuro	Rocio, Tabor 5	9
23. (+)	VG	Fruit: size of insertion of peduncle	Fruit: taille de l'insertion du pédoncule	Frucht: Größe des Stielansatzes	Fruto: tamaño de la inserción del pedúnculo		
QN	(b)	small	petite	klein	pequeño	Charleston Gray, Sugar Bush	3
		medium	moyenne	mittel	mediano	Fumin, Picnic	5
		large	grande	groß	grande	Dixie Queen, Kanro	7
24. (+)	VG	Fruit: depression at base	Fruit: dépression à la base	Frucht: Vertiefung an der Basis	Fruto: depresión de la base		
QN	(b)	shallow	peu profonde	flach	poco profunda	Kahô, Yellow Baby	3
		medium	moyenne	mittel	media	Triple Sweet, Yamato 3	5
		deep	profonde	tief	profunda	À graine rouge à confire à chair verte, Kanro	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
25.	VG	Fruit: shape of apical part	Fruit: forme de la partie apicale	Frucht: Form des apikalen Teils	Fruto: forma de la zona apical		
(*) (+)							
PQ	(b)	flat	plate	flach	plana	Cream Sinka, Kanro	1
		flat to rounded	plate à arrondie	flach bis abgerundet	plana a redondeada		2
		rounded	arrondie	abgerundet	redondeada	Glory, Sugar Baby, Toro, Yamato 3	3
		rounded to conical	arrondie à conique	abgerundet bis kegelförmig	redondeada a cónica		4
		conical	conique	kegelförmig	cónica	Kahô	5
26.	VG	Fruit: depression at apex	Fruit: cuvette pistillaire	Frucht: Vertiefung an der Spitze	Fruto: depresión del ápice		
(+)							
QN	(b)	shallow	peu profonde	flach	poco profunda	Burpee Hybrid, Kahô	3
		medium	moyenne	mittel	media	Asahi Miyako, Fumin	5
		deep	profonde	tief	profunda		7
27.	VG	Fruit: size of pistil scar	Fruit: taille de l'attache pistillaire	Frucht: Größe der Griffelnarbe	Fruto: tamaño de la cicatriz del pistilo		
QN	(b)	small	petite	klein	pequeña	Charleston Gray, Daisen	3
		medium	moyenne	mittel	media	Yamato 3	5
		large	grande	groß	grande	Kanro	7
28.	VG	Fruit: distribution of grooves	Fruit: distribution des cannelures	Frucht: Verteilung der Riefen	Fruto: distribución de las acanaladuras		
PQ	(b)	absent	absentes	fehlend	ausente	Sugar Baby, Yamato	1
		at basal half	au niveau de la moitié basale	an der basalen Hälfte	en la mitad basal		2
		at apical half	au niveau de la moitié apicale	an der apikalen Hälfte	en la mitad apical		3
		on whole fruit	sur tout le fruit	an der gesamten Frucht	en todo el fruto	Kurobe, Tabata	4

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29.	VG	Fruit: degree of grooving	Fruit: degré de la cannelure	Frucht: Grad der Riefung	Fruto: grado de acanalado	
QN	weak	faible	gering	débil	Rapid, Kanro	3
	medium	moyenne	mittel	medio	Miyako, Asahi	5
	strong	forte	stark	fuerte	Napsugár, Marsowszky, Panni	7
30.	VG	Fruit: stripes	Fruit: stries	Frucht: Streifen	Fruto: rayas	
(*) (+)						
QL	(b) absent	absentes	fehlend	ausentes	Asahi, Yamato, Marsowszky Sugar Baby	1
	present	presentes	vorhanden	presentes	Kanro, Yellow Baby	9
31.	VG	Fruit: type of stripes	Fruit: type de stries	Frucht: Art der Streifen	Fruto: tipo de rayas	
QL	diffused	diffuses	diffus	difusas	Asahi, Yamato, Fumin	1
	clearly defined	clairement définies	deutlich definiert	claramente definidas	Kanro, Miyako, Crimson Sweet	2
32.	VG	Fruit: intensity of color of stripes	Fruit: intensité de la couleur des stries	Frucht: Intensität der Farbe der Streifen	Fruto: intensidad del color de las rayas	
(*) (+)						
QN	(b) very light	très faible	sehr hell	muy claro		1
	light	faible	hell	claro		3
	medium	moyenne	mittel	medio	Kurobe	5
	dark	forte	dunkel	oscuro	Crimson Sweet, Miyako 3	7
	very dark	très forte	sehr dunkel	muy oscuro	Tabata	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
33.	VG	Fruit: width of stripes	Fruit: largeur des stries	Frucht: Breite der Streifen	Fruto: anchura de las rayas		
QN	(b)	very narrow	très étroites	sehr schmal	muy estrechas	Napsugár	1
		narrow	étroites	schmal	estrechas	Festival Queen, Yamato Cream 2	3
		medium	moyennes	mittel	medias		5
		broad	larges	breit	anchas	Crimson Sweet, Kurobe, Sweet Heart	7
		very broad	très larges	sehr breit	muy anchas	Sangria	9
34.	VG	Fruit: intensity of marbling	Fruit: intensité de la marbrure	Frucht: Intensität der Marmorierung	Fruto: intensidad del jaspeado		
QN	(b)	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Napsugár	1
		weak	faible	gering	débil	Fumin	3
		medium	moyenne	mittel	medio	Panni, Yamato 3	5
		strong	forte	stark	fuerte	Kurobe	7
		very strong	très forte	sehr stark	muy fuerte	Rapid	9
35.	MS/ VG	Fruit: thickness of pericarp	Fruit: épaisseur du péricarpe	Frucht: Dicke des Perikarps	Fruto: espesor del pericarpio		
QN	(b)	thin	mince	dünn	delgado	À graine rouge à confire à chair verte, Beni-kodama, Kahô	3
		medium	moyen	mittel	medio	Panonia, Sugar Baby, Sugar Belle, Yamato 3	5
		thick	épais	dick	grueso	Charleston Gray, Crimson Sweet, Kurobe, Triple Sweet	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
36. (*)	VS	Fruit: main color of flesh	Fruit: couleur principale de la chair	Frucht: Hauptfarbe des Fleisches	Fruto: color principal de la pulpa		
PQ	(b)	white	blanche	weiß	blanco	Yamato Cream 3	1
		yellow	jaune	gelb	amarillo	Yamato Cream 1, Napsugár	2
		orange	orange	orange	naranja	Kahô	3
		pink	rose	rosa	rosa	Sadur	4
		pinkish red	rouge rosâtre	rosarot	rojo rosado	Bingo, Crimson Sweet	5
		red	rouge	rot	rojo	Asahi Yamato, Sugar Baby	6
37.	VG	Fruit: intensity of main color of flesh	Fruit: intensité de la couleur principale de la chair	Frucht: Intensität der Hauptfarbe des Fleisches	Fruto: intensidad del color principal de la pulpa		
QN	(b)	light	claire	hell	claro		3
		medium	moyenne	mittel	medio		5
		dark	foncée	dunkel	oscuro		7
38. (+)	MS	Fruit: firmness of flesh	Fruit: fermeté de la chair	Frucht: Festigkeit des Fleisches	Fruto: firmeza de la pulpa		
QN	(b)	soft	molle	weich	blanda	Yamato Cream 2	3
		medium	moyenne	mittel	media	Miyako 3	5
		firm	ferme	fest	firme	Fumin	7
39.	QN	Fruit: number of seeds	Fruit: nombre de graines	Frucht: Anzahl Samen	Fruto: número de semillas		
VG	(b)	absent or few	nul ou très petit	fehlend oder sehr gering	ausente o muy bajo	Tanenashi Kôyô	1
		medium	moyen	mittel	medio	Miyako 3	2
		many	grand	groß	alto	Fumin	3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
40.	MS/ (*) VG	Seed: size	Graine: taille	Samen: Größe	Semilla: tamaño		
QN	(c)	very small	très petite	sehr klein	muy pequeña	Urimi	1
		small	petite	klein	pequeña	Panonia, Tabata	3
		medium	moyenne	mittel	mediana	Sugar Baby	5
		large	grande	groß	grande	Charleston Gray, Kurobe	7
		very large	très grande	sehr groß	muy grande	Malali	9
41.	VG	Seed: ground color of testa	Graine: couleur de fond du tégument	Samen: Grundfarbe der Samenschale	Semilla: color de fondo del tegumento		
PQ	(c)	white	blanc	weiß	blanco	Sanpaku	1
		cream	crème	cremefarben	crema	Kurobe	2
		green	vert	grün	verde	Green Citron	3
		red	rouge	rot	rojo	Red Citron	4
		red-brown	brun-rouge	rotbraun	marrón rojizo	Kahô	5
		brown	brun	braun	marrón	Otome, Sugar Baby	6
		black	noir	schwarz	negro	Yamato Cream	7
42.	VG	Seed: secondary color of testa	Graine: couleur secondaire de fond du tégument	Samen: sekundäre Grundfarbe der Samenschale	Semilla: color secundario del tegumento		
QL	(c)	absent	absente	fehlend	ausente	Kahô	1
		present	présente	vorhanden	present	Charleston Gray	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
43.	VG	Seed: distribution of secondary color of testa	Graine: distribution de la couleur secondaire du tégument	Samen: Verteilung der Sekundärfarbe der Samenschale	Semilla: distribución del color secundario del tegumento		
(+)							
PQ	(c)	in dots only	en points seulement	nur in Punkten	sólo en puntos	Charleston Gray, Excel	1
		in dots and in patches	en points et en taches	in Punkten und Flecken	en puntos y manchas	Lady, Yamato 3	2
		in patches only	en taches seulement	nur in Flecken	sólo en manchas	Kurobe, Rattle Snake	3
44.	VG	Seed: area of secondary color in relation to that of ground color	Graine: surface de la couleur secondaire par rapport à celle de la couleur de fond	Samen: Ausdehnung der Sekundärfarbe im Vergleich zu der Grundfarbe	Semilla: área del color secundario en relación con el del color de fondo		
QN	(c)	small	petite	klein	pequeño	Early Star	3
		medium	moyenne	mittel	medio	Grimson Sweet	5
		large	grande	groß	grande	Resistant	7
45.	VG	Seed: patches at hilum	Graine: taches sur le hile	Samen: Flecken am Nabel	Semilla: manchas en el hilo		
QL	(c)	absent	absentes	fehlend	ausentes	Daisen, Kahô	1
		present	présentes	vorhanden	presentes	Kurobe, Rattle Snake, Yamato 3	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
46.	VG	Time of female flowering (50% of plants with at least one female flower)	Époque de floraison femelle (50% des plantes avec au moins une fleur femelle)	Zeitpunkt der Blüte der weiblichen Blüte (50% der Pflanzen mit mindestens einer weiblichen Blüte)	Época de la floración femenina (50% de las plantas con al menos una flor femenina)	
QN	early	précoce	früh	temprana		3
	medium	moyenne	mittel	media	Sugar Baby, Yamato 3	5
	late	tardive	spät	tardía	Kurobe	7
47.	VG	Time of maturity (50% of plants with at least one ripe fruit)	Époque de maturité (50% des plantes avec au moins un fruit mûr)	Zeitpunkt der Reife (50% der Pflanzen mit mindestens einer reifen Frucht)	Época de madurez (50% de las plantas con al menos un fruto maduro)	
QN	early	précoce	früh	temprana	Kahô, Sugar Baby	3
	medium	moyenne	mittel	media	Panonia, Yamato 3	5
	late	tardive	spät	tardía	Charleston Gray, Fumin, Kurobe	7
48.	(+)	Resistance to Fusarium oxysporum f.sp. niveum (E.F. Smith) Snyder et Hansen	Résistance au Fusarium oxysporum f.sp. niveum (E.F. Smith) Snyder et Hansen	Resistenz gegen Fusarium oxysporum f.sp. niveum (E.F. Smith) Snyder et Hansen	Resistencia a Fusarium oxysporum f.sp. niveum (E.F. Smith) Snyder et Hansen	
48.1	Race 0	Pathotype 0	Pathotyp 0	Raza 0		
	absent	absente	fehlend	ausente	Kahô	1
	present	présente	vorhanden	presente	Calhoun Gray, Charleston Gray	9
48.2	Race 1	Pathotype 1	Pathotyp 1	Raza 1		
	absent	absente	fehlend	ausente	Kahô	1
	present	présente	vorhanden	presente	Calhoun Gray	9
48.3	Race 2	Pathotype 2	Pathotyp 2	Raza 2		
	absent	absente	fehlend	ausente	Kahô	1
	present	présente	vorhanden	presente	P.I.-296341-FR	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
49. (+)	Resistance to <i>Colletotrichum lagenarium</i> (<i>passerini</i>) Ellis et Halsted	Résistance au <i>Colletotrichum lagenarium</i> (<i>passerini</i>) Ellis et Halsted	Resistenz gegen <i>Colletotrichum lagenarium</i> (<i>passerini</i>) Ellis et Halsted	Resistencia a <i>Colletotrichum lagenarium</i> (<i>passerini</i>) Ellis et Halsted		
49.1	Race 1	Pathotype 1	Pathotyp 1	Raza 1		
	absent	absente	fehlend	ausente	Kahô	1
	present	présente	vorhanden	presente	Charleston Gray, Congo	9
49.2	Race 2	Pathotype 2	Pathotyp 2	Raza 2		
	absent	absente	fehlend	ausente	Kahô	1
	present	présente	vorhanden	presente	African citron W-695	9
49.3	Race 3	Pathotype 3	Pathotyp 3	Raza 3		
	absent	absente	fehlend	ausente	Kahô	1
	present	présente	vorhanden	presente	Charleston Gray, Congo	9

8. Explanations on the Table of Characteristics

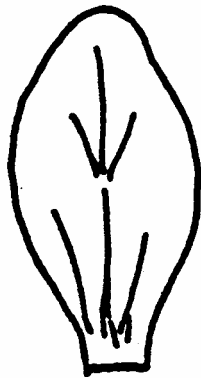
8.1 *Explanations covering several characteristics*

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

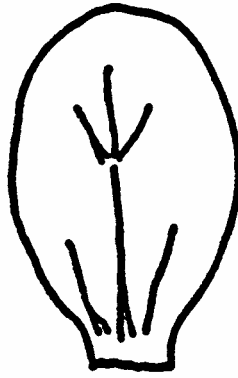
- (a) Leaf blade: All observations on the leaf blade should be recorded on fully developed leaves
- (b) Fruit: Unless otherwise indicated, all observations on the fruit should be made on first well developed, mature fruits.
- (c) Seed: All observations on the seed should be recorded on fully developed, mature seeds.

8.2 *Explanations for individual characteristics*

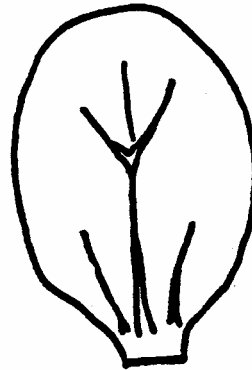
Ad. 2: Cotyledon: shape



1
narrow elliptic



2
medium elliptic



3
broad elliptic

Ad. 12: Leaf blade: degree of primary lobing

The incisions should be observed on the 3rd leaf of the main stem when fully developed.



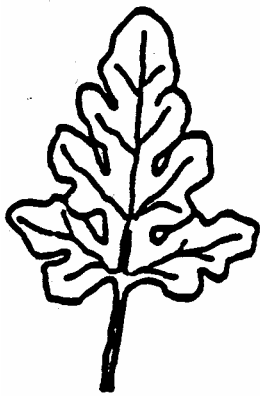
3
weak

5
medium

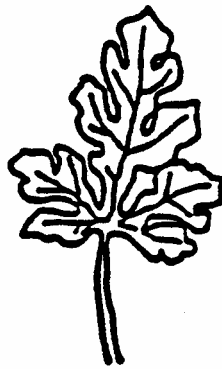
7
strong

Ad. 13: Leaf blade: degree of secondary lobing

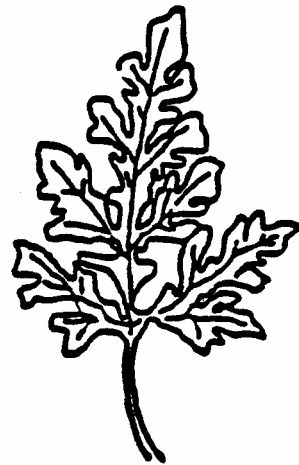
The incisions should be observed at the largest leaf between the fifteenth and twentieth node of the main stem.



3
weak

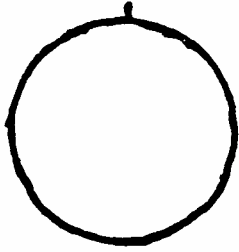


5
medium

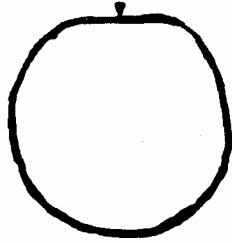


7
strong

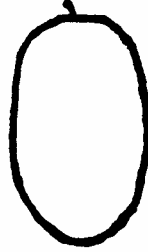
Ad. 20: Fruit: shape in longitudinal section



1
circular



2
broad elliptic



3
elliptic

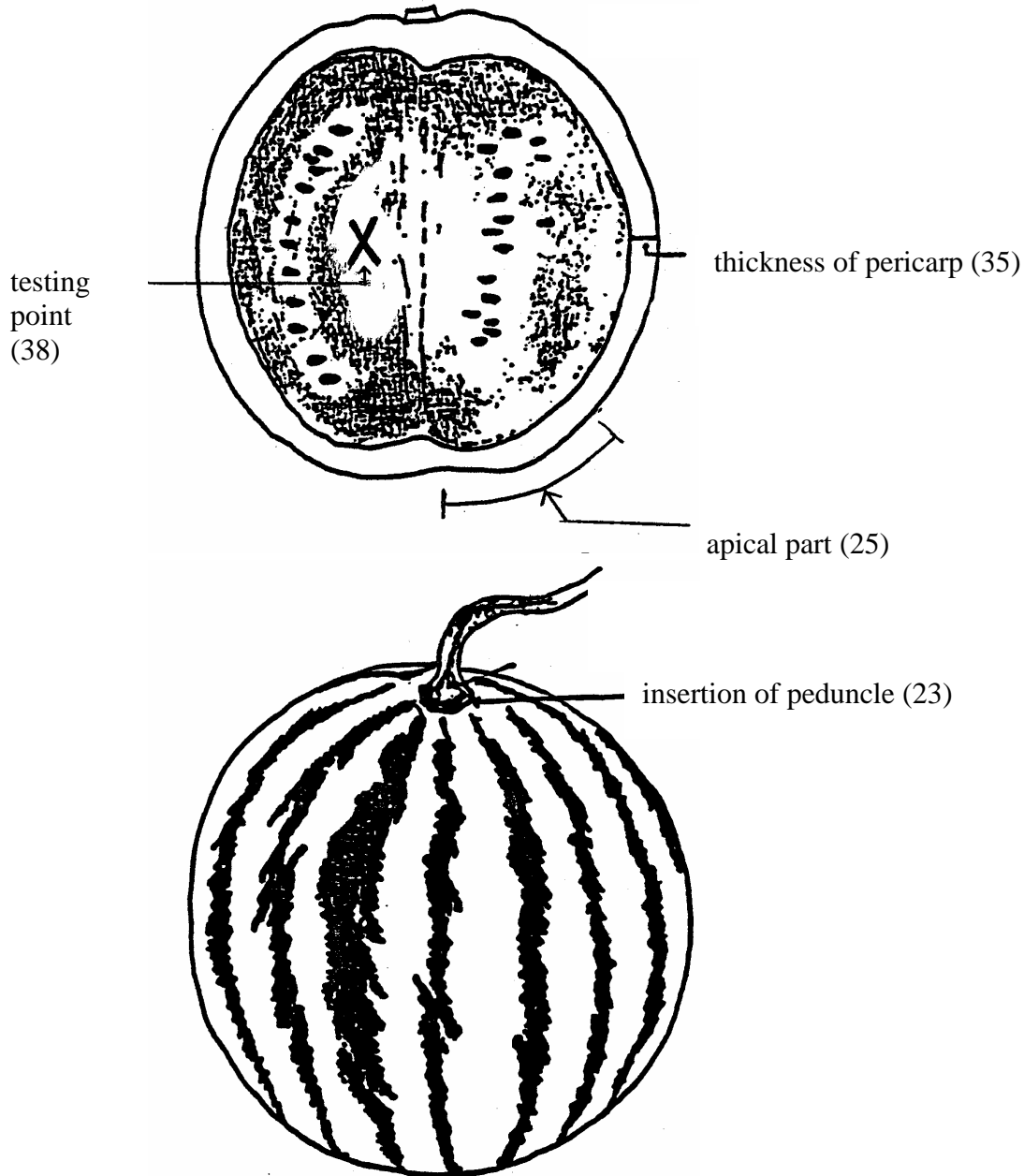


4
elongated elliptic

Ad. 21 + 22 + 30 + 32: Fruit: ground color of skin and color of stripes

The ground color is defined as the lighter color and the color of the stripes as the darker color.

Ad. 23 + 25 + 35 + 38: Fruit



Ad. 24: Fruit: depression at base



3
shallow



5
medium



7
deep

Ad. 26: Fruit: depression at apex



3
shallow



5
medium

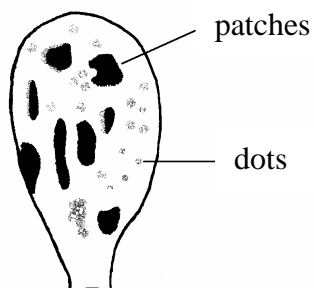


7
deep

Ad. 38: Fruit: firmness of flesh

Testing method: Firmness is measured by a hardness meter (tester), which has 9 mm (diameter head) and measures from 10 g/cm²– 2000 g/cm².

Ad. 43: Seed: distribution of secondary color of testa



Ad. 48: Resistance to *Fusarium oxysporum* f. sp. *niveum* (E.F. Smith) Snyder et Hansen

Maintenance of races

Type of medium: P.S.A. (Potato, Sugar and Agar) medium
Special conditions: Stored below 5°C
Preparation of inoculum: Shaking culture in P.S. (Potato and Sugar) liquid medium for 7 to 10 days at 28°C. Filtration by using double gauzes. Adjusting concentration of spore to 1.3×10^7 /ml with sterilized water.

Execution of test

Sowing the seeds: In sterilized soil
Growth stage of plants: Expanding of 2nd to 3rd true leaf
Method of inoculation: Soaking of roots and of hypocotyl axis for one minute inoculum solution. After inoculation, transplantation of plantlets in sterilised (by steam) soil or perlite.
Number of plants tested: 10 to 20 plants

Environmental condition after inoculation

Temperature: Day: 25°C; night: 16°C
Light: Natural (longer than 12 hours)
Growing method: In the greenhouse or climatic room. Application of liquid fertilizer every week.

Duration of test

Inoculation to last observation: 20 days. Disease symptoms appear from 5 to 10 days after inoculation. Observation should be made on several occasions

Remarks

Keeping of pathogenecity: Renewal of medium at least once a year

Standard varieties	Race 0	Race 1	Race 2

Black Diamond, Kahô	S	S	S
Charleston Gray	R	S	S
Calhoun Gray	R	R	S
P.I. 296341-FR	R	R	R

S: susceptible R: resistant

Ad. 49: Resistance to *Colletotrichum lagenarium (passerini)* Ellis et Halsted

Maintenance of races

Type of medium: P.S.A. (Potato, Sugar and Agar) medium
Special conditions: Stored below 5°C
Preparation of inoculum: Shaking culture in P.D. (Potato and Dextrose) liquid medium for 7 to 10 days at 28°C. Filtration by using double gauzes. Adjusting concentration of spore to 1.5×10^4 /ml with sterilized water.

Execution of test

Sowing the seeds: In sterilized soil
Growth stage of plants: Expanding of 2nd to 3rd true leaf
Method of inoculation: Spraying inoculum on the leaves and the stem
Treatment after inoculation: Inoculated plants should be placed in a dark and humid chamber at 25°C with 100% relative humidity for 48 hours before being moved to the greenhouse.
Number of plants tested: 10 to 20 plants

Environmental condition after inoculation

Temperature: Day: 25°C; night: 16°C
Light: Natural (longer than 12 hours)
Growing method: In the greenhouse

Duration of test

Inoculation to last observation: 25 days

Remarks

Race: Three races are identified
Keeping of pathogenecity: Renewal of medium at least once a year

Standard varieties	Race 1	Race 2	Race 3
Kahô	S	S	S
Charleston Gray,			
Congo	R	S	R
African citron W-695	S	R	S

S: susceptible R: resistant

9. Literature

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Cucurbit Genetics Cooperative, Cucurbit Gene List Committee, 1987: "Gene List for Watermelon," Cucurbit Gent.Coop. Rpt. 10, pp 106-110

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Kanda, T., 1951: "Triploid Watermelons," Proc. Am. Soc. Hort. Sci. 58, pp 217-230

Kensler, T.R., Barham, W.S., 1958: "The Inheritance of Seed Size in Watermelon," Proc. Amer. Soc. Hort. Sci. 71, pp 480-484

Martyn, R.D., McLaughlin, R.J., 1983: "Susceptibility of Summer Squash to the Watermelon Wilt Pathogen (*Fusarium oxysporum* f. sp. *niveum*)," Plant Disease 67(3), pp 263-266

Martyn, R.D., Netzer, D., 1991: "Resistance to Race 0, 1 and 2 of *Fusarium* Wilt of Watermelon in *Citrullus* sp.," PI-296341-FR

Mizyno, S., Pratt, H.K., 1973: "Relations of Respiration and Ethylene Production to Maturity in the Watermelon," J. Amer. Soc. Hort. Sci. 98(6), pp 614-617

Mohr, H.C., 1963: "Utilization of the Genetic Character for Short-internode in Improvement of the Watermelon". J. Amer. Soc. Hort. Sci. 82, pp 454-459

Pool, C.F., Porter, D.R., 1933: "Pollen Germination and Development in Watermelon," Proc. Amer. Soc. Hort. Sci. 30, pp 526-530

Pool, C.F., Grimball, P.C., Porter, D.R., 1941: "Inheritance of Seed Characters in Watermelon," Jour. Agr. Res. 66, pp 433-456

Shomotsuma, M., Jines, C.M., 1972: "Effect of Ethephon and Daylight on Sex Expression of Muskmelon and Watermelon," Hort. Sci. 7, pp 73-75

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
<p>TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p> <p>In the case of hybrid varieties which are the subject of an application for plant breeders' rights, and where the parent lines are to be submitted as a part of the examination of the hybrid variety, this Technical Questionnaire should be completed for each of the parent lines, in addition to being completed for the hybrid variety.</p>		
1. Subject of the Technical Questionnaire		
1.1 Latin Name	<input type="text" value="Citrullus lanatus (Thunb.) Matsum. et Nakai"/>	
1.2 Common Name	<input type="text" value="Watermelon"/>	
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 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

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>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).</p>		
Characteristics	Example Varieties	Note
<p>5.1 Ploidy (1)</p>		
diploid	Sugar Baby, Yamato 3	2[]
triploid	Kimiwa Red Seedless, Kôyô Seedless, Pepsin	3[]
<p>5.2 Fruit: weight (1st mature fruit) (19)</p>		
very low	Colocynthis	1[]
very low to low	Mini	2[]
low	Angela	3[]
low to medium	Pasi�n	4[]
medium	Boston, Sugar Baby	5[]
medium to high	Panonia	6[]
high	Fabiola	7[]
high to very high	Crimson Sweet	8[]
very high	Florida Giant	9[]
<p>5.3 Fruit: shape in longitudinal section (20)</p>		
circular	Kanro, Sugar Baby	1[]
broad elliptic	Fumin, Gray Belle, Yellow Baby, Zorba	2[]
elliptic	Congo, Kurobe, Picnic	3[]
elongated elliptic	Charleston Gray	4[]
<p>5.4 Fruit: ground color of skin (21)</p>		
yellow	Okan, Taiy�	1[]
green	Fabiola, Sugar Baby, Sugar Belle	2[]

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics		Example Varieties	Note
5.5 Fruit: stripes (30)			
absent		Asahi, Yamato, Marsowszky, Sugar Baby	1[]
present		Kanro, Yellow Baby	9[]
5.6 Fruit: width of stripes (33)			
very narrow		Napsugár	1[]
narrow		Festival Queen, Yamato Cream 2	3[]
medium			5[]
broad		Crimson Sweet, Kurobe, Sweet Heart	7[]
very broad		Sangria	9[]
5.7 Fruit: main color of flesh (36)			
white		Yamato Cream 3	1[]
yellow		Yamato Cream 1, Napsugár	2[]
orange		Kahô	3[]
pink		Sadur	4[]
pinkish red		Bingo, Crimson Sweet	5[]
red		Asahi Yamato, Sugar Baby	6[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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
<i>Example</i>	<i>Fruit: width of stripes</i>	<i>narrow</i>	<i>medium</i>

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

A representative color photograph of the variety should accompany the Technical Questionnaire.

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:
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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]