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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 experts from France**to be considered by the**Technical Working Party for Ornamental Plants and Forest Trees
at its fortieth session, to be held in Kunming, China, from July 2 to 6, 2007*

Alternative Names: *

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Canna</i> L.	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 vegetatively 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 or plants able to give a normal flowering.

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

10 rooted plants, or rhizomes, able to give a normal flowering within one season and should have never flowered before

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 8 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 8 plants or parts taken from each of 8 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 8 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) Plant: total height at flowering (characteristic 1)
- (b) Leaf blade: main color (characteristic 6)
- (c) Leaf blade: variegation (characteristic 7)
- (d) Leaf blade: variegation color (characteristic 8)
- (e) Leaf blade: anthocyanin coloration (characteristic 9)
- (f) Flower: number of colors (characteristic 18)
- (g) Flower: main color (characteristic 19)
- (h) Flower: secondary color (characteristic 20) to be discussed

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, MS, VG, VS: See Chapter 3.3.2

(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: total height at flowering	Plante: hauteur totale à la floraison	Pflanze:	Planta:		
QN	short	basse			Tafraout	3
	medium	moyenne			Oiseau de feu	5
	tall	haute			Liberté	7
2. VG	Plant: growth habit	Plante: port	Pflanze: Wuchsform	Planta:		
QN	upright	dressé			Florence Waugham	1
	semi upright	demi dressé			Pretoria, Prince Charmant	2
3. MG (*)	Leaf blade : length of blade	Limbe foliaire : longueur du limbe				
QN	short	courte			Lolita, Turcano	3
	medium	moyenne			Oiseau d'or	5
	tall	Longue			Liberté	7
4. VG	Leaf blade: width	Limbe foliaire : largeur				
QN	narrow	étroite			Lucifer	3
	medium	moyenne			Oiseau de feu	5
	broad	large			Liberté	7
5. VG (*)	Leaf : conspicuousness of veins	Feuille : netteté des nervures				
QN	absent or very weak	absent ou très faible			Confetii	1
	weak	faible			Bonnezeau	3
	medium	moyenne			Oiseau d'Or	5
	strong	forte			Louis Cottin	7
	very strong	très forte			Durban	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6. (*)(+)	VG Leaf blade : main color (excluding variegation)	Limbe foliaire : couleur principale (à l'exclusion de la panachure)			France 07 proposes to delete state s'yellow'. 'Yellow' type is 'light green'	
PQ	yellow	jaune				1
	green	verte			Oiseau d'Or	2
	red purple	rouge pourpre			Liberté	3
7. (*)	VG Leaf blade: variegation	Limbe foliaire : panachure				
QL	absent	absente			Oiseau de Feu	1
	present	présente			Prétoria, Stuttgart	9
8. (*)	VG Leaf blade: variegation color	Limbe foliaire : couleur de la panachure				
QL	cream white	blanc crème			Stuttgart	1
	yellow	jaune			Prétoria	2
9. (*)	VG Leaf blade: anthocyanin coloration	Limbe foliaire : coloration anthocyanique				
QL	absent	absente			Oiseau de feu	1
	present	présente			Liberté	9
10.	VG Leaf blade: intensity of anthocyanin coloration	Limbe foliaire : intensité de la pigmentation anthocyanique				
QN	weak	faible			Angèle Martin	3
	medium	moyenne			Hercule	5
	strong	forte			Liberté	7
	very strong	très forte			Australia	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11. (*)	VG	Leaf blade: anthocyanin coloration pattern	Limbe foliaire : répartition de la pigmentation anthocyanique			
QL	diffuse	diffuse			Liberté	1
	along veins	le long des nervures			Durban	2
	both	les deux				3
12.	VG	Leaf blade: intensity of main color for varieties without anthocyan	Limbe foliaire : intensité de la couleur principale pour les variétés sans anthocyan		To be placed after character 6 ?	
QN	weak	faible			Oiseau d'Or	3
	medium	moyenne			Centenaire	5
	strong	forte			Roi soleil	7
13.	MG	Inflorescence : length of flowering part of stalk end (at the opening of the first flower)	Inflorescence : longueur de la partie florifère de la hampe florale (à l'ouverture de la hampe florale)			
QN	short	courte			Flamèche	3
	medium	moyenne			Roi Soleil	5
	long	longue			Liberté	7
14.	MG	Inflorescence : thickness of flower stalk at base, at full flowering	Inflorescence : épaisseur de la hampe florale à la base, à la pleine floraison			
QN	thin	fine			Diana, Gracia	3
	medium	moyenne			Extra	5
	thick	épaisse			Pallagszépe	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
15. VG	Plant: position of the inflorescence part in relation with the foliage	Plant : position relative de l'inflorescence par rapport au feuillage				
QN	at same level	au même niveau			Flamèche	1
	above	au dessus			Félix Ragot	2
	strongly above	nettement au dessus			Liberté	3
16. MG	Inflorescence : number of flowers	Inflorescence : nombre de fleurs			To check if it could be deleted: France 07 maintains the deletion	
QN	few	petit				3
	medium	moyen				5
	many	grand				7
17. VG (*)	Flower : size	Fleur : taille				
QN	very small	très petite			Stuttgart	1
	small	petite			Yara	3
	medium	moyenne			Roi Soleil	5
	large	grande			Liberté	7
18. MG (*)	Flower : number of colors	Fleur : nombre de couleurs				
QN	one	unicolore			Roi Soleil	1
	two	bicolore			Reine Charlotte, En Avant	2

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
19. (*)	VG Flower : main color	Fleur : couleur principale				
	cream	crème			Oiseau d'Or	
	yellow	jaune			Félix Ragot	
	orange	orange			Liberté	
	pink	rose			Extase	
	red	rouge			Roi Soleil	
	RHS Colour Chart (indicate reference number)					
20. (*)	VG Flower : secondary color	Fleur : couleur secondaire			Check if states 'white' and 'white cream' are necessary: France07 agrees for state 'white cream'	
PQ	white cream	blanc crème			Horn	1
	yellow	jaune			Reine Charlotte	2
	red	rouge			En Avant	3
21. (*)	VG Flower : secondary color pattern	Fleur : répartition de la couleur secondaire				
QL	shaded or splashed	diffuse (ou maculée)			Picador	1
	spotted or speckled	moucheté (ou tacheté)			En Avant	2
	with margin	bordé (ou avec une bordure)			Reine Charlotte	3
	with border	avec liseré			Lolita	4
21.a	VG Flower: shade				France 07: a flower can have several coloration patterns. France will deliver example varieties	
QL	absent					
	present					

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
(i)	Flower: color of the shade					
	white cream					
	yellow					
	red					
(ii)	Flower: splash					
	absent					
	present					
(iii)	Flower: color of the splash					
	white cream					
	yellow					
	red					
(iv)	Flower: spots					
	absent					
	present					
(v)	Flower: color of the spots					
	white cream					
	yellow					
	red					
(vi)	Flower: margin					
	absent					
	present					
(vii)	Flower: color of the margin					
	white cream					
	yellow					
	Red					

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
22. VG	Staminodes: position (open flower)	Staminodes: position (fleur ouverte)				
(+)						
PQ	upright	dressé			Angèle Martin	1
	semi upright	demi dressé			Peau rouge	2
	spreading	retombant			Florence Waugham	3
23. VG	Staminodes: overlapping	Staminodes : chevauchement				
QL	absent	absent			Perkéo	1
	présent	présente			Peau Rouge	9
24. MG	Time of flowering (*)	Époque de floraison				
QN	very early	très précoce				1
	early	précoce			Corial	3
	medium	moyenne			Roi Soleil	5
	late	tardive			Liberté	7
	very late	très tardive				9
25. VG	Rhizome : skin color	Rhizome : couleur de l'épiderme				
QL	beige	beige			Pax	1
	pinkish	rosé			Gracia	2

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:

8.2 *Explanations for individual characteristics*

9. Literature

Cooke, I., 2001: Gardeners Guide to Growing Cannas, edit David and Charles

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
<p style="text-align: center;">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:
<p>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).</p>		
Characteristics	Example Varieties	Note
5.1 Plant: total height at flowering (1)		
5.2 Leaf blade: main color (6)		
5.3 Leaf blade: variegation (7)		
5.4 Leaf blade: variegation color (8)		
5.5 Leaf blade: anthocyanin coloration (9)		
5.6 Flower: number of colors (18)		
5.7 Flower: main color (19)		
5.8 Flower: secondary color (20)		

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>Flower color</i>	<i>orange</i>	<i>orange red</i>
<p>Comments:</p>			

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 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]