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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

MACADAMIA

UPOV Code(s): MACAD_INT; MACAD_TET

Macadamia integrifolia Maiden et Betche; *Macadamia tetraphylla* L. Johns.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Australia
to be considered by the
Enlarged Editorial Committee
at its meeting, to be held in Geneva
from 2019-03-26 to 2019-03-27

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Macadamia integrifolia Maiden et Betche	Macadamia, Queensland Nut	Macadamia	Macadamia	Macadamia
Macadamia tetraphylla L. Johns.	Macadamia, Queensland Nut	Macadamia	Macadamia	Macadamia

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

ASSOCIATED DOCUMENTS

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

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

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Macadamia integrifolia* Maiden et Betche, *Macadamia tetraphylla* L. Johns. and hybrids of these species.

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 grafted plants on a rootstock specified by the authority.

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

5 plants

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

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

3.1.2 The two independent growing cycles should be in the form of two separate plantings.

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

3.1.4 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.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 5 plants.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 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.

4.1.4 Number of Plants or Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 5 plants or parts of plants taken from each of 5 plants and any other observations made on all plants in the test, disregarding any off-type plants.

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

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

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 These Test Guidelines have been developed for the examination of vegetatively propagated varieties varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

4.2.3 For the assessment of uniformity of vegetatively propagated varieties, 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 further examined by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the initial 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) Tree: growth habit (characteristic 1)
(b) Tree: height (characteristic 2)
(c) Tree: angle of primary branches (characteristic 3)
(d) Stem: texture of surface (characteristic 5)
(e) Leaf blade: number of spines on margin (characteristic 18)
(f) Inflorescence: color (characteristic 23)
(g) Shell: shape (characteristic 28)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

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

6.2.1 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.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	*Note*
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	*Note*
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 **2**	**3** **4**	**5** **6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

5 (+) See Explanations on the Table of Characteristics in Chapter 8.2

6 (a)-(b) See Explanations on the Table of Characteristics in Chapter 8.1

7 Not applicable

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	**(*) PQ VG**		**(+)**				
		Tree: growth habit	**Arbre : port**	**Baum: Wuchsform**	**Árbol: hábito de crecimiento**		
		upright	dressé	aufrecht	erecto	EMB-1, Hidden Valley A16, MRG-20	1
		upright to spreading	dressé à étalé	aufrecht bis breitwüchsig	erecto a extendido		2
		spreading	étalé	breitwüchsig	extendido		3
		drooping	retombant	überhängend	colgante	KRG-15	4
2.	**(*) QN VG**						
		Tree: height	**Arbre : hauteur**	**Baum: Höhe**	**Árbol: altura**		
		short	bas	niedrig	bajo	Daleys Dwarf, MiniMaca	3
		medium	moyen	mittel	medio	Hidden Valley A4, Own Venture	5
		tall	haut	hoch	alto	Daddow, Own Choice	7
3.	**(*) QN VG**						
		Tree: angle of primary branches	**Arbre : angle des ramifications primaires**	**Baum: Winkel der Primäräste**	**Árbol: ángulo de las ramas primarias**		
		acute	aigu	spitz	agudo	MiniMaca	1
		intermediate	intermédiaire	mittel	intermedio		2
		obtuse	obtus	stumpf	obtuso		3
4.	**QN VG**		**(+)**				
		Tree: density of foliage	**Arbre : densité du feuillage**	**Baum: Dichte des Laubes**	**Árbol: densidad del follaje**		
		sparse	faible	locker	laxo	Hidden Valley A4	3
		medium	moyenne	mittel	medio	Daddow	5
		dense	forte	dicht	denso	Hidden Valley A16, Own Choice	7
5.	**(*) QN VG**		**(+)**				
		Stem: texture of surface	**Tige : texture de la surface**	**Stamm: Textur der Oberfläche**	**Tallo: textura de la superficie**		
		smooth	douce	glatt	lisa		1
		medium	moyenne	mittel	media		2
		rough	rugueuse	rauh	áspera		3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	**QN VG**	**(+)**				
	Branch: number of leaves per whorl	**Ramification : nombre de feuilles par verticille**	**Zweig: Anzahl Blätter je Wirtel**	**Rama: número de hojas por verticilo**		
	three	trois	drei	tres	EMB-1, KRG-15, MRG-20, MRG-25	1
	four	quatre	vier	cuatro	KMB-3	2
	five	cinq	fünf	cinco		3
7.	**QL VG**	**(a)**				
	Leaf: petiole	**Feuille : pétiole**	**Blatt: Blattstiel**	**Hoja: pecíolo**		
	absent	absent	fehlend	ausente	Kabere, MiniMaca	1
	present	présent	vorhanden	presente	KMB-3, KRG-15, MRG-20, MRG-25, Own Venture	9
8.	**QN MS/VG**	**(a)**				
	Petiole: length	**Pétiole : longueur**	**Blattstiel: Länge**	**Pecíolo: longitud**		
	short	court	kurz	corto	Hidden Valley A16, KMB-3, MRG-20, MRG-25	1
	medium	moyen	mittel	medio	Daddow, EMB-1	2
	long	long	lang	largo	KRG-15, Own Venture	3
9.	**QN VG**	**(+)** **(a)**				
	Leaf: conspicuousness of secondary veins	**Feuille : netteté des nervures secondaires**	**Blatt: Ausprägung der sekundären Adern**	**Hoja: visibilidad de los nervios secundarios**		
	weak	faible	schwach	poco visibles	EMBU-1, KRG-15	1
	medium	moyenne	mittel	medianamente visibles	KMB-3, MRG-20	2
	strong	forte	stark	muy visibles	849, Kabere	3
10.	**QN MS/VG**	**(a)**				
	Leaf blade: length	**Limbe : longueur**	**Blattspreite: Länge**	**Limbo: longitud**		
	short	court	kurz	corto	MiniMaca	3
	medium	moyen	mittel	medio	Daleys Dwarf, Hidden Valley A4, KRG-15, MRG-20, MRG-25	5
	long	long	lang	largo	Own Venture	7
11.	**QN MS/VG**	**(a)**				
	Leaf blade: width	**Limbe : largeur**	**Blattspreite: Breite**	**Limbo: anchura**		
	narrow	étroit	schmal	estrecho	Hidden Valley A4	3
	medium	moyen	mittel	medio	Own Choice	5
	broad	large	breit	ancho	Hidden Valley A16	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
12.	**(*)**	**PQ VG**	**(+)**				
		Leaf blade: shape	**Limbe : forme**	**Blattspreite: Form**	**Limbo: forma**		
		lanceolate	lancéolé	lanzettlich	lanceolado		1
		ovate	ovale	eiförmig	oval		2
		oblong	oblong	rechteckig	oblongo		3
		elliptic	elliptique	elliptisch	elíptico	Hidden Valley A4	4
		obovate	obovale	verkehrt eiförmig	oboval	Daddow	5
		oblanceolate	oblancéolé	verkehrt lanzettlich	oblanceolado	Own Venture	6
13.		**PQ VG**	**(+)**	**(a)**			
		Leaf blade: tip	**Limbe : sommet**	**Blattspreite: Spitze**	**Limbo: punta**		
		none	aucun	keine	ausente		1
		apiculate	apiculé	fein zugespitzt	apiculada		2
		acuminate	acuminé	zugespitzt	acuminada		3
		mucronate	mucroné	mit kurzer aufgesetzter Spitze	mucronada		4
14.		**PQ VG**	**(+)**	**(a)**			
		Leaf blade: shape of apex excluding tip	**Limbe : forme de l'apex à l'exclusion du sommet**	**Blattspreite: Form der Spitze ohne aufgesetzte Spitze**	**Limbo: forma del ápice (excluida la punta)**		
		acute	pointu	spitz	agudo	Hidden Valley A4, Kabere, KMB-3, KRG-15	1
		obtuse	obtus	stumpf	obtuso	Daleys Dwarf, EMBU-1, MRG-20, MRG-25, Own Venture	2
		rounded	arrondi	abgerundet	redondeado	Daddow, Nelmak 26	3
15.		**PQ VG**		**(a)**			
		Leaf blade: shape of base	**Limbe : forme de la base**	**Blattspreite: Form der Basis**	**Limbo: forma de la base**		
		attenuate	effilée	verjüngt	atenuada	816	1
		acute	pointue	spitz	aguda	A16	2
		obtuse	obtuse	stumpf	obtusa	333, A4	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16. **(*)**	**QN** **VG**		**(a)**			
	Leaf blade: undulation of margin	**Limbe : ondulation du bord**	**Blattspreite: Wellung des Randes**	**Limbo: ondulación del borde**		
	very weak	très faible	sehr gering	muy débil		1
	weak	faible	gering	débil	Daleys Dwarf, Hidden Valley A4, MRG-25	2
	medium	moyenne	mittel	media	EMB-1, KMB-3, KRG-15, Own Venture	3
	strong	forte	stark	fuerte	Daddow	4
	very strong	très forte	sehr stark	muy fuerte	MiniMaca	5
17.	**QN** **VG**		**(a)**			
	Leaf blade: depth of incisions of margin	**Limbe : profondeur des incisions du bord**	**Blattspreite: Tiefe der Randeinschnitte**	**Limbo: profundidad de las incisiones del borde**		
	shallow	peu profondes	flach	poco profundas	A203	1
	medium	moyennes	mittel	medianamente profundas	A38	2
	deep	profondes	tief	profundas	Own Venture	3
18. **(*)**	**QN** **VG**		**(a)**			
	Leaf blade: number of spines on margin	**Limbe : nombre d'épines au bord**	**Blattspreite: Anzahl Stacheln am Rand**	**Limbo: número de espinas en el borde**		
	absent or very few	nul ou très petit	fehlend oder sehr wenige	nulo o muy bajo	Daleys Dwarf, MRG-20	1
	few	petit	wenige	bajo	EMB-1	3
	medium	moyen	mittel	medio	KRG-15	5
	many	grand	viele	alto	KMB-3, MiniMaca	7
	very many	très grand	sehr viele	muy alto	Kabere	9
19.	**PQ** **VG**	**(+)**				
	Young leaf blade: color	**Jeune limbe : couleur**	**Spreite des jungen Blattes: Farbe**	**Limbo joven: color**		
	green	vert	grün	verde	816, 849, A16, EMB-1, KRG-15, MRG-20	1
	reddish	rougeâtre	rötlich	rojizo		2
	purple	pourpre	purpurn	púrpura		3
	brown	brun	braun	marrón	KMB-5	4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.		**QN VG**	**(a)**				
		Leaf blade: intensity of color on upper side	**Limbe : intensité de la couleur sur la face supérieure**	**Blattspreite: Intensität der Farbe auf der Oberseite**	**Limbo: intensidad del color en el haz**		
		light	claire	hell	claro		1
		medium	moyenne	mittel	medio		2
		dark	foncée	dunkel	oscuro		3
21.		**QN MS/VG**					
		Inflorescence: length	**Inflorescence : longueur**	**Blütenstand: Länge**	**Inflorescencia: longitud**		
		short	courte	kurz	corta	Own Choice	3
		medium	moyenne	mittel	media	H2	5
		long	longue	lang	larga	A4	7
22.		**QN VG**	**(+)**				
		Inflorescence: density of flowers	**Inflorescence : densité des fleurs**	**Blütenstand: Dichte der Blüten**	**Inflorescencia: densidad de las flores**		
		sparse	faible	locker	laxa		1
		medium	moyenne	mittel	media		2
		dense	forte	dicht	densa	A16	3
23.	**(*)**	**QL VG**					
		Inflorescence: color	**Inflorescence : couleur**	**Blütenstand: Farbe**	**Inflorescencia: color**		
		white	blanc	weiß	blanco	Daleys Dwarf, EMB-1, KRG-15, MRG-20, MRG-25	1
		pink	rose	rosa	rosa	KMB-3, MiniMaca	2
24.		**QN VG**	**(a)**				
		Husk: size of neck	**Cosse : taille du col**	**Hülle: Größe des Halses**	**Vaina: tamaño del cuello**		
		absent or small	absent ou petit	fehlend oder klein	ausente o pequeño	H2	1
		medium	moyen	mittel	medio	Daddow, Own Choice	2
		large	grand	groß	grande	Hidden Valley A38	3
25.		**QN VG**	**(b)**				
		Husk: size of apical point	**Cosse : taille de la pointe apicale**	**Hülle: Größe des apikalen Punkts**	**Vaina: tamaño del punto apical**		
		small	petite	klein	pequeño	EMB-1, MRG-20	3
		medium	moyenne	mittel	medio	KMB-3, KRG-15, MRG-25	5
		large	grande	groß	grande	Kabere	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
26.		**QN VG**	**(b)**				
		Husk: thickness of pericarp	**Cosse : épaisseur du péricarpe**	**Hülle: Dicke des Perikarps**	**Vaina: grosor del pericarpio**		
		very thin	très mince	sehr dünn	muy delgado	Kabere	1
		thin	mince	dünn	delgado	EMB-1, KMB-3, KRG-15	3
		medium	moyen	mittel	medio	MRG-20, MRG-25	5
		thick	épais	dick	grueso		7
27.		**QN VG**	**(+) (b)**				
		Shell: size	**Coque : taille**	**Schale: Größe**	**Cáscara: tamaño**		
		small	petite	klein	pequeña	H2	1
		medium	moyenne	mittel	media	333	2
		large	grande	groß	grande	246	3
28.	**(*)**	**PQ VG**	**(+) (b)**				
		Shell: shape	**Coque : forme**	**Schale: Form**	**Cáscara: forma**		
		ovate	ovale	eiförmig	oval	Hidden Valley A16, Hidden Valley A4	1
		oblate	arrondie aplatie	breitrund	achatada	H2, MRG-20, MRG-25	2
		circular	circulaire	kreisförmig	circular	Daleys Dwarf, EMB-1, Hidden Valley A38, MiniMaca	3
		elliptic	elliptique	elliptisch	elíptica	Nelmak 1	4
		obovate	obovale	verkehrt eiförmig	oboval	Kabere	5
29.		**QN VG**	**(b)**				
		Shell: texture of surface	**Coque : texture de la surface**	**Schale: Textur der Oberfläche**	**Cáscara: textura de la superficie**		
		smooth	douce	glatt	lisa	Daleys Dwarf, EMB-1, Hidden Valley A38, MRG-25	1
		slightly rough	légèrement rugueuse	leicht rauh	ligeramente áspera	KRG-15, MiniMaca	2
		moderately rough	modérément rugueuse	mäßig rauh	moderadamente áspera	KMB-3, MRG-20	3
		very rough	très rugueuse	sehr rauh	muy áspera		4
30.		**QN MS/VG**	**(b)**				
		Shell: thickness	**Coque : épaisseur**	**Schale: Dicke**	**Cáscara: grosor**		
		thin	mince	dünn	delgada	A16	3
		medium	moyenne	mittel	media		5
		thick	épaisse	dick	gruesa	333	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31.	**QN VG**	**(b)**				
	Shell: conspicuousness of suture	**Coque : netteté de la suture**	**Schale: Ausprägung der Naht**	**Cáscara: visibilidad de la sutura**		
	weak	faible	schwach	poco visible	Kabere, KMB-3, MRG-20	1
	medium	moyenne	mittel	medianamente visible	KRG-15	2
	strong	forte	stark	muy visible	MiniMaca	3
32.	**QN VG**	**(b)**				
	Kernel: size	**Amande : taille**	**Kern: Größe**	**Semilla: tamaño**		
	very small	très petite	sehr klein	muy pequeña		1
	small	petite	klein	pequeña	Keaau (660)	3
	medium	moyenne	mittel	media		5
	large	grande	groß	grande	Hidden Valley A4	7
	very large	très grande	sehr groß	muy grande		9
33.	**PQ VG**	**(b)**				
	Kernel: color	**Amande : couleur**	**Kern: Farbe**	**Semilla: color**		
	white	blanc	weiß	blanco		1
	yellowish white	blanc jaunâtre	gelblich weiß	blanco amarillento		2
	light brown	brun clair	hellbraun	marrón claro		3
	medium brown	brun moyen	mittelbraun	marrón medio		4
	dark brown	brun foncé	dunkelbraun	marrón oscuro		5
34.	**QN VG**	**(+) (b)**				
	Kernel: micropyle	**Amande : micropyle**	**Kern: Micropyle**	**Semilla: micrópilo**		
	closed	fermé	geschlossen	cerrado	KMB-3, KRG-15, MRG-20	1
	partially open	partiellement ouvert	teilweise geöffnet	parcialmente abierto		2
	fully open	complètement ouvert	vollständig geöffnet	totalmente abierto	Kabere	3
35.	**QN MS/VG**	**(+) (b)**				
	Kernel: length	**Amande : longueur**	**Kern: Länge**	**Semilla: longitud**		
	short	courte	kurz	corta	660	3
	medium	moyenne	mittel	media	738	5
	long	longue	lang	larga	A4	7
36.	**QN MS/VG**	**(+) (b)**				
	Kernel: width	**Amande : largeur**	**Kern: Breite**	**Semilla: anchura**		
	narrow	étroite	schmal	estrecha	Own Venture	3
	medium	moyenne	mittel	media	A4	5
	broad	large	breit	ancha	660	7

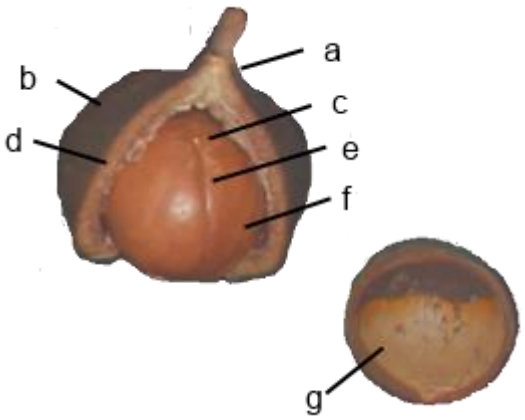
8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

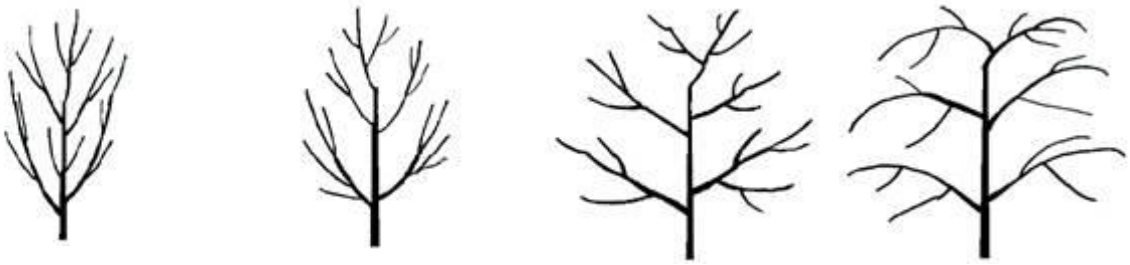
(a) Observations on leaves should be made on basal leaves of new vegetative flush in mid to late summer.

(b)

	a: neck b: husk c: micropyle d: pericarp e: suture f: shell g: kernel

8.2 Explanations for individual characteristics

Ad. 1: Tree: growth habit



1	2	3	4
upright	upright to spreading	spreading	drooping

Ad. 4: Tree: density of foliage

Observations should be made at time of flowering.

Ad. 5: Stem: texture of surface

Observations should be made on the middle third of the main stem.

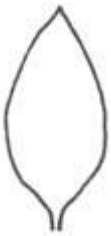
Ad. 6: Branch: number of leaves per whorl

Observations should be made at flowering.

Ad. 9: Leaf: conspicuousness of secondary veins

Observations should be made on fully developed leaf.

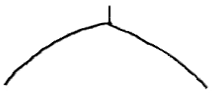
Ad. 12: Leaf blade: shape

	← broadest part →		
	below middle	at middle	above middle
width (ratio length/width)			
narrow (high)	 2 lanceolate	 4 oblong	 6 oblanceolate
medium (medium)	 1 ovate	 3 elliptic	
broad (low)			 5 obovate

Ad. 13: Leaf blade: tip

2
apiculate

3
acuminate



4
mucronate

Ad. 14: Leaf blade: shape of apex excluding tip

1
acute

2
obtuse

3
rounded

Ad. 19: Young leaf blade: color

Observations should be made on terminal leaves of new vegetative flush in late winter to early spring.

Ad. 22: Inflorescence: density of flowers

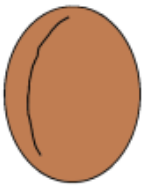
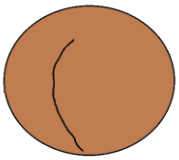
Observations should be made at the end of inflorescence growth and when 75% to 100% of the flowers are open.

Ad. 27: Shell: size

Observations should be made in lateral view.

Ad. 28: Shell: shape

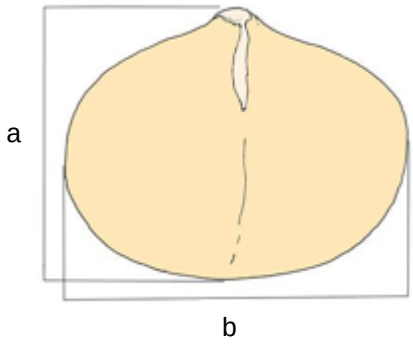
Observations should be made in lateral view.

	← broadest part →		
	below middle	at middle	above middle
width (ratio length/ width)			
narrow (high)		 4 elliptic	
medium (medium)	 1 ovate	 3 circular	 5 obovate
broad (low)		 2 oblate	

Ad. 34: Kernel: micropyle

The micropyle is the white spot at the end of the nut that allows water to enter for the initiation of germination (see 8.1).

Ad. 35: Kernel: length



a = Kernel: length
b = Kernel: width

Ad. 36: Kernel: width

See Ad. 36

8.3 Unless otherwise indicated, observations should be made on at least 3-year-old trees.

9. Literature

Vock, N., Bell, D., Bryen, L., Firth, D., Jones, K., Gallagher, E., McConachie, I., O'Hare, P. and Stephenson, R., 1998: Macadamia Variety Identifier, Agrilink, Queensland Department of Primary Industries, Nambour, Queensland, AU, 62pp

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

1.1.1	Botanical name	*Macadamia integrifolia* Maiden et Betche	[ ]
1.1.2	Common name	Macadamia, Queensland Nut	
1.2.1	Botanical name	*Macadamia tetraphylla* L. Johns.	[ ]
1.2.2	Common name	Macadamia, Queensland Nut	

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]

(please state parent varieties)
(……..……..…) x (……..……..…)

female parent male parent

(b) partially known cross [ ]
(please state known parent variety(ies))

(please state known parent varieties)
(……..……..…) x (……..……..…)

female parent male parent

(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)

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:

4.2 Method of propagating the variety

4.2.1 Vegetative propagation

(a) Cuttings [ ]
(b) Other (state method) [ ]

4.2.2 Other [ ]
(Please provide details)

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

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

	Characteristics	Example Varieties	Note
5.1 (1)	**Tree: growth habit**		
	upright	EMB-1, Hidden Valley A16, MRG-20	1 [ ]
	upright to spreading		2 [ ]
	spreading		3 [ ]
	drooping	KRG-15	4 [ ]
5.2 (2)	**Tree: height**		
	very short		1 [ ]
	very short to short		2 [ ]
	short	Daleys Dwarf, MiniMaca	3 [ ]
	short to medium		4 [ ]
	medium	Hidden Valley A4, Own Venture	5 [ ]
	medium to tall		6 [ ]
	tall	Daddow, Own Choice	7 [ ]
	tall to very tall		8 [ ]
	very tall		9 [ ]
5.3 (3)	**Tree: angle of primary branches**		
	acute	MiniMaca	1 [ ]
	intermediate		2 [ ]
	obtuse		3 [ ]
5.4 (5)	**Stem: texture of surface**		
	smooth		1 [ ]
	medium		2 [ ]
	rough		3 [ ]
5.5 (23)	**Inflorescence: color**		
	white	Daleys Dwarf, EMB-1, KRG-15, MRG-20, MRG-25	1 [ ]
	pink	KMB-3, MiniMaca	2 [ ]

	Characteristics	Example Varieties	Note
5.6 (28)	**Shell: shape**		
	ovate	Hidden Valley A16, Hidden Valley A4	1 [ ]
	oblate	H2, MRG-20, MRG-25	2 [ ]
	circular	Daleys Dwarf, EMB-1, Hidden Valley A38, MiniMaca	3 [ ]
	elliptic	Nelmak 1	4 [ ]
	obovate	Kabere	5 [ ]

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

6. Similar varieties and differences from these varieties

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

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

Comments:

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)"

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (http://www.upov.int/tgp/en/).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

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:

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.

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

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

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

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

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

.....

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

Applicant’s name

Signature Date

[End of document]