

UPOV

TG/112/4(proj.2)

ORIGINAL: English

DATE: September 9, 2003

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

MANGO

Mangifera indica L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*to be considered by the
Technical Working Party for Fruit Crops at its thirty-fourth session,
to be held in Niagara Falls, Canada, from September 29 to October 3, 2003*

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

ASSOCIATED DOCUMENTS

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

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

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1. SUBJECT OF THESE TEST GUIDELINES	3
2. MATERIAL REQUIRED	3
3. METHOD OF EXAMINATION	3
3.1 Duration of Tests	3
3.2 Testing Place	3
3.3 Conditions for Conducting the Examination	3
3.4 Test Design	3
3.5 Number of Plants / Parts of Plants to be Examined	4
3.6 Additional Tests	4
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	4
4.1 Distinctness	4
4.1.1 <i>General Recommendations</i>	4
4.1.2 <i>Consistent Differences</i>	4
4.1.3 <i>Clear Differences</i>	4
4.2 Uniformity	4
4.3 Stability	4
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL	5
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS	5
6.1 Categories of Characteristics	5
6.1.1 <i>Standard Test Guidelines Characteristics</i>	5
6.1.2 <i>Asterisked Characteristics</i>	5
6.2 States of Expression and Corresponding Notes	6
6.3 Types of Expression	6
6.4 Example Varieties	6
6.5 Legend	6
7. TABLE OF CHARACTERISTICS	7
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS	34
8.1 Explanations covering several characteristics	34
8.2 Explanations for individual characteristics	36
9. LITERATURE	43
10. TECHNICAL QUESTIONNAIRE	44

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 graft sticks.

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

12 graft sticks, sufficient to propagate 5 (6) 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 *Duration of Tests*

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

3.2 *Testing Place*

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

3.3 *Conditions for Conducting the Examination*

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination. 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 minimum duration of tests recommended in section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.2 *Uniformity*

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 (6) 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 is aided by the use of grouping characteristics.

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

5.3 The following have been agreed as useful grouping characteristics:

- (a) Mature fruit: ratio length/width (characteristic 45);
- (b) Mature fruit: shape of left shoulder (characteristic 58);
- (c) Seed: polyembryony (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

MoE ^o	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			
PQ	erect	dressé	aufrecht			3
	horizontal	horizontal	waagerecht			5
	drooping	retombant	hängend		Sensation	7

ZA: to read: ,Young leaf: presence of anthocyanin coloration‘

ARTM To add new char. 2a ‘Color of young leaf’ with states light green 1, dark green 2, red brown 3.

ZA 2003 If we add this additional char. we will be duplicating some of what we already have. One could rather replace chars. 2,3 and 4 with Color of young leaf: light green 1, dark green 2, light reddish 3, medium reddish 4, dark reddish 5. (To say ‘reddish’ because it can sometimes be red brown and sometimes purplish.)

2. (*)	Young leaf: anthocyanin coloration	Jeune feuille: pigmentation anthocyanique	Junges Blatt: Anthocyanfärbung			
QL (a)	absent	absente	fehlend			1
	present	présente	vorhanden			9

ZA, ARTM: to delete char.

3.	Young leaf: hue of anthocyanin coloration	Jeune feuille: teinte de la pigmentation anthocyanique	Junges Blatt: Ton der Anthocyanfärbung			
PQ (a)	reddish	rougeâtre	rötlich		Gouveia, Sensation, Tommy Atkins	1
	brownish	brunâtre	bräunlich		Florigon, Peach, Sabre	2

^o
MoE = Method of Examination

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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ARTM: To add state 9 with an example variety indicated later by Tropical Fruits Network (and due to consistency with IPGRI descriptor)

4.	Young leaf: intensity of anthocyanin coloration	Jeune feuille : intensité de la pigmentation anthocyanique	Jungblatt: Stärke der Anthocyanfärbung			
QN	(a) weak	faible	gering		Irwin, Sensation	3
	medium	moyenne	mittel		Kent, Zill	5
	strong	forte	stark		Goveia, Peach, Sabre	7

ZA, ARTM: to delete char.

5.	Young leaf: shape in cross section	Jeune feuille: forme de la section transversale	Junges Blatt: Form im Querschnitt			
(+)						
PQ/ QL?	(a) straight	droite	gerade		Carrie	1
	concave	concave	konkav		Sabre	2

ZA, ARTM: to delete char.

6.	Young leaf: relief of upper face	Jeune feuille: relief de la face supérieure	Junges Blatt: Relief der Oberseite			
(+)						
QN	(a) sunken between secondary veins	en creux entre les nervures secondaires	eingesunken zwischen den sekundären Adern		Sabre	3
	smooth	lisse	glatt			5
	raised between secondary veins	élevée entre les nervures secondaires	erhöht zwischen den sekundären Adern		Carrie	7

ZA, ARTM: to delete char.

7.	Young leaf: undulation of margin	Jeune feuille: ondulation du bord	Junges Blatt: Wellung des Randes			
QL	(a) absent	absente	fehlend		Carrie, Irwin	1
	present	présente	vorhanden		Kent, Peach	9

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<p>ZA: should we say ,leaf` instead of ,fully developed leaf` for chars. 8 – 27, as in apple? The leaves mostly don't droop but rather recurve. The attitude could be influenced by curvature of the petiole and/or the blade. How should we handle this? Compare chars 17, 18 and 26. Should we combine all these into this char 8 and say: ,Leaf: general attitude semi-erect 1, perpendicular 2, slightly recurved 3, strongly recurved 4? (Notes could also be 3,5,7,9 depending on decision for TGP/7.) Don't know of mangoes with erect leaves. ARTM: To delete if immature leaves are taken into consideration. Maintain if other species besides <i>M. indica</i> are to be included Yes, there are mangoes with erect leaves. ZA: Agree. This char. should only apply to mature leaves if we decide to maintain it.</p>						
8. (*)	Fully developed leaf: attitude	Feuille à complet développement: port	Vollentwickeltes Blatt: Haltung			
QL/ PQ?	(b) horizontal	horizontal	waagrecht		Sensation	1
	drooping	retombant	hängend		Irwin	2
9.	Fully developed leaf: length	Feuille à complet développement: longueur	Vollentwickeltes Blatt: Länge			
QN	(b) short	courte	kurz		Adams	3
	medium	moyenne	mittel		Peach	5
	long	longue	lang		Florigon, Hood	7
10.	Fully developed leaf: width	Feuille à complet développement: largeur	Vollentwickeltes Blatt: Breite			
QN	(b) narrow	étroite	schmal		Peach	3
	medium	moyenne	mittel			5
	broad	large	breit		Hood, Nimrod	7

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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ZA: changed

ARTM: To delete, as additionally to the ratio the position of the broadest width is of importance, but the combination of these properties can be found in char. 12 (shape).

ZA 2003: We find the ratio very important since it normally gives better distinction than length or width separately. We should either have the ratio plus the position of the broadest part or, alternatively, the ratio plus the shape.

11. (*)	Fully developed leaf: ratio length/width	Feuille à complet développement: rapport longueur/largeur	Vollentwickeltes Blatt: Verhältnis Länge/Breite		
QN	(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

ZA: to delete? Or to change: ,Leaf: position of broadest part – below middle 1, in middle 2, along most of its length 3?
Have to check.

ARTM: To replace by ‘Fully developed leaf: shape’ with the states linear 1, oblong 2, elliptic 3, ovate 4, obovate 5.

ZA 2003: See comments under char. 11. We don’t have examples with obovate leaves.

12. (+)	Fully developed leaf: predominant shape	Feuille à complet développement: forme prédominante	Vollentwickeltes Blatt: vorwiegende Form		
PQ	(b) trullate to ovate	lancéolée à ovale	lanzettförmig bis eiförmig	Carrie, Van Dyke	1
	elliptic	elliptique	elliptisch		2
	oblong	oblongue	rechteckig	Hood	3

ZA: change states to yellow green, medium green, dark green

ARTM: To have the states light green 1, yellowish green 2, dark green 3.

13.	Fully developed leaf: color	Feuille à complet développement: couleur	Vollentwickeltes Blatt: Farbe		
PQ	(b) yellow green	vert jaune	gelbgrün	Carrie, Zill	1
	green	verte	grün	Peach	2
	brown green	vert brun	braungrün		3
	dark green	vert foncé	dunkelgrün	Fascell, Nimrod	4

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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ZA: Should we have a third state to handle intermediate situations? Absent or very weak 1, weak 2, strong 3? (However, true absence does exist and could be separated out. This is a TGP/7 question.)

ARTM: To retain unchanged.

ZA 2003: OK.

14. (+)	Fully developed leaf: twisting of blade	Feuille à complet développement: torsion du limbe	Vollentwickeltes Blatt: Drehung der Blattspreite			
QL	(b) absent	absente	fehlend		Hood	1
	present	présente	vorhanden		Florigon	9

ZA: Same question as above – straight or slightly concave 1, moderately concave 2, strongly concave 3? ARTM: To retain unchanged.

ZA 2003: OK.

15. (+)	Fully developed leaf: shape in cross section	Feuille à complet développement: forme de la section transversale	Vollentwickeltes Blatt: Form im Querschnitt			
PQ/ QL?	(b) straight	droite	gerade		Hood	1
	concave	concave	konkav		Zill	2

ZA, ARTM: to delete

16. (+)	Fully developed leaf: symmetry	Feuille à complet développement: symétrie	Vollentwickeltes Blatt: Symmetrie			
?	(b) often asymmetric	souvent asymétrique	häufig asymmetrisch		Carrie	1
	always symmetric	toujours symétrique	immer symmetrisch		Hood	2

ZA: To delete and incorporate into char 8. (Or change to: ,Leaf: longitudinal curvature (or recurvature) of midrib absent or very weak 1, moderate 2, strong 3.)

ARTM: To retain unchanged in case of including other species besides *M. indica*.

17. (+)	Fully developed leaf: curvature of midrib	Feuille à complet développement: courbure de la nervure principale	Vollentwickeltes Blatt: Krümmung der Mittelrippe			
QL	(b) absent	absente	fehlend		Hood	1
	present	présente	vorhanden		Fascell, Haden	9

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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ZA: to delete?

ARTM: To retain unchanged in case of including other species besides *M. indica*.

18.	Fully developed leaf: position of curvatur of midrib	Feuille à complet développement: position de la courbure de la nervure principale	Vollentwickeltes Blatt: Position der Krümmung der Mittelrippe			
(+)						
PQ	(b) apical	apicale	an der Spitze			1
	basal	basale	an der Basis			2
	from apex to base	du sommet à la base	von der Spitze zur Basis	Fascell		3

ZA: There is also another state, namely ,sunken between secondary veins. Drawing of state 1 is upside down. However, we do not find it necessary to observe so many leaf chars. Rather delete and add some very useful fruit chars.

ARTM: Agree to delete.

19.	Fully developed leaf: relief of upper surface	Feuille à complet développement: relief de la face supérieure	Vollentwickeltes Blatt: Relief der Oberseite			
(+)						
?	(b) smooth	lisse	glatt	Sabre		1
	raised between secondary veins	élevée entre les nervures secondaires	erhöht zwischen den sekundären Adern	Carrie		2
20.	Fully developed leaf: spacing of secondary veins	Feuille à complet développement: espacement entre les nervures secondaires	Vollentwickeltes Blatt: Abstand zwischen den sekundären Adern			
QN	(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

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA: to delete, depends strongly on age of leaf. Anyway should read ,relief of reticulate veins....' ARTM: Agree to delete.							
21.		Fully developed leaf: predominant relief of veins on upper surface	Feuille à complet développement: relief prédominant des nervures réticulées de la face supérieure	Vollentwickeltes Blatt: überwiegendes Relief der netzartigen Adern der Oberseite			
QL	(b)	smooth	lisses	glatt			1
		grooved	cannelés	gefurcht		Early Gold	2
ZA, ARTM: change to ,absent or weak 1' moderate 2, strong 3'							
22.		Fully developed leaf: undulation of margin	Feuille à complet développement: ondulation du bord	Vollentwickeltes Blatt: Wellung des Randes			
QN	(b)	weak	faible	gering		Tommy Atkins	3
		medium	moyenne	mittel			5
		strong	forte	stark		Florigon	7
ZA, ARTM: change to ,shape of apex'							
23.		Fully developed leaf: shape of tip	Feuille à complet développement: forme du sommet	Vollentwickeltes Blatt: Form der Spitze			
(+)							
PQ	(b)	attenuate	pointu	mit lang ausgezogener Spitze		Florigon	1
		acuminate	acuminé	mit aufgesetzter Spitze		Gouveia, Nimrod	2
		acute	aigu	spitz		Hood	3
24.		Fully developed leaf: shape of base	Feuille à complet développement: forme de la base	Vollentwickeltes Blatt: Form der Basis			
(+)							
PQ	(b)	acute	aiguë	spitz		Florigon, Sabre	1
		obtuse	obtuse	stumpf			2
		rounded	arrondie	abgerundet		Fascell, Kent	3

^o MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA: to delete. 'Flower fragrance' occurs in very few varieties and all varieties have some aroma. ARTM: Change to 'odor (when crushed)'. ZA: Don't agree. They all smell of mango when crushed. Only one type we have has a specific flower fragrance. The 'turpentine is anyway observable in the fruit as well.						
25.	Fully developed leaf: fragrance	Feuille à complet développement: parfum	Vollentwickeltes Blatt: Duft			
QL	(b) absent	absent	fehlend			1
	present	présent	vorhanden		Carrie	9
ZA: to combine under char 8?						
26.	Fully developed leaf: attitude of petiole (in relation to stem)	Feuille à complet développement: port du pétiole (par rapport à la tige)	Vollentwickeltes Blatt: Haltung des Stieles (im Verhältnis zum Stengel)			
QN	(b) erect	dressé	aufrecht		Sensation	1
	semi-erect	demi-dressé	halb aufrecht		Peach	3
	perpendicular	perpendiculaire	senkrecht		Haden, Zill	5
	recurved	retombant	zurückgebogen			7
	strongly recurved	très retombant	stark zurückgebogen			9
27.	Fully developed leaf: length of petiole	Feuille à complet développement: longueur du pétiole	Voll entwickeltes Blatt: Länge des Stieles			
QN	(b) short	court	kurz		Adams	3
	medium	moyen	mittel			5
	long	long	lang		Florigon, Irwin	7

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA: Either ,semi-erect 3, horizontal 5, semi-drooping 7’ or states 1,2,3, depending on TGP/7. ARTM: To say ‘Inflorescence (including peduncle)’ and have the notes 1,2,3. ZA 2003: Agree. To say ‘Inflorescence (including peduncle): general attitude - erect 1, horizontal (or spreading) 2, drooping 3’.						
28. (*)	Inflorescence: attitude of axis	Inflorescence: port de l’axe	Blütenstand: Haltung der Achse			
QN	(c) erect	dressé	aufrecht			3
	(d) horizontal	horizontal	waagerecht		Irwin, Peach	5
	drooping	retombant	überhängend		Florigon, Kent	7
ZA: We do length excluding peduncle and length of peduncle in separate chars. ARTM: Agree to have two chars. a) Inflorescence: length (excluding peduncle) and b) Peduncle: length						
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
30.	Inflorescence: width	Inflorescence: largeur	Blütenstand: Breite			
QN	(c) narrow	étroite	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 branches	Inflorescence: nombre de rameaux	Blütenstand: Anzahl Zweige			
QN	(c) few	petit	gering			3
	(d) medium	moyen	mittel			5
	many	grand	groß			7

^o MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33. (*)	Inflorescence: color of axis and branches	Inflorescence: couleur de l'axe et des rameaux	Blütenstand: Farbe der Achse und der Zweige			
PQ	(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			8

ZA: not important char?

ARTM: To check example variety for state 9.

34.	Inflorescence: pubescence on axis and branches	Inflorescence: pilosité sur l'axe et sur les rameaux	Blütenstand: Behaarung der Achse und der Zweige			
QL	(c) absent	absente	fehlend			1
	(d) present	présente	vorhanden		Tommy Atkins, Zill	9

ZA: not important char?

ARTM: To find example varieties for all states.

35.	Inflorescence: density of pubescence on axis and branches	Inflorescence: densité de la pilosité sur l'axe et sur les rameaux	Blütenstand: Dichte der Behaarung der Achse und der Zweige			
QN	(c) sparse	faible	locker			3
	(d) medium	moyenne	mittel			5
	dense	forte	dicht			7

^o MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA: to delete. Varies from year to year. ARTM: Agree to delete.						
36.	Inflorescence: leafy bracts	Inflorescence: bractées en forme de feuilles	Blütenstand: blattartige Hochblätter			
QL	(c) absent	absentes	fehlend			1
	(d) present	présentes	vorhanden	Zill		9
ZA: to delete? Difficult with size difference between male and female flowers. ARTM: Agree to delete.						
37.	Flower: size	Fleur: taille	Blüte: Größe			
QN	(d) small	petite	klein		Carrie, Peach	3
	medium	moyenne	mittel		Fascell, Sabre, Sensation	5
	large	grande	groß		Florigon, Haden	7
ZA: to delete ARTM: Agree to delete.						
38.	Flower: position of fertile stamen(s) in relation to style	Fleur: position des étamines par rapport au style	Blüte: Stellung des Staubblatts im Verhältnis zum Griffel			
QL	(d) parallel	parallèle	parallel		Kent, Peach	1
	oblique	oblique	schräg abstehend		Irwin	2
ZA: to delete ARTM: Agree to delete.						
39.	Flower: length of fertile stamen(s) in relation to style	Fleur: longueur des étamines fertiles par rapport au style	Blüte: Länge des fertilen Staubblatts im Verhältnis zum Griffel			
QN?	(d) shorter	plus courtes	kürzer		Florigon, Irwin	1
	equal	de même longueur	gleichlang		Sensation, Sheil	2
	longer	plus longues	länger			3

^o MoE	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
ZA: to delete ARTM: Agree to delete.						
40.	Flower: development of staminodes	Fleur: développement des staminodes	Blüte: Entwicklung der Staminodien			
QN	(d) weak	faible	gering			3
	medium	moyen	mittel			5
	strong	fort	stark			7
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.						
41. (*)	Old flower: anthocyanin coloration	Fleur âgée: pigmentation anthocyanique	Alte Blüte: Anthocyanfärbung			
QL	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.						
42. (*)	Old flower: intensity of anthocyanin coloration	Fleur âgée: intensité de la pigmentation anthocyanique	Alte Blüte: Stärke der Anthocyanfärbung			
QN	weak	faible	gering		Carrie, Early Gold, Haden	3
	medium	moyenne	mittel		Irwin, Zill	5
	strong	forte	stark		Hood, Peach	7
43. (*) (+)	Mature fruit: length	Fruit prêt à cueillir: longueur	Erntereife Frucht: Länge			
QN	(e) very short	très court	sehr kurz			1
	(h) 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

MoE ^o	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
44. (*) (+)	Mature fruit: width	Fruit prêt à cueillir: largeur	Erntereife Frucht: Breite			
QN	(e) very narrow	très étroit	sehr schmal			1
	(h) narrow	étroit	schmal		Adams	3
	medium	moyen	mittel		Irwin, Zill	5
	broad	large	breit		Keitt, Nimrod	7
	very broad	très large	sehr breit		Extrema	9

ZA: changed

45. (*) (+)	Mature fruit: ratio length/width	Fruit prêt à cueillir: rapport longueur/ largeur	Erntereife Frucht: Verhältnis Länge/Breite			
QN	(e) very small	très petit	sehr klein		Extrema, Santa Alexandrina	1
	(h) 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

ZA: change to ‚thickness‘ – ‚thin, medium, thick‘

ARTM: To retain unchanged.

ZA 2003: We find the thickness useful because of the very diagnostic data derived from the ratio width/thickness. We could, however, ‚live with‘ the present states but then the notes should be changed to 1,2,3.

46. (*) (+)	Mature fruit: shape in cross section	Fruit prêt à cueillir: forme de la section transversale	Erntereife Frucht: Form im Querschnitt			
QN	(e) narrow elliptic	elliptique étroite	schmal elliptisch		Gouveia	3
	broad elliptic	elliptique large	breit elliptisch		Sabre, Tommy Atkins	5
	circular	arrondie	abgerundet		Extrema, Santa Alexandrina	7

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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Add more characteristics:

New char. 46a: “Mature fruit: ratio width/thickness: small (1) large (9)”

New char. 46b: “Mature fruit: width at base: narrow (3), medium (5), broad (7)”. To measure the width at 1/8th of the fruit length from the basal point.

New char. 46c: “Mature fruit: ratio width/width at base: small (3), medium (5), large (7)”.

New char. 46d: “Mature fruit: width at apex”. Measure at 1/8th of fruit length from apical point. Longitudinal axis goes from the stalk attachment to the furthest point.

New char. 46e: “Mature fruit: ratio width/width at apex. States as 46c

New char. 46f: “Mature fruit: thickness at base” – thin, medium, thick. Also at 1/8th of length from basal point

New char. 46g: “Mature fruit: ratio thickness/thickness at base”. States as 46c

New char. 46h: “Mature fruit: thickness at apex”. Also at 1/8th of length from apex

New char. 46i: “Mature fruit: ratio thickness/thickness at apex”. States as 46c

ARTM: Not to include any of these proposed new chars.

ZA: OK. Could be too detailed for the TG’s, although very useful as objective data.

ZA: to change order of states: ,only green, green and orange, green and pink, green and red, green and purple‘ and add as state 6 ,only purple‘.

ARTM: Agree to proposed order. To insert two states ‘green and yellow’ and ‘yellow’. Example varieties to follow.

ZA 2003: Agree. Then we must delete the word ‘only’ in state 1.

47. (*)	Mature fruit: color of skin	Fruit prêt à cueillir: couleur de l'épiderme	Erntereife Frucht: Farbe der Schale		
PQ	(e) only green	seulement vert	nur grün	Carrie	1
	green and purple	vert et violet	grün und purpur	Sensation, Zill	2
	green and red	vert et rouge	grün und rot	Fascell	3
	green and orange	vert et orange	grün und orange	Gouveia	4
	green and pink	vert et rose	grün und rosa	Kensington	5
48.	Mature fruit: size of area of non- green color of skin	Fruit prêt à cueillir: taille de la zone de la couleur non verte de l'épiderme	Erntereife Frucht: Größe der Zone der nicht grünen Farbe der Schale		
QN	(e) small	petite	klein	Zill	3
	medium	moyenne	mittel	Irwin	5
	large	grande	groß	Hood, Sensation	7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA: to change to ,conspicuousness of bloom - weak, medium, strong'							
ARTM: Agree to change as proposed and to change states to 'absent or very weak,' 'medium', 'strong'.							
ZA: Agree. Notes to be 1,2,3 and wording to be checked with TGP/7.							
49.		Mature fruit: bloom on skin	Fruit prêt à cueillir: pruine de l'épiderme	Erntereife Frucht: Bereifung der Schale			
QL	(e)	inconspicuous	peu nette	undeutlich		Early Gold	1
		conspicuous	nette	deutlich		Sensation	2
50.		Mature fruit: density of lenticels	Fruit prêt à cueillir: densité des lenticelles	Erntereife Frucht: Dichte der Lentizellen			
QN	(e)	sparse	faible	locker		Carrie, Fascell, Kensington	3
	(g)	medium	moyenne	mittel		Sabre	5
		dense	forte	dicht		Hood, Sensation	7
ARTM: Participants to examine their variety collections.							
51.		Mature fruit: conspicuousness of lenticels	Fruit prêt à cueillir: netteté des lenticelles	Erntereife Frucht: Ausprägung der Lentizellen			
QN	(e)	weak	faible	gering		Kensington, Peach, Sandersha	3
	(g)	medium	moyenne	mittel		Sheil	5
		strong	forte	stark		Haden, Ruby	7
ARTM: Participants to examine their variety collections.							
52.		Mature fruit: size of lenticels	Fruit prêt à cueillir: taille des lenticelles	Erntereife Frucht: Größe der Lentizellen			
QN	(e)	small	petites	klein		Sandersha, Sensation	3
	(g)	medium	moyennes	mittel			5
		large	grandes	groß		Haden, Sheil	7

^o MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA: 'absent or very weak 1', 'weak 2', 'strong 3' ARTM: To keep the states as they are. ZA 2003 OK.						
53.	Mature fruit: roughness of surface caused by lenticels	Fruit prêt à cueillir: rugosité de la surface causée par des lenticelles	Erntereife Frucht: durch Lentizellen bedingte Rauheit der Oberfläche			
QL	(e) absent	absente	fehlend		Hood, Peach, Zill	1
	(g) present	présente	vorhanden		Haden, Kensington	9
ZA: change to 'presence of stalk cavity'						
54.	Mature fruit: stalk cavity	Fruit prêt à cueillir: cavité pédonculaire	Erntereife Frucht: Stielhöhle			
QL	(e) absent	absente	fehlend		Adams, Ruby	1
	present	présente	vorhanden		Nimrod	9
55.	Mature fruit: depth of stalk cavity	Fruit prêt à cueillir: profondeur de la cavité pédonculaire	Erntereife Frucht: Tiefe der Stielhöhle			
(+)						
QN	(e) shallow	peu profonde	flach		Florigon, Haden, Irwin	3
	medium	moyenne	mittel			5
	deep	profonde	tief		Nimrod	7
ZA: change to 'presence of neck' ARTM: Agree.						
56.	Mature fruit: neck	Fruit prêt à cueillir: collet	Erntereife Frucht: Hals			
QL	(e) absent	absent	fehlend		Fascell, Zill	1
	present	présent	vorhanden		Ruby	9

^o MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA: change to ,length of neck – short, medium, long‘ ARTM: Agree.						
57. (+)	Mature fruit: prominence of neck	Fruit prêt à cueillir: netteté du collet	Erntereife Frucht: Ausprägung des Halses			
QN	(e) weak	faible	gering		Peach, Sandersha	3
	medium	moyenne	mittel			5
	strong	forte	stark		Ruby	7
ARTM: ‘...shape of ventral (i.e. left) shoulder’ ZA 2003: OK						
58. (* (+)	Mature fruit: shape of left shoulder	Fruit prêt à cueillir: forme de l’épaule gauche	Erntereife Frucht: Form der linken Schulter			
PQ	(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
ARTM: ‘...shape of dorsal (i.e. right) shoulder’ ZA 2003: OK						
59. (* (+)	Mature fruit: shape of right shoulder	Fruit prêt à cueillir: forme de l’épaule droite	Erntereife Frucht: Form der rechten Schulter			
PQ	(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

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ARTM: ‘...presence of groove in ventral shoulder’. ZA 2003: Agree.						
60.	Mature fruit: groove in left shoulder	Fruit prêt à cueillir: sillon dans l’épaule gauche	Erntereife Frucht: Furche in der linken Schulter			
(+)						
QL	(e) absent	absent	fehlend		Ruby	1
	present	présent	vorhanden		Kensington	9
ZA 2003: See ARTM proposal ‘left’ to be ‘ventral’.						
61.	Mature fruit: length of groove in left shoulder	Fruit prêt à cueillir: longueur du sillon dans l’épaule gauche	Erntereife Frucht: Länge der Furche in der linken Schulter			
QN	(e) short	court	kurz		Fascell, Sheil	3
	medium	moyenne	mittel		Kensington	5
	long	long	lang			7
ARTM: To reduce number of states to three and change wording to e.g. ‘absent or very weak’, ‘medium’ and ‘strong’. ZA 2003: Agree. Also see ARTM proposal ‘left’ to be ‘ventral’.						
62.	Mature fruit: depth of groove in left shoulder	Fruit prêt à cueillir: profondeur du sillon dans l’épaule gauche	Erntereife Frucht: Tiefe der Furche in der linken Schulter			
QN	(e) shallow	peu profond	flach		Fascell	3
	medium	moyen	mittel		Sheil	5
	deep	profond	tief			7
ZA: could add a char: ,prominence of lumpiness on left shoulder’ – ‘weak’, ‘medium’, ‘strong’ ARTM: To find a proper wording instead of ‘lumpiness’ or to deliver an explanation.						
63.	Mature fruit: lumpiness on left shoulder	Fruit prêt à cueillir: excroissance sur l’épaule gauche	Erntereife Frucht: Auswuchs auf der linken Schulter			
(+)						
QL	(e) absent	absente	fehlend		Peach, Ruby	1
	present	présente	vorhanden		Fascell, Zill	9

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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ARTM: To read ‘...presence of...’ and to delete ‘...proximal of stylar scar’.
ZA 2003: Agree.

64. (* (+)	Mature fruit: sinus proximal of stylar scar	Fruit prêt à cueillir: sinus proximal de la cicatrice stytaire	Erntereife Frucht: Sinus proximal von der Griffelnarbe			
QL	(e) absent	absent	fehlend		Fascell, Hood, Kent	1
	present	présent	vorhanden		Gouveia, Sabre, Sandersha	9

ZA: change to ‘depth’ with states shallow, medium, deep’

ARTM: To delete ‘...proximal of stylar scar’, to change notes into 1,2,3 and to change the wording of the states accordingly, e.g. ‘absent or very weak’, ‘medium’ and ‘strong’.

ZA 2003: Agree to delete ‘...proximal of stylar scar’ but if we keep char. 64, then we cannot change the wording as proposed by ARTM. Then we should consider the states ‘shallow’, ‘medium’, ‘deep’ as proposed above.

65. (* (+)	Mature fruit: prominence of sinus proximal of stylar scar	Fruit prêt à cueillir: netteté du sinus proximal de la cicatrice stytaire	Erntereife Frucht: Ausprägung des Sinus proximal von der Griffelnarbe			
QN	(e) weak	faible	gering		Florigon, Peach	3
	medium	moyenne	mittel		Kensington	5
	strong	forte	stark		Anderson, Sabre	7

ARTM: 66, 67 and 68 to be deleted and to be replaced by ‘Mature fruit: form of stylar scar’ with the states beak 1, flat 2 and depressed 3.

ZA 2003: Char 66 and 67 refer to an actual bulge proximal to the stylar scar (see drawing) which occurs in some varieties. It is like a ‘nose’. It is not the shape of the stylar scar itself, nor the state ‘pointed’ referred to in char. 68.

66. (* (+)	Mature fruit: bulge proximal of stylar scar	Fruit prêt à cueillir: excroissance proximale de la cicatrice stytaire	Erntereife Frucht: Auswuchs proximal von der Griffelnarbe			
QN	(e) absent	absente	fehlend		Adams, Anderson	1
	present	présente	vorhanden		Sheil	9

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
67.		Mature fruit: prominence of bulge proximal of stylar scar	Fruit prêt à cueillir: netteté de l'excroissance proximale de la cicatrice stylaire	Erntereife Frucht: Ausprägung des Auswuchses proximal von der Griffelnarbe			
QN	(e)	weak	faible	gering		Fascell	3
		medium	moyenne	mittel			5
		strong	forte	stark		Nimrod, Sheil	7
ZA: could add a char: ‚size of point at stylar scar – small, medium, large’							
68.		Mature fruit: shape at stylar scar	Fruit prêt à cueillir: forme de la cicatrice stylaire	Erntereife Frucht: Form an der Griffelnarbe			
PQ	(e)	depressed	déprimée	eingesenkt		Sheil	1
		flattened	aplatie	abgeflacht		Kent	2
		pointed	pointue	spitz		Sandersha, Van Dyke	3
		ridged	sillonnée	gefurcht		Zill	4
ZA: change to ‚diameter of stalk attachment’. Easier to observe. ARTM: Agree with proposal. To consider condensed quant. scale. ZA 2003: Cannot have condensed scale because state 1 would have to read ‘absent or...’ and this is not possible for diameter of stalk attachment. See explanation under char. 75.							
69.		Mature fruit: diameter of stalk	Fruit prêt à cueillir: diamètre du pédoncule	Erntereife Frucht: Durchmesser des Stieles			
QN	(e)	small	petit	klein		Sensation	3
		medium	moyen	mittel		Adams	5
		large	grand	groß		Tommy Atkins	7
ZA: to delete. Correlated with 33. ARTM: To change wording to ‘Rachis: predominant color...’.							
70.		Infructescence: predominant color of main axis (at mature fruit stage)	Fructification: couleur prédominante de l'axe principal (au stade du fruit prêt à cueillir)	Fruchtstand: überwiegende Farbe der Hauptachse (im Stadium der erntereifen Früchte)			
PQ	(e)	green to yellow	vert à jaune	grün bis gelb		Early Gold	1
		reddish	rougeâtre	rötlich		Hood	2

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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ARTM: To change to ‘...predominant color(s)...’ and to add a state ‘yellow orange’ with the example variety ‘Pico’.
ZA: Agree. We don’t have Pico.

71. (*)	Ripe fruit: predominant color of skin	Fruit mûr: couleur prédominante de l’épiderme	Essreife Frucht: überwiegende Farbe der Schale		
PQ	(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 and orange	jaune et orange	gelb und orange	Peach	5
	orange	orange	orange		6
	yellow and red	jaune et rouge	gelb und rot	Adams, Ruby, Sensation	7
	orange and red	orange et rouge	orange und rot		8
	red	rouge	rot	Van Dyke	9
	orange and purple	orange et violet	orange und purpur	Tommy Atkins	10
	red and purple	rouge et violet	rot und purpur		11
	purple	violet	purpur		12

ZA: to delete. Don’t know what it means.

ARTM: To change to ‘...glossiness of skin’.

ZA 2003: Is this after the bloom has been removed?

72.	Ripe fruit: brilliance of skin color	Fruit mûr: brillance de la couleur de l’épiderme	Essreife Frucht: Glanz der Farbe der Schale		
QL	(f) absent	absente	fehlend	Gouveia, Hood, Sheil	1
	present	présente	vorhanden	Adams, Ruby	9

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

ARTM: To retain unchanged.

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

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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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 2003: OK.

74.	Ripe fruit: degree of speckling of skin color	Fruit mûr: densité de la tacheture de l'épiderme	Essreife Frucht: Dichte der Fleckung der Farbe der Schale		
QN	(f) weak	faible	gering		3
	medium	moyen	mittel		5
	strong	fort	stark		7

ARTM: To change to condensed scale e.g. ‘very thin’, ‘thin to medium’, ‘thick’.

ZA 2003: This is not possible according to our rules for the condensed scale. We accepted this for cases where there is not much possibility for distinction more than ‘absent or weak’, ‘strong’, and possibly one state in between (‘moderate’ or ‘medium’), therefore only allowing for the first state and two further steps. We talk about two distinct expressions and a ‘grey area in between’. See TGP/7. The normal quantitative 1 – 9 scale is advisable for skin thickness, even though we are dealing with very small measurements. In fact, we are able to distinguish many more than only three distinct thicknesses.

75.	Ripe fruit: thickness of skin	Fruit mûr: épaisseur de l'épiderme	Essreife Frucht: Dicke der Schale		
QN	(f) thin	fin	dünn	Adams, Carrie, Florigon	3
	medium	moyen	mittel	Sabre, Sheil	5
	thick	épais	dick	Haden	7

76.	Ripe fruit: adherence of skin to flesh	Fruit mûr: adhérence de l'épiderme à la chair	Essreife Frucht: Anhaften der Schale am Fleisch		
QN	(f) weak	faible	gering	Peach	3
	medium	moyenne	mittel		5
	strong	forte	stark	Fascell, Sheil, Zill	7

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ZA: changed						
77. (*)	Ripe fruit: main color of flesh	Fruit mûr: couleur principale de la chair	Essreife Frucht: Hauptfarbe des Fleisches			
PQ	(f) 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
78.	Ripe fruit: firmness of flesh	Fruit mûr: fermeté de la chair	Essreife Frucht: Festigkeit des Fleisches			
QN	(f) soft	molle	weich		Carrie, Sheil	3
	medium	moyenne	mittel		Haden, Zill	5
	firm	ferme	fest		Peach, Sensation, Tommy Atkins	7
79.	Ripe fruit: juiciness	Fruit mûr: succulence	Essreife Frucht: Saftigkeit			
QN	(f) dry	sec	trocken			3
	medium	moyen	mittel		Tommy Atkins	5
	juicy	juteux	saftig		Carrie	7
80.	Ripe fruit: texture of flesh	Fruit mûr: texture de la chair	Essreife Frucht: Textur des Fleisches			
QN	(f) fine	fine	fein		Adams, Fascell	3
	medium	moyenne	mittel		Tommy Atkins	5
	coarse	grossière	grob		Sheil	7

MoE ^o	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
81. (*)	Ripe fruit: amount of non-fleshy fibre in flesh attached to stone	Fruit mûr: importance de la fibre non charnue de la chair attachée au noyau	Essreife Frucht: Anteil der am Kern anliegenden nichtfleischigen Fasern des Fleisches			
QN	(f) 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
82.	Ripe fruit: amount of fleshy fibre beneath the skin	Fruit mûr: importance de la fibre charnue au-dessous de l'épiderme	Essreife Frucht: Anteil der fleischigen Fasern unter der Schale			
QN	(f) low	faible	klein		Kent	3
	medium	moyenne	mittel			5
	high	forte	groß		Sheil, Tommy Atkins	7
83. (*)	Ripe fruit: turpentine flavor	Fruit mûr: saveur térébenthine	Essreife Frucht: Terpentin-geschmack			
QL	(f) absent	absente	fehlend		Kent, Sensation	1
	present	présente	vorhanden		Extrema, Sandersha	9
84.	Stone: prominence of point at stylar area	Noyau: netteté de la pointe à l'extrémité stylaire	Kern: Ausprägung der Spitze an der Griffelzone			
QN	weak	faible	gering		Adams, Hood	3
	medium	moyenne	mittel		Sensation, Tommy Atkins	5
	strong	forte	stark		Carrie, Zill	7

ZA: should we say seed or stone? To check. We don't think we need so many stone chars. **Could delete 84, 86, 88, 89, 90, 91, 92.**

ARTM: To keep wording as it is and to say 'stone' (botanically the skin of a mango fruit is an exocarp, the flesh is the mesocarp, the endocarp is the shell around the seed, therefore this 'enclosed seed' is determined as a stone). Further to change the states into a condensed scale, e.g. 'absent or very weak', 'medium', 'strong'.

ZA 2003: Thanks for the explanation. Agree with proposals. States could read: 'absent or weak', 'moderate', 'strong'.

^o MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
ARTM: To read 'Stone: veins' with the states 'depressed' 1, 'even with surface' 2, and 'elevated' 3, in order to harmonize with IPGRI Descriptors. ZA 2003: OK.						
85.	Stone: relief of surface	Noyau: relief de la surface	Kern: Relief der Oberfläche			
PQ	grooved	cannelé	gefurcht		Extrema, Sabre, Zill	3
	smooth	lisse	glatt		Ruby	5
	ridged	annelé	geringelt		Irwin, Tommy Atkins	7
86.	Stone: sharp points on surface	Noyau: pointes sur la surface	Kern: scharfe Spitzen auf der Oberfläche			
QL	absent	absentes	fehlend		Peach, Ruby	1
	present	présentes	vorhanden		Tommy Atkins, Zill	9
ZA: changed ARTM: To read 'Stone: length of fibre on the edges'. ZA: Will have to check.						
87.	Stone: length of fibre on lateral sides	Noyau: longueur des fibres sur les joues	Kern: Länge der Fasern an den Wangen			
QN	very short	très courtes	sehr kurz			1
	short	courtes	kurz		Zill	3
	medium	moyennes	mittel		Anderson	5
	long	longues	lang		Sabre	7
	very long	très longues	sehr lang		Peach	9

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
(ZA: ‚lateral sides‘ if it is not deleted)						
ARTM: To read ‘Stone: density of fibre on the edges’.						
ZA: Will have to check.						
88.	Stone: density of fibre on cheeks	Noyau: densité des fibres sur les joues	Kern: Dichte der Fasern an den Wangen			
QN	very sparse	très faible	sehr locker			1
	sparse	faible	locker		Fascell, Zill	3
	medium	moyenne	mittel		Sabre, Tommy Atkins	5
	dense	forte	dicht		Hood, Sensation	7
	very dense	très forte	sehr dicht		Peach	9
ARTM: To change the states into a condensed scale, e.g. ‘very fine to fine’, ‘medium’, ‘coarse’.						
ZA 2003: Do not agree. See explanation under char. 75.						
89.	Stone: texture of fibre	Noyau: texture de la fibre	Kern: Textur der Faser			
QN	fine	fine	fein		Sabre, Tommy Atkins	3
	medium	moyenne	mittel			5
	coarse	grosse	grob		Sensation	7
90.	Stone: thickness of endocarp	Noyau: épaisseur de l’endocarpe	Kern: Dicke des Endokarps			
QN	very thin	très fin	sehr dünn		Ruby	1
	thin	fin	dünn		Irwin	3
	medium	moyen	mittel		Carrie, Sensation	5
	thick	épais	dick			7
	very thick	très épais	sehr dick		Irwin, Sabre	9
91. (*)	Seed: length in relation to that of stone	Pépin: longueur par rapport à celle du noyau	Samen: Länge im Verhältnis zu der des Kernes			
QN	short	courte	kurz		Tommy Atkins	3
	medium	moyenne	mittel			5
	long	longue	lang		Sensation	7

^o MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
(ZA: state 3 to read 'strongly kidney-shaped' if it is not deleted) ARTM: Only two states 'oblong' and 'kidney-shaped'. ZA 2003: OK, if the char. is not deleted.						
92.	Seed: shape	Semence: forme	Samen: Form			
PQ	oblong	rectangulaire	rechteckig		Sabre	1
	slightly kidney-shaped	faiblement réniforme	leicht nierenförmig			2
	kidney-shaped	réniforme	nierenförmig		Sensation	3
93. (*)	Seed: polyembryony	Semence: polyembryonnie	Samen: Polyembryonie			
QL	absent	absente	fehlend		Sensation, Tommy Atkins	1
	present	présente	vorhanden		Peach, Sabre	9
ARTM: To read 'Time of beginning of flowering', to add (+), as well as an explanation. ZA 2003: Agree. ARTM to please help with explanation.						
94.	Time of first flowering	Époque de début de floraison	Zeitpunkt des Blühbeginns			
QN	early	précoce	früh		Early Gold	3
	medium	moyenne	mittel		Fascell	5
	late	tardive	spät		Sensation	7
95. (*)	Time of fruit maturity	Époque de maturité des fruits	Zeitpunkt der Fruchtreife			
QN	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

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).
- (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.

Characteristics of the leaf:

	Tip	
		apex
		midrib
Length		blade
		secondary veins
		reticulate veins
		base
		petiole
	Width	

- (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.

Characteristics of the mature fruit:

	branch of infructescence
	Fruit stalk
base	Right shoulder Left shoulder
middle section	cheek Sinus
apex	Stylar scar

- (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. For observations on the width/thickness at the base and apex of the fruit, the length is divided into eighths and observations are made at one eighth and seven eighths respectively.

8.2 *Explanations for individual characteristics*

Ad. 5 + 15: Leaf: shape in cross section

1
straight

2
concave

Ad. 6: Young leaf: relief of upper face

a b
3
sunken between
secondary veins

a b
5
smooth

b a b
7
raised between
secondary veins

Ad. 12: Fully developed leaf: predominant shape

1
trullate to ovate

2
elliptic

3
oblong

Ad. 14: Fully developed leaf: twisting of blade

1
absent

9
present

Ad. 16: Fully developed leaf: symmetry

1
often asymmetric

2
always symmetric

Ad. 17: Fully developed leaf: curvature of midrib

1
absent

9
present

Ad. 18: Fully developed leaf: position of curvature of midrib

1
apical

2
basal

3
from apex to base

Ad. 19: Fully developed leaf: relief of upper side

1
smooth

2
raised between secondary veins

Ad. 23: Fully developed leaf: shape of tip

1
attenuate

2
acuminate

3
acute

Ad. 24: Fully developed leaf: shape of base

1
acute

2
obtuse

3
rounded

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

Ad. 46: Mature fruit: shape in cross section

3
narrow elliptic

5
broad elliptic

7
circular

Ad. 55: Mature fruit: depth of stalk cavity

3
shallow

5
medium

7
deep

Ad. 57: Mature fruit: prominence of neck

3
weak

5
medium

7
strong

Ad. 58 + 59: Mature fruit: shape of left (58) and right (59) shoulder

1
rounded upward

3
rounded outward

5
rounded downward

7
sloping downward

9
falling abruptly

Ad. 60: Mature fruit: groove in left shoulder

1
absent

9
present

Ad. 63: Mature fruit: lumpiness on left shoulder

1
absent

9
present

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

stylar scar

1
absent

sinus

stylar scar

9
present

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

		bulge	
stylar scar	1	stylar scar	9
	absent		present

9. Literature

ARTM: Relevant literature to be added.

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:
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	Application date: (not to be filled in by the applicant)
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TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 *Latin Name*

1.2 *Common Name*

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:
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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) totally unknown cross []

4.1.2 Mutation []
(please state parent variety)

4.1.3 Discovery []
(please state where, when and how developed)

4.1.4 Other []
(please provide details)

4.2 Method of propagating the variety

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 Mature fruit: length/width ratio (45)		
very small	Extrema, Santa Alexandrina	1[]
small	Fascell, Sheil	3[]
medium	Sensation, Tommy Atkins	5[]
large	Carrie, Gouveia	7[]
very large	Anderson, Sabre	9[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.2 Mature fruit: shape of left shoulder (58)		
rounded upward	Tommy Atkins	1[]
rounded outward	Florigon, Palmer, Zill	3[]
rounded downward	Keitt, Ruby, Sandersha	5[]
sloping downward		7[]
falling abruptly		9[]
5.3 Mature fruit: shape of right shoulder (59)		
rounded upward		1[]
rounded outward	Fascell	3[]
rounded downward	Ruby, Zill	5[]
sloping downward	Keitt	7[]
falling abruptly	Palmer, Sandersha	9[]
5.4 Mature fruit: sinus proximal of stylar scar (64)		
absent	Fascell, Hood, Kent	1[]
present	Gouveia, Sabre, Sandersha	9[]
5.5 Mature fruit: bulge proximal of stylar scar (66)		
absent	Adams, Anderson	1[]
present	Sheil	9[]
5.6 Seed: polyembryony (93)		
absent	Sensation, Tommy Atkins	1[]
present	Peach, Sabre	9[]

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.

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]