



TG/JATRO_CUR(proj.1)

ORIGINAL: English

DATE: 2016-09-28

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

PHYSIC NUT

UPOV Code(s): JATRO_CUR

Jatropha curcas L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*prepared by experts from Mexico
to be considered by the
Technical Working Party for Fruit Crops
at its forty-seventh session, to be held in Angers, France,
from 2016-11-14 to 2016-11-18*

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Jatropha curcas</i> L.	Physic Nut			

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.

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1. SUBJECT OF THESE TEST GUIDELINES.....	4
2. MATERIAL REQUIRED.....	4
3. METHOD OF EXAMINATION.....	5
3.1 Number of Growing Cycles.....	5
3.2 Testing Place.....	5
3.3 Conditions for Conducting the Examination.....	5
3.4 Test Design.....	5
3.5 Additional Tests.....	5
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY.....	6
4.1 Distinctness.....	6
4.2 Uniformity.....	7
4.3 Stability.....	7
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL.....	8
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS.....	9
6.1 Categories of Characteristics.....	9
6.2 States of Expression and Corresponding Notes.....	9
6.3 Types of Expression.....	9
6.4 Example Varieties.....	10
6.5 Legend.....	11
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES.....	12
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS.....	19
8.1 Explanations covering several characteristics.....	19
8.2 Explanations for individual characteristics.....	19
9. LITERATURE.....	19
10. TECHNICAL QUESTIONNAIRE.....	21

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Jatropha curcas* 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 young plants or seed.

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

Vegetatively propagated varieties: 5 young plants.

Seed propagated varieties: 30 seeds.

In the case of seed, the seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent 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.

3.1.4 The growing cycle is considered to be the period ranging from the beginning of development of an individual flower or inflorescence, through fruit development and concluding with the harvesting of fruit from the corresponding individual flower or inflorescence.

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*

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

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

In the case of vegetatively propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 5 plants or parts taken from each of 5 plants and any other observation 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 5.

In the case of seed-propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 15 plants or parts taken from each of 15 plants and any other observation 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 5.

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 The assessment of uniformity for cross-pollinated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction.

4.2.3 For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, no off-types are allowed. For the assessment of uniformity of seed 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 15 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 further examined by testing a new seed or 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 blade: margin (characteristic 6)
 - (b) Leaf blade: number of lobes (characteristic 9)
 - (c) Petiole: intensity of anthocyanin coloration (characteristic 11)
 - (d) Fruit: length (characteristic 20)
 - (e) Seed: length (characteristic 25)
- 5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 "Examining Distinctness".

6. Introduction to the Table of Characteristics

6.1 *Categories of Characteristics*

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

6.2 *States of Expression and Corresponding Notes*

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

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

<i>State</i>	<i>Note</i>
small	3
medium	5
large	7

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

<i>State</i>	<i>Note</i>
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

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

6.3 *Types of Expression*

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

6.4 *Example Varieties*

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

6.5 Legend

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

- 1 Characteristic number
- 2 (*) Asterisked characteristic – see Chapter 6.1.2
- 3 Type of expression
 QL Qualitative characteristic – see Chapter 6.3
 QN Quantitative characteristic – see Chapter 6.3
 PQ Pseudo-qualitative characteristic – see Chapter 6.3
- 4 Method of observation (and type of plot, if applicable)
 MG, MS, VG, VS – see Chapter 4.1.5
- 5 (+) See Explanations on the Table of Characteristics in Chapter 8.2
- 6 (a)-(e) See Explanations on the Table of Characteristics in Chapter 8.1
- 7 Not applicable

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	QN VG					
	Plant: growth habit					
	upright					1
	semi-upright					2
	spreading					3
2. (*)	QN MS/VS	(a)				
	Leaf blade: length					
	short					3
	medium					5
	long					7
3.	QN MS/VS	(a)				
	Leaf blade: width					
	narrow					3
	medium					5
	broad					7
4.	QN MS/VS	(a)				
	Leaf blade: ratio length/width					
	small					3
	medium					5
	large					7
5.	QL VG	(a)				
	Leaf blade: shape of base					
	rounded					1
	cordate					2
6. (*)	QL VG	(a)				
	Leaf blade: margin					
	entire					1
	serrate					2

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7.	QL	VG	(a)				
	Leaf blade: shape of apex						
	apiculate						1
	acuminate						2
8.	QN	VG	(a)				
	Leaf blade: intensity of anthocyanin coloration						
	absent or very weak						1
	weak						3
	medium						5
	strong						7
	very strong						9
9. (*)	QN	VG	(a)				
	Leaf blade: number of lobes						
	none or few						1
	medium						2
	many						3
10. (*)	QN	VG	(b)				
	Petiole: length						
	short						3
	medium						5
	long						7
11. (*)	QN	VG	(b)				
	Petiole: intensity of anthocyanin coloration						
	absent or very weak						1
	medium						3
	strong						5

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
12.	QL	MG/MS	(c)				
	Inflorescence: flowers						
	mainly male						1
	only female						2
	mainly female						3
	mainly hermaphrodite						4
13.	PQ	VG	(c)				
	Female flower: shape of sepal						
	elliptic						1
	medium ovate						2
	broad ovate						3
	triangular						4
14.	QN	MG	(c)				
	Female flower: length of petal						
	short						1
	medium						2
	long						3
15.	QN	MG	(c)				
	Female flower: width of petal						
	narrow						1
	medium						2
	broad						3
16.	QN	MG	(c)				
	Female flower: ratio length/width of petal						
	small						1
	medium						2
	large						3

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17.	QN	VG	(c)				
	Female flowers: intensity of green color of petal						
	light						1
	medium						2
	dark						3
18.	QN	VG	(d)				
	Immature fruit: intensity of green color						
	light						1
	medium						2
	dark						3
19. (*)	QN	MG	(e)				
	Fruit: pericarp thickness						
	thin						3
	medium						5
	thick						7
20. (*)	QN	MG	(e)				
	Fruit: length						
	short						3
	medium						5
	long						7
21.	QN	MG	(e)				
	Fruit: width						
	narrow						3
	medium						5
	broad						7
22.	QN	MG	(e)				
	Fruit: ratio length/width						
	small						3
	medium						5
	large						7

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23. (*)	QN	MG	(e)				
	Fruit: length of peduncle						
	short						3
	medium						5
	long						7
24.	PQ	VG	(e)				
	Seed: shape						
	oblong						1
	elliptic						2
	obovate						3
25. (*)	QN	MG	(e)				
	Seed: length						
	short						3
	medium						5
	long						7
26.	QN	MG	(e)				
	Seed: width						
	narrow						3
	medium						5
	broad						7
27.	QN	MG	(e)				
	Seed: length/width ratio						
	small						3
	medium						5
	large						7
28.	QN	MG	(e)				
	Seed: thickness						
	thin						3
	medium						5
	thick						7

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29.	QN	MG	(e)				
	Endocarp: intensity of brown color						
	light						1
	medium						2
	dark						3
30. (*)	QL	MG	(e)				
	Endocarp: brightness						
	opaque						1
	bright						9
31.	QN	MG	(e)				
	Endocarp: rugosity						
	absent or low						1
	medium						2
	high						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 blade: Observations on the leaf blade should be made on mature leaves. Leaves should be taken from the middle third of the current season's growth.
- (b) Petiole: Observations on the leaf petiole should be made on mature leaves. Leaves should be taken from the middle third of the current season's growth and from the leaf attached adjacent to the inflorescence.
- (c) Inflorescence: All observations on the inflorescence should be made at the time of full flowering.
- (d) Immature fruit: Observations on the immature fruit should be made taken from the middle part of the fruiting region at the time of harvest maturity.
- (e) Fruit and seed: Observations on the fruit and seed should be made taken from the middle part of the fruiting region at the time of the fruit ripening.

8.2 *Explanations for individual characteristics*

9. Literature

Avendaño-Arzate, C.H., Zamarripa-Colmenero, A. 2012: Guía gráfica de descriptores varietales de piñón mexicano (*Jatropha curcas* L.) Publicación Especial Núm. 1. Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias. Campo Experimental, Tuxtla Chico, Chiapas, México. 76 pp.

Barrientos Priego, A., Córdova Téllez, L. Zamarripa Colmanero, A., Avendaño Arrazate, C.H. 2014: Guía técnica para la descripción varietal de jatropha (*Jatropha curcas* L.). Servicio Nacional de Inspección y Certificación de Semillas, Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación. Tlalnepantla, Estado de México, México. 19 p.

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	<input type="text" value="Jatropha curcas L."/>
1.2	Common name	<input type="text" value="Physic 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)

(.....) 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:
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4.2	Method of propagating the variety	
4.2.1	Other (Please provide details)	[]
	<input type="text"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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 Leaf blade: length (2)		
short		3 []
medium		5 []
long		7 []
5.2 Leaf blade: margin (6)		
entire		1 []
serrate		2 []
5.3 Leaf blade: number of lobes (9)		
none or few		1 []
medium		2 []
many		3 []
5.4 Petiole: length (10)		
short		3 []
medium		5 []
long		7 []
5.5 Petiole: intensity of anthocyanin coloration (11)		
absent or very weak		1 []
medium		3 []
strong		5 []
5.6 Fruit: pericarp thickness (19)		
thin		3 []
medium		5 []
thick		7 []
5.7 Fruit: length (20)		
short		3 []
medium		5 []
long		7 []

Characteristics	Example Varieties	Note
5.8 Fruit: length of peduncle		
(23)		
short		3 []
medium		5 []
long		7 []
5.9 Seed: length		
(25)		
short		3 []
medium		5 []
long		7 []
5.10 Endocarp: brightness		
(30)		
opaque		1 []
bright		9 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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
<i>Example</i>	<i>Seed: length</i>	<i>short</i>	<i>long</i>
Comments:			

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