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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

BLACK WALNUT

UPOV Code(s):
JUGLA_HIN; JUGLA_HRE;
JUGLA_MAJ; JUGLA_MRG;
JUGLA_NIG; JUGLA_NRE

Juglans hindsii (Jeps.) R. E. Sm.;
Juglans hindsii × *Juglans regia*;
Juglans major (Torr.) A. Heller;
Juglans major x *Juglans regia*;
Juglans nigra L.;
Juglans nigra x *Juglans regia* L.

[*]

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Spain
to be considered by the
Enlarged Editorial Committee
at its meeting, to be held in Geneva
from 2018-03-26 to 2018-03-27

Disclaimer: this document does not represent UPOV policies or guidance

[*] 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.]

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Juglans hindsii (Jeps.) R. E. Sm.	Hinds's black walnut; Hinds's walnut; northern California black walnut; northern California walnut		kalifornische Walnuß	
Juglans hindsii × *Juglans regia*				
Juglans major (Torr.) A. Heller	Arizona walnut			Nogal, Nogal silvestre
Juglans major x *Juglans regia*				
Juglans nigra L.	Black Walnut	Noyer noir	Schwarznuss	Nogal negro
Juglans nigra x *Juglans regia* L.				

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.

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Juglans hindsii* (Jeps.) R. E. Sm., *Juglans hindsii* × *Juglans regia*, *Juglans major* (Torr.) A. Heller, *Juglans major* x *Juglans regia*, *Juglans nigra* L.and *Juglans nigra* x *Juglans regia* 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 one-year-old grafts.

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

5 trees (one-year-old grafts). The rootstock to be used is the progeny Ng209xRa or any other commercial hybrid specified by the authority.

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 may be observed from a single planting, examined in two separate growing cycles.

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

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

3.3.1 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.

3.3.2 The optimum stage of development for the assessment of each characteristic is indicated by a number in the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.

3.3.3 The growing cycle is considered to be the duration of a single growing season, beginning with bud burst, and concluding when the following dormant period ends with the swelling of new season buds.

3.4 Test Design

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

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 The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction.

4.2.4 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) Leaf: terminal leaflet (characteristic 4)
(b) Time of budburst (characteristic 16)
(c) Time of female flowering (characteristic 18)

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)-(d) See Explanations on the Table of Characteristics in Chapter 8.1

7 Growth stage key See Explanations on the Table of Characteristics in Chapter 8

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**	**(+)**	**(a)**	**2**			
		Tree: growth habit		**Arbre : port**		**Baum: Wuchsform**	**Árbol: hábito de crecimiento**		
		upright		dressé		aufrecht	erecto		1
		semi-upright		demi-dressé		halbaufrecht	semierecto	MB Ng-10	2
		spreading		étalé		breitwüchsig	extendido	Mj209	3
		drooping		pendant		überhängend	colgante		4
2.		**PQ**	**VG**	**(+)**	**(a)**	**2**			
		Trunk: bark color		**Tronc : couleur de l'écorce**		**Stamm: rindenfarbig**	**Tronco: color de la corteza**		
		whitish		crème		weißlich	blanquecina	Eurowalnut B03, Eurowalnut B07, Mj209	1
		brownish		brunâtre		bräunlich	amarronada		2
		blackish		noirâtre		schwärzlich	negruzca	Beineke 10, Ng23	3
3.	**(*)**	**QN**	**MS/VG**	**(+)**	**(b)**	**1**			
		Leaf: number of leaflets		**Feuille : nombre de folioles**		**Blatt: Anzahl der Blattfiedern**	**Hoja: número de folíolos**		
		very few		très petit		sehr gering	muy bajo	IRTA X-80	1
		few		petit		gering	bajo	Eurowalnut-8	2
		medium		moyen		mittel	medio	Beineke 3, Mj2-2	3
		many		grand		groß	alto	Beineke 10, Typpecanoe-1	4
		very many		très grand		sehr groß	muy alto		5
4.	**(*)**	**QL**	**VG**		**(b)**	**1**			
		Leaf: terminal leaflet		**Feuille : foliole terminale**		**Blatt: Endblattfieder**	**Hoja: folíolo terminal**		
		absent or rachitic		absente ou rachitique		fehlend oder sehr klein	ausente o raquítico	Emilie, MB Ng-13	1
		well developed		bien développée		gut entwickelt	bien desarrollado	Eurowalnut B07, IRTA X-80	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.		**QN VG**	**(b)**	**1**			
		Leaf: size of terminal leaflet in relation to lateral leaflets	**Feuille : taille de la foliole terminale par rapport aux folioles latérales**	**Blatt: Größe der Endblattfieder im Verhältnis zu den lateralen Blattfiedern**	**Hoja: tamaño del folíolo terminal en relación con los laterales**		
		smaller	plus petite	kleiner	más pequeño	Beineke 8, Mj2-2	1
		same size	de même taille	gleich groß	mismo tamaño		2
		bigger	plus grande	größer	más grande	Eurowalnut B03, Eurowalnut B07, IRTA X-80	3
6.		**QL VG**	**(+)** **(c)**	**3**			
		Female flower: conspicuousness	**Fleur femelle : netteté**	**Weibliche Blüte: Ausprägung**	**Flor femenina: visibilidad**		
		absent	absente	fehlend	ausente	MB Ng-10, MB Ng-2	1
		present	présente	vorhanden	presente	Beineke 5, Ng23	9
7.	**(*)**	**QN VG**	**(c)**	**3**			
		Female flower: predominant number of flowers per inflorescence	**Fleur femelle : nombre prédominant de fleurs par inflorescence**	**Weibliche Blüte: vorwiegende Anzahl Blüten pro Blütenstand**	**Flor femenina: número predominante de flores por inflorescencia**		
		one	une	eine	una		1
		in group of two	groupe de deux	in Gruppen von zwei	en un grupo de dos	IRTA X-80, Typpecanoe-1	2
		in group of three	groupe de trois	in Gruppen von drei	en un grupo de tres	Beineke 5, MB Hd-37, MB Ng-10	3
		in group of four	groupe de quatre	in Gruppen von vier	en un grupo de cuatro	Beineke 8	4
		in group of five or more	groupe de cinq ou plus	in Gruppen von fünf und mehr	en un grupo de cinco o más		5
8.	**(*)**	**QL VG**	**(c)**	**3**			
		Female flower: anthocyanin coloration of stigma	**Fleur femelle : pigmentation anthocyanique du stigmate**	**Weibliche Blüte: Anthocyanfärbung der Narbe**	**Flor femenina: pigmentación antociánica del estigma**		
		absent	absente	fehlend	ausente	MB Hd-37, MB Ng-10	1
		present	présente	vorhanden	presente	Mj209, Typpecanoe-1	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
9.		**QN VG**	**(c)**	**3**			
		Female flower: length of stigma	**Fleur femelle : longueur du stigmate**	**Weibliche Blüte: Länge der Narbe**	**Flor femenina: longitud del estigma**		
		short	court	kurz	corto	IRTA X-80	1
		medium	moyen	mittel	medio	Beineke 5	2
		long	long	lang	largo	MB Hd-37, MB Ng-10	3
10.	**(*)**	**PQ VG**	**(+) (c)**	**3**			
		Female flower: stigma attitude	**Fleur femelle : port du stigmate**	**Weibliche Blüte: Haltung der Narbe**	**Flor femenina: porte del estigma**		
		upright	dressé	aufrecht	erecto	Mj209, Typpecanoe-1	1
		spreading	étalé	breitwüchsig	divergente		2
		drooping to one side	pendant d'un côté	auf eine Seite überhängend	colgante hacia un lado	Ng23	3
		drooping to both sides	pendant des deux côtés	auf beide Seiten überhängend	colgante hacia ambos lados		4
11.		**QL VG**	**(+) (c)**	**3**			
		Catkins: presence of fully developed catkins	**Chatons : présence de chatons pleinement développés**	**Kätzchen: Vorhandensein von voll entwickelten Kätzchen**	**Amentos: presencia de amentos plenamente desarrollados**		
		absent	absents	fehlend	ausentes	IRTA X95	1
		present	présents	vorhanden	presentes	MB Ng-10, Mj209	9
12.		**PQ VG**	**(+) (c)**	**3**			
		Catkins: shape	**Chatons : forme**	**Kätzchen: Form**	**Amentos: forma**		
		broad oblong	oblongue large	breit rechteckig	oblonga ancha	MB Ng-2, MB Ng-7	1
		narrow oblong	oblongue étroite	schmal rechteckig	oblonga estrecha	MB Hd-37, Mj209	2
		ovate	ovale	eiförmig	oval	MB Ng-10, Ng23	3

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13.	**(*)**	**PQ**	**VG**	**(+)**	**(d)**				
		Nut: shape in longitudinal section, perpendicular to suture		**Noix : forme en section longitudinale, perpendiculaire à la suture**		**Nuß: Form im Längsschnitt, rechtwinklig zur Naht**	**Nuez: forma en sección longitudinal, perpendicular a la sutura**		
		ovate		ovale		eiförmig	oval		1
		transverse oblong		oblongue transversale		quer rechteckig	oblonga transversal	Beineke 8	2
		broad elliptic		elliptique large		breit elliptisch	elíptica ancha	EccoVenner	3
		oblate		arrondie aplatie		breitrund	achatada	MB Ng-2	4
		medium elliptic		elliptique moyenne		mittel elliptisch	elíptica media	IRTA X-80	5
		circular		circulaire		kreisförmig	circular	Mj209	6
		narrow elliptic		elliptique étroite		schmal elliptisch	elíptica estrecha		7
14.	**(*)**	**PQ**	**VG**	**(+)**	**(d)**				
		Nut: shape of base		**Noix : forme de la base**		**Nuß: Form der Basis**	**Nuez: forma de la base**		
		pointed		pointue		spitz	en punta		1
		cuneate		cunée		keilförmig	cuneada	Beineke 4	2
		rounded		arrondie		abgerundet	redondeada	MB Ng-2	3
		truncate		tronquée		abgestumpft	truncada	Beineke 8	4
		emarginate		émarginée		eingekerbt	emarginada	Eurowalnut B07	5
		acuminate		acuminée		zugespitzt	acuminada	MB Hd-37	6

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15.	**(*)**	**PQ VG**	**(+) (d)**				
		Nut: shape of apex perpendicular to suture	**Noix : forme du sommet perpendiculaire à la suture**	**Nuß: Form der Spitze rechtwinklig zur Naht**	**Nuez: forma del ápice perpendicular a la sutura**		
		pointed	pointu	spitz	en punta	Eurowalnut B07, Purdue-1	1
		obtuse	obtus	stumpf	obtuso	Mj209, Ng23	2
		rounded	arrondi	abgerundet	redondeado	Beineke 7	3
		truncate	tronqué	abgestumpft	truncado	Beineke 8	4
		acuminate	acuminé	zugespitzt	acuminado		5
		trapezium	en trapèze	trapezförmig	trapezoidal	MB Hd-37	6
16.	**(*)**	**QN MG**	**(+)**				
		Time of budburst	**Époque de débourrement**	**Zeitpunkt des Knospenaufbruchs**	**Época de brotación**		
		very early	très précoce	sehr früh	muy precoz	IRTA X-80, MB Hd-37	1
		early	précoce	früh	precoz	MB Ng-13	2
		medium	moyenne	mittel	media	MB Ng-2, MB Ng-3, Ng23	3
		late	tardive	spät	tardía	Beineke 8, Beineke 9	4
		very late	très tardive	sehr spät	muy tardía	Eurowalnut-8	5
17.	**(*)**	**QN MG**	**(+) (c)**				
		Time of male flowering	**Époque de floraison mâle**	**Zeitpunkt der männlichen Blüte**	**Época de la floración masculina**		
		very early	très précoce	sehr früh	muy precoz	IRTA X-80, MB Ng-13	1
		early	précoce	früh	precoz	Beineke 1, Mj209	2
		medium	moyenne	mittel	media	Beineke 6, Beineke 7, Ng23	3
		late	tardive	spät	tardía	Beineke 8, Beineke 9, Purdue-1	4
		very late	très tardive	sehr spät	muy tardía	Beineke 2	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18. (*)	**QN MG**	**(+) (c)**				
	Time of female flowering	**Époque de floraison femelle**	**Zeitpunkt der weiblichen Blüte**	**Época de la floración femenina**		
	very early	très précoce	sehr früh	muy precoz	IRTA X-80, Mj209	1
	early	précoce	früh	precoz	Beineke 6, Ng23	2
	medium	moyenne	mittel	media	MB Ng-13, MB Ng-2	3
	late	tardive	spät	tardía	Beineke 1, MB Ng-10	4
	very late	très tardive	sehr spät	muy tardía	Beineke 10	5
19. (*)	**QN VG**	**(+) (c)**				
	Time of male flowering compared to female flowering	**Époque de floraison mâle par rapport à l'époque de floraison femelle**	**Zeitpunkt der männlichen Blüte im Vergleich zur weiblichen Blüte**	**Época de la floración masculina comparada con la floración femenina**		
	before	antérieure	früher	anterior	Beineke 5, Mj209, Ng23	1
	simultaneous	simultanée	gleichzeitig	simultánea		2
	after	postérieure	später	posterior	Beineke 1, Beineke 7, MB Ng-10, MB Ng-2	3
20. (*)	**QN MG**	**(+)**				
	Time of leaf drop	**Époque de chute des feuilles**	**Zeitpunkt des Blattfalls**	**Época de defoliación**		
	very early	très précoce	sehr früh	muy precoz	Beineke 6	1
	early	précoce	früh	precoz	Beineke 5	2
	medium	moyenne	mittel	media	MB Ng-2, MB Ng-3, Ng23	3
	late	tardive	spät	tardía	Beineke 8, IRTA X-80, Mj209	4
	very late	très tardive	sehr spät	muy tardía	IRTA X95	5

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 trees should be made in the dormant season.

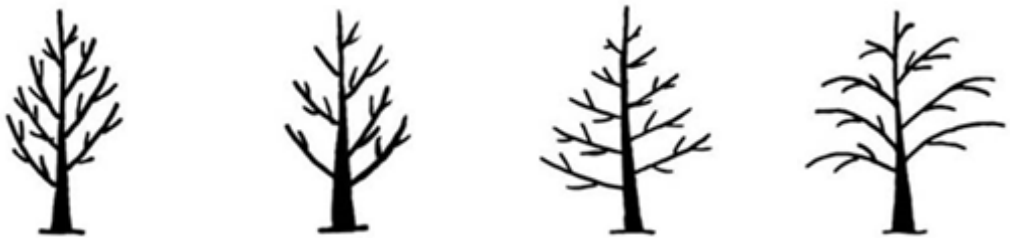
(b) Observations on leaflets should be made on lateral leaves from the middle part of the canopy.

(c) Observations on flowers should be made during full blossom period.

(d) Observations on nuts should be made on physiologically ripe nuts excluding the pericarp.

8.2 Explanations for individual characteristics

Ad. 1: Tree: growth habit



1 upright | 2 semi-upright | 3 spreading | 4 drooping

Ad. 2: Trunk: bark color

The bark is the most external layer of the trunk that covers and protects the wood.
Observations should be made when the tree is less than five years old.

Ad. 3: Leaf: number of leaflets

The number of leaflets should be assessed in the growing season when leaves are completely developed.

Very low number of leaflets $\leq$ 9
Low 9 < number of leaflets $\leq$ 13
Medium 13 < number of leaflets $\leq$ 17
High 17 < number of leaflets < 21
Very high 21 $\leq$ number of leaflets

Ad. 6: Female flower: conspicuousness

Female flower is considered conspicuous at stage D_f (see 8.3).
Female flower is considered non conspicuous when the flowers are observed when the leaves are fully developed.

Ad. 10: Female flower: stigma attitude

The attitude of the stigma should be observed when it is completely unfolded, at F_{f2} stage (see 8.3).

1
upright

2
spreading

3
drooping to one side

4
drooping to both sides

Ad. 11: Catkins: presence of fully developed catkins

The presence of fully developed catkins should be observed at stage B_m, C_m and even D_m (see 8.3)

Ad. 12: Catkins: shape

Catkins shape should be observed at B_m to C_m stages (see 8.3).

1
broad oblong

2
narrow oblong

3
ovate

Ad. 13: Nut: shape in longitudinal section, perpendicular to suture

		< broadest part >	
		below middle	at middle
relative width	broad		 7 narrow elliptic
		 1 ovate	 5 medium elliptic
			 6 circular
	narrow		 3 broad elliptic
			 4 oblate
			 2 transverse oblong

Ad. 14: Nut: shape of base

Observation should be made facing the suture.


1
pointed


2
cuneate

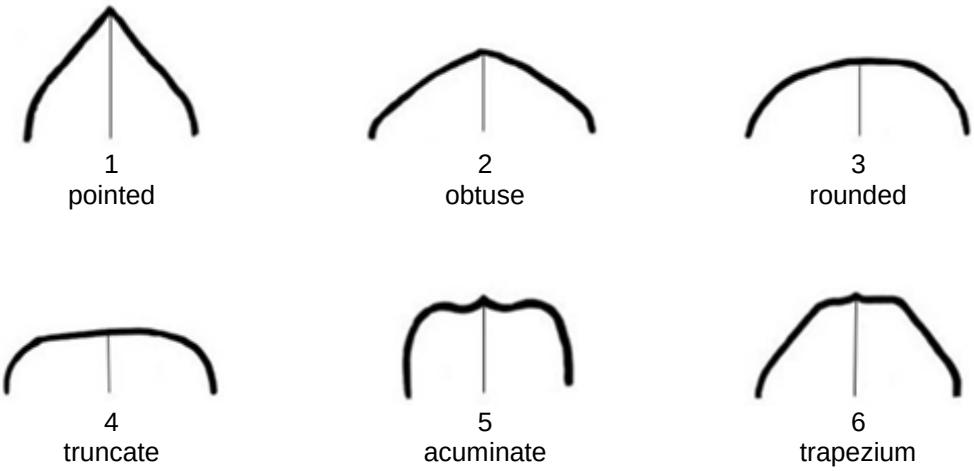

3
rounded


4
truncate


5
emarginate


6
acuminate

Ad. 15: Nut: shape of apex perpendicular to suture



1 pointed | 2 obtuse | 3 rounded

4 truncate | 5 acuminate | 6 trapezium

Ad. 16: Time of budburst

Observations should be made when more than 50% of terminal buds are at C_f stage (see 8.3).

Ad. 17: Time of male flowering

Observations should be made when anthers are completely dehiscent during the period of pollen emission, at F_{m2} stage (see 8.3)

Ad. 18: Time of female flowering

The period of female flowering is between F_{f1} and F_{f2} stages (see 8.3).

Ad. 19: Time of male flowering compared to female flowering

The male and female flowering cannot coincide in time on the same tree; that is the definition of dicogamy. If catkins mature before female flowers that is protandry, when female flowers are the first that is protoginy; if there is coincidence in time that is homogamy.

Ad. 20: Time of leaf drop

The time of defoliation is defined as the moment in which the tree has lost over 50% of its leaves.

8.3 *Growth stages*

(1) 2º year of plantation in ahead
(2) 3 -4 years
(3) From the second male and female flowering

Phenological growth stages

C_f **Budbreak**. Bud extends and scales open. Conspicuous leaf *primordium*

D_f Initial leaflet individualisation

PISTILATE FLOWERING

F_{f1} **Starting of stigma opening.** Intensive stigma coloration. Position clearly over the ovary. Maximum peak of female flowers

F_{f2} **Unfolded stigma.** Pistillate flower receptivity decreases

MALE FLOWERS

B_m **The growth starts.** Catkin lengthens. Color turns greenish.

C_m **Conspicuous inflorescence differentiation.** Catkin continues to lengthen, and male flowers are still closed.

D_m **Male flowers separation.** Catkin continues lengthening, losing stiffness and starts bending.

F_{m2} **Total dehiscence of anthers.** Peak of pollen emission. Catkins completely yellow.

9. Literature

Aletà, A., Vilanova, A., 2011: Criterios orientadores para la admisión de materiales de base del género *Juglans*. Ministerio de Medio Ambiente y Medio Rural y Marino (MAGRAMA), Madrid, ES, 39 pp.

Becquey, J., 1997: Les noyers à bois. Institut pour le Développement Forestier, Paris, FR, 144 pp.

Germain, E., Prunet, J.P., Garcin, A., 1999: Le Noyer. Centre Technique Interprofessionnel des Fruits et Legumes (CTIFL), Paris, FR, 279 pp.

International Plant Genetic Resources Institute (IPGRI) 1994: Descriptor for Walnut. IPGRI, Rome, IT, 51 pp.

UPOV, 1999: Directrices para la ejecución del examen de la distinción, la homogeneidad y la estabilidad. Nogal (*Juglans regia* L.), TG/125/6. Geneva, CH, 31 pp.

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	*Juglans hindsii* (Jeps.) R. E. Sm.	[ ]
1.1.2	Common name	Hinds's black walnut, Hinds's walnut, northern California black walnut, northern California walnut	
1.2.1	Botanical name	*Juglans hindsii* × *Juglans regia*	[ ]
1.2.2	Common name		
1.3.1	Botanical name	*Juglans major* (Torr.) A. Heller	[ ]
1.3.2	Common name	Arizona walnut	
1.4.1	Botanical name	*Juglans major* x *Juglans regia*	[ ]
1.4.2	Common name		
1.5.1	Botanical name	*Juglans nigra* L.	[ ]
1.5.2	Common name	Black Walnut	
1.6.1	Botanical name	*Juglans nigra* x *Juglans regia* L.	[ ]
1.6.2	Common name		

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

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))

(……..……..…) x (……..……..…)

female parent male parent

(c) unknown cross [ ]

4.1.2 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.3 Mutation [ ]
(please state parent variety)

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) *In vitro* propagation [ ]
(b) The micropropagation is the usual system of propagation used. But, in some cases varieties are grafted on seedlings of the same species. [ ]
(c) 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 (4)	**Leaf: terminal leaflet**		
	absent or rachitic	Emilie, MB Ng-13	1 [ ]
	well developed	Eurowalnut B07, IRTA X-80	9 [ ]
5.2 (16)	**Time of budburst**		
	very early	IRTA X-80, MB Hd-37	1 [ ]
	early	MB Ng-13	2 [ ]
	medium	MB Ng-2, MB Ng-3, Ng23	3 [ ]
	late	Beineke 8, Beineke 9	4 [ ]
	very late	Eurowalnut-8	5 [ ]
5.3 (18)	**Time of female flowering**		
	very early	IRTA X-80, Mj209	1 [ ]
	early	Beineke 6, Ng23	2 [ ]
	medium	MB Ng-13, MB Ng-2	3 [ ]
	late	Beineke 1, MB Ng-10	4 [ ]
	very late	Beineke 10	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	*Nut: shape of the base*	*rounded*	*pointed*

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

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]