

UPOV

TG/PECAN(proj.1)

ORIGINAL: English

DATE: September 9, 2003

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

PECAN NUT

Carya illinoensis

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

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

Alternative Names: *

<i>Latin</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Carya illinoensis</i>	Pecan nut	Pacancier	Pekan, Pekannuß	Nuez pecán, Pecán, Nogal pacanero

ASSOCIATED DOCUMENTS

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

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

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Carya illinoensis*.

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 plants (one year of grafting), dormant shoots for grafting (15 cm long and 1-1.5 of diameter with 3 groups of buds) to be sent at grafting time.

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

10 grafted plants
12 dormant shoots

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 *Duration of Tests*

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

3.2 *Testing Place*

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

3.3 *Conditions for Conducting the Examination*

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of, at least, 7 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 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations should be made on 7 plants

3.6 *Additional Tests*

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

The minimum duration of tests recommended in section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

4.1.3 Clear Differences

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

4.2 *Uniformity*

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

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 7 plants, 1 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 tested, either by growing a further generation, or by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness is aided by the use of grouping characteristics.

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

5.3 The following have been agreed as useful grouping characteristics:

- (a)
- (b)
- (c)
- (d)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

6. Introduction to the Table of Characteristics

6.1 *Categories of Characteristics*

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 *States of Expression and Corresponding Notes*

States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.3 *Types of Expression*

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 *Example Varieties*

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.5 *Legend*

(*) Asterisked characteristic – see Section 6.1.2

(QL) Qualitative characteristic – see Section 6.3

(QN) Quantitative characteristic – see Section 6.3

(PQ) Pseudo-qualitative characteristic – see Section 6.3

(a)–(x) See Explanations on the Table of Characteristics in Chapter 8, Section 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8, Section 8.2

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

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.	Tree: vigor	Arbre: vigueur	Baum: Wuchsstärke	Árbol: vigor		
QN	weak	faible	gering	débil		3
	medium	moyenne	mittel	medio		5
	strong	forte	stark	fuerte		7
2.	Tree: density of crown	Arbre: densité de la couronne	Baum: Kronendichte	Árbol: densidad de la copa		
QN	sparse	faible	locker	laxa		3
	medium	moyenne	mittel	media		5
	dense	dense	dicht	densa		7
3.	Shoots: attitude	Pousse: port		Ramas: porte		
QN	erect	dressé	aufrecht	erecto		1
	semi-erect	demi-dressé	halbaufrecht	semierecto		3
	horizontal	horizontal	waagerecht	horizontal		5
4.	One-year-old shoot: color			Rama de un año: color		
PQ	greenish brown			castaño verdoso		1
	brown			castaño		2
	reddish brown			castaño rojizo		3
5.	One-year-old shoot: intensity of color			Rama de un año: intensidad del color		
QN	light			claro		3
	medium			medio		5
	dark			oscuro		7
6.	Leaf: persistence of rachis	Feuille: persistance du rachis	Blatt: Anhaften der Spindel	Hoja: persistencia del raquis		
QL	persistent	non persistant	nicht anhaftend	persistente		1
	not persistent	persistant	anhaftend	no persistente		2

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
7.	Leaf: ratio length/ width of terminal leaflet		Hoja: relación largo/ ancho del folíolo terminal			
QN	small	faible	klein	pequeña		3
	medium	moyen	mittel	media		5
	large	élevé	groß	grande		7
8.	Leaf: intensity of green color		Hoja: intensidad del color verde			
QN	light			claro		3
	medium			medio		5
	dark			oscuro		7
9.	Female inflorescence: number of flowers		Inflorescencia femenina: número de flores			
QN	few			pocas		3
	medium			medio		5
	many			muchas		7
10.	Husk: intensity of green color		Vaina: intensidad del color verde			
QN	light			claro		3
	medium			medio		5
	dark			oscuro		7
11.	Husk: presence of ribs		Vaina: presencia de costillas			
QN	weak			débil		3
	medium			medio		5
	strong			fuerte		7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
12.	Husk: persistence on tree after nut fall	Brou: persistance sur l'arbre après la chute de la noix	Nußhülle: Anhaften am Baum nach dem Abfallen der Nuß	Vaina: persistencia en el árbol luego de la caída de la nuez		
?	not persistent	nulle	nicht anhaftend	no persistente		1
	partially persistent	partielle	teilweise anhaftend	parcialmente persistente		2
	fully persistent	totale	vollständig anhaftend	completamente persistente		3
13.	Nut: length			Nuez: largo		
QN	short			pequeño		3
	medium			medio		5
	long			largo		7
14.	Nut: height			Nuez: alto		
QN	short			pequeño		3
	medium			medio		5
	long			alto		7
15.	Nut: width			Nuez: ancho		
QN	short			pequeño		3
	medium			medio		5
	long			ancho		7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16.	Nut: shape in longitudinal section perpendicular to the suture (ratio length/height)			Nuez: forma en sección longitudinal perpendicular a la sutura (relación largo/alto)		
PQ	orbicular (1 to 1.39)			orbicular (1 a 1.39)		1
	ovate (1.40 to 1.59, widest at base)			ovado (1.40 a 1.59, más ancho en la base)		2
	oval elliptic (1.40 to 1.59, widest in middle)			oval elíptico (1.40 a 1.59, más ancho en el medio)		3
	obovate (1.40 to 1.59, widest at apex)			obovado (1.40 a 1.59, más ancho en el ápice)		4
	elliptic (1.60 to 1.79)			elíptico (1.60 a 1.79)		5
	oblong elliptic (1.80 to 1.99)			oblongo elíptico (1.80 a 1.99)		6
	oblong (greater than 2)			oblongo (mayor a 2)		7
17.	Nut: shape in longitudinal section through suture (ratio length/width)			Nuez: forma en sección longitudinal a través de la sutura (relación largo/ancho)		
PQ	orbicular (1 to 1.39)			orbicular (1 a 1.39)		1
	ovate (1.40 to 1.59, widest at base)			ovado (1.40 a 1.59, más ancho en la base)		2
	oval elliptic (1.40 to 1.59, widest in middle)			oval elíptico (1.40 a 1.59, más ancho en el medio)		3
	obovate (1.40 to 1.59, widest at apex)			obovado (1.40 a 1.59, más ancho en el ápice)		4
	elliptic (1.60 to 1.79)			elíptico (1.60 a 1.79)		5
	oblong elliptic (1.80 to 1.99)			oblongo elíptico (1.80 a 1.99)		6
	oblong (greater than 2)			oblongo (mayor a 2)		7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18.	Nut: shape in cross section			Nuez: forma en sección transversal		
PQ	laterally compressed			lateralmente comprimido		1
	circular			circular		2
	flattened			aplanado		3
19.	Nut: apex			Nuez: ápice		
PQ	acuminate			acuminado		1
	apiculate			apiculado		2
	obtuse			obtuso		3
	rounded			redondeado		4
20.	Nut: base			Nuez: base		
PQ	caudate			caudada		1
	acuminate			acuminada		2
	apiculate			apiculada		3
	obtuse			obtusa		4
	rounded			redondeada		5
21.	Nut: intensity of ground color of shell			Nuez: intensidad del color de base de la cáscara		
QN	light			claro		3
	medium			medio		5
	dark			oscuro		7
22.	Nut: percentage of spotted surface			Nuez: porcentaje de superficie cubierta con manchas		
QN	low			baja		3
	medium			media		5
	high			alta		7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
23.	Nut: thickness of shell			Nuez: grosor de la cáscara		
QN	very thin			muy delgada		1
	thin			delgada		3
	medium			media		5
	thick			gruesa		7
24.	Nut: adherence of two halves of shell			Nuez: adherencia de las dos mitades de la cáscara		
QN	weak			débil		3
	medium			media		5
	strong			fuerte		7
25.	Nut: thickness of central partition wall			Nuez: grosor del tabique central		
QN	thin			delgado		3
	medium			medio		5
	thick			grueso		7
26.	Kernel: size			Semilla: tamaño		
QN	small			pequeño		3
	medium			medio		5
	large			grande		7
27.	Nut: intensity of ground color			Nuez: intensidad del color de fondo		
QN	very light			muy claro		1
	light			claro		3
	medium			medio		5

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
28.	Nut: percentage of weight relative to total weight of nut			Semilla: porcentaje del peso en relación con el peso total de la nuez		
QN	low			bajo		3
	medium			medio		5
	high			alto		7
29.	Kernel: ease of removal			Semilla: facilidad de extracción		
	easy			fácil		3
	medium			media		5
	difficult			difícil		7
30.	Time of leaf bud burst			Época de brotación de las hojas		
QN	early			temprana		3
	medium			media		5
	late			tardía		7
31.	Time of leaf fall			Época de defoliación		
QN	early			temprana		3
	medium			media		5
	late			tardía		7
32.	Time of female flowering			Época de floración femenina		
QN	early			temprana		3
	medium			media		5
	late			tardía		7
33.	Duration of female flowering			Duración de la floración femenina		
QN	short			corta		3
	medium			media		5
	long			larga		7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
34.	Time of male flowering			Época de floración masculina		
QN	early			temprana		3
	medium			media		5
	late			tardía		7
35.	Duration of male flowering			Duración de la floración masculina		
QN	short			corta		3
	medium			media		5
	long			larga		7
36.	Time of female flowering compared to male flowering			Época de floración femenina comparada con la floración masculina		
?	before (protogyny)			anterior (protoginia)		1
	simultaneous (homogamy)			simultánea (homogamia)		2
	after (protandry)			posterior (protandria)		3
37.	Time of begining of production			Época de comienzo de la producción		
QN	early			temprana		3
	medium			media		5
	late			tardía		7
38.	Distribution of highest productions			Distribución de las mayores producciones		
QN	early			temprana		3
	medium			media		5
	late			tardía		7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
39.	Time of maturity for harvest			Época de madurez para cosecha		
QN	early			temprana		3
	medium			media		5
	late			tardía		7
40.	Tendency to alternancy in production			Tendencia a la alternancia en la producción		
QL	absent			ausente		1
	present			presente		9

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)
- (b)
- (c)
- (d) etc.

8.2 *Explanations for individual characteristics*

Ad. x etc.

9. Literature

{xx}

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 Latin Name	<input type="text" value="Carya illinoensis"/>	
1.2 Common Name	<input type="text" value="PECAN 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"/>	

TECHNICAL QUESTIONNAIRE	Page (x) of {y}	Reference Number:
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4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross []
(please state parent varieties)

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

(c) totally unknown cross []

4.1.2 Mutation []
(please state parent variety)

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

4.1.4 Other []
(please provide details)

4.2 Method of propagating the variety

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

Characteristics	Example Varieties	Note

TECHNICAL QUESTIONNAIRE	Page (x) of {y}	Reference Number:
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6. Similar varieties and differences from these varieties

Please use the table, and space provided for comments, below 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
<i>Example</i>	<i>Fruit: size</i>	<i>small</i>	<i>medium</i>

Comments:

TECHNICAL QUESTIONNAIRE	Page (x) of {y}	Reference Number:
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7. Additional information which may help in the examination of the variety

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

Yes [] No []

(If yes, please provide details)

7.2 Special conditions for the examination of the variety

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

Yes [] No []

7.2.2 If yes, please give details:

7.3 Other information

A representative color photograph of the variety should accompany the Technical Questionnaire.

8. Authorization for release

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

Yes [] No []

(b) Has such authorization been obtained?

Yes [] No []

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

TECHNICAL QUESTIONNAIRE	Page (x) of {y}	Reference Number:
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9. Information on plant material to be examined.

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

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

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

Please provide details of where you have indicated "yes".

.....

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

Applicant's name

Signature

Date

[End of document]