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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

Cordyline

UPOV Code: CORDY

Cordyline Comm. ex Juss. *

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by (an) expert(s) from New Zealand

to be considered by the

Technical Working Party for Ornamental Plants and Forest Trees
at its forty-eighth session
to be held in Cambridge, United Kingdom,
from 2015-09-14
to 2015-09-18

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Cordyline Comm. ex Juss., Cordyline Comm. ex R. Br.	Cordyline	Cordyline	Cordyline, Keulenbaum, Keulenlilie	Cordyline

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.]

TABLE OF CONTENTS PAGE

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of Cordyline Comm. ex Juss..

excluding Cordyline brasiliensis Planch. and Cordyline fruticosa (L.) A. Chev.

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of Plants which are capable of expressing the relevant characteristics of the variety in the first growing season.

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

8 plants

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 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 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. The color chart and version used should be specified in the variety description.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 8 plants.

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 / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 7 plants or parts taken from each of 7 plants and any other observations 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 2.

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 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 further examined by testing a new 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) Plant: growth habit (characteristic 1)
(b) Plant: basal shoots (characteristic 4)
(c) Leaf blade: width (characteristic 16)
(d) Leaf: main color (characteristic 19)
(e) Leaf: secondary color (characteristic 20)

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:

State	Note
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:

State	Note
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

(*) 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 4.1.5

(a)-(d) See Explanations on the Table of Characteristics in Chapter 8.

(+) See Explanations on the Table of Characteristics in Chapter 8.

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				Southern Splendour	1
semi upright				Tana	3
spreading				Red Fountain	5
2. QN VG (+) **Plant: height**	**Plante: hauteur**	**Pflanze: Höhe**	**Planta: altura**		
short	basse	niedrig	baja	Tana	3
medium	moyenne	mittel	media	Red Fountain	5
tall	haute	hoch	alta	Jel01	7
3. QN VG **Plant: width**	**Plante : largeur**	**Pflanze: Breite**	**Planta: anchura**		
narrow	étroite	schmal	estrecha	Pink Champagne	3
medium	moyenne	mittel	medio	Red Star	5
broad	large	breit	ancha	Can Can	7
very broad	très large	sehr breit	muy ancha	Red Fountain	9
4. (*) QL VG (+) **Plant: basal shoots**					
absent				Southern Splendour	1
present				Tana	9
5. QN VG (+) **Plant: number of basal shoots**	**Plante: nombre de pousses basales**	**Pflanze: Anzahl Basistriebe**	**Planta: número de ramas basales**		
few				Green Goddess	1
medium				Tana	2
many				Red Fountain	3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6. (*) QN MS VG (a) **Petiole: length**	**Pétiole: longueur**	**Blattstiel: Länge**	**Peciolo: longitud**		
very short				Cardinal	1
short				Tana	3
medium				Jel01	5
long				Purple Sensation	7
very long				Red Fountain	9
7. QN MG VG (+) (a) **Petiole: width at narrowest point**					
narrow				Red Fountain	1
medium				Cardinal	2
broad				Red Star	3
8. (*) QN VG (+) (a) **Petiole: profile in cross section**					
flat or slightly concave				Cardinal	1
moderately concave				Purple Sensation	2
strongly concave				Red Fountain	3
9. (*) PQ VG (a) **Petiole: main color of inner side** RHS Color Chart (indicate reference number)					
10. (*) PQ VG (+) (b) (c) **Young leaf: main color** RHS Color Chart (indicate reference number)					

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11. PQ VG (b) (c) **Young leaf: Secondary color** RHS Color Chart (indicate reference number)					
12. PQ VG (b) (c) **Young leaf: Tertiary color** RHS Color Chart (indicate reference number)					
13. (*) QN VG (+) **Leaf: curvature of distal third**					
absent or very weak				Pink Champagne	1
weak				Green Goddess	3
medium				Albertii	5
strong				Can Can	7
14. QN VG (+) **Leaf: attitude of basal third**					
upwards				Pink Champagne	1
upwards and outwards				Albertii	2
outwards				Red Fountain	3
15. (*) QN MS VG (d) **Leaf blade:length**					
very short				Karo	1
short				Pink Champagne	3
medium				Tana	5
long				Purple Sensation	7
very long				Red Fountain	9

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16. (*) QN MS VG (d) **Leaf blade: width**					
very narrow				Pink Champagne	1
medium				Purple Sensation	3
broad				Green Goddess	5
17. QL VG (+) (d) **Leaf: venation on inner side**					
parallel				Albertii, Red Fountain	1
angled				Tana	2
18. QN VG (c) (d) **Leaf: glossiness**					
absent or very weak				Green Goddess	1
medium				Albertii	2
strong				Red Fountain, Tana	3
19. (*) PQ VG (+) (c) (d) **Leaf: main color** RHS Color Chart (indicate reference number)					
20. (*) PQ VG (c) (d) **Leaf: secondary color** RHS Color Chart (indicate reference number)					
21. PQ VG (+) (c) (d) **Leaf: distribution of secondary color**					
mostly middle part				Purple Sensation	1
margin and middle part				Pink Champagne, Red Star	2
mostly margin				Southern Splendour	3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22. PQ VG (c) (d) **Leaf: tertiary color** RHS Color Chart (indicate reference number)					
23. (*) PQ VG (c) (d) **Leaf: main color of outer side** RHS Color Chart (indicate reference number)					

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) Observations on the petiole should be made on the mature leaf in the middle third of the foliage on a stem.

(b) Observations on the young leaf should be made on the apex of the stem.

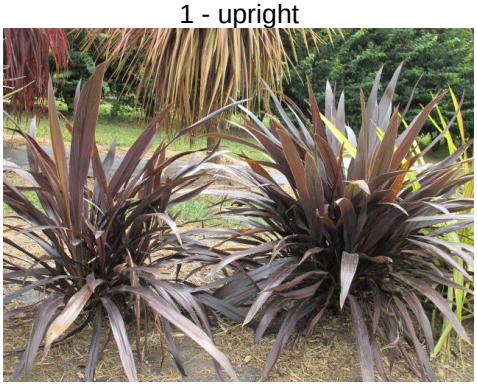
(c) Observations on colour and glossiness of the leaf should be made on the inner side.

(d) Observations on the leaf and leaf blade should be made on mature leaves on the lower part of the foliage on the stem.

8.2 Explanations for individual characteristics

Ad. 1: Plant: growth habit

1 - upright



3 - semi upright

5 - spreading

Ad. 2: Plant: height

Plant height is observed towards the end of the growing cycle and is observed in comparison with other varieties present.

Ad. 4: Plant: basal shoots

The observation is made towards the end of the growing cycle.

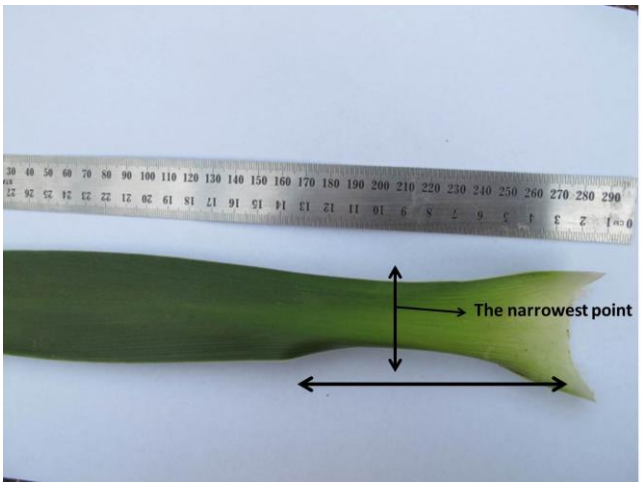
1 - absent

9 - present

Ad. 5: Plant: number of basal shoots

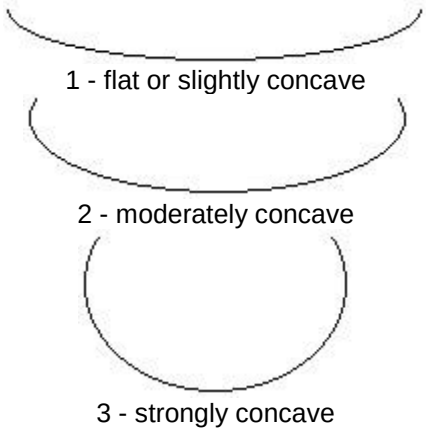
The number of basal shoots is observed towards the end of the growing cycle.

Ad. 7: Petiole: width at narrowest point



width at narrowest point

Ad. 8: Petiole: profile in cross section



1 - flat or slightly concave

2 - moderately concave

3 - strongly concave

Ad. 10: Young leaf: main color

The main color is the color with the largest surface area present on the inner side of a leaf. The secondary color is the color with the second largest surface area present and the tertiary color is the color with the smallest surface area present on the inner side of a leaf. In cases where the areas of the main and secondary colors are too similar to reliably decide which color has the largest area of the blade, the darkest color is considered to be the main color. e.g. For a light yellow and medium green leaf, medium green is considered the main color.

Ad. 13: Leaf: curvature of distal third

1 - absent or very weak

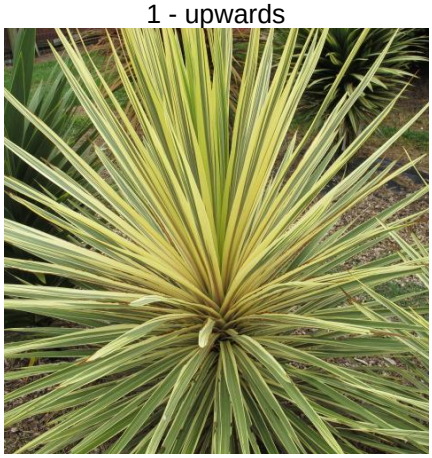
3 - weak

5 - medium

7 - strong

Ad. 14: Leaf: attitude of basal third

1 - upwards



2 - upwards and outwards

3 - outwards

Ad. 17: Leaf: venation on inner side

1 - parallel

2 - angled

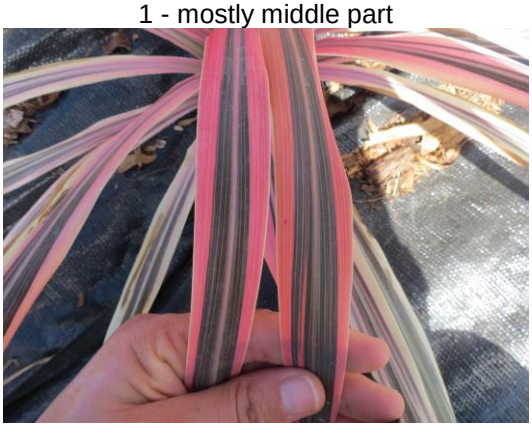
Ad. 19: Leaf: main color

The main color is the color with the largest surface area present on the inner side of a leaf. The secondary color is the color with the second largest surface area present and the tertiary color is the color with the smallest surface area present on the inner side of a leaf In cases where the areas of the main and secondary colors are too similar to reliably decide which color has the largest area of the blade, the darkest color is considered to be the main color. e.g. For a light yellow and medium green leaf, medium green is considered the main color.

Ad. 21: Leaf: distribution of secondary color

The pattern of secondary color only exists as stripes.

1 - mostly middle part



2 - margin and middle part

3 - mostly margin

9. Literature

Harris, W., 2001: Horticultural and conservation significance of the genetic variation of cabbage trees (Cordyline spp.). In: Oates MR ed. New Zealand plants and their story : proceedings of a conference held in Wellington 1-3 October 1999. Lincoln, Royal New Zealand Institute of Horticulture. pp. 87-91.
Simpson, P., 2000: Dancing Leaves: The story of the New Zealand cabbage tree, Canterbury University Press, Christchurch, New Zealand

Poole, A,.L. and Adams, N.M., 1986: Trees and Shrubs of New Zealand; Government Printing Office Publishing, Wellington, New Zealand, pp 38 to 42.

Metcalf, L.J., 1975: The Cultivation of New Zealand trees and shrubs, AH & AW Reed Ltd. Auckland, New Zealand

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			
1.1.1	Botanical Name	Cordyline Comm. ex Juss. excluding C. brasiliensis Planch. and C. fruticosa (L.) A. Chev.	
1.1.2	Common Name	Cordyline, Cabbage Tree, Torquay Palm	

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)

(……..……..…) 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)

4.2 Method of propagating the variety

4.2.1 Vegetative propagation

(a)	cuttings	[ ]
(b)	in vitro propagation	[ ]
(c)	division	[ ]
(d)	Other (state method)	[ ]

.....
: :
: :
:.....:

4.2.2 Other [ ]

(please provide details)

.....
: :
: :
:.....:

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: growth habit**		
	upright	Southern Splendour	1[ ]
	semi upright	Tana	3[ ]
	spreading	Red Fountain	5[ ]
5.2 (4)	**Plant: basal shoots**		
	absent	Southern Splendour	1[ ]
	present	Tana	9[ ]
5.3 (16)	**Leaf blade: width**		
	very narrow	Pink Champagne	1[ ]
	medium	Purple Sensation	3[ ]
	broad	Green Goddess	5[ ]
5.4 (19)	**Leaf: main color**		
	RHS Color Chart (indicate reference number)		
	white		1[ ]
	yellow		2[ ]
	green		3[ ]
	red		4[ ]
	purple		5[ ]
	brown		6[ ]
	blackish		7[ ]
5.5 (20)	**Leaf: secondary color**		
	RHS Color Chart (indicate reference number)		
	white		1[ ]
	yellow		2[ ]
	green		3[ ]
	red		4[ ]
	purple		5[ ]
	brown		6[ ]
	blackish		7[ ]

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	*Plant: growth habit*	*semi upright*	*spreading*

Comments:

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

Main use of the variety

a) container plant	[…]
b) garden plant	[…]
c) other (please provide details)	[…]

7.4 A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (http://www.upov.int/tgp/en/).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

8. Authorization for release

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

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

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

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

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]