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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

CANNA *

UPOV Code: CANNA

Canna L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from France

*to be considered by the
Technical Working Party for Ornamental Plants and Forest Trees
at its thirty-eighth session
to be held in Seoul, Republic of Korea, from September 12 to 16, 2005*

Alternative Names: *

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Canna L.</i>	Canna	Balisier, Canna	Blumenrohr	Achira

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 *Canna* 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 rhizomes able to give a normal flowering.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:
- Rhizomes able to give a normal flowering.
- Height rhizomes
-

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*

The minimum duration of tests should normally be a single growing cycle

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 recommended method of observing the characteristic is indicated by the following key in the second column of the Table 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

3.3.3 Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background.

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 6 plants.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations should be made on 6 plants or parts taken from each of 6 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 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.

4.2 *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 6 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.

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: color of blade (characteristic 10)
- (b) Leaf: variegation (characteristic 14)
- (c) Flower: number of colors (characteristic 19)
- (d) Flower: edging on petals (characteristic 22)

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 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: single measurement of a group of plants or parts of plants – see Chapter 3.3.1

MS: measurement of a number of individual plants or parts of plants – see Chapter 3.3.1

VG: visual assessment by a single observation of a group of plants or parts of plants – Chapter 3.3.1

VS: visual assessment by observation of individual plants or parts of plants” –see Chapter 3.3.1

(a)-{x} 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.	MG	Plant: height	Plante: hauteur	Pflanze:	Planta:	
QN	short	basse				3
	medium	moyenne				5
	tall	haute				7
2.	VG	Plant: attitude	Plante: port	Pflanze: Wuchsform	Planta:	
QN	upright	dressé				1
	semi upright	demi dressé				2
	spreading	étalé				3
3.	MG	Plant: number of ramifications	Plante : nombre de ramifications			
QN	low	faible				3
	medium	moyen				5
	high	fort				7
4. (*)	VG	Plant: anthocyanin coloration of stem	Plante : pigmentation anthocyanique de la tige			
QL	absent	absente				1
	present	présente				9
5.	VG	Plant : intensity of anthocyanin coloration of stem	Plante : intensité de la coloration anthocyanique			
QN	very weak	très faible				1
	weak	faible				3
	medium	moyenne				5
	strong	forte				7
	very strong	très forte				9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6.	VG	Leaf : width	Feuille : largeur			
QN	narrow	étroite				3
	medium	moyenne				5
	broad	large				7
7.	VG	Leaf : ratio height/width	Feuille : rapport hauteur/largeur			
QN	higher than broad	plus haut que large				1
	as high as broad	aussi haut que large				2
	broader than high	plus large que haut				3
8.	VG	Leaf : conspicuousness of nerves	Feuille : netteté des nervures			
QL	absent	absente				1
	present	présente				9
9.	VG	Leaf : intensity of conspicuousness of nerves	Feuille: intensité de la netteté des nervures			
QN	very weak	très faible				1
	weak	faible				3
	medium	moyenne				5
	strong	forte				7
	very strong	très forte				9
10. (*).	VG	Leaf: color of blade	Feuille : couleur du limbe			
PQ	yellow	jaune				1
	red	rouge				2
	green	vert				3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11.	VG	Leaf: intensity of color of blade	Feuille : intensité de la couleur			
QN	very weak	très faible				1
	weak	faible				3
	medium	moyenne				5
	strong	forte				7
	very strong	très forte				9
12.	VG	Leaf : anthocyanin coloration of blade	Feuille : coloration anthocyanique du limbe			
QL	absent	absente				1
	present	présente				9
13.	VG	Leaf: intensity of anthocyanin coloration of blade	Feuille: intensité de la pigmentation anthocyanique			
QN	very weak	très faible				1
	weak	faible				3
	medium	moyenne				5
	strong	forte				7
	very strong	très forte				9
14. (*)	VG	Leaf : variegation	Feuille : panachure			
QL	absent	absente				1
	present	présente				9
15.	VG	Leaf: intensity of variegation	Feuille : intensité de la panachure			
QN	very weak	très faible				1
	weak	faible				3
	medium	moyenne				5
	strong	forte				7
	very strong	très forte				9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16.	MG	Inflorescence : length of stalk end	Inflorescence : longueur de la hampe florale			
QN	short	courte				3
	medium	moyenne				5
	long	longue				7
17.	VG	Inflorescence : number of flowers	Inflorescence : nombre de fleurs			
QN	few	petit				3
	medium	moyen				5
	many	grand				7
18.	VG	Flower : size	Fleur : taille			
QN	very small	très petite				1
	small	petite				3
	medium	moyenne				5
	large	grande				7
	very large	très grande				9
19. (*)	VG	Flower : number of colors	Fleur : nombre de couleurs			
QL	single-colored	unicolore				1
	bicolored	bicolore				2
20. (*)	VG	Flower : main color(there are no levels)	Fleur : couleur principale (il n'y a pas de niveaux)			
PQ	RHS Colour Chart (indicate reference number)					

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21.	VG	Flower : intensity of color	Fleur : intensité de la couleur			
QN	very weak	très faible				1
	weak	faible				3
	medium	moyenne				5
	strong	forte				7
	very strong	très forte				9
22.	VG	Flower : edging on petals	Fleur : liseré du bord des pétales			
(*)						
(+)						
QL	absent	absente				1
	present	présente				9
23.	VG	Flower : width of edging on petals	Fleur : intensité de l'épaisseur du liseré			
QN	very narrow	très faible				1
	narrow	faible				3
	medium	moyenne				5
	wide	forte				7
	very wide	très forte				9
24.	VG	Flower : color of edging	Fleur : couleur du liseré			
(*)						
QL	yellow	jaune				1
	orange	orange				2
	red	rouge				3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
25.	VG	Flower : intensity of color of edging	Fleur : intensité de la couleur			
QN	very weak	très faible				1
	weak	faible				3
	medium	moyenne				5
	strong	forte				7
	very strong	très forte				9
26.	VG	Flower : secondary color pattern	Fleur: distribution de la couleur secondaire			
(+)						
QL	spotted	moucheté				1
	striped	strié				2
	stained	maculé				3
27.	VG	Flower : distribution of secondary coloration	Fleur : localisation de la couleur secondaire			
PQ	basal	a la base				1
	on the half lower side	sur la moitié inférieure				2
	on the half upper side	sur la moitié supérieure				3
	on the whole	sur l'ensemble				4
28.	VG	Flower : secondary color	Fleur : couleur secondaire			
(*)						
PQ	yellow	jaune				1
	red	rouge				2
	orange	orange				3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29.	VG	Flower : intensity of secondary color	Fleur : intensité de la couleur			
QN	very weak	très faible				1
	weak	faible				3
	medium	moyenne				5
	strong	forte				7
	very strong	très forte				9
30.	MG	Time of flowering	Époque de floraison			
QN	very early	très précoce				1
	early	précoce				3
	medium	moyenne				5
	late	tardive				7
	very late	très tardive				9
31.	VG	Fruit: color of husk (before maturity)	Fruit: couleur de l'enveloppe avant maturité			
PQ	green	vert				1
	red	rouge				2
	reddish green	vert pigmenté de rouge				3
32.	VG	Fruit : size	Fruit : taille des fruits			
QN	small	petite				3
	medium	moyenne				5
	large	grande				7
33.	VG	Fruit : presence of seeds	Fruit : graines			
QL	absent	absente				1
	present	présente				9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
34.	Fruit : number of seeds	Fruit : nombre de graines				
VG	few	petit				3
QN	medium	moyen				5
	many	grand				7
35.	VG Rhizome : color	Rhizome : couleur				
QL	beige	beige				1
	pinkish	rosé				2
36.	VG Rhizome : intensity of color	Rhizome : intensité de la couleur				
QN	very weak	très faible				1
	weak	faible				3
	medium	moyenne				5
	strong	forte				7
	very strong	très forte				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) etc.

8.2 *Explanations for individual characteristics*

9. Literature

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
<p>TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p>		
<p>1. Subject of the Technical Questionnaire</p> <p>1.1 Botanical name <input type="text" value="Canna L."/></p> <p>1.2 Common name <input type="text" value="Canna"/></p>		
<p>2. Applicant</p> <p>Name <input type="text"/></p> <p>Address <input type="text"/></p> <p>Telephone No. <input type="text"/></p> <p>Fax No. <input type="text"/></p> <p>E-mail address <input type="text"/></p> <p>Breeder (if different from applicant) <input type="text"/></p>		
<p>3. Proposed denomination and breeder's reference</p> <p>Proposed denomination (if available) <input type="text"/></p> <p>Breeder's reference <input type="text"/></p>		

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)	[]	
(b) partially known cross (please state known parent variety(ies))	[]	
(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)	[]	
4.2 Method of propagating the variety		
4.2.1 Vegetative propagation		
(a) cuttings	[]	
(b) <i>in vitro</i> propagation	[]	
(c) other (state method)	[]	
4.2.2 Seed	[]	
4.2.3 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:
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:	
<p>6. Similar varieties and differences from these varieties</p> <p><i>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.</i></p>			
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>[e.g. Flower color]</i>	<i>[e.g. orange]</i>	<i>[e.g. orange red]</i>
<p>Comments:</p>			

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>#7. Additional information which may help in the examination of the variety</p> <p>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?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.2 Are there any special conditions for growing the variety or conducting the examination?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.3 Other information</p> <p>7.3.1 Main use</p> <p>(a) garden plant []</p> <p>(b) pot plant []</p> <p>(c) cut-flower []</p> <p>(d) other []</p> <p>(please provide details)</p> <p>A representative color photograph of the variety should accompany the Technical Questionnaire.</p>		
<p>8. Authorization for release</p> <p>(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?</p> <p>Yes [] No []</p> <p>(b) Has such authorization been obtained?</p> <p>Yes [] No []</p> <p>If the answer to (b) is yes, please attach a copy of the authorization.</p>		

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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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”.

.....

9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes []

(please provide details as specified by the Authority)

No []

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]