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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

MANGO *

UPOV Code: MANGI_IND

Mangifera indica L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Mangifera indica L.	Mango	Manguier	Mango	Mango

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 *Mangifera indica* 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 budsticks.

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

12 budsticks, sufficient to propagate 5 trees.

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

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

3. Method of Examination

3.1 Number of Growing Cycles

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

The growing cycle is considered to be the period ranging from the beginning of active vegetative growth or flowering, continuing through active vegetative growth or flowering and fruit development and concluding with the harvesting of fruit.

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

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. In particular, it is essential that the trees produce a satisfactory crop of fruit in each of the two growing cycles.

3.4 Test Design

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 5 plants or parts taken from each of 5 plants. In the case of parts of plants, the number to be taken from each of the plants should be 2.

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 5 plants, no 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) Mature fruit: ratio length/width (characteristic 22);

(b) Mature fruit: shape of ventral shoulder (characteristic 32);

(c) Seed: embryony (characteristic 55);

(d) Time of fruit maturity (characteristic 57).

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

(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. **(*)**		**Tree: attitude of main branches**	**Arbre: port des rameaux principaux**	**Baum: Haltung der Hauptzweige**	**Árbol: porte de las ramas principales**		
PQ		erect	dressé	aufrecht	erecto	Kent, Palmer	1
		spreading	horizontal	waagerecht	extendido	Irwin, Peach, Tommy Atkins, Zill	2
		drooping	retombant	hängend	colgante	Sensation	3
2. **(*)** **(+)**		**Young leaf: intensity of anthocyanin coloration**	**Jeune feuille: intensité de la pigmentation anthocyanique**	**Junges Blatt: Intensität der Anthocyanfärbung**	**Hoja joven: intensidad de la pigmentación antociánica**		
QN		absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Palmer	1
		weak	faible	gering	débil	Early Gold, Irwin	3
		medium	moyenne	mittel	media		5
		strong	forte	stark	fuerte		7
		very strong	très forte	sehr stark	muy fuerte	Osteen	9
3.		**Leaf blade: length**	**Limbe: longueur**	**Blattspreite: Länge**	**Limbo: longitud**		
QN	**(a)**	short	court	kurz	corto	Adams, Heidi	3
		medium	moyen	mittel	medio	Kent, Peach, Tommy Atkins	5
		long	long	lang	largo	Florigon, Hood, Keitt	7
4.		**Leaf blade: width**	**Limbe: largeur**	**Blattspreite: Breite**	**Limbo: anchura**		
QN	**(a)**	narrow	étroit	schmal	estrecho	Heidi, Long Green, Peach	3
		medium	moyen	mittel	medio	Kent, Tommy Atkins	5
		broad	large	breit	ancho	Hood, Keitt, Nimrod, Osteen, Palmer	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5. **(*)**		**Leaf blade: ratio length/width**	**Limbe: rapport longueur/ largeur**	**Blattspreite: Verhältnis Länge/Breite**	**Limbo: relación longitud/anchura**		
QN	**(a)**	small	petit	klein	pequeña	Hood, Nimrod	3
		medium	moyen	mittel	media	Adams, Irwin, Sensation	5
		large	grand	groß	grande	Florigon	7
		very large	très grand	sehr groß	muy grande	Chené, Peach	9
6. **(+)**		**Leaf blade: shape**	**Limbe: forme**	**Blattspreite: Form**	**Limbo: forma**		
PQ	**(a)**	ovate	ovale	eiförmig	oval	Van Dyke	1
		elliptic	elliptique	elliptisch	elíptico		2
		oblong	oblong	rechteckig	oblongo	Hood	3
7.		**Leaf blade: color**	**Limbe: couleur**	**Blattspreite: Farbe**	**Limbo: color**		
PQ	**(a)**	yellow green	vert jaune	gelbgrün	verde amarillo	Carrie, Zill	1
		light green	vert clair	hellgrün	verde claro		2
		medium green	vert moyen	grün	verde medio		3
		dark green	vert foncé	dunkelgrün	verde oscuro	Fascell, Long Green, Nimrod	4
8. **(+)**		**Leaf blade: twisting**	**Limbe: torsion**	**Blattspreite: Drehung**	**Limbo: torsión**		
QL	**(a)**	absent	absente	fehlend	ausente	Heidi, Hood, Keitt	1
		present	présente	vorhanden	presente	Florigon, Peach, Zill	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
9.		**Leaf blade: spacing of secondary veins**	**Limbe: espacement entre les nervures secondaires**	**Blattspreite: Abstand zwischen den sekundären Adern**	**Limbo: espacio entre los nervios secundarios**		
QN	**(a)**	very close	très faible	sehr gering	muy escaso	Early Gold	1
		close	faible	gering	escaso	Sensation	3
		medium	moyen	mittel	medio	Adams	5
		wide	grand	groß	grande	Nimrod	7
		very wide	très grand	sehr groß	muy grande	Hood	9
10.		**Leaf blade: undulation of margin**	**Limbe: ondulation du bord**	**Blattspreite: Wellung des Randes**	**Limbo: ondulación del borde**		
QN	**(a)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Keitt, Kent, Tommy Atkins, Van Dyke	1
		medium	moyenne	mittel	medio	Long Green, Zill	2
		strong	forte	stark	fuerte	Chené, Early Gold, Florigon	3
11. **(+)**		**Leaf blade: shape of base**	**Limbe: forme de la base**	**Blattspreite: Form der Basis**	**Limbo: forma de la base**		
PQ	**(a)**	acute	aiguë	spitz	aguda	Florigon, Sabre	1
		obtuse	obtuse	stumpf	obtusa		2
		rounded	arrondie	abgerundet	redondeada	Fascell, Kent	3
12. **(+)**		**Leaf blade: shape of apex**	**Limbe: forme du sommet**	**Blattspreite: Form der Spitze**	**Limbo: forma del ápice**		
PQ	**(a)**	attenuate	pointu	mit lang ausgezogener Spitze	afilado	Florigon	1
		acuminate	acuminé	mit aufgesetzter Spitze	acuminado	Gouveia, Nimrod	2
		acute	aigu	spitz	agudo	Hood	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13.		**Petiole: attitude in relation to shoot**	**Pétiole: port par rapport à la tige**	**Stiel: Haltung im Verhältnis zum Trieb**	**Peciolo: porte en relación con el brote**		
QN	**(a)**	erect	dressé	aufrecht	erecto	Sensation	1
		semi erect	demi-dressé	halb aufrecht	semierecto	Peach	3
		perpendicular	perpendiculaire	senkrecht	perpendicular	Haden, Zill	5
		moderately recurved	modérément retombant	mäßig zurückgebogen	medianamente colgante		7
		strongly recurved	très retombant	stark zurückgebogen	muy colgante		9
14.		**Petiole: length**	**Pétiole: longueur**	**Stiel: Länge**	**Peciolo: longitud**		
QN	**(a)**	short	court	kurz	corto	Adams	3
		medium	moyen	mittel	medio		5
		long	long	lang	largo	Kensington	7
15. **(*)** **(+)**		**Inflorescence: length**	**Inflorescence: longueur**	**Blütenstand: Länge**	**Inflorescencia: longitud**		
QN	**(b)**	short	courte	kurz	corta	Carrie, Long Green, Peach, Sabre	3
		medium	moyenne	mittel	media	Osteen, Zill	5
		long	longue	lang	larga	Haden, Keitt, Kent	7
16. **(+)**		**Inflorescence: diameter**	**Inflorescence: diamètre**	**Blütenstand: Durchmesser**	**Inflorescencia: diámetro**		
QN	**(b)**	small	petit	klein	estrecha	Peach, Sabre	3
		medium	moyen	mittel	media	Sensation, Zill	5
		large	grand	groß	ancha	Haden, Keitt	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. **(+)**		**Inflorescence: ratio length/diameter**	**Inflorescence: rapport longueur/ diamètre**	**Blütenstand: Verhältnis Länge/ Durchmesser**	**Inflorescencia: relación longitud/ diámetro**		
QN	**(b)**	small	petit	klein	pequeña	Kensington	3
		medium	moyen	mittel	media	Haden, Tommy Atkins, Zill	5
		large	grand	groß	grande	Irwin	7
18. **(+)**		**Inflorescence: number of primary branches**	**Inflorescence: nombre de rameaux primaires**	**Blütenstand: Anzahl primäre Seitentriebe**	**Inflorescencia: número de ramas primarias**		
QN	**(b)**	few	petit	gering	bajo	Sensation, Smith	3
		medium	moyen	mittel	medio		5
		many	grand	groß	elevado	Haden, Keitt, Osteen	7
19. **(*)**		**Inflorescence: anthocyanin coloration of axis and branches**	**Inflorescence: pigmentation anthocyanique de l'axe et des rameaux**	**Blütenstand: Anthocyanfärbung der Achse und der Zweige**	**Inflorescencia: pigmentación antociánica del eje y las ramas**		
QN	**(b)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
		weak	faible	gering	débil	Early gold, Kensington, Long Green	3
		medium	moyenne	mittel	medio	Haden, Peach, Sensation	5
		strong	forte	stark	fuerte	Heidi, Hood, Irwin, Kent, Palmer, Smith, Van Dyke, Zill	7
		very strong	très forte	sehr stark	muy fuerte	Osteen, Tommy Atkins	9
20. **(*)** **(+)**		**Mature fruit: length**	**Fruit prêt à cueillir: longueur**	**Erntereife Frucht: Länge**	**Fruto listo para la cosecha: longitud**		
QN	**(c)**	short	court	kurz	corto	Adams	3
		medium	moyen	mittel	medio	Irwin	5
		long	long	lang	largo	Sabre, Tommy Atkins	7
		very long	très long	sehr lang	muy largo	Anderson	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21. (*) (+)		**Mature fruit: width**	**Fruit prêt à cueillir: largeur**	**Erntereife Frucht: Breite**	**Fruto listo para la cosecha: anchura**		
QN	**(c)**	narrow	étroit	schmal	estrecho	Adams	3
		medium	moyen	mittel	medio	Irwin, Zill	5
		broad	large	breit	ancho	Keitt, Nimrod	7
		very broad	très large	sehr breit	muy ancho	Extrema	9
22. (*) (+)		**Mature fruit: ratio length/width**	**Fruit prêt à cueillir: rapport longueur/largeur**	**Erntereife Frucht: Verhältnis Länge/Breite**	**Fruto listo para la cosecha: relación longitud/anchura**		
QN	**(c)**	very small	très petit	sehr klein	muy pequeña	Extrema, Santa Alexandrina	1
		small	petit	klein	pequeña	Fascell, Sheil	3
		medium	moyen	mittel	media	Sensation, Tommy Atkins	5
		large	grand	groß	grande	Carrie, Gouveia	7
		very large	très grand	sehr groß	muy grande	Anderson, Sabre	9
23. (*) (+)		**Mature fruit: shape in cross section**	**Fruit prêt à cueillir: forme en section transversale**	**Erntereife Frucht: Form im Querschnitt**	**Fruto listo para la cosecha: forma en sección transversal**		
PQ	**(c)**	medium elliptic	elliptique moyen	mittel elliptisch	elíptica media	Gouveia	1
		broad elliptic	elliptique large	breit elliptisch	elíptica ancha	Sabre, Tommy Atkins	2
		circular	arrondie	rund	circular	Extrema, Santa Alexandrina	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
24. (*)		**Mature fruit: color of skin**	**Fruit prêt à cueillir: couleur de l'épiderme**	**Erntereife Frucht: Farbe der Schale**	**Fruto listo para la cosecha: color de la cáscara**		
PQ	**(c)**	only yellow	seulement jaune	nur gelb	solo amarilla		1
		only green	seulement vert	nur grün	solo verde	Carrie	2
		green and yellow	vert et jaune	grün und gelb	verde y amarilla		3
		green and orange	vert et orange	grün und orange	verde y naranja	Gouveia	4
		green and pink	vert et rose	grün und rosa	verde y rosa	Kensington	5
		green and red	vert et rouge	grün und rot	verde y roja	Fascell	6
		green and purple	vert et violet	grün und purpurn	verde y violeta	Sensation, Zill	7
25.		**Mature fruit: density of lenticels**	**Fruit prêt à cueillir: densité des lenticelles**	**Erntereife Frucht: Dichte der Lentizellen**	**Fruto listo para la cosecha: densidad de las lenticelas**		
QN	**(c)**	sparse	faible	locker	débil	Carrie, Fascell, Kensington	3
	(e)	medium	moyenne	mittel	media	Sabre, Tommy Atkins	5
		dense	forte	dicht	fuerte	Haden, Hood, Kent, Sensation	7
26.		**Mature fruit: color contrast between lenticels and skin**	**Fruit prêt à cueillir: contraste de couleur entre les lenticelles et l'épiderme**	**Erntereife Frucht: Farbkontrast zwischen den Lentizellen und der Schale**	**Fruto listo para la cosecha: contraste de colores entre lenticelas y cáscara**		
QN	**(c)**	weak	faible	gering	débil	Peach, Sandersha	3
	(e)	medium	moyen	mittel	media	Sheil	5
		strong	fort	stark	fuerte	Haden, Ruby	7
27.		**Mature fruit: size of lenticels**	**Fruit prêt à cueillir: taille des lenticelles**	**Erntereife Frucht: Größe der Lentizellen**	**Fruto listo para la cosecha: tamaño de las lenticelas**		
QN	**(c)**	small	petites	klein	pequeñas	Sandersha, Sensation	3
	(e)	medium	moyennes	mittel	medias		5
		large	grandes	groß	grandes	Haden, Sheil	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
28.		**Mature fruit: roughness of surface (corkiness) caused by lenticels**	**Fruit prêt à cueillir: rugosité de la surface (liège) causée par des lenticelles**	**Erntereife Frucht: durch Lentizellen bedingte Rauheit der Oberfläche (Korkbildung)**	**Fruto listo para la cosecha: rugosidad de la superficie (acorchado) causada por las lenticelas**		
QL	**(c)**	absent	absente	fehlend	ausente	Hood, Peach, Zill	1
	(e)	present	présente	vorhanden	presente	Haden, Kensington	9
29. **(+)**		**Mature fruit: stalk cavity**	**Fruit prêt à cueillir: cavité pédonculaire**	**Erntereife Frucht: Stielhöhle**	**Fruto listo para la cosecha: cavidad peduncular**		
QN	**(c)**	absent or shallow	absente ou peu profonde	fehlend oder flach	ausente o poco profunda	Adams, Ruby	1
		medium	moyenne	mittel	media	Haden	2
		deep	profonde	tief	profunda	Nimrod	3
30. **(+)**		**Mature fruit: presence of neck**	**Fruit prêt à cueillir: présence du collet**	**Erntereife Frucht: Hals**	**Fruto listo para la cosecha: cuello**		
QL	**(c)**	absent	absent	fehlend	ausente	Fascell, Zill	1
		present	présent	vorhanden	presente	Long Green, Ruby	9
31.		**Mature fruit: length of neck**	**Fruit prêt à cueillir: longueur du collet**	**Erntereife Frucht: Länge des Halses**	**Fruto listo para la cosecha: longitud del cuello**		
QN	**(c)**	short	court	kurz	corto	Peach, Sandersha	3
		medium	moyen	mittel	medio		5
		long	long	lang	largo	Ruby	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
32. (*) (+)		**Mature fruit: shape of ventral shoulder**	**Fruit prêt à cueillir: forme de l'épaule ventrale**	**Erntereife Frucht: Form der ventralen Schulter**	**Fruto listo para la cosecha: forma del hombro izquierdo**		
PQ	**(c)**	rounded upward	arrondie vers le haut	abgerundet nach oben	redondeado hacia arriba	Tommy Atkins	1
		rounded outward	arrondie horizontale	abgerundet abstehend	redondeado horizontal	Florigon, Irwin, Palmer, Zill	2
		rounded downward	arrondie vers le bas	abgerundet nach unten	redondeado hacia abajo	Keitt, Ruby, Sandersha	3
		sloping downward	inclinée vers le bas	nach unten geneigt	inclinado hacia abajo	Long Green	4
		falling abruptly	en rupture brusque	abrupt abfallend	en descenso abrupto		5
33. (*) (+)		**Mature fruit: shape of dorsal shoulder**	**Fruit prêt à cueillir: forme de l'épaule dorsale**	**Erntereife Frucht: Form der dorsalen Schulter**	**Fruto listo para la cosecha: forma del hombro derecho**		
PQ	**(c)**	rounded upward	arrondie vers le haut	abgerundet nach oben	redondeado hacia arriba		1
		rounded outward	arrondie horizontale	abgerundet abstehend	redondeado horizontal	Fascell	2
		rounded downward	arrondie vers le bas	abgerundet nach unten	redondeado hacia abajo	Irwin, Ruby, Zill	3
		sloping downward	inclinée vers le bas	nach unten geneigt	inclinado hacia abajo	Keitt	4
		falling abruptly	en rupture brusque	abrupt abfallend	en descenso abrupto	Long Green, Palmer, Sandersha	5
34. (+)		**Mature fruit: length of groove in ventral shoulder**	**Fruit prêt à cueillir: longueur du sillon dans l'épaule ventrale**	**Erntereife Frucht: Länge der Furche in der ventralen Schulter**	**Fruto listo para la cosecha: longitud del surco en el hombro izquierdo**		
QN	**(c)**	absent or short	absent ou court	fehlend oder kurz	ausente o corto	Fascell, Sheil	1
		medium	moyen	mittel	medio	Kensington	2
		long	long	lang	largo		3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35. **(+)**		**Mature fruit: depth of groove in ventral shoulder**	**Fruit prêt à cueillir: profondeur du sillon dans l'épaule ventrale**	**Erntereife Frucht: Tiefe der Furche in der ventralen Schulter**	**Fruto listo para la cosecha: profundidad del surco en el hombro izquierdo**		
QN	**(c)**	absent or shallow	absent ou peu profond	fehlend oder flach	ausente o poco profundo	Fascell	1
		medium	moyen	mittel	medio	Sheil	2
		deep	profond	tief	profundo	Kensington	3
36. **(+)**		**Mature fruit: bulging on ventral shoulder**	**Fruit prêt à cueillir: excroissance sur l'épaule ventrale**	**Erntereife Frucht: Auswuchs auf der ventralen Schulter**	**Fruto listo para la cosecha: protuberancia en el hombro izquierdo**		
QL	**(c)**	absent	absente	fehlend	ausente	Peach, Ruby	1
		present	présente	vorhanden	presente	Fascell, Zill	9
37. **(*)** **(+)**		**Mature fruit: presence of sinus**	**Fruit prêt à cueillir: présence du sinus**	**Erntereife Frucht: Vorhandensein von Buchten**	**Fruto listo para la cosecha: seno**		
QL	**(c)**	absent	absent	fehlend	ausente	Fascell, Hood, Kent	1
		present	présent	vorhanden	presente	Gouveia, Sabre, Sandersha	9
38. **(*)**		**Mature fruit: depth of sinus**	**Fruit prêt à cueillir: profondeur du sinus**	**Erntereife Frucht: Tiefe der Buchten**	**Fruto listo para la cosecha: profundidad del seno**		
QN	**(c)**	shallow	peu profond	flach	poco profundo	Florigon, Peach	3
		medium	moyen	mittel	medio	Kensington	5
		deep	profond	tief	profundo	Anderson, Sabre	7
39. **(*)** **(+)**		**Mature fruit: bulging proximal of stylar scar**	**Fruit prêt à cueillir: excroissance proximale de la cicatrice stylaire**	**Erntereife Frucht: Auswuchs proximal von der Griffelnarbe**	**Fruto listo para la cosecha: protuberancia proximal de la cicatriz estilar**		
QN	**(c)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Adams, Anderson	1
		medium	moyenne	mittel	media		2
		strong	forte	stark	fuerte	Nimrod, Sheil	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
40. **(+)**		**Mature fruit: point at stylar scar**	**Fruit prêt à cueillir: point à la cicatrice stylaire**	**Erntereife Frucht: Spitze an der Griffelnarbe**	**Fruto listo para la cosecha: punto en la cicatriz estilar**		
QN	**(c)**	absent or small	absent ou petit	fehlend oder klein	ausente o pequeño	Kent, Sheil	1
		medium	moyen	mittel	medio		2
		large	grand	groß	grande	Kensington, Long Green, Sandersha	3
41.		**Mature fruit: diameter of stalk attachment**	**Fruit prêt à cueillir: diamètre du pédoncule**	**Erntereife Frucht: Durchmesser des Stielansatzes**	**Fruto listo para la cosecha: diámetro del pedúnculo**		
QN	**(c)**	small	petit	klein	pequeño	Irwin, Sensation	3
		medium	moyen	mittel	mediano	Adams	5
		large	grand	groß	grande	Tommy Atkins	7
42. **(*)**		**Ripe fruit: predominant color of skin**	**Fruit mûr: couleur prédominante de l'épiderme**	**Eßreife Frucht: überwiegende Farbe der Schale**	**Fruto maduro: color predominante de la cáscara**		
PQ	**(d)**	green	vert	grün	verde	Long Green	1
		yellow green	vert jaune	gelbgrün	verde amarillo	Carrie, Sandersha	2
		green and yellow	vert et jaune	grün und gelb	verde y amarillo	Early Gold	3
		yellow	jaune	gelb	amarillo	Ataulfo, Carabao	4
		yellow orange	orange jaune	gelborange	naranja amarillo	Kensington	5
		yellow and orange	jaune et orange	gelb und orange	amarillo y naranja	Peach	6
		orange	orange	orange	naranja		7
		yellow and red	jaune et rouge	gelb und rot	amarillo y rojo	Adams, Haden, Ruby, Sensation, Zill	8
		orange and red	orange et rouge	orange und rot	naranja y rojo		9
		red	rouge	rot	rojo	Van Dyke	10
		orange and purple	orange et violet	orange und purpurn	naranja y violeta	Tommy Atkins	11
		red and purple	rouge et violet	rot und purpurn	rojo y violeta		12
		purple	violet	purpurn	violeta		13

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
43.		**Ripe fruit: speckling of skin**	**Fruit mûr: tacheture de l'épiderme**	**Eßreife Frucht: Fleckung der Schale**	**Fruto maduro: moteado de la cáscara**		
QN	**(d)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	(e)	weak	faible	gering	débil	Kensington	3
		medium	moyenne	mittel	media		5
		strong	forte	stark	fuerte	Sheil	7
44.		**Ripe fruit: thickness of skin**	**Fruit mûr: épaisseur de l'épiderme**	**Eßreife Frucht: Dicke der Schale**	**Fruto maduro: espesor de la cáscara**		
QN	**(d)**	thin	fin	dünn	fina	Adams, Carrie, Florigon	3
		medium	moyen	mittel	media	Sabre, Sheil	5
		thick	épais	dick	espesa	Haden	7
45.		**Ripe fruit: adherence of skin to flesh**	**Fruit mûr: adhérence de l'épiderme à la chair**	**Eßreife Frucht: Anhaften der Schale am Fleisch**	**Fruto maduro: adherencia de la cáscara a la pulpa**		
QN	**(d)**	weak	faible	gering	débil	Peach	3
		medium	moyenne	mittel	media		5
		strong	forte	stark	fuerte	Fascell, Sheil, Zill	7
46.		**Ripe fruit: main color of flesh**	**Fruit mûr: couleur principale de la chair**	**Eßreife Frucht: Hauptfarbe des Fleisches**	**Fruto maduro: color principal de la pulpa**		
PQ	**(d)**	greenish yellow	jaune verdâtre	grünlichgelb	amarillo verdoso		1
		light yellow	jaune pâle	hellgelb	amarillo claro		2
		medium yellow	jaune moyen	mittelgelb	amarillo		3
		light orange	orange pâle	hellorange	naranja claro		4
		medium orange	orange	mittelorange	naranja		5
		dark orange	orange foncé	dunkelorange	naranja oscuro		6

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
47.		**Ripe fruit: firmness of flesh**	**Fruit mûr: fermeté de la chair**	**Eßreife Frucht: Festigkeit des Fleisches**	**Fruto maduro: firmeza de la pulpa**		
QN	**(d)**	soft	molle	weich	blanda	Carrie, Sheil	3
		medium	moyenne	mittel	media	Haden, Zill	5
		firm	ferme	fest	firme	Peach, Sensation, Tommy Atkins	7
48.		**Ripe fruit: juiciness**	**Fruit mûr: succulence**	**Eßreife Frucht: Saftigkeit**	**Fruto maduro: jugosidad**		
QN	**(d)**	low	bas	hoch	baja		3
		medium	moyen	mittel	media	Tommy Atkins	5
		high	haut	niedrig	alta	Carrie	7
49.		**Ripe fruit: texture of flesh**	**Fruit mûr: texture de la chair**	**Eßreife Frucht: Textur des Fleisches**	**Fruto maduro: textura de la pulpa**		
QN	**(d)**	fine	fine	fein	fina	Adams, Fascell	3
		medium	moyenne	mittel	media	Tommy Atkins	5
		coarse	grossière	grob	gruesa	Sheil	7
50. (*)		**Ripe fruit: amount of fiber attached to stone**	**Fruit mûr: importance de la fibre attachée au noyau**	**Eßreife Frucht: Anteil der am Kern anliegenden Fasern**	**Fruto maduro: cantidad de fibra pegada al hueso**		
QN	**(d)**	very low	très faible	sehr klein	muy escasa	Haden, Heidi, Irwin, Keitt, Kensington, Kent, Zill	1
		low	faible	klein	escasa	Tommy Atkins	3
		medium	moyenne	mittel	media	Sabre	5
		high	forte	groß	elevada		7
		very high	très forte	sehr groß	muy elevada	Kidney, Peach	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
51.		**Ripe fruit: amount of fiber attached to skin**	**Fruit mûr: importance de la fibre attachée à l'épiderme**	**Eßreife Frucht: Anteil der an der Schale anliegenden Fasern**	**Fruto maduro: cantidad de fibra pegada a la cáscara**		
QN	**(d)**	low	faible	klein	escasa		3
		medium	moyenne	mittel	media		5
		high	forte	groß	elevada		7
52. **(*)** **(+)**		**Ripe fruit: "turpentine flavor"**	**Fruit mûr: "saveur térébenthine"**	**Eßreife Frucht: „Terpentin-geschmack"**	**Fruto maduro: "sabor a trementina"**		
QL	**(d)**	absent	absente	fehlend	ausente	Kent, Sensation	1
		present	présente	vorhanden	presente	Extrema, Kensington, Sandersha	9
53.		**Stone: relief of surface**	**Noyau: relief de la surface**	**Kern: Relief der Oberfläche**	**Hueso: relieve de la superficie**		
PQ		grooved	cannelé	gefurcht	acanalada	Extrema, Keitt, Kensington, Long Green, Peach, Sabre, Zill	1
		smooth	lisse	glatt	lisa	Ruby	2
		ridged	annelé	geringelt	anillada	Heidi, Irwin, Kent, Tommy Atkins	3
54. **(+)**		**Seed: shape in lateral view**	**Pépin: forme en vue latérale**	**Samen: Form in der Seitenansicht**	**Semilla: forma en perspectiva lateral**		
QL		oblong	rectangulaire	rechteckig	rectangular	Sabre	1
		reniform	réniforme	nierenförmig	reniforme	Carabao	2
55. **(*)**		**Seed: embryony**	**Pépin: embryonnie**	**Samen: Embryonie**	**Semilla: embronía**		
QL		monoembryonic	monoembryonnique	monoembryonisch	monoembriónico	Sensation, Tommy Atkins	1
		polyembryonic	polyembryonnique	polyembryonisch	poliembriónico	Peach, Sabre	2

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
56.	**Time of beginning of flowering**	**Époque de début de floraison**	**Zeitpunkt des Blühbeginns**	**Época de comienzo de floración**		
QN	early	précoce	früh	temprana	Early Gold	3
	medium	moyenne	mittel	media	Fascell	5
	late	tardive	spät	tardía	Sensation	7
57. **(*)**	**Time of fruit maturity**	**Époque de maturité des fruits**	**Zeitpunkt der Fruchtreife**	**Época de madurez de los frutos**		
QN	very early	très précoce	sehr früh	muy temprana	Early Gold, Florigon, Long Green	1
	early	précoce	früh	temprana	Zill	3
	medium	moyenne	mittel	media	Fascell, Nimrod, Tommy Atkins	5
	late	tardive	spät	tardía	Sensation	7
	very late	très tardive	sehr spät	muy tardía	Keitt	9

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) Observations on the leaf which should be made on mature leaves in the middle third of the youngest shoots not showing signs of active growth. The attitude of the petiole should be observed on upward growing shoots.

(b) Inflorescences should be selected from terminal panicles of typical shoots from the exposed regions of the tree. Observations should be made at the time of full flowering.

(c) The mature fruit is the fruit at the stage ready for harvesting. This stage is reached when the flesh is still quite firm and has not become juicy but has started coloring around the stone.

(d) The ripe fruit is the fruit at the stage ready for consumption. This stage is reached when the flesh is juicy and has become colored from the stone to the skin.

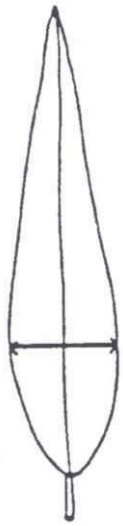
(e) Observations on the lenticels and the speckling of the skin should be made on the lateral side of the fruit.

8.2 Explanations for individual characteristics

Ad. 2: Young leaf: intensity of anthocyanin coloration

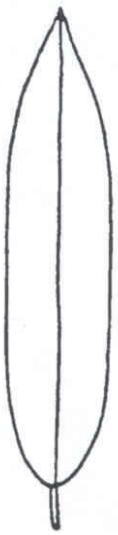
Observations should be made on active growth (flush) on the youngest leaves.

Ad. 6: Leaf blade: shape



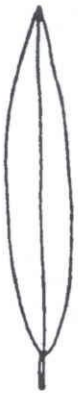
1
ovate

2
elliptic



3
oblong

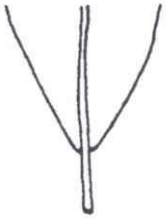
Ad. 8: Leaf blade: twisting



1
absent

9
present

Ad. 11: Leaf blade: shape of base



1
acute

2
obtuse

3
rounded

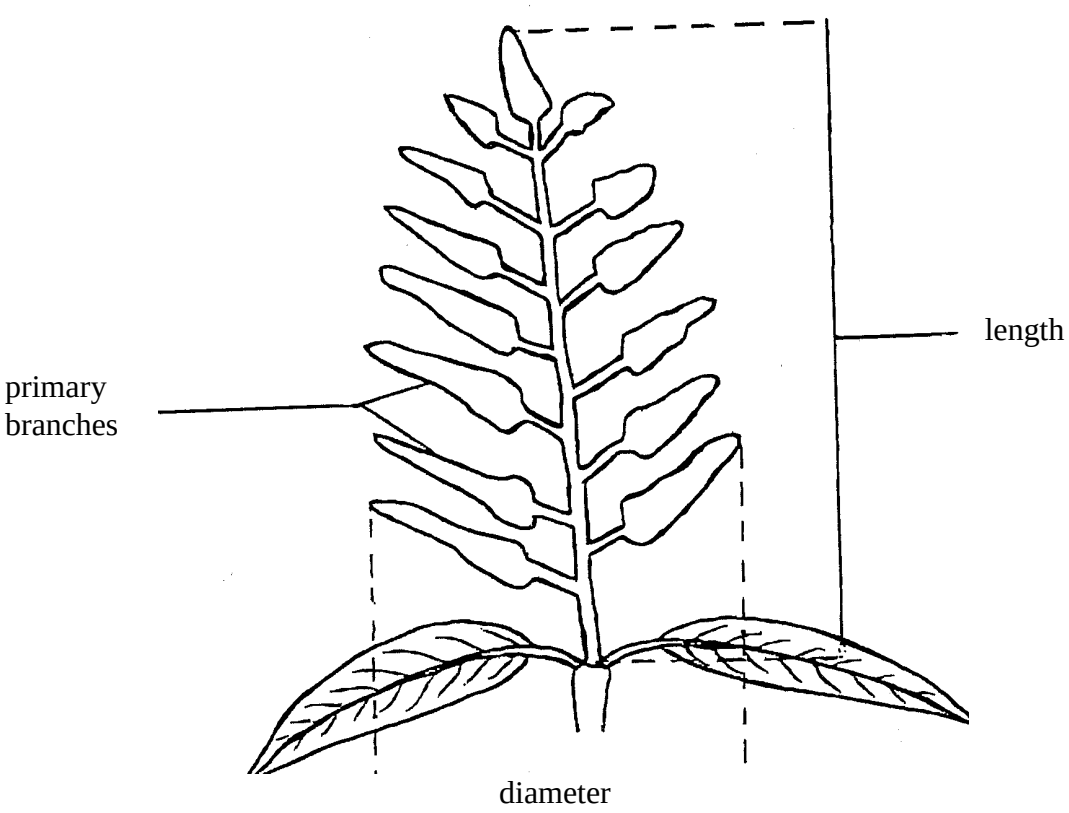
Ad. 12: Leaf blade: shape of apex

1
attenuate

2
acuminate

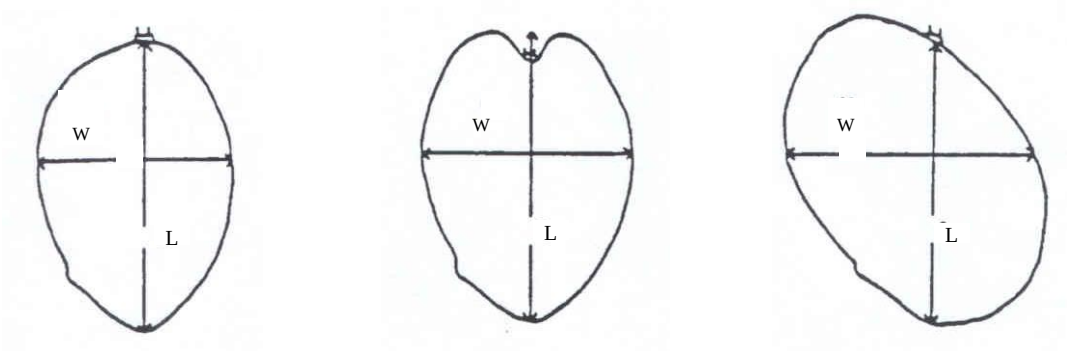
3
acute

Ad. 15: Inflorescence: length
Ad. 16: Inflorescence: diameter
Ad. 17: Inflorescence: ratio length/diameter
Ad. 18: Inflorescence: number of primary branches



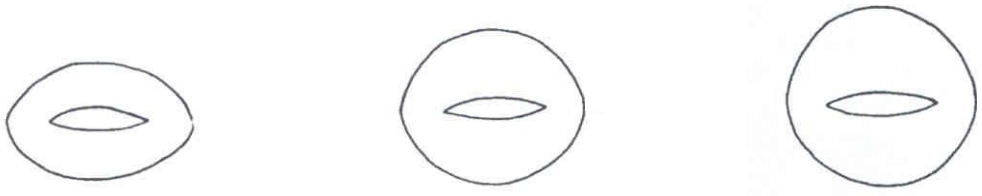
Ad. 20: Mature fruit: length (= L)
Ad. 21: Mature fruit: width (= W)
Ad. 22: Mature fruit: ratio length/width

For observations on the length and width of the fruit, the fruit should be sawed lengthwise, through the stalk attachment and the stylar scar. The outline may be traced and measurements made on paper. The length of the fruit is taken along the axis through the stalk attachment and the furthest point. The width is taken at the broadest part perpendicular to the length.



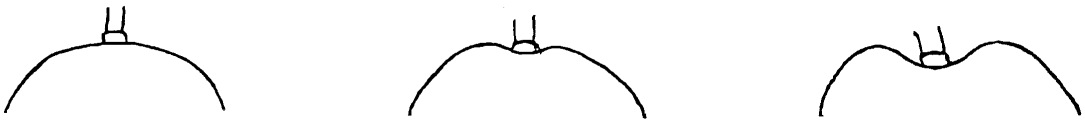
Ad. 23: Mature fruit: shape in cross section

To determine the shape in cross section, the fruit should be sawed through the broadest part, at a right angle (perpendicular) to the length.



1	2	3
medium elliptic	broad elliptic	circular

Ad. 29: Mature fruit: stalk cavity



1	2	3
absent or shallow	medium	deep

Ad. 30: Mature fruit: presence of neck

1
absent

9
present

Ad. 32: Mature fruit: shape of ventral shoulder
Ad. 33: Mature fruit: shape of dorsal shoulder

1
rounded upward

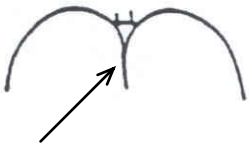
2
rounded outward

3
rounded downward

4
sloping downward

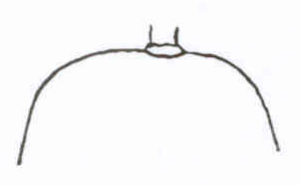
5
falling abruptly

Ad. 34: Mature fruit: length of groove in ventral shoulder
Ad. 35: Mature fruit: depth of groove in ventral shoulder

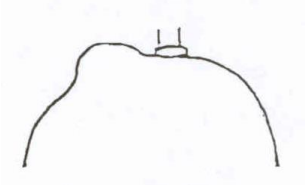


groove

Ad. 36: Mature fruit: bulging on ventral shoulder

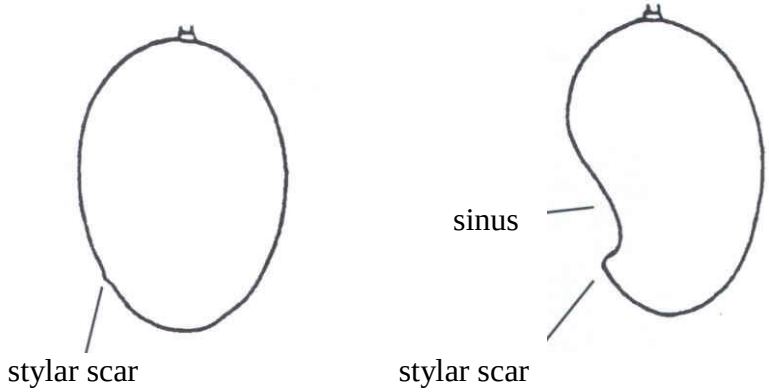


1
absent



9
present

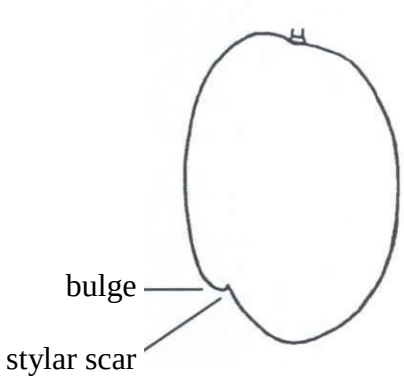
Ad. 37: Mature fruit: presence of sinus



1
absent

9
present

Ad. 39: Mature fruit: bulging proximal of stylar scar



Ad. 40: Mature fruit: point at stylar scar

1
absent or small

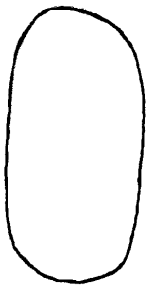
2
medium

3
large

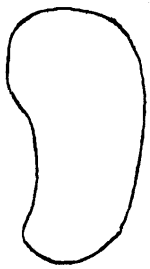
Ad. 52: Ripe fruit: "Turpentine flavor"

"Turpentine flavor" is a very recognizable aromatic flavor.

Ad. 54: Seed: shape in lateral view



1
oblong



2
reniform

9. Literature

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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	*Mangifera indica* L.
1.2 Common name	Mango

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

[#] 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 (22)	**Mature fruit: ratio length/width**		
	very small	Extrema, Santa Alexandrina	1[ ]
	small	Fascell, Sheil	3[ ]
	medium	Sensation, Tommy Atkins	5[ ]
	large	Carrie, Gouveia	7[ ]
	very large	Anderson, Sabre	9[ ]
5.2 (32)	**Mature fruit: shape of ventral shoulder**		
	rounded upward	Tommy Atkins	1[ ]
	rounded outward	Florigon, Irwin, Palmer, Zill	2[ ]
	rounded downward	Keitt, Ruby, Sandersha	3[ ]
	sloping downward	Long Green	4[ ]
	falling abruptly		5[ ]
5.3 (33)	**Mature fruit: shape of dorsal shoulder**		
	rounded upward		1[ ]
	rounded outward	Fascell	2[ ]
	rounded downward	Irwin, Ruby, Zill	3[ ]
	sloping downward	Keitt	4[ ]
	falling abruptly	Long Green, Palmer, Sandersha	5[ ]
5.4 (37)	**Mature fruit: presence of sinus**		
	absent	Fascell, Hood, Kent	1[ ]
	present	Gouveia, Sabre, Sandersha	9[ ]

	Characteristics	Example Varieties	Note
5.5 (39)	**Mature fruit: bulging proximal of stylar scar**		
	absent or weak	Adams, Anderson	1[ ]
	medium		2[ ]
	strong	Nimrod, Sheil	3[ ]
5.6 (55)	**Seed: embryony**		
	monoembryonic	Sensation, Tommy Atkins	1[ ]
	polyembryonic	Peach, Sabre	2[ ]
5.7 (57)	**Time of fruit maturity**		
	very early	Early Gold, Florigon, Long Green	1[ ]
	early	Zill	3[ ]
	medium	Fascell, Nimrod, Tommy Atkins	5[ ]
	late	Sensation	7[ ]
	very late	Keitt	9[ ]

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	*Mature fruit: shape of ventral shoulder*	*rounded upward*	*sloping downward*

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

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

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.

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

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

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

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

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

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

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

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

……

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

Applicant’s name

Signature Date

[End of document]