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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

PECAN NUT *

UPOV Code: CARYA_ILL

Carya illinoinensis (Wangenh.) K. Koch

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Mexico

to be considered by the

Enlarged Editorial Committee at its meeting
to be held in Geneva, on January 7 and 8, 2015

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Carya illinoinensis (Wangenh.) K. Koch	Pecan nut	Noix de pécan	Pekan, Pekannuß	Nuez pecán, Pecan, Nogal pecanero

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 *Carya illinoinensis* (Wangenh.) K. Koch.

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 dormant budsticks or grafted plants.

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

8 dormant budsticks or 8 grafted 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 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.

3.1.3 In particular, it is essential that the plants 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

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 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 / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations should be made on 5 plants or parts taken from each of 5 plants. In the case of observations of parts of 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 second column of 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 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 trees, no off-type is 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: vigor (characteristic 1)
(b) Tree: growth habit (characteristic 3)
(c) Lateral leaflet: presence of petiolule (characteristic 11)
(d) Nut: length (characteristic 19)
(e) Nut: width in lateral view (characteristic 20)
(f) Nut: width in lateral view facing the suture (characteristic 21)
(g) Nut: shape in lateral view (characteristic 23)

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

(*)	Asterisked characteristic	– see Chapter 6.1.2
QL	Qualitative characteristic	– see Chapter 6.3
QN	Quantitative characteristic	– see Chapter 6.3
PQ	Pseudo-qualitative characteristic	– see Chapter 6.3
MG, MS, VG, VS		– see Chapter 4.1.5
(a)-(c)	See Explanations on the Table of Characteristics in Chapter 8.1	
(+)	See Explanations on the Table of Characteristics in Chapter 8.2.	

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. **(*)** **(+)**	**VG**	**Tree: vigor**	**Arbre : vigueur**	**Baum: Wuchsstärke**	**Árbol: vigor**		
QN		weak	faible	gering	débil	Barton, Success	3
		medium	moyenne	mittel	medio	Cheyenne	5
		strong	forte	stark	fuerte	Desirable, Western	7
2. **(+)**	**VG**	**Tree: density of canopy**	**Arbre : densité de la frondaison**	**Baum: Laubdichte**	**Árbol: densidad de la copa**		
QN		sparse	faible	locker	escasa	Cheyenne	3
		medium	moyenne	mittel	media	Desirable, Mahan	5
		dense	forte	dicht	densa	Success, Wichita	7
3. **(*)** **(+)**	**VG**	**Tree: growth habit**	**Arbre : port**	**Baum: Wuchsform**	**Árbol: hábito de crecimiento**		
QN		upright	dressé	aufrecht	erecto	Success	1
		semi-upright	demi-dressé	halbaufrecht	semierecto	Desirable, Mohawk	2
		spreading	étalé	breitwüchsig	extendido	Shoshoni, Western	3
4.	**VG**	**One-year-old shoot: color**	**Rameau d'un an : couleur**	**Einjähriger Trieb: Farbe**	**Rama de un año: color**		
PQ		greenish brown	brun verdâtre	grünlichbraun	marrón verdoso	Stuart	1
		reddish brown	brun rougeâtre	rötlichbraun	marrón rojizo	Mahan	2
		brown	brun	braun	marrón	Desirable, Success	3
5.	**VG**	**Leaf: intensity of green color**	**Feuille : intensité de la couleur verte**	**Blatt: Intensität der Grünfärbung**	**Hoja: intensidad del color verde**		
QN	**(a)**	light	faible	hell	claro	Desirable	1
		medium	moyenne	mittel	medio	Stuart	2
		dark	forte	dunkel	oscuro		3
6. **(+)**	**VG/ MS**	**Leaf: length of terminal leaflet**	**Feuille : longueur de la foliole terminale**	**Blatt: Länge der Endfieder**	**Hoja: longitud del folíolo terminal**		
QN	**(a)**	short	courte	kurz	corto	Desirable	3
		medium	moyenne	mittel	medio	Shoshoni, Stuart	5
		long	longue	lang	largo	Mahan	7
7. **(+)**	**VG/ MS**	**Leaf: width of terminal leaflet**	**Feuille : largeur de la foliole terminale**	**Blatt: Breite der Endfieder**	**Hoja: anchura del folíolo terminal**		
QN	**(a)**	narrow	étroite	schmal	estrecho	Desirable	3
		medium	moyenne	mittel	medio	Success	5
		broad	large	breit	ancho		7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
8. **(+)**	**VG/ MS**	**Leaf: terminal leaflet: ratio length/width**	**Feuille : foliole terminale : rapport longueur/largeur**	**Blatt: Endfieder: Verhältnis Länge/Breite**	**Hoja: folíolo terminal: relación longitud/anchura**		
QN	**(a)**	low	bas	klein	baja	Mahan, Stuart	3
		medium	moyen	mittel	media	Shoshoni	5
		high	élevé	groß	alta	Desirable	7
9. **(+)**	**VG/ MS**	**Leaf: length of petiole**	**Feuille : longueur du pétiole**	**Blatt: Länge des Blattstiels**	**Hoja: longitud del pecíolo**		
QN	**(a)**	short	court	kurz	corto	Desirable	3
		medium	moyen	mittel	medio	Success	5
		long	long	lang	largo	Mahan, Stuart	7
10. **(+)**	**VG**	**Lateral leaflet: curvature along longitudinal axis**	**Foliole latérale : courbure le long de l'axe longitudinal**	**Seitenfieder: Biegung entlang der Längsachse**	**Folíolo lateral: curvatura del eje longitudinal**		
QN	**(a)**	weak	faible	gering	débil	Desirable	1
		medium	moyenne	mittel	media		2
		strong	forte	stark	fuerte	Mahan	3
11. **(*)** **(+)**	**VG**	**Lateral leaflet: presence of petiolule**	**Foliole latérale : présence de pétiolule**	**Seitenfieder: Vorhandensein des Blattfiederstiels**	**Folíolo lateral: presencia de peciólulo**		
QL	**(a)**	absent	absent	fehlend	ausente	Desirable	1
		present	présent	vorhanden	presente	Stuart, Success	9
12. **(+)**	**VG**	**Lateral leaflet: asymmetry at base**	**Foliole latérale : asymétrie à la base**	**Seitenfieder: Asymmetrie an der Basis**	**Folíolo lateral: asimetría en la base**		
QN	**(a)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Desirable	1
		moderate	modérée	mäßig	moderada		2
		strong	forte	stark	fuerte		3
13. **(*)** **(+)**	**VG/ MG**	**Catkin: length**	**Chaton : longueur**	**Kätzchen: Länge**	**Amento: longitud**		
QN		short	court	kurz	corto	Desirable	3
		medium	moyen	mittel	medio	Mahan, Stuart	5
		long	long	lang	largo		7
14.	**VG/ MS**	**Female inflorescence: number of flowers**	**Inflorescence femelle : nombre de fleurs**	**Weiblicher Blütenstand: Anzahl Blüten**	**Inflorescencia femenina: número de flores**		
QN		very few	très petit	sehr gering	muy bajo		1
		few	petit	gering	bajo	Success	2
		medium	moyen	mittel	medio	Cape Fear, Harris Super, Stuart	3
		many	grand	groß	alto	Mahan	4
		very many	très grand	sehr groß	muy alto		5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15.	**VG**	**Stigma: splitting**	**Stigmate : scission**	**Narbe: Spaltung**	**Estigma: división**		
(+)							
QN	**(b)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	INTA DELTA II, Mahan	1
		moderate	modérée	mäßig	moderada		2
		strong	forte	stark	fuerte	Cape Fear, Desirable, Stuart	3
16. **(*)**	**VG**	**Stigma: anthocyanin coloration**	**Stigmate : pigmentation anthocyanique**	**Narbe: Anthocyanfärbung**	**Estigma: pigmentación antociánica**		
QN	**(b)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	INTA DELTA II, Mahan	1
		medium	modérée	mittel	media	Desirable, Success	2
		strong	forte	stark	fuerte	Shoshoni	3
17.	**VG**	**Husk: intensity of green color**	**Cosse : intensité de la couleur verte**	**Narbe: Intensität der Grünfärbung**	**Vaina: intensidad del color verde**		
QN		light	faible	hell	claro	Shoshoni	1
		medium	moyenne	mittel	medio	Desirable	2
		dark	forte	dunkel	oscuro		3
18. **(*)** **(+)**	**VG**	**Husk: prominence of ribs**	**Cosse : proéminence des côtes**	**Nußhülle: Hervortreten von Rippen**	**Vaina: prominencia del acostillado**		
QN		absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil		1
		weak	faible	gering	débil	Shoshoni	3
		medium	moyenne	mittel	medio		5
		strong	forte	stark	fuerte		7
19. **(*)** **(+)**	**VG/ MS**	**Nut: length**	**Noix : longueur**	**Nuß: Länge**	**Nuez: longitud**		
QN	**(c)**	short	courte	kurz	corta	Desirable, Success	3
		medium	moyenne	mittel	media	Harris Super, Stuart	5
		long	longue	lang	larga	Mahan	7
20. **(*)** **(+)**	**VG/ MS**	**Nut: width in lateral view**	**Noix : largeur en vue latérale**	**Nuß: Breite in Seitenansicht**	**Nuez: anchura en vista lateral**		
QN	**(c)**	narrow	étroite	schmal	estrecha	Desirable, Kernodle, Mahan	3
		medium	moyenne	mittel	media	Stuart	5
		broad	large	breit	ancha	Shoshoni	7
21. **(*)** **(+)**	**VG/ MS**	**Nut: width in lateral view facing the suture**	**Noix : largeur en vue latérale en face de la suture**	**Nuß: Breite in Naht zugewandter Seitenansicht**	**Nuez: anchura en vista lateral con la sutura de frente**		
QN	**(c)**	narrow	étroite	schmal	estrecha	Mahan	3
		medium	moyenne	mittel	media	Stuart	5
		broad	large	breit	ancha	Shoshoni	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22. **(*)** **(+)**	**VG**	**Nut: shape in lateral view facing the suture**	**Noix : forme en vue latérale en face de la suture**	**Nuß: Form in Naht zugewandter Seitenansicht**	**Nuez: forma en vista lateral con la sutura de frente**		
PQ	**(c)**	ovate	ovale	eiförmig	oval	Curtis	1
		circular	circulaire	kreisförmig	circular	Major	2
		elliptic	elliptique	elliptisch	elíptica	Kanza	3
		oblong	oblong	rechteckig	oblonga	Harris Super, Mahan, Maramec	4
		obovate	obovale	verkehrt eiförmig	oboval	Chetopa	5
23. **(*)** **(+)**	**VG**	**Nut: shape in lateral view**	**Noix : forme en vue latérale**	**Nuß: Form in Seitenansicht**	**Nuez: forma en vista lateral**		
PQ	**(c)**	ovate	ovale	eiförmig	oval	Amling, Cheyenne, Elliot	1
		circular	circulaire	kreisförmig	circular		2
		elliptic	elliptique	elliptisch	elíptica	Candy, Chickasaw	3
		oblong	oblongue	rechteckig	oblonga	Curtis, Harris Super, Mahan	4
		obovate	obovale	verkehrt eiförmig	oboval	Western Schley	5
24. **(+)**	**VG**	**Nut: shape in ventral view facing the attachment**	**Noix : forme en vue ventrale en face de l'attache**	**Nuß: Form in Ansatzstelle zugewandter Bauchansicht**	**Nuez: forma en vista ventral con el punto de inserción de frente**		
PQ		broad oblate	aplatie large	breit breitrund	achatada ancha		1
		medium oblate	aplatie moyenne	mittel breitrund	achatada media	Kernodle	2
		circular	circulaire	kreisförmig	circular	Desirable, Shoshoni	3
25. **(*)** **(+)**	**VG**	**Nut: shape of apex in lateral view (excluding tip)**	**Noix : forme du sommet en vue latérale (pointe exclue)**	**Nuß: Form des Scheitels (ohne Spitze)**	**Nuez: forma del ápice en vista lateral (excluida la punta)**		
PQ		acute	aigu	spitz	agudo	Desirable, Stuart	1
		obtuse	obtus	stumpf	obtuso	Success	2
		rounded	arrondi	abgerundet	redondeado	Major	3
26. **(*)** **(+)**	**VG/ MS**	**Nut: length of tip**	**Noix : longueur de la pointe**	**Nuß: Länge der Spitze**	**Nuez: longitud de la punta**		
QN		absent or short	absente ou courte	fehlend oder kurz	ausente o corta	Major	1
		medium	moyenne	mittel	media	Chetopa	2
		long	longue	lang	larga	Curtis, Mahan, Sioux	3
27. **(+)**	**VG**	**Nut: ground color**	**Noix : couleur de fond**	**Nuß: Grundfarbe**	**Nuez: color de fondo**		
PQ		grey brown	brun-gris	graubraun	marrón grisáceo	Barton	1
		light brown	brun clair	hellbraun	marrón claro	Desirable, Mahan, Success	2
		medium brown	brun moyen	mittelbraun	marrón medio	Harris Super, Stuart	3
		dark brown	brun foncé	dunkelbraun	marrón oscuro	Kernodle, Shoshoni	4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
28.	**VG**	**Nut: area covered by spots**	**Noix : surface couverte de tâches**	**Nuß: mit Flecken bedeckte Fläche**	**Nuez: superficie que ocupan las manchas**		
QN		small	petite	klein	pequeña	Desirable, Harris Super, Kernodle	3
		medium	moyenne	mittel	media	Mahan	5
		large	grande	groß	grande	Stuart	7
29. **(*)** **(+)**	**VG/** **MS**	**Nut: thickness of shell**	**Noix : épaisseur de la coque**	**Nuß: Dicke der Schale**	**Nuez: grosor de la cáscara**		
QN		thin	mince	dünn	delgada	Candy, Curtis, Hastings	1
		medium	moyenne	mittel	media	Desirable, Stuart	2
		thick	épaisse	dick	gruesa	Elliot, Moneymaker	3
30. **(+)**	**VG**	**Kernel: size of the kernel in relation to the size of the nut**	**Cerneau : taille du cerneau par rapport à la taille de la noix**	**Kern: Größe des Kerns im Verhältnis zur Größe der Nuß**	**Semilla: tamaño de la semilla en relación con el tamaño de la nuez**		
QN	**(c)**	small	petit	klein	pequeña	Jackson, Shoshoni	1
		medium	moyen	mittel	media	Melrose, Kiowa	2
		large	grand	groß	grande	Hastings, Stuart	3
31. **(*)** **(+)**	**MS**	**Kernel: weight**	**Cerneau : poids**	**Kern: Gewicht**	**Semilla: peso**		
QN		light	bas	leicht	liviana	Mahan	3
		medium	moyen	mittel	media	Pawnee	5
		heavy	élevé	schwer	pesada	Wichita	7
32.	**VG**	**Kernel: intensity of brown color**	**Cerneau : intensité de la couleur brune**	**Kern: Intensität der Braunfärbung**	**Semilla: intensidad del color marrón**		
QN		light	faible	hell	claro	Desirable	1
		medium	moyenne	mittel	medio	Pawnee	2
		dark	forte	dunkel	oscuro	Stuart	3
33. **(+)**	**MG**	**Time of leaf bud burst**	**Époque du débourrement foliaire**	**Zeitpunkt des Aufbruchs der Blattknospen**	**Época de brotación de las yemas foliares**		
QN		early	précoce	früh	temprana	Woodroof	3
		medium	moyenne	mittel	media	Curtis, Kernodle	5
		late	tardive	spät	tardía	Stuart, Success	7
34. **(+)**	**MG**	**Time of leaf fall**	**Époque de la chute des feuilles**	**Zeitpunkt des Laubfalls**	**Época de caída de las hojas**		
QN		early	précoce	früh	temprana	Dooley, Stuart	3
		medium	moyenne	mittel	media	Colby	5
		late	tardive	spät	tardía	Comanche, Woodroof	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35. **(+)**	**MG**	**Time of husk opening**	**Époque de l'ouverture de la cosse**	**Zeitpunkt der Öffnung der Nußhülle**	**Época de dehiscencia de las vainas**		
QN		early	précoce	früh	temprana	Norton,	3
		medium	moyenne	mittel	media	Elliot, Sioux	5
		late	tardive	spät	tardía	Kernodle	7
36. **(+)**	**VG**	**Tree: persistence of husk after nut fall**	**Arbre : persistance de la cosse après la chute de la noix**	**Baum: Anhaften der Nußhülle nach dem Abfallen der Nuß**	**Árbol: persistencia de la vaina tras la caída de la nuez**		
QN		not persistent	nulle	nicht anhaftend	no persistente	Success	1
		partially persistent	partielle	teilweise anhaftend	parcialmente persistente		2
		fully persistent	totale	vollständig anhaftend	completamente persistente	Desirable, Stuart	3

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) Leaf/Leaflet: observations should be made at the end of leaflet expansion on fully developed leaflets. Leaves on the middle section of a one year old shoot.
(b) Flower: observations should be made at full receptivity of stigma when stigma is turgid and sticky. Observation must be done on the terminal section of a one-year-old shoot.
(c) Husk nut: observations should be made at husk opening stage, 24 weeks after pollination. At Full development of the nut. Observation must be done on the terminal section of a one-year-old shoot.

8.2 Explanations for individual characteristics

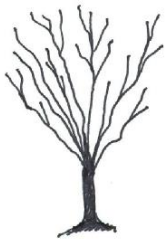
Ad. 1: Tree: vigor

The vigor of the plant should be considered as the overall abundance of vegetative growth.

Ad. 2: Tree: density of canopy

The density of canopy of the plant should be considered as the overall abundance of branches during the dormant period.

Ad. 3: Tree: growth habit



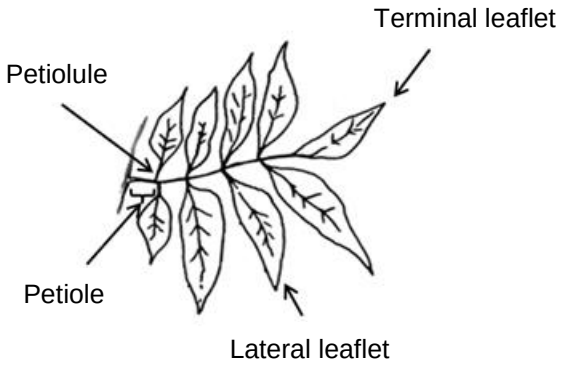
1
upright

2
semi-upright

3
spreading

Ad. 6: Leaf: length of terminal leaflet
Ad. 7: Leaf: width of terminal leaflet
Ad. 8: Leaf: terminal leaflet: ratio length/width
Ad. 9: Leaf: length of petiole
Ad. 10: Lateral leaflet: curvature along longitudinal axis
Ad. 11: Lateral leaflet: presence of petiolule

To observe on fully developed leaves on the middle third of branches growing in the current year.



Ad. 8: Leaf: terminal leaflet: ratio length/width

3
low

5
medium

7
high

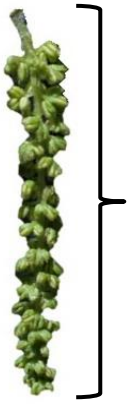
Ad. 12: Lateral leaflet: asymmetry at base

1
absent or weak

2
moderate

3
strong

Ad. 13: Catkin: length



Ad. 15: Stigma: splitting

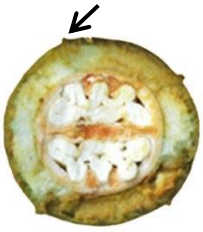
1
absent or weak

2
moderate

3
strong

Ad. 18: Husk: prominence of ribs

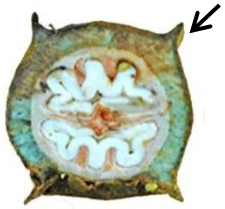
To be observed before husk opening.



1
absent or very weak

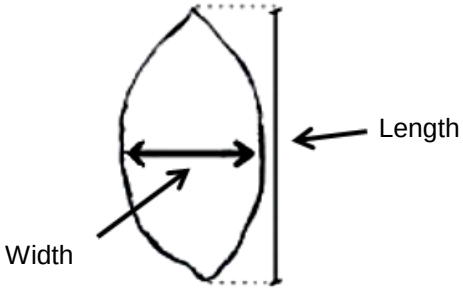
3
weak

5
medium

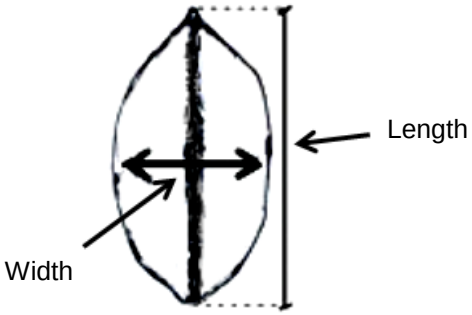


7
strong

Ad. 19: Nut: length
Ad. 20: Nut: width in lateral view
Ad. 21: Nut: width in lateral view facing the suture



lateral view



lateral view facing the suture

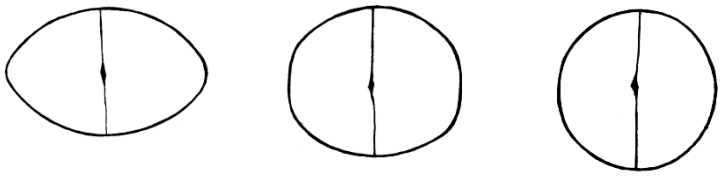
Ad. 22: Nut: shape in lateral view facing the suture
Ad. 23: Nut: shape in lateral view

The grid are nuts in ventral view and the general outline shape should be considered for lateral view.

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

Ad. 24: Nut: shape in ventral view facing the attachment

To be observed with suture in vertical position



1
broad oblate

2
medium oblate

3
circular

Ad. 25: Nut: shape of apex in lateral view (excluding tip)

1
acute

2
obtuse

3
rounded

Ad. 26: Nut: length of tip

1
absent or short

2
medium

3
long

Ad. 27: Nut: ground color

The color is observed on the surface of the nut, disregarding the spots.

Ad. 29: Nut: thickness of shell

To be observed with the help of a Vernier caliper.

Ad. 30: Kernel: size of the kernel in relation to the size of the nut

1
small

2
medium

3
large

Ad. 31: Kernel: weight

The weight of the kernel should be assessed as the average weight of 10 kernels when ready for consumption.

Ad. 33: Time of leaf bud burst

The time of leaf burst should be considered when 75% of the buds are open.

Ad. 34: Time of leaf fall

The time of leaf fall should be considered when 75% of the leaves have fallen.

Ad. 35: Time of husk opening

The time of husk opening should be considered when 75% of the husks are split.

Ad. 36: Tree: persistence of husk after nut fall

The persistence of the husk is its retention on the infrutescence on the shoot after the fall of the nuts. The observation is made during late winter.

9. Literature

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10. Technical Questionnaire

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

	Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 Botanical name	*Carya illinoinensis* (Wangenh.) K. Koch
1.2 Common name	Pecan 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))

(……) 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 Seed-propagated varieties

(a)	Self-pollination	[ ]
(b)	Cross-pollination	
	(i) population	[ ]
	(ii) synthetic variety	[ ]
(c)	Hybrid	[ ]
(d)	Other (please provide details)	[ ]

4.2.2 Vegetative propagation

(a)	cuttings	[ ]
(b)	*in vitro* propagation	[ ]
(c)	grafting	[ ]
(d)	other (state method)	[ ]

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: vigor**		
	very weak		1[ ]
	very weak to weak		2[ ]
	weak	Barton, Success	3[ ]
	weak to medium		4[ ]
	medium	Cheyenne	5[ ]
	medium to strong		6[ ]
	strong	Desirable, Western	7[ ]
	strong to very strong		8[ ]
	very strong		9[ ]
5.2 (3)	**Tree: growth habit**		
	upright	Success	1[ ]
	semi-upright	Desirable, Mohawk	2[ ]
	spreading	Shoshoni, Western	3[ ]
5.3 (11)	**Lateral leflet: presence of petiolule**		
	absent	Desirable	1[ ]
	present	Stuart, Success	9[ ]
5.4 (19)	**Nut: length**		
	very short		1[ ]
	very short to short		2[ ]
	short	Desirable, Success	3[ ]
	short to medium		4[ ]
	medium	Harris Super, Stuart	5[ ]
	medium to long		6[ ]
	long	Mahan	7[ ]
	long to very long		8[ ]
	very long		9[ ]

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

	Characteristics	Example Varieties	Note
5.5 (20)	**Nut: width in lateral view**		
	very narrow		1[ ]
	very narrow to narrow		2[ ]
	narrow	Desirable, Kernodle, Mahan	3[ ]
	narrow to medium		4[ ]
	medium	Stuart	5[ ]
	medium to broad		6[ ]
	broad	Shoshoni	7[ ]
	broad to very broad		8[ ]
	very broad		9[ ]
5.6 (21)	**Nut: width in lateral view facing th suture**		
	very narrow		1[ ]
	very narrow to narrow		2[ ]
	narrow	Mahan	3[ ]
	narrow to medium		4[ ]
	medium	Stuart	5[ ]
	medium to broad		6[ ]
	broad	Shoshoni	7[ ]
	broad to very broad		8[ ]
	very broad		9[ ]
5.7 (23)	**Nut: shape in lateral view**		
	ovate	Amling, Cheyenne, Elliot	1[ ]
	circular		2[ ]
	elliptic	Candy, Chickasaw	3[ ]
	oblong	Curtis, Harris Super, Mahan	4[ ]
	obovate	Western Schley	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	*Kernel: intensity of brown color*	*light*	*dark*

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 image of the variety should accompany the Technical Questionnaire.

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

[#] 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:

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]