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

GENEVA

DRAFT

MANGO

UPOV-Code: MANGI\_IND

*Mangifera indica* L.

## GUIDELINES

## FOR THE CONDUCT OF TESTS

## FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*prepared by an expert from South Africa*

*to be considered by the  
Technical Working Party for Fruit Crops at its thirty-fifth session,  
to be held in Marquardt (Potsdam), Germany, from July 19 to 23, 2004*

Alternative Names: \*

<i>Latin</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Mangifera indica</i> 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 guidelines (“Test 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](http://www.upov.int)), for the latest information.]

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## 1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *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 45);
- (b) Mature fruit: shape of ventral shoulder (characteristic 58);
- (c) Seed: embryony (characteristic 93);
- (d) Time of fruit maturity (characteristic 95).

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

### 6. Introduction to the Table of Characteristics

#### 6.1 *Categories of Characteristics*

##### 6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

### 6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by \*) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

### 6.2 *States of Expression and Corresponding Notes*

States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

### 6.3 *Types of Expression*

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

### 6.4 *Example Varieties*

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

### 6.5 *Legend*

(\*) Asterisked characteristic – see Section 6.1.2

(QL) Qualitative characteristic – see Section 6.3

(QN) Quantitative characteristic – see Section 6.3

(PQ) Pseudo-Qualitative characteristic – see Section 6.3

(a)–(h) 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
<b>1.</b> <b>(*)</b>	<b>Tree: attitude of main branches</b>	<b>Arbre: port des rameaux principaux</b>	<b>Baum: Haltung der Hauptzweige</b>	<b><u>Changed</u></b>		
<b>PQ</b>	erect	dressé	aufrecht		<b>Kent (ZA 2004)</b>	1
	spreading	horizontal	waagrecht		<b>Carabao (proposed by which country?)</b>	2
	drooping	retombant	hängend		<b>Sensation (OK ZA 2004)</b>	3

ZA 2004: Does a dark green young leaf exist? Rather just light green and medium green? We have deleted the hues of anthocyanin coloration and more or less followed the ARTM proposal but after checking again we wonder whether a light brownish green (khaki) would be interpreted as 'light reddish'. Or should we say 'reddish to brownish' instead of just 'reddish'? To be discussed.

ZA 2004: This should be PQ because of intermediates between most of the states. We could have had 'anthocyanin absent/present' as a separate QL char as in our previous document but in the way we present it now there are all intensities in between the states.

<b>2.</b> <b>(*)</b>	<b>Young leaf: color</b>	<b>Jeune feuille: pigmentation anthocyanique</b>	<b>Junges Blatt: Anthocyanfärbung</b>	<b><u>Changed</u></b>		
<b>PQ</b>	<b>(a)</b> light green					1
	dark green					2
	light reddish					3
	medium reddish					4
	dark reddish					5
<b>9.</b>	<b>Leaf blade: length</b>	<b>Feuille à complet développement: longueur</b>	<b>Vollentwickeltes Blatt: Länge</b>	<b><u>Changed</u></b>		
<b>QN</b>	<b>(b)</b> short	courte	kurz		Adams	3
	medium	moyenne	mittel		Peach	5
	long	longue	lang		Florigon, Hood	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>10.</b>	<b>Leaf blade: width</b>	<b>Feuille à complet développement: largeur</b>	<b>Vollentwickeltes Blatt: Breite</b>	<b><u>Changed</u></b>		
<b>QN (b)</b>	narrow	étroite	schmal		Peach	3
	medium	moyenne	mittel			5
	broad	large	breit		Hood, Nimrod	7
<b>11. (*)</b>	<b>Leaf blade: ratio length/width</b>	<b>Feuille à complet développement: rapport longueur/largeur</b>	<b>Vollentwickeltes Blatt: Verhältnis Länge/Breite</b>	<b><u>Changed</u></b>		
<b>QN (b)</b>	very small	très petit	sehr klein			1
	small	petit	klein		Hood, Nimrod	3
	medium	moyen	mittel		Adams, Irwin, Sensation	5
	large	grand	groß		Florigon	7
	very large	très grand	sehr groß		Peach	9
<b>12. (+)</b>	<b>Leaf blade: shape</b>	<b>Feuille à complet développement: forme prédominante</b>	<b>Vollentwickeltes Blatt: vorwiegende Form</b>	<b><u>Changed</u></b>		
<b>PQ (b)</b>	linear					1
	oblong	lancéolée à ovale	lanzettförmig bis eiförmig		Hood	2
	elliptic	elliptique	elliptisch			3
	ovate				Van Dyke	4
	obovate					5
<b>13.</b>	<b>Leaf blade: color</b>	<b>Feuille à complet développement: couleur</b>	<b>Vollentwickeltes Blatt: Farbe</b>	<b><u>Changed</u></b>		
<b>PQ (b)</b>	yellow green	vert jaune	gelbgrün		Carrie, Zill	1
	light green	vert clair	hellgrün			2
	medium green	verte	grün			3
	dark green	vert foncé	dunkelgrün		Fascell, Nimrod	4



	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>14.</b>	<b>Leaf blade: twisting</b>	<b>Feuille à complet développement: torsion du limbe</b>	<b>Vollentwickeltes Blatt: Drehung der Blattspreite</b>	<b><u>Changed</u></b>		
(+)						
<b>QL</b>	(b) absent	absente	fehlend		Hood	1
	present	présente	vorhanden		Florigon	9
ZA 2004: We think it is risky to have this as a QL char. The concavity changes with irrigation and one has to be very careful when observing this.						
<b>15.</b>	<b>Leaf blade: shape in cross section</b>	<b>Feuille à complet développement: forme de la section transversale</b>	<b>Vollentwickeltes Blatt: Form im Querschnitt</b>	<b><u>changed</u></b>		
(+)						
<b>PQ/ QL?</b>	(b) straight	droite	gerade		Hood	1
	concave	concave	konkav		Zill	2
<b>20.</b>	<b>Leaf blade: spacing of secondary veins</b>	<b>Feuille à complet développement: espacement entre les nervures secondaires</b>	<b>Vollentwickeltes Blatt: Abstand zwischen den sekundären Adern</b>	<b><u>Changed</u></b>		
<b>QN</b>	(b) very close	très faible	sehr gering		Early Gold	1
	close	faible	gering		Sensation	3
	medium	moyen	mittel		Adams	5
	wide	grand	groß		Nimrod	7
	very wide	très grand	sehr groß		Hood	9
<b>22.</b>	<b>Leaf blade: undulation of margin</b>	<b>Feuille à complet développement: ondulation du bord</b>	<b>Vollentwickeltes Blatt: Wellung des Randes</b>	<b><u>Changed</u></b>		
<b>QN</b>	(b) absent or weak	faible	gering		Tommy Atkins	1
	medium	moyenne	mittel		Long Green ( <b>new</b> )	2
	strong	forte	stark		Florigon	3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA 2004: To put char. 24 before 23.					
<b>23.</b>	<b>Leaf blade: shape of apex</b>	<b>Feuille à complet développement: forme du sommet</b>	<b>Vollentwickeltes Blatt: Form der Spitze</b>	<b><u>Changed</u></b>	
(+)					
<b>PQ</b>	(b) attenuate	pointu	mit lang ausgezogener Spitze	Florigon	1
	acuminate	acuminé	mit aufgesetzter Spitze	Gouveia, Nimrod	2
	acute	aigu	spitz	Hood	3
<b>24.</b>	<b>Leaf blade: shape of base</b>	<b>Feuille à complet développement: forme de la base</b>	<b>Vollentwickeltes Blatt: Form der Basis</b>	<b><u>Changed</u></b>	
(+)					
<b>PQ</b>	(b) acute	aiguë	spitz	Florigon, Sabre	1
	obtuse	obtuse	stumpf		2
	rounded	arrondie	abgerundet	Fascell, Kent	3
<b>26.</b>	<b>Petiole: attitude in relation to shoot</b>	<b>Feuille à complet développement: port du pétiole (par rapport à la tige)</b>	<b>Vollentwickeltes Blatt: Haltung des Stieles (im Verhältnis zum Stengel)</b>	<b><u>Changed</u></b>	
<b>QN</b>	(b) erect	dressé	aufrecht	Sensation	1
	semi erect	demi-dressé	halb aufrecht	Peach	3
	perpendicular	perpendiculaire	senkrecht	Haden, Zill	5
	moderately recurved	retombant	zurückgebogen		7
	strongly recurved	très retombant	stark zurückgebogen		9
<b>27.</b>	<b>Petiole: length</b>	<b>Feuille à complet développement: longueur du pétiole</b>	<b>Voll entwickeltes Blatt: Länge des Stieles</b>	<b><u>Changed</u></b>	
<b>QN</b>	(b) short	court	kurz	Adams	3
	medium	moyen	mittel		5
	long				7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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ZA 2003: We do length excluding peduncle and length of peduncle in separate chars.

ARTM 2003: Agree to have two chars. a) Inflorescence: length (excluding peduncle) and b) Peduncle: length

ZA 2004: TWF 2003 proposed to add an illustration for characteristics 29, 31 and 32. Should we have two chars for 29, as proposed above?

29. (* )	Inflorescence: length	Inflorescence: longueur	Blütenstand: Länge		
QN (c)	short	courte	kurz	Carrie, Peach	3
(d)	medium	moyenne	mittel	Fascell	5
	long	longue	lang	Adams, Kent, Sheil	7

Char. 30: Comment ARTM 2004: (+) to be added.

ZA 2004: Yes, this is a problem. We normally don't give drawings for quantitative chars but in this case the question is how to measure the width.

We could give an explanation such as: 'The width is taken across the broadest part of the inflorescence with primary branches perpendicular to the axis. How do other countries do this? There are also sometimes one or two primary branches sticking out beyond the majority and we ignore them. Will such an explanation be better than a drawing?'

30.	Inflorescence: width	Inflorescence: largeur	Blütenstand: Breite		
QN (c)	narrow	etroite	schmal		3
(d)	medium	moyenne	mittel		5
	broad	large	breit		7

31.	Inflorescence: ratio length/width	Inflorescence: rapport longueur/largeur	Blütenstand: Verhältnis Länge/Breite		
QN (c)	small	petit	klein		3
(d)	medium	moyen	mittel		5
	large	grand	gross		7

32.	Inflorescence: number of primary branches	Inflorescence: nombre de rameaux	Blütenstand: Anzahl Zweige <u>Changed</u>		
QN (c)	few	petit	gering		3
(d)	medium	moyen	mittel		5
	many	grand	gross		7

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
<b>33. (*)</b>	<b>Inflorescence: color of axis and branches</b>	<b>Inflorescence: couleur de l'axe et des rameaux</b>	<b>Blütenstand: Farbe der Achse und der Zweige</b>			
<b>PQ</b>	(c) whitish	blanchâtre	weißlich			1
	(d) yellow green	vert jaune	gelbgrün			2
	yellow	jaune	gelb			3
	light orange pink	rose orangé pâle	hellorange-rosa		Early Gold	4
	medium pink	rose	rosa		Haden, Peach	5
	dark pink	rose foncé	dunkelrosa		Zill	6
	red	rouge	rot		Hood	7
	purple	violet	purpur		<b>IL and MX to provide example vars.</b>	8

ZA: to combine 41 and 42 under one char and place after char 33. Wording: 'Inflorescence: predominant color of flowers' with states ,whitish, light orange pink, medium pink, dark pink' States to be checked. It is too much effort to visit the orchards again to specially observe the color of the old flowers.

ARTM: To read: Flower: anthocyanin coloration (at anthesis) and to move accordingly.

ZA 2004: TWF 2003 did not comment on the proposals above.

<b>41. (*)</b>	<b>Old flower: anthocyanin coloration</b>	<b>Fleur âgée: pigmentation anthocyanique</b>	<b>Alte Blüte: Anthocyanfärbung</b>			
<b>QL</b>	absent	absente	fehlend			1
	present	présente	vorhanden		Hood	9

ZA: see comments under 41.

ARTM: To read: Flower: intensity of anthocyanin coloration (at anthesis)' and to move accordingly.

ZA 2004: TWF 2003 proposed to delete but did not comment on the proposals under 41.

<b>42. (*)</b>	<b>Old flower: intensity of anthocyanin coloration</b>	<b>Fleur âgée: intensité de la pigmentation anthocyanique</b>	<b>Alte Blüte: Stärke der Anthocyanfärbung</b>			
<b>QN</b>	weak	faible	gering		Carrie, Early Gold, Haden	3
	medium	moyenne	mittel		Irwin, Zill	5
	strong	forte	stark		Hood, Peach	7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA 2004: TWF 2003 proposed to delete the word ‘mature’ in characteristics 43 to 69. Should we then also delete the word ‘ripe’ for characteristics 71 to 83, assuming that the (e) and (f) in the second column will be sufficient indication for the stage of observaton?					
<b>43.</b> (* (+)	<b>Mature fruit: length</b>	<b>Fruit prêt à cueillir: longueur</b>	<b>Erntereife Frucht: Länge</b>		
<b>QN</b>	<b>(e)</b> very short	très court	sehr kurz	<b>IL and MX to provide example varieties</b>	1
	<b>(h)</b> short	court	kurz	Adams	3
	medium	moyen	mittel	Irwin	5
	long	long	lang	Sabre, Tommy Atkins	7
	very long	très long	sehr lang	Anderson	9
<b>44.</b> (* (+)	<b>Mature fruit: width</b>	<b>Fruit prêt à cueillir: largeur</b>	<b>Erntereife Frucht: Breite</b>		
<b>QN</b>	<b>(e)</b> very narrow	très étroit	sehr schmal		1
	<b>(h)</b> narrow	etroit	schmal	Adams	3
	medium	moyen	mittel	Irwin, Zill	5
	broad	large	breit	Keitt, Nimrod	7
	very broad	très large	sehr breit	Extrema	9
<b>45.</b> (* (+)	<b>Mature fruit: ratio length/width</b>	<b>Fruit prêt à cueillir: rapport longueur/ largeur</b>	<b>Erntereife Frucht: Verhältnis Länge/Breite</b>		
<b>QN</b>	<b>(e)</b> very small	très petit	sehr klein	Extrema, Santa Alexandrina	1
	<b>(h)</b> small	petit	klein	Fascell, Sheil	3
	medium	moyen	mittel	Sensation, Tommy Atkins	5
	large	grand	gross	Carrie, Gouveia	7
	very large	très grand	sehr groß	Anderson, Sabre	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>46.</b> (*) (+)	<b>Mature fruit: shape in cross section</b>	<b>Fruit prêt à cueillir: forme de la section transversale</b>	<b>Erntereife Frucht: Form im Querschnitt</b>	<b><u>Changed</u></b>		
<b>PQ</b>	(e) narrow elliptic	elliptique étroite	schmal elliptisch		Gouveia	1
	broad elliptic	elliptique large	breit elliptisch		Sabre, Tommy Atkins	2
	circular	arrondie	abgerundet		Extrema, Santa Alexandrina	3
<b>47.</b> (*)	<b>Mature fruit: color of skin</b>	<b>Fruit prêt à cueillir: couleur de l'épiderme</b>	<b>Erntereife Frucht: Farbe der Schale</b>	<b><u>Changed</u></b>		
<b>PQ</b>	(e) only yellow					1
	only green	seulement vert	nur grün		Carrie	2
	green and yellow					3
	green and orange	vert et orange	grün und orange		Gouveia	4
	green and pink	vert et rose	grün und rosa		Kensington	5
	green and red	vert et rouge	grün und rot		Fascell	6
	green and purple	vert et violet	grün und purpur		Sensation, Zill	7
<b>49.</b>	<b>Mature fruit: bloom</b>	<b>Fruit prêt à cueillir: pruine de l'épiderme</b>	<b>Erntereife Frucht: Bereifung der Schale</b>	<b><u>changed</u></b>		
<b>QN</b>	(e) absent or weak					1
	medium					2
	strong	nette	deutlich		Sensation	3
<b>50.</b>	<b>Mature fruit: density of lenticels</b>	<b>Fruit prêt à cueillir: densité des lenticelles</b>	<b>Erntereife Frucht: Dichte der Lentizellen</b>			
<b>QN</b>	(e) sparse	faible	locker		Carrie, Fascell, Kensington	3
	(g) medium	moyenne	mittel		Sabre	5
	dense	forte	dicht		Hood, Sensation	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>51.</b>	<b>Mature fruit: conspicuousness of lenticels</b>	<b>Fruit prêt à cueillir: netteté des lenticelles</b>	<b>Erntereife Frucht: Ausprägung der Lentizellen</b>			
<b>QN</b>	(e) weak	faible	gering		Kensington, Peach, Sandersha	3
	(g) medium	moyenne	mittel		Sheil	5
	strong	forte	stark		Haden, Ruby	7
<b>52.</b>	<b>Mature fruit: size of lenticels</b>	<b>Fruit prêt à cueillir: taille des lenticelles</b>	<b>Erntereife Frucht: Größe der Lentizellen</b>			
<b>QN</b>	(e) small	petites	klein		Sandersha, Sensation	3
	(g) medium	moyennes	mittel			5
	large	grandes	groß		Haden, Sheil	7
<b>53.</b>	<b>Mature fruit: roughness of surface caused by lenticels</b>	<b>Fruit prêt à cueillir: rugosité de la surface causée par des lenticelles</b>	<b>Erntereife Frucht: durch Lentizellen bedingte Rauheit der Oberfläche</b>			
<b>QL</b>	(e) absent	absente	fehlend		Hood, Peach, Zill	1
	present	présente	vorhanden		Haden, Kensington	9
<b>54.</b>	<b>Mature fruit: presence of stalk cavity</b>	<b>Fruit prêt à cueillir: cavité pédonculaire</b>	<b>Erntereife Frucht: Stielhöhle</b>	<b><u>Changed</u></b>		
<b>QL</b>	(e) absent	absente	fehlend		Adams, Ruby	1
	present	présente	vorhanden		Nimrod	9
<b>55.</b>	<b>Mature fruit: depth of stalk cavity</b>	<b>Fruit prêt à cueillir: profondeur de la cavité pédonculaire</b>	<b>Erntereife Frucht: Tiefe der Stielhöhle</b>			
(+)						
<b>QN</b>	(e) shallow	peu profonde	flach		Florigon, Haden, Irwin	3
	medium	moyenne	mittel			5
	deep	profonde	tief		Nimrod	7
<b>56.</b>	<b>Mature fruit: presence of neck</b>	<b>Fruit prêt à cueillir: collet</b>	<b>Erntereife Frucht: Hals</b>	<b><u>changed</u></b>		
<b>QL</b>	(e) absent	absent	fehlend		Fascell, Zill	1
	present	présent	vorhanden		Ruby	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>57.</b> (+)	<b>Mature fruit: length of neck</b>	<b>Fruit prêt à cueillir: netteté du collet</b>	<b>Erntereife Frucht: Ausprägung des Halses</b>	<b><u>changed</u></b>		
<b>QN</b>	(e) short	faible	gering		Peach, Sandersha	3
	medium	moyenne	mittel			5
	long	forte	stark		Ruby	7
<b>58.</b> (* (+)	<b>Mature fruit: shape of ventral shoulder</b>	<b>Fruit prêt à cueillir: forme de l'épaule gauche</b>	<b>Erntereife Frucht: Form der linken Schulter</b>	<b><u>Changed</u></b>		
<b>PQ</b>	(e) rounded upward	arrondie, vers le haut	abgerundet, nach oben		Tommy Atkins	1
	rounded outward	arrondie, horizontale	abgerundet, abstehend		Florigon, Palmer, Zill	3
	rounded downward	arrondie, vers le bas	abgerundet, nach unten		Keitt, Ruby, Sandersha	5
	sloping downward	inclinée, vers le bas	nach unten geneigt			7
	falling abruptly	rupture brusque	abrupt abfallend			9
<b>59.</b> (* (+)	<b>Mature fruit: shape of dorsal shoulder</b>	<b>Fruit prêt à cueillir: forme de l'épaule droite</b>	<b>Erntereife Frucht: Form der rechten Schulter</b>	<b><u>Changed</u></b>		
<b>PQ</b>	(e) rounded upward	arrondie, vers le haut	abgerundet, nach oben			1
	rounded outward	arrondie, horizontale	abgerundet, abstehend		Fascell	3
	rounded downward	arrondie, vers le bas	abgerundet, nach unten		Ruby, Zill	5
	sloping downward	inclinée, vers le bas	nach unten geneigt		Keitt	7
	falling abruptly	rupture brusque	abrupt abfallend		Palmer, Sandersha	9
<b>60.</b> (+)	<b>Mature fruit: presence of groove in ventral shoulder</b>	<b>Fruit prêt à cueillir: sillon dans l'épaule gauche</b>	<b>Erntereife Frucht: Furche in der linken Schulter</b>	<b><u>Changed</u></b>		
<b>QL</b>	(e) absent	absent	fehlend		Ruby	1
	present	présent	vorhanden		Kensington	9



	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>61.</b>	<b>Mature fruit: length of groove in ventral shoulder</b>	<b>Fruit prêt à cueillir: longueur du sillon dans l'épaule gauche</b>	<b>Erntereife Frucht: Länge der Furche in der linken Schulter</b>	<b><u>Changed</u></b>		
<b>QN</b>	(e) short	court	kurz		Fascell, Sheil	3
	medium	moyenne	mittel		Kensington	5
	long	long	lang			7
<p>TWF 2003: To have the states: absent or weak (1); medium (2); strong (3). ZA 2004: Have to discuss this. Characteristic 60 already takes care of absence/presence. We should either combine characteristics 60 and 62 or keep them as they are. Does one say 'groove in' or 'groove on'?</p>						
<b>62.</b>	<b>Mature fruit: depth of groove in ventral shoulder</b>	<b>Fruit prêt à cueillir: profondeur du sillon dans l'épaule gauche</b>	<b>Erntereife Frucht: Tiefe der Furche in der linken Schulter</b>	<b><u>Changed</u></b>		
<b>QN</b>	(e) shallow	peu profond	flach		Fascell	3
	medium	moyen	mittel		Sheil	5
	deep	profond	tief			7
<p>ZA 2003: could add a char: ,prominence of lumpiness on left shoulder' – 'weak', 'medium', 'strong' ARTM 2003: To find a proper wording instead of 'lumpiness' or to deliver an explanation.</p>						
<b>63.</b>	<b>Mature fruit: lumpiness on ventral shoulder</b>	<b>Fruit prêt à cueillir: excroissance sur l'épaule gauche</b>	<b>Erntereife Frucht: Auswuchs auf der linken Schulter</b>	<b><u>Changed</u></b>		
<b>QL</b>	(e) absent	absente	fehlend		Peach, Ruby	1
	present	présente	vorhanden		Fascell, Zill	9
<b>64.</b>	<b>Mature fruit: presence of sinus</b>	<b>Fruit prêt à cueillir: sinus proximal de la cicatrice styloïde</b>	<b>Erntereife Frucht: Sinus proximal von der Griffelnarbe</b>	<b><u>Changed</u></b>		
<b>QL</b>	(e) absent	absent	fehlend		Fascell, Hood, Kent	1
	present	présent	vorhanden		Gouveia, Sabre, Sandersha	9
<b>65.</b>	<b>Mature fruit: depth of sinus</b>	<b>Fruit prêt à cueillir: netteté du sinus proximal de la cicatrice styloïde</b>	<b>Erntereife Frucht: Ausprägung des Sinus proximal von der Griffelnarbe</b>	<b><u>Changed</u></b>		
<b>QN</b>	(e) shallow	faible	gering		Florigon, Peach	3
	medium	moyenne	mittel		Kensington	5
	deep	forte	stark		Anderson, Sabre	7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA 2004: TWF 2003 proposed to delete char. 67. However, one could combine 66 and 67 as follows: 'absent or weakly expressed (1), medium (2), strongly expressed (3) or similar wording. We don't think 66 should be a QL characteristic. It varies a lot in some varieties.					
<b>66.</b> (*) (+)	<b>Mature fruit: bulge proximal of stylar scar</b>	<b>Fruit prêt à cueillir: excroissance proximale de la cicatrice stylaire</b>	<b>Erntereife Frucht: Auswuchs proximal von der Griffelnarbe</b>	<b><u>Changed</u></b>	
<b>QL</b>	(e) absent  present	absente  présente	fehlend  vorhanden	Adams, Anderson  Sheil	1  9
<b>67.</b>	<b><u>deleted</u></b>				
<b>68.</b> (+)	<b>Mature fruit: shape at stylar scar</b>	<b>Fruit prêt à cueillir: forme de la cicatrice stylaire</b>	<b>Erntereife Frucht: Form an der Griffelnarbe</b>	<b><u>Changed. TWF 2003 propopsed illustration to be provided.</u></b>	
<b>PQ</b>	(e) depressed  flattened  pointed  ridged	déprimée  aplatie  pointue  sillonnée	eingesenkt  abgeflacht  spitz  gefurcht	Sheil  Kent  Sandersha, Van Dyke  Zill	1  2  3  4
<b>69.</b>	<b>Mature fruit: diameter of stalk attachment</b>	<b>Fruit prêt à cueillir: diamètre du pédoncule</b>	<b>Erntereife Frucht: Durchmesser des Stieles</b>	<b><u>Changed. To review example varieties.</u></b>	
<b>QN</b>	(e) small  medium  large	petit  moyen  grand	klein  mittel  groß	Sensation  Adams  Tommy Atkins	3  5  7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>71.</b> (*)	<b>Ripe fruit: predominant color of skin</b>	<b>Fruit mûr: couleur prédominante de l'épiderme</b>	<b>Essreife Frucht: überwiegende Farbe der Schale</b>	<b><u>Changed</u></b>	
<b>PQ</b>	(f) green	vert	grün	Long Green	1
	yellow green	vert jaune	gelbgrün	Carrie, Sandersha	2
	green and yellow	vert et jaune	grün und gelb	Early Gold	3
	yellow	jaune	gelb		4
	yellow orange			<b>Pico (provided by which country?)</b>	5
	yellow and orange	jaune et orange	gelb und orange	Peach	6
	orange	orange	orange		7
	yellow and red	jaune et rouge	gelb und rot	Adams, Ruby, Sensation	8
	orange and red	orange et rouge	orange und rot		9
	red	rouge	rot	Van Dyke	10
	orange and purple	orange et violet	orange und purpur	Tommy Atkins	11
	red and purple	rouge et violet	rot und purpur		12
	purple	violet	purpur		13

ZA: could combine with 74 and change to: ,even 1, slightly blotchy 2, strongly blotchy 3'

ARTM: To retain unchanged.

TWF 2003: Characteristic to be checked.

ZA 2004: Risky to make it a QL characteristic because even the smoothest mango might have some blotchiness. The above ZA proposal should be considered. Could also read 'even, slightly speckled, strongly speckled'.

<b>73.</b>	<b>Ripe fruit: pattern of skin color</b>	<b>Fruit mûr: répartition de la couleur de l'épiderme</b>	<b>Essreife Frucht: Verteilung der Farbe der Schale</b>		
<b>QL</b>	(f) even	uniforme	einheitlich		1
	speckled	tachetée	gefleckt		2

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<p>ARTM: To change to condensed scale, e.g. ‘absent or very weak’, ‘medium’, ‘strong’.            ZA 2003: This agrees with our proposal of last year to combine 73 and 74 into a condensed scale char. We cannot have 73 unchanged together with the ARTM proposal because of repetition of the states. States could be worded either ‘...speckled...’ or ‘...blotchy...’.            ARTM: To insert a char. 74a, ‘Ripe fruit: color of speckles’.            ZA 2004: We find it difficult to determine colors if the mango is speckled or blotchy.</p>					
<b>74.</b>	<b>Ripe fruit: degree of speckling of skin color</b>	<b>Fruit mûr: densité de la tacheture de l'épiderme</b>	<b>Essreife Frucht: Dichte der Fleckung der Farbe der Schale</b>		
<b>QN</b>	<b>(f)</b> weak	faible	gering		3
	medium	moyen	mittel		5
	strong	fort	stark		7
<b>75.</b>	<b>Ripe fruit: thickness of skin</b>	<b>Fruit mûr: épaisseur de l'épiderme</b>	<b>Essreife Frucht: Dicke der Schale</b>		
<b>QN</b>	<b>(f)</b> thin	fin	dünn	Adams, Carrie, Florigon	3
	medium	moyen	mittel	Sabre, Sheil	5
	thick	epais	dick	Haden	7
<b>76.</b>	<b>Ripe fruit: adherence of skin to flesh</b>	<b>Fruit mûr: adhérence de l'épiderme à la chair</b>	<b>Essreife Frucht: Anhaften der Schale am Fleisch</b>		
<b>QN</b>	<b>(f)</b> weak	faible	gering	Peach	3
	medium	moyenne	mittel		5
	strong	forte	stark	Fascell, Sheil, Zill	7
<b>77.</b>	<b>Ripe fruit: main color of flesh</b>	<b>Fruit mûr: couleur principale de la chair</b>	<b>Essreife Frucht: Hauptfarbe des Fleisches</b>		
<b>PQ</b>	<b>(f)</b> greenish yellow	jaune verdâtre	grünlichgelb		1
	light yellow	jaune pâle	hellgelb		2
	medium yellow	jaune	gelb		3
	light orange	orange pâle	hellorange	Extrema	4
	medium orange	orange	orange		5
	dark orange	orange foncé	dunkelorange		6

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
<b>78.</b>	<b>Ripe fruit: firmness of flesh</b>	<b>Fruit mûr: fermeté de la chair</b>	<b>Essreife Frucht: Festigkeit des Fleisches</b>			
<b>QN (f)</b>	soft	molle	weich		Carrie, Sheil	3
	medium	moyenne	mittel		Haden, Zill	5
	firm	ferme	fest		Peach, Sensation, Tommy Atkins	7
<b>79.</b>	<b>Ripe fruit: juiciness</b>	<b>Fruit mûr: succulence</b>	<b>Essreife Frucht: Saftigkeit</b>			
<b>QN (f)</b>	dry	sec	trocken			3
	medium	moyen	mittel		Tommy Atkins	5
	juicy	juteux	saftig		Carrie	7
<b>80.</b>	<b>Ripe fruit: texture of flesh</b>	<b>Fruit mûr: texture de la chair</b>	<b>Essreife Frucht: Textur des Fleisches</b>			
<b>QN (f)</b>	fine	fine	fein		Adams, Fascell	3
	medium	moyenne	mittel		Tommy Atkins	5
	coarse	grossière	grob		Sheil	7
<p>TWF 2003 proposed for characteristics 81 and 82 that ‘non-fleshy fibre’ and ‘fleshy fibre’ should merely read ‘fiber’. ZA 2004: There are two distinct types of fibre in a mango fruit: non-fleshy, which is attached to the stone and gets stuck between the teeth, and fleshy fibre, which may be found throughout the flesh and/or concentrated underneath the skin. The fleshy fibre is chewable. Please discuss before we decide to change.</p>						
<b>81. (*)</b>	<b>Ripe fruit: amount of non-fleshy fiber attached to stone</b>	<b>Fruit mûr: importance de la fibre non charnue de la chair attachée au noyau</b>	<b>Essreife Frucht: Anteil der am Kern anliegenden nichtfleischigen Fasern des Fleisches</b>	<b><u>Changed</u></b>		
<b>QN (f)</b>	very low	très faible	sehr klein		Kent, Zill	1
	low	faible	klein		Tommy Atkins	3
	medium	moyenne	mittel		Sabre	5
	high	forte	groß			7
	very high	très forte	sehr groß		Kidney, Peach	9

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
<b>82.</b>	<b>Ripe fruit: amount of fleshy fiber underneath the skin</b>	<b>Fruit mûr: importance de la fibre charnue au-dessous de l'épiderme</b>	<b>Essreife Frucht: Anteil der fleischigen Fasern unter der Schale</b>	<b><u>Changed</u></b>		
<b>QN</b>	(f) low	faible	klein		Kent	3
	medium	moyenne	mittel			5
	high	forte	groß		Sheil, Tommy Atkins	7
<b>83.</b> (*)	<b>Ripe fruit: turpentine flavor</b>	<b>Fruit mûr: saveur térébenthine</b>	<b>Essreife Frucht: Terpentin-geschmack</b>	<b><u>ZA to check the term 'turpentine flavour'</u></b>		
<b>QL</b>	(f) absent	absente	fehlend		Kent, Sensation	1
	present	présente	vorhanden		Extrema, Sandersha	9
<b>85.</b>	<b>Stone: relief of surface</b>	<b>Noyau: relief de la surface</b>	<b>Kern: Relief der Oberfläche</b>	<b><u>ZA 2004 changed notes from 3,5,7 to 1,2,3. OK? It could possibly be considered a condensed QN char.</u></b>		
<b>PQ</b>	grooved	cannelé	gefurcht		Extrema, Sabre, Zill	1
	smooth	lisse	glatt		Ruby	2
	ridged	annelé	geringelt		Irwin, Tommy Atkins	3
ZA 2003 and 2004: Propose to delete.						
<b>90.</b>	<b>Stone: thickness of endocarp</b>	<b>Noyau: épaisseur de l'endocarpe</b>	<b>Kern: Dicke des Endokarps</b>			
<b>QN</b>	very thin	très fin	sehr dünn		Ruby	1
	thin	fin	dünn		Irwin	3
	medium	moyen	mittel		Carrie, Sensation	5
	thick	epais	dick			7
	very thick	très épais	sehr dick		Irwin, Sabre	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>92.</b>	<b>Seed: shape</b>	<b>Semence: forme</b>	<b>Samen: Form</b>	<b><u>Changed</u></b>		
<b>QL</b>	oblong	rectangulaire	rechteckig		Sabre	1
	reniform	faiblement réniforme	leicht nierenförmig			2

Char. 93: Comment ARTM 2004: To change from 'Polyembryony absent/present' to the following.  
ZA 2004: Changed. OK TWF?

<b>93.</b> (*)	<b>Seed: embryony</b>	<b>Semence: polyembryonnie</b>	<b>Samen: Polyembryonie</b>			
<b>QL</b>	monoembryonic	absente	fehlend		Sensation, Tommy Atkins	1
	polyembryonic	présente	vorhanden		Peach, Sabre	9
<b>94.</b>	<b>Time of beginning of flowering</b>	<b>Époque de début de floraison</b>	<b>Zeitpunkt des Blühbeginns</b>	<b><u>Changed</u></b>		
<b>QN</b>	early	précoce	früh		Early Gold	3
	medium	moyenne	mittel		Fascell	5
	late	tardive	spät		Sensation	7
<b>95.</b> (*)	<b>Time of fruit maturity</b>	<b>Époque de maturité des fruits</b>	<b>Zeitpunkt der Fruchtreife</b>			
<b>QN</b>	very early	très précoce	sehr früh		Early Gold, Florigon	1
	early	précoce	früh		Zill	3
	medium	moyenne	mittel		Fascell, Nimrod, Tommy Atkins	5
	late	tardive	spät		Sensation	7
	very late	très tardive	sehr spät		Keitt	9

8. Explanations on the Table of Characteristics

**TWF 2003: To be updated in accordance with the changes to the Table of Chars and Ad. 58 to 63 to add illustration showing the dorsal and ventral shoulder.**

8.1 *Explanations Covering Several Characteristics*

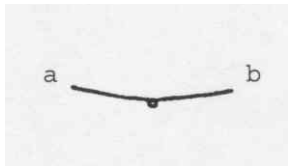
Characteristics containing the following notes in the second column of the Table of Characteristics should be examined as indicated below:

- (a) All observations on the young leaf should be made on active growth (flush).  
**Comment ARTM 2004: To be elaborated to further clarify the period of observation.**  
**ZA 2004: During flush there are very young soft leaves which in some varieties will show anthocyanin coloration. How to elaborate?**
- (b) All observations on the leaf should be on mature leaves in the middle third of the youngest shoots not showing signs of active growth. The attitude of the leaf should be observed on upward growing shoots.
- (c) Inflorescences should be selected from terminal panicles of typical shoots from the exposed regions of the tree.
- (d) Unless otherwise stated, all observations on the inflorescence and the flower should be made at the time of full flowering.
- (e) 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. All fruits for observation should be harvested from the periphery of the tree and ripened at room temperature without any artificial ripening agents.
- (f) 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.
- (g) All observations on the lenticels should be made on the lateral side of the fruit.
- (h) For observations on the length and width of the fruit, the fruit should be sawed lengthwise, through the stalk attachment and the stylar scar. For observations on the thickness, it should be sawed at right angle (perpendicular) to this. 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. The thickness is taken at the thickest part perpendicular to the width. **‘ZA 2004: In lateral view the fruit is normally viewed with the ventral shoulder and the stylar scar to the left and with the dorsal shoulder to the right.’**

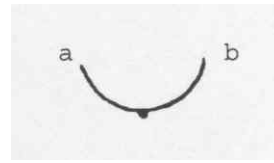


8.2 *Explanations for individual characteristics*

Ad. 15: Leaf: shape in cross section



1  
straight



2  
concave

Ad. 12: Leaf blade: shape

**ZA 2004: ARTM proposed new states. Could they please provide drawings and example varieties. We only have oblong, elliptic and lanceolate.**



1  
trullate to ovate



2  
Elliptic



3  
oblong

Ad. 14: Leaf blade: twisting



1  
absent



9  
present

Ad. 23: Leaf blade: shape of apex



1  
attenuate



2  
acuminate



3  
acute

Ad. 24: Leaf blade: shape of base



1  
acute



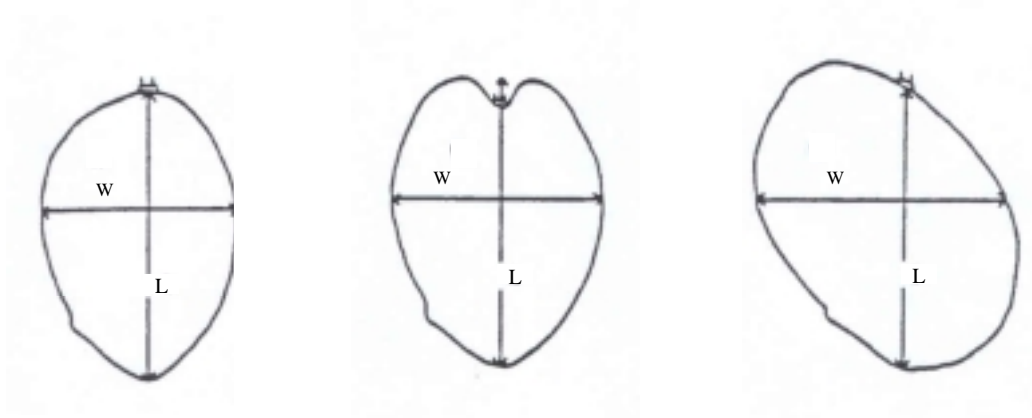
2  
obtuse



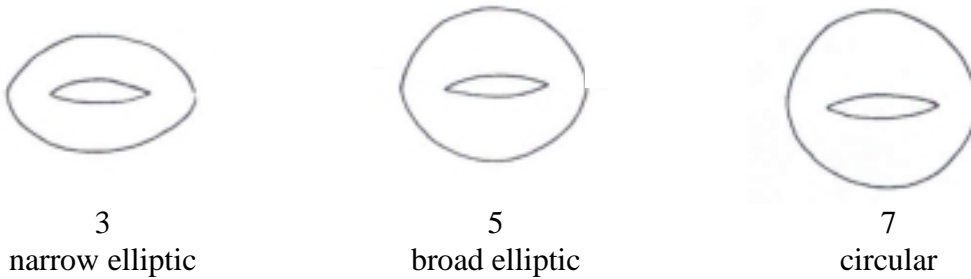
3  
rounded

**Ad. 30: Comment ARTM 2004: To explain the part of the inflorescence on which to observe the width.**

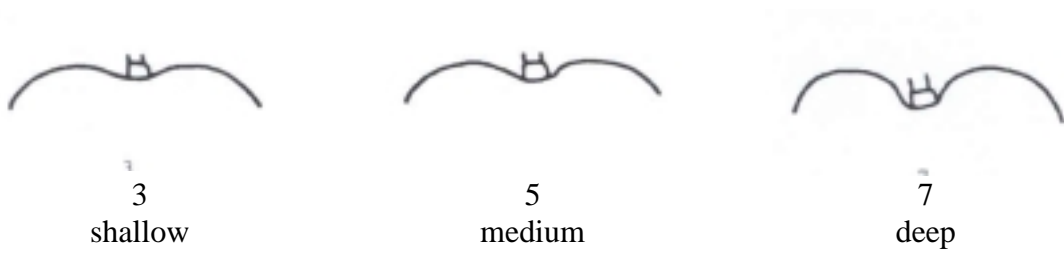
Ad. 43-45: Mature fruit: length (= L) and width (= W)



Ad. 46: Mature fruit: shape in cross section

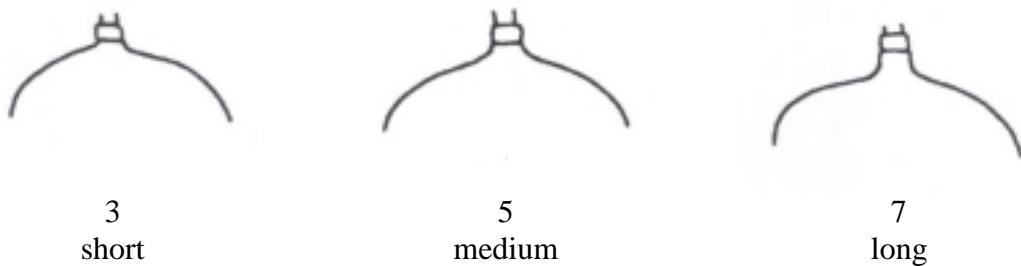


Ad. 55: Mature fruit: depth of stalk cavity



Ad. 57: Mature fruit: length of neck

**ZA 2004: Should we rather have drawings for 56 'presence of neck'?**



Ad. 58 + 59: Mature fruit: shape of ventral (58) and dorsal (59) shoulder



1  
rounded upward



3  
rounded outward



5  
rounded downward



7  
sloping downward



9  
falling abruptly

Ad. 60: Mature fruit: presence of groove in ventral shoulder



1  
absent



9  
present

Ad. 63: Mature fruit: lumpiness on ventral shoulder

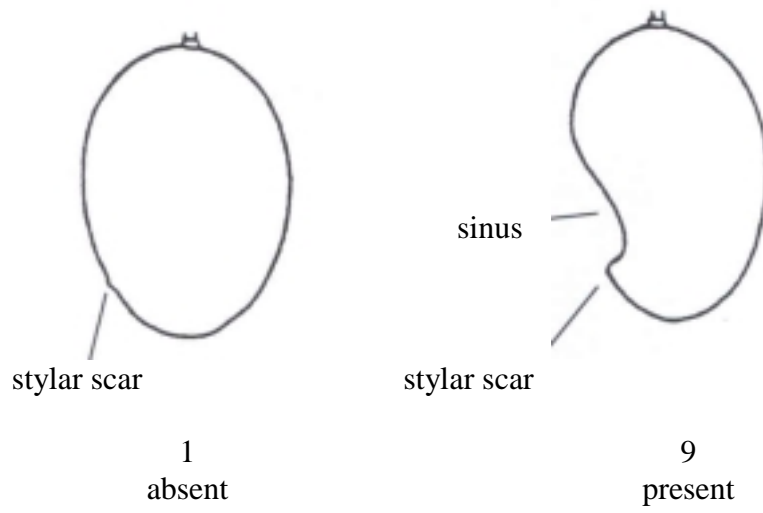


1  
absent

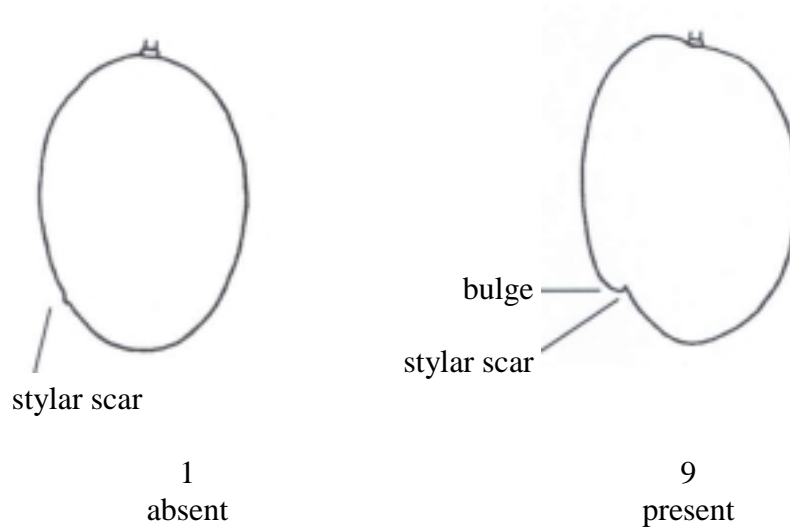


9  
present

Ad. 64: Mature fruit: sinus proximal of stylar scar



Ad. 66: Mature fruit: bulge proximal of stylar scar



9. Literature

**ARTM 2003: Relevant literature to be added.**

**TWF 2003: 'Mango Number' reference to be completed.**

**ARTM 2004: Experts from India, Philippines and TFNet to provide further literature.**

**ZA 2004: Books by Campbell? And IPGRI Descriptors?**

**TWF 2003: 'Mango Number' reference to be completed.**

Gangolly, S.R., Singh, R., Katyal, S.L., Singh, D., 1957: "The Mango," Indian Council of Agricultural Research, New Delhi, India, pp. 19-459

Kurup, C.G.R. (Chief Editor), 1967: "The Mango: A Handbook," Indian Council of Agricultural Research, New Delhi, India, pp. 14-31

"Mango Number," Punjab Fruit Journal, nn. 82-83, 1960

Naik, K.C., Gangolly, S.R., 1950: "A Monograph on Classification and Nomenclature of South Indian Mangoes", Superintendent, Government Press, Madras, India, pp. 36-273

Singh, L.B., 1960: "The Mango: Botany, Cultivation and Utilization," Interscience Publishers, Leonard Hill, London, GB, New York, US, pp. 91-142

Singh, L.B., 1969: "Mango, Outlines of Perennial Crop Breeding in the Tropics," Misc. Papers, 4. Landbouwhogeschool Edit., Wageningen, NL

Valmayor, R., 1962: "The Mango: Its Botany and Production," University of the Philippines, College, Laguna

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	<input type="text" value="Mangifera indica L."/>	
1.2 Common name	<input type="text" value="MANGO"/>	
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

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

Characteristics	Example Varieties	Note
<b>5.1 Mature fruit: ratio length/width (45)</b>		
very small	Extrema, Santa Alexandrina	1[ ]
small	Fascell, Sheil	3[ ]
medium	Sensation, Tommy Atkins	5[ ]
large	Carrie, Gouveia	7[ ]
very large	Anderson, Sabre	9[ ]
<b>5.2 Mature fruit: shape of ventral shoulder (58)</b>		
rounded upward	Tommy Atkins	1[ ]
rounded outward	Florigon, Palmer, Zill	3[ ]
rounded downward	Keitt, Ruby, Sandersha	5[ ]
sloping downward		7[ ]
falling abruptly		9[ ]
<b>5.3 Mature fruit: shape of dorsal shoulder (59)</b>		
rounded upward		1[ ]
rounded outward	Fascell	3[ ]
rounded downward	Ruby, Zill	5[ ]
sloping downward	Keitt	7[ ]
falling abruptly	Palmer, Sandersha	9[ ]
<b>5.4 Mature fruit: presence of sinus (64)</b>		
absent	Fascell, Hood, Kent	1[ ]
present	Gouveia, Sabre, Sandersha	9[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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	Characteristics	Example Varieties	Note
<b>5.5</b>	<b>Mature fruit: bulge proximal of stylar scar</b>		
<b>(66)</b>			
	absent	Adams, Anderson	1[ ]
	present	Sheil	9[ ]
<b>5.6</b>	<b>Seed: embryony</b>		
<b>(93)</b>			
	monoembryonic	Sensation, Tommy Atkins	1[ ]
	polyembryonic	Peach, Sabre	9[ ]
<b>5.7</b>	<b>Time of fruit maturity</b>		
<b>(95)</b>			
	very early	Early Gold, Florigon	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 <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety
<i>(Example)</i>			

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#7. Additional information which may help in the examination of the variety

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

Yes [ ] No [ ]

(If yes, please provide details)

7.2 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.

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# 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:
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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]