



TG/111/4

ORIGINAL: English

DATE: 2019-10-29

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

Geneva

**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**

Alternative names:\*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Macadamia integrifolia</i> Maiden et Betche	Macadamia, Queensland Nut	Macadamia	Macadamia	Macadamia
<i>Macadamia tetraphylla</i> 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](http://www.upov.int)), for the latest information.]

TABLE OF CONTENTS	PAGE
1. SUBJECT OF THESE TEST GUIDELINES.....	<a href="#">3</a>
2. MATERIAL REQUIRED.....	<a href="#">3</a>
3. METHOD OF EXAMINATION.....	<a href="#">3</a>
3.1 Number of Growing Cycles.....	<a href="#">3</a>
3.2 Testing Place.....	<a href="#">3</a>
3.3 Conditions for Conducting the Examination.....	<a href="#">3</a>
3.4 Test Design.....	<a href="#">3</a>
3.5 Additional Tests.....	<a href="#">3</a>
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY.....	<a href="#">4</a>
4.1 Distinctness.....	<a href="#">4</a>
4.2 Uniformity.....	<a href="#">5</a>
4.3 Stability.....	<a href="#">5</a>
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL.....	<a href="#">5</a>
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS.....	<a href="#">6</a>
6.1 Categories of Characteristics.....	<a href="#">6</a>
6.2 States of Expression and Corresponding Notes.....	<a href="#">6</a>
6.3 Types of Expression.....	<a href="#">6</a>
6.4 Example Varieties.....	<a href="#">6</a>
6.5 Legend.....	<a href="#">7</a>
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES.....	<a href="#">8</a>
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS.....	<a href="#">14</a>
8.1 Explanations covering several characteristics.....	<a href="#">14</a>
8.2 Explanations for individual characteristics.....	<a href="#">14</a>
8.3 Example varieties and synonyms.....	<a href="#">18</a>
9. LITERATURE.....	<a href="#">19</a>
10. TECHNICAL QUESTIONNAIRE.....	<a href="#">20</a>

1. Subject of these Test Guidelines

- 1.1 These Test Guidelines apply to all varieties of *Macadamia integrifolia* Maiden et Betche, *Macadamia tetraphylla* L. Johns..
- 1.2 Guidance on the use of Test Guidelines for interspecific hybrids that are not explicitly covered by Test Guidelines is provided in document TGP/13 "Guidance for New Types and 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 In particular, it is essential that the plants produce a satisfactory crop of fruit in each of the two growing cycles.
- 3.1.3 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.
- 3.1.4 The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test.

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. 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 16)
- (f) Inflorescence: color (characteristic 21)
- (g) Seed: shape (characteristic 26)

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:

<i>State</i>	<i>Note</i>
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:

<i>State</i>	<i>Note</i>
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	(+)				
	<b>Tree: growth habit</b>		<b>Arbre : port</b>	<b>Baum: Wuchsform</b>	<b>Árbol: hábito de crecimiento</b>		
	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					
	<b>Tree: height</b>		<b>Arbre : hauteur</b>	<b>Baum: Höhe</b>	<b>Árbol: altura</b>		
	short		basse	niedrig	baja	Daleys Dwarf, MiniMaca	3
	medium		moyenne	mittel	media	Hidden Valley A4, Own Venture	5
	tall		haute	hoch	alta	Daddow, Own Choice	7
3. (*)	QN	VG					
	<b>Tree: angle of primary branches</b>		<b>Arbre : angle des ramifications primaires</b>	<b>Baum: Winkel der Primäräste</b>	<b>Árbol: ángulo de las ramas primarias</b>		
	acute		aigu	spitz	agudo	MiniMaca	1
	right-angle		angle droit	rechtwinklig	ángulo recto		2
	obtuse		obtus	stumpf	obtuso	Hidden Valley A203	3
4.	QN	VG	(+)				
	<b>Tree: density of foliage</b>		<b>Arbre : densité du feuillage</b>	<b>Baum: Dichte des Laubes</b>	<b>Árbol: densidad del follaje</b>		
	sparse		lâche	locker	laxa	Hidden Valley A4	3
	medium		moyenne	mittel	media	Daddow	5
	dense		dense	dicht	densa	Hidden Valley A16, Own Choice	7
5. (*)	QN	VG	(+)				
	<b>Stem: texture of surface</b>		<b>Tige : texture de la surface</b>	<b>Stamm: Textur der Oberfläche</b>	<b>Tallo: textura de la superficie</b>		
	smooth		douce	glatt	lisa	MCT1	1
	medium		moyenne	mittel	media	Hidden Valley A16	2
	rough		rugueuse	rauh	áspera	MiniMaca	3



	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	QN	VG	(+)				
	<b>Branch: number of leaves per whorl</b>		<b>Ramification : nombre de feuilles par verticille</b>	<b>Zweig: Anzahl Blätter je Wirtel</b>	<b>Rama: número de hojas por verticilo</b>		
	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)				
	<b>Leaf: petiole</b>		<b>Feuille : pétiole</b>	<b>Blatt: Blattstiel</b>	<b>Hoja: pecíolo</b>		
	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)				
	<b>Petiole: length</b>		<b>Pétiole : longueur</b>	<b>Blattstiel: Länge</b>	<b>Pecíolo: longitud</b>		
	short		courte	kurz	corta	Hidden Valley A16, KMB-3, MRG-20, MRG-25	1
	medium		moyenne	mittel	media	Daddow, EMB-1	2
	long		longue	lang	larga	KRG-15, Own Venture	3
9.	PQ	VG	(+)				
	<b>Young leaf: color</b>		<b>Jeune feuille : couleur</b>	<b>Junges Blatt: Farbe</b>	<b>Hoja joven: color</b>		
	green		vert	grün	verde	HAES 816, HAES 849, Hidden Valley 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
10.	QN	MS/VG	(a)				
	<b>Leaf blade: length</b>		<b>Limbe : longueur</b>	<b>Blattspreite: Länge</b>	<b>Limbo: longitud</b>		
	short		courte	kurz	corta	MiniMaca	3
	medium		moyenne	mittel	media	Daleys Dwarf, Hidden Valley A4, KRG-15, MRG-20, MRG-25	5
	long		longue	lang	larga	Own Venture	7
11.	QN	MS/VG	(a)				
	<b>Leaf blade: width</b>		<b>Limbe : largeur</b>	<b>Blattspreite: Breite</b>	<b>Limbo: anchura</b>		
	narrow		étroite	schmal	estrecha	Hidden Valley A4	3
	medium		moyenne	mittel	media	Own Choice	5
	broad		large	breit	ancha	Hidden Valley A16	7

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>12. (*)</b>	<b>PQ</b>	<b>VG</b>	<b>(+)</b>	<b>(a)</b>				
	<b>Leaf blade: shape</b>	<b>Limbe : forme</b>	<b>Blattspreite: Form</b>	<b>Limbo: forma</b>				
	elliptic	elliptique	elliptisch	elíptica		Hidden Valley A4	1	
	oblong	oblong	rechteckig	oblonga		HAES 781	2	
	obovate	obovale	verkehrt eiförmig	oboval		Daddow	3	
	oblanceolate	oblanceolé	verkehrt lanzettlich	oblanceolada		Own Venture	4	
<b>13.</b>	<b>PQ</b>	<b>VG</b>	<b>(+)</b>	<b>(a)</b>				
	<b>Leaf blade: tip</b>	<b>Limbe : sommet</b>	<b>Blattspreite: Spitze</b>	<b>Limbo: punta</b>				
	none	aucun	keine	ausente		H2 Hinde	1	
	apiculate	apiculé	fein zugespitzt	apiculada		HAES 800	2	
	acuminate	acuminé	zugespitzt	acuminada		Hidden Valley A268	3	
	mucronate	mucroné	mit kurzer aufgesetzter Spitze	mucronada		Hidden Valley A38	4	
<b>14. (*)</b>	<b>QN</b>	<b>VG</b>		<b>(a)</b>				
	<b>Leaf blade: undulation of margin</b>	<b>Limbe : ondulation du bord</b>	<b>Blattspreite: Wellung des Randes</b>	<b>Limbo: ondulación del borde</b>				
	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	
<b>15.</b>	<b>QN</b>	<b>VG</b>		<b>(a)</b>				
	<b>Leaf blade: depth of incisions of margin</b>	<b>Limbe : profondeur des incisions du bord</b>	<b>Blattspreite: Tiefe der Randeinschnitte</b>	<b>Limbo: profundidad de las incisiones del borde</b>				
	shallow	peu profonde	flach	poco profunda		A203	1	
	medium	moyenne	mittel	medianamente profunda		Hidden Valley A38	2	
	deep	profonde	tief	profunda		Own Venture	3	
<b>16. (*)</b>	<b>QN</b>	<b>VG</b>		<b>(a)</b>				
	<b>Leaf blade: number of spines on margin</b>	<b>Limbe : nombre d'épines au bord</b>	<b>Blattspreite: Anzahl Stacheln am Rand</b>	<b>Limbo: número de espinas en el borde</b>				
	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	

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17.	QN	VG	(+)	(a)				
	<b>Leaf blade: conspicuousness of secondary veins</b>		<b>Limbe : netteté des nervures secondaires</b>		<b>Blattspreite: Ausprägung der sekundären Adern</b>	<b>Limbo: visibilidad de los nervios secundarios</b>		
	weak		faible		schwach	poco visible	EMBU-1, KRG-15	1
	medium		moyenne		mittel	medianamente visible	KMB-3, MRG-20	2
	strong		forte		stark	muy visible	HAES 849, Kabere	3
18.	QN	VG	(+)	(a)				
	<b>Leaf blade: intensity of green color</b>		<b>Limbe : intensité de la couleur verte</b>		<b>Blattspreite: Intensität der Grünfärbung</b>	<b>Limbo: intensidad del color verde</b>		
	light		claire		hell	clara		1
	medium		moyenne		mittel	media		2
	dark		foncée		dunkel	oscura		3
19.	QN	MS/VG						
	<b>Inflorescence: length</b>		<b>Inflorescence : longueur</b>		<b>Blütenstand: Länge</b>	<b>Inflorescencia: longitud</b>		
	short		courte		kurz	corta	Own Choice	3
	medium		moyenne		mittel	media	H2 Hinde	5
	long		longue		lang	larga	Hidden Valley A4	7
20.	QN	VG	(+)					
	<b>Inflorescence: density of flowers</b>		<b>Inflorescence : densité des fleurs</b>		<b>Blütenstand: Dichte der Blüten</b>	<b>Inflorescencia: densidad de las flores</b>		
	sparse		lâche		locker	laxa		1
	medium		moyenne		mittel	media		2
	dense		dense		dicht	densa	Hidden Valley A16	3
21. (*)	QL	VG						
	<b>Inflorescence: color</b>		<b>Inflorescence : couleur</b>		<b>Blütenstand: Farbe</b>	<b>Inflorescencia: color</b>		
	white		blanc		weiß	blanco	Daleys Dwarf, EMB-1, KRG-15, MRG-20, MRG-25	1
	pink		rose		rosa	rosa	KMB-3, MiniMaca	2
22.	QN	VG		(b)				
	<b>Husk: size of neck</b>		<b>Cosse : taille du col</b>		<b>Hülle: Größe des Halses</b>	<b>Vaina: tamaño del cuello</b>		
	absent or small		absent ou petite		fehlend oder klein	ausente o pequeño	H2 Hinde	1
	medium		moyenne		mittel	medio	Daddow, Own Choice	2
	large		grande		groß	grande	Hidden Valley A38	3

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23.	QN	VG	(+)				
	<b>Husk: size of apical point</b>		<b>Cosse : taille de la pointe apicale</b>	<b>Hülle: Größe des apikalen Punkts</b>	<b>Vaina: tamaño del punto apical</b>		
	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
24.	QN	VG	(b)				
	<b>Husk: thickness of pericarp</b>		<b>Cosse : épaisseur du péricarpe</b>	<b>Hülle: Dicke des Perikarps</b>	<b>Vaina: grosor del pericarpio</b>		
	thin		mince	dünn	delgado	Kabere	1
	medium		moyenne	mittel	medio	EMB-1, KMB-3, KRG-15	3
	thick		épaisse	dick	grueso	MRG-20, MRG-25	5
25.	QN	VG	(+)	(b)			
	<b>Seed: size</b>		<b>Graine : taille</b>	<b>Samen: Größe</b>	<b>Semilla: tamaño</b>		
	small		petite	klein	pequeño	H2 Hinde	1
	medium		moyenne	mittel	medio	Ikaika	2
	large		grande	groß	grande	Keauhou	3
26. (*)	PQ	VG	(+)	(b)			
	<b>Seed: shape</b>		<b>Graine : forme</b>	<b>Samen: Form</b>	<b>Semilla: forma</b>		
	ovate		ovale	eiförmig	oval	Hidden Valley A16, Hidden Valley A4	1
	oblate		arrondie aplatie	breitrund	achatada	H2 Hinde, 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
27.	QN	VG	(b)				
	<b>Shell: texture of surface</b>		<b>Coque : texture de la surface</b>	<b>Schale: Textur der Oberfläche</b>	<b>Cáscara: textura de la superficie</b>		
	smooth		douce	glatt	lisa	Daleys Dwarf, EMB-1, Hidden Valley A38, MRG-25	1
	slightly rough		légèrement rugueuse	leicht rau	ligeramente áspera	KRG-15, MiniMaca	2
	moderately rough		modérément rugueuse	mäßig rau	moderadamente áspera	KMB-3, MRG-20	3
	moderately rough to very rough		modérément rugueuse à très rugueuse	mäßig rau bis sehr rau	moderadamente áspera a muy áspera		4
	very rough		très rugueuse	sehr rau	muy áspera		5

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>29.</b>	<b>QN</b>	<b>MS/VG</b>	<b>(b)</b>				
	<b>Shell: thickness</b>	<b>Coque : épaisseur</b>	<b>Schale: Dicke</b>	<b>Cáscara: grosor</b>			
	thin	mince	dünn	delgado	Hidden Valley A16		3
	medium	moyenne	mittel	medio			5
	thick	épaisse	dick	grueso	Ikaika		7
<b>29.</b>	<b>QN</b>	<b>VG</b>	<b>(b)</b>				
	<b>Shell: conspicuousness of suture</b>	<b>Coque : netteté de la suture</b>	<b>Schale: Ausprägung der Naht</b>	<b>Cáscara: visibilidad de la sutura</b>			
	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
<b>30.</b>	<b>QN</b>	<b>VG</b>	<b>(b)</b>				
	<b>Kernel: size</b>	<b>Amande : taille</b>	<b>Kern: Größe</b>	<b>Grano: tamaño</b>			
	very small	très petite	sehr klein	muy pequeño			1
	small	petite	klein	pequeño	Keaau		3
	medium	moyenne	mittel	media			5
	large	grande	groß	grande	Hidden Valley A4		7
	very large	très grande	sehr groß	muy grande			9
<b>31.</b>	<b>QN</b>	<b>VG</b>	<b>(+)</b>	<b>(b)</b>			
	<b>Seed: micropyle</b>	<b>Graine : micropyle</b>	<b>Samen: Micropyle</b>	<b>Semilla: micrópilo</b>			
	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
<b>32.</b>	<b>QN</b>	<b>MS/VG</b>	<b>(+)</b>	<b>(b)</b>			
	<b>Kernel: length</b>	<b>Amande : longueur</b>	<b>Kern: Länge</b>	<b>Grano: longitud</b>			
	short	courte	kurz	corta	Keaau		3
	medium	moyenne	mittel	media	HAES 783		5
	long	longue	lang	larga	Hidden Valley A4		7
<b>33.</b>	<b>QN</b>	<b>MS/VG</b>	<b>(+)</b>	<b>(b)</b>			
	<b>Kernel: width</b>	<b>Amande : largeur</b>	<b>Kern: Breite</b>	<b>Grano: anchura</b>			
	narrow	étroite	schmal	estrecha	Own Venture		3
	medium	moyenne	mittel	media	Hidden Valley A4		5
	broad	large	breit	ancha	Keaau		7

8. Explanations on the Table of Characteristics

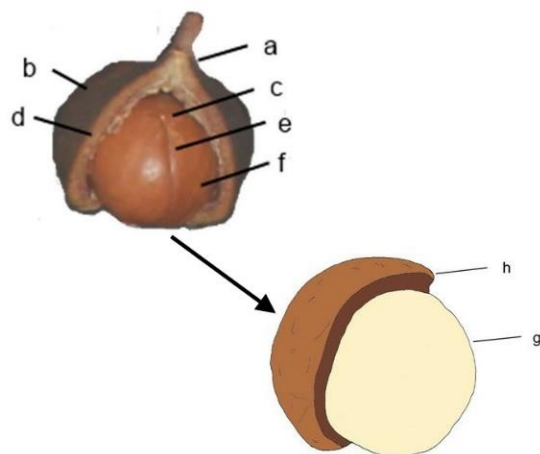
8.1 *Explanations covering several characteristics*

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

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: seed  
g: kernel  
h: shell

8.2 *Explanations for individual characteristics*

Ad. 1: Tree: growth habit



1  
upright



2  
upright to spreading



3  
spreading



4  
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: Young leaf: color

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

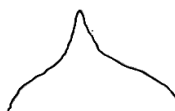
Ad. 12: Leaf blade: shape

relative width	← broadest part →	
	at middle	above middle
narrow	 2 oblong	 4 oblanceolate
medium	 1 elliptic	
broad		 3 obovate

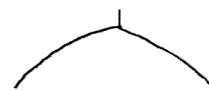
Ad. 13: Leaf blade: tip



2  
 apiculate



3  
 acuminate



4  
 mucronate

Ad. 17: Leaf blade: conspicuousness of secondary veins

Observations should be made on fully developed leaf.

Ad. 18: Leaf blade: intensity of green color

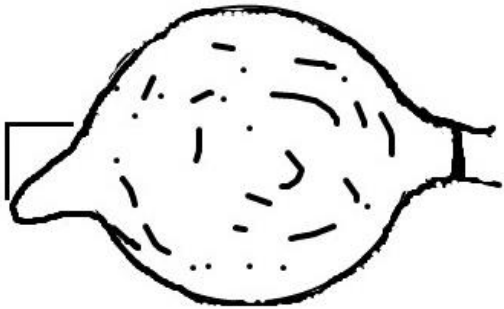
Observations should be made on the upper side.

Ad. 20: 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. 23: Husk: size of apical point

The apical point is the protrusion of the husk opposite to the stalk end.



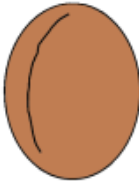

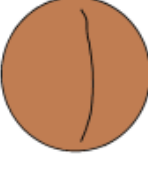

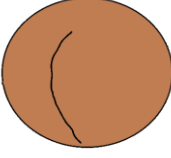
Ad. 25: Seed: size

Observations should be made in lateral view.



Ad. 26: Seed: shape

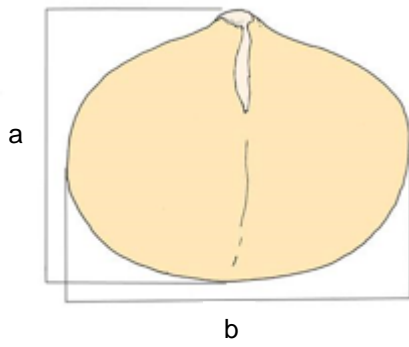
Observations should be made in lateral view.

		←      broadest part      →		
		below middle	at middle	above middle
relative width				
narrow			 4 elliptic	
medium		 1 ovate	 3 circular	 5 obovate
broad			 2 oblate	

Ad. 31: Seed: micropyle

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

Ad. 32: Kernel: length



a = Kernel: length  
b = Kernel: width

Ad. 33: Kernel: width

See Ad. 32

8.3 *Example varieties and synonyms*

Example variety	Synonym
Keauhou	HAES 246
Ikaika	HAES 333
Keaau	HAES 660

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	<input type="text" value="Macadamia integrifolia Maiden et Betche"/> [ ]
1.1.2	Common name	<input type="text" value="Macadamia, Queensland Nut"/>
1.2.1	Botanical name	<input type="text" value="Macadamia tetraphylla L. Johns."/> [ ]
1.2.2	Common name	<input type="text" value="Macadamia, Queensland Nut"/>
2. Applicant		
	Name	<input type="text"/>
	Address	<input type="text"/>
	Telephone No.	<input type="text"/>
	Fax No.	<input type="text"/>
	E-mail address	<input type="text"/>
	Breeder (if different from applicant)	<input type="text"/>
3. Proposed denomination and breeder's reference		
	Proposed denomination (if available)	<input type="text"/>
	Breeder's reference	<input type="text"/>

#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))

(.....) 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)

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
<b>5.1 Tree: growth habit</b> <b>(1)</b>		
upright	EMB-1, Hidden Valley A16, MRG-20	1 [ ]
upright to spreading		2 [ ]
spreading		3 [ ]
drooping	KRG-15	4 [ ]
<b>5.2 Tree: height</b> <b>(2)</b>		
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 [ ]
<b>5.3 Tree: angle of primary branches</b> <b>(3)</b>		
acute	MiniMaca	1 [ ]
right-angle		2 [ ]
obtuse	Hidden Valley A203	3 [ ]
<b>5.4 Stem: texture of surface</b> <b>(5)</b>		
smooth	MCT1	1 [ ]
medium	Hidden Valley A16	2 [ ]
rough	MiniMaca	3 [ ]
<b>5.5 Leaf blade: number of spines on margin</b> <b>(16)</b>		
absent or very few	Daleys Dwarf, MRG-20	1 [ ]
very few to few		2 [ ]
few	EMB-1	3 [ ]
few to medium		4 [ ]
medium	KRG-15	5 [ ]
medium to many		6 [ ]
many	KMB-3, MiniMaca	7 [ ]
many to very many		8 [ ]
very many	Kabere	9 [ ]

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

Characteristics	Example Varieties	Note
<b>5.6 Inflorescence: color</b> <b>(21)</b>		
white	Daleys Dwarf, EMB-1, KRG-15, MRG-20, MRG-25	1 [ ]
pink	KMB-3, MiniMaca	2 [ ]
<b>5.7 Seed: shape</b> <b>(26)</b>		
ovate	Hidden Valley A16, Hidden Valley A4	1 [ ]
oblate	H2 Hinde, 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 <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety
<i>Example</i>	<i>Plant: growth habit</i>	<i>upright</i>	<i>spreading</i>
Comments:			

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

7.2 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.]

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]