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TG/CANNA(proj.4)
ORIGINAL: English
DATE: 2008-05-13

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 forty-first session, to be held in Wageningen, Netherlands, from June 9 to 13, 2008

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Canna L.	Canna, Indian Shot	Balisier, Canna	Blumenrohr	Achira, Platanillo

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 propagated 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 young plants.

2.3 The minimum quantity of plant material, to be provided by the applicant, should be 10 rooted plants, or rhizomes, which will flower within one year and display all characteristics of the variety.

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:

NZ08: to check if we need all these options

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.

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 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 beginning of flowering (characteristic 1)
(b) Leaf blade: main color (characteristic 7)
(c) Leaf blade: secondary color (characteristic 9)
(d) Staminode: number of colors (characteristic 18)
(e) Staminode: ground color (characteristic 19)

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, 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 beginning of flowering**	**Plante: hauteur totale au début de la floraison**	**Pflanze:**	**Planta:**		
QN		short	basse			Tafraout	3
		medium	moyenne			Oiseau de feu	5
		tall	haute			Liberté	7
		HU proposal: to add a new char Plant number of shoots: few Alberich 3 medium Picasso, Aranyalom 5 many Richard Wagner, Lucifer					
2.	**VG**	**Plant: growth habit**	**Plante: port**	**Pflanze: Wuchsform**	**Planta:**		
QL		upright	dressé			Florence Waugham	1
		semi upright	demi dressé			Pretoria, Prince Charmant	2
3. (*)	**MG**	**Leaf blade: length**	**Limbe foliaire : longueur**				
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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5. (*)	**VG**	**Leaf: conspiciousness of veins**	**Feuille : netteté des nervures**	NZ proposes to include the color of the veins			
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
6. (*)		**Leaf blade: number of colors**	**Limbe foliaire: nombre de couleur**				
QN		one	une			Oiseau d'or	1
		two	deux			Stuttgart	2
		three	trois				3
7. (*)	**VG**	**Leaf blade: main color**	**Limbe foliaire : couleur principale**				
PQ?		yellowish white	blanc jaunâtre				1
		yellow	jaune				2
		yellow green	jaune vert			Pretoria	3
		green	vert			Oiseau d'or	4
		orange	orange				5
		orange brown	orange marron				6
		brown	marron				7
		purple	violet			Liberté	8
8. (*)		**Leaf blade: intensity of main color**	**Limbe foliaire: intensité de la couleur principale**				
QN?		weak	faible			Oiseau d'or ?	
		medium	moyenne				
		strong	forte			Liberté	

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. (*)		**Leaf blade: secondary color**	**Limbe foliaire : couleur secondaire**				
		yellowish white	blanc jaunâtre			Stuttgart	1
		yellow	jaune				2
		yellow green	jaune vert				3
		green	vert				4
		orange	orange				5
		orange brown	orange marron				6
		brown	marron				7
		purple	violet				8
10. (*)		**Leaf blade: pattern of secondary color**	**Limbe foliaire: distribution de la couleur secondaire**	NZ proposal To add more states: marginal, blotched, marbled			
		diffused	diffuse				
		along veins	le long des nervures				
		both	les deux			Stuttgart	
11.	**VG**	**Plant: position of the inflorescence in relation to foliage**	**Plant : position relative de l'inflorescence par rapport au feuillage**	NZ proposal char 13 moved before char 11 (ok)			
QN	**(a)**	at same level	au même niveau			Flamèche	1
		moderately above	légèrement au dessus			Félix Ragot	2
		strongly above	nettement au dessus			Liberté	3
12.	**MG**	**Inflorescence: length excluding peduncle**	**Inflorescence : longueur en excluant le pédoncule**				
QN	**(a)**	short	courte			Flamèche	3
		medium	moyenne			Roi Soleil	5
		long	longue			Liberté	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13. **(+)**	**MG**	**Inflorescence: thickness at top of peduncle**	**Inflorescence : épaisseur en haut du pédoncule**				
QN	**(a)**	thin	fine			Diana, Gracia	3
		medium	moyenne			Extra	5
		thick	épaisse			Pallagszépe	7
14.	**VG**	**Inflorescence: arrangement of staminodes**	**Inflorescence : position des staminodes**	NZ proposal to place char 17 after 12 (ok) and to change staminode attitude by Inflorescence: arrangement of staminodes (ok).			
QL		free	libre			Perkéo	1
		intermediate	intermédiaire	FR proposal To delete intermediate			2
		overlapping	se chevauchant			Peau Rouge	3
15.		**Staminode: type**	**Staminode : type**				
		single	simple			Plantagenet	1
		double	double				2
		NZ proposal to add a new char Staminode: undulation 1 absent or weak 2 medium 3 strong Alberich					
16. **(*)**	**VG**	**Staminode: size (excluding first flower)**	**Staminode : taille (en excluant la première fleur)**	NZ proposal: size to be replaced by length and width			
QN		very small	très petite			Stuttgart	1
		small	petite			Yara	3
		medium	moyenne			Roi Soleil	5
		large	grande			Liberté	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17. **(+)**	**VG**	**Staminode: reflexing (open flower)**	**Staminode: courbure (fleur ouverte)**				
QN		weak	faible			Angèle Martin	1
		medium	moyenne			Peau rouge	2
		strong	forte			Florence Waugham	3
18. **(*)**	**MG**	**Staminode: number of colors**	**Staminode : nombre de couleurs**				
QL		one	une			Roi Soleil	1
		two	deux			En Avant, Reine Charlotte	2
		more than two	plus de deux				3
19. **(*)**	**VG**	**Staminode: ground color**	**Staminode : couleur principale**				
		cream	crème			Oiseau d'Or	1
		yellow	jaune			Félix Ragot	2
		orange	orange			Liberté	3
		pink	rose			Extase	4
		red	rouge			Roi Soleil	5
		RHS Colour Chart (indicate reference number)	NZ and FR proposals: we must choose between the ground color and RHS code OR to maintain both				
20.	**VG**	**Staminode: flush**	**Staminode: zone irisée**				
QL		absent	absent				1
		present	présent				9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21.	**Staminode: color of flush**	**Staminode: couleur de la zone irisée**				
?	yellowish white	blanc jaunâtre				1
	yellow	jaune				2
	yellow orange	jaune orange				3
	red	rouge				4
22.	**Staminode: stripes**	**Staminode: stries**				
?	absent	absentes				1
	present	présentes				9
23.	**Staminode: color of stripes**	**Staminode: couleur des stries**				
?	yellowish white	blanc jaunâtre				1
	yellow	jaune				2
	yellow orange	jaune orange				3
	red	rouge				4
24.	**Staminode: blotch**	**Staminode: taches**				
?	absent	absentes			Brillant, Oiseau d'or	1
	present	présentes			Dollar	9
25.	**Staminode: color of blotch**	**Staminode: couleur des taches**				
?	yellowish white	blanc jaunâtre				1
	yellow	jaune				2
	yellow orange	jaune orange				3
	red	rouge			Dollar	4
26.	**Staminode: marginal zone**	**Staminode: bordure**				
?	absent	absente			Brillant	1
	present	présente			Reine Charlotte	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
27.		**Staminode: color of marginal zone**	**Staminode: couleur de la bordure**				
?		yellowish white	blanc jaunâtre				1
		yellow	jaune			Lolita, Lucifer, Reine Charlotte	2
		yellow orange	jaune orange				3
		orange	orange				4
		pink	rose				
		orange red	rouge orangé				
		red	rouge				4
28. (*)	**MG**	**Time of flowering**	**Époque de floraison**				
QN		very early	très précoce	FR proposal: to delete			1
		early	précoce			Corial	3
		medium	moyenne			Roi Soleil	5
		late	tardive			Liberté	7
		very late	très tardive	FR proposal: to delete			9
29.	**VG**	**Rhizome: color of skin**	**Rhizome : couleur de l'épiderme**				
QL		yellow brown	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

Ad. 1: Plant: total height at beginning of flowering
Add.1 : Plante: hauteur totale en début de floraison:

Plant height includes the inflorescence (the flower spike) and is determined at the beginning of flowering.

Ad.13: Inflorescence: thickness at top of peduncle
Add. 13: Inflorescence : épaisseur sur le haut du pédoncule

Ad. 17: Staminode: reflexing (open flower)

[TO BE PROVIDED]

9. Literature

Cooke, I., 2001: Gardeners Guide to Growing Cannas, Timber Press, 160 pp.

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	*Canna* L.
1.2 Common name	Canna

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)
(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) *in vitro* 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
5.1 (1)	**Plant: total height at beginning of flowering**		
	short	Tarfraout	3[ ]
	medium	Oiseau de feu	5[ ]
	tall	Liberté	7[ ]
5.2 (7)	**Leaf blade: main color**		
	yellowish white		1[ ]
	yellow		2[ ]
	yellow green	Pretoria	3[ ]
	green	Oiseau d'or	4[ ]
	orange		5[ ]
	orange brown		6[ ]
	brown		7[ ]
	purple	Liberté	8[ ]
5.3 (9)	**Leaf blade: secondary color**		
	yellowish white	Stuttgart	1[ ]
	yellow		2[ ]
	yellow green		3[ ]
	green		4[ ]
	orange		5[ ]
	orange brown		6[ ]
	brown		7[ ]
	purple		8[ ]

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

	Characteristics	Example Varieties	Note
5.4 (18)	**Staminode: number of colors**		
	one	Roi Soleil	1[ ]
	two	En Avant, Reine Charlotte	2[ ]
	more than two		3[ ]
5.7 (19)	**Staminode: ground color**		
	cream	Oiseau d'Or	1[ ]
	yellow	Félix Ragot	2[ ]
	orange	Liberté	3[ ]
	pink	Extase	4[ ]
	red	Roi Soleil	5[ ]
	RHS Colour Chart (indicate reference number)		
5.8 (20)	**~~Flower: secondary color~~ ???**		

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

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Flower color*	*orange*	*orange red*

Comments:

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

[#]7. Additional information which may help in the examination of the variety

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

7.3.1 Main use

(a) garden plant [ ]
(b) pot plant [ ]
(c) cut-flower [ ]
(d) other [ ]
(please provide details)

7.3.2 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.

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

9. Information on plant material to be examined or submitted for examination.

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

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

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details for where you have indicated “yes”.

……

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]