



PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

***Cordyline* Comm. ex Juss.
excluding *C. brasiliensis* Planch. and *C. fruticosa* (L.) A. Chev.**

CORDYLINE, CABBAGE TREE, TORQUAY PALM

UPOV Code: CORDY

Adopted on 04/10/2017

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1. SUBJECT OF THE PROTOCOL AND REPORTING

1.1 Scope of the technical protocol

This Technical Protocol applies to all varieties of *Cordyline Comm. ex Juss. excluding Cordyline brasiliensis Planch. and Cordyline fruticosa (L.) A. Chev.*

The protocol describes the technical procedures to be followed in order to meet the requirements of Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on documents agreed by the International Union for the Protection of New Varieties of Plants (UPOV), such as the General Introduction to DUS (UPOV Document TG/1/3 http://www.upov.int/en/publications/intro_dus.htm), its associated TGP documents (<http://www.upov.int/en/publications/tgp/>) and the relevant UPOV Test Guideline TG/317/1 dated 16/03/2016 (<http://www.upov.int/edocs/tgdocs/en/tg317.pdf>) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **04.10.2017**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the Technical Protocol. Technical examinations of candidate varieties are carried out according to the TP in force when the DUS test starts. The starting date of a DUS examination is considered to be the due date for submitting of plant material for the first test period.

In cases where the Office requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process to be carried out at the moment of this request, such report can only be accepted if the technical examination has been carried out according to the CPVO TP which was in force at the moment when the technical examination started.

1.3 Reporting between Examination Office and CPVO and Liaison with Applicant

1.3.1 Reporting between Examination Office and CPVO

The Examination Office shall deliver to the CPVO a preliminary report ("the preliminary report") no later than two weeks after the date of the request for technical examination by the CPVO.

The Examination Office shall also deliver to the CPVO a report relating to each growing period ("the interim report") and, when the Examination Office considers the results of the technical examination to be adequate to evaluate the variety or the CPVO so requests, a report relating to the examination ("the final report").

The final report shall state the opinion of the Examination Office on the distinctness, uniformity and stability of the variety. Where it considers those criteria to be satisfied, or where the CPVO so requests, a description of the variety shall be added to the report. If a report is negative the Examination Office shall set out the detailed reasons for its findings.

The interim and the final reports shall be delivered to the CPVO as soon as possible and no later than on the deadlines as laid down in the designation agreement.

1.3.2 Informing on problems in the DUS test

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior permanent agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

1.3.3 Sample keeping in case of problems

If the technical examination has resulted in a negative report, the CPVO shall inform the Examination Office as soon as possible in case that a representative sample of any relevant testing material shall be kept.

2. MATERIAL REQUIRED

2.1 Plant material requirements

Information with respect to the agreed closing dates and submission requirements of plant material for the technical examination of varieties can be found on <http://www.cpvo.europa.eu/main/en/home/documents-and-publications/s2-gazette> in the special issue S2 of the Official Gazette of the Office. General requirements on submission of samples are also to be found following the same link.

2.2 Informing the applicant of plant material requirements

The CPVO informs the applicant that

- he is responsible for ensuring compliance with any customs and plant health requirements.
- the plant material supplied should be visibly healthy, not lacking in vigour, nor affected by any important pest or disease.
- 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.

2.3 Informing about problems on the submission of material

The Examination Office shall report to the CPVO immediately in cases where the test material of the candidate variety has not arrived in time or in cases where the material submitted does not fulfil the conditions laid down in the request for material issued by the CPVO.

In cases where the examination office encounters difficulties to obtain plant material of reference varieties the CPVO should be informed.

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"

http://www.upov.int/export/sites/upov/en/publications/tgp/documents/tgp_9_1.pdf.

3.3 Conditions for Conducting the Examination

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

Because daylight varies, colour determinations made against a colour 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 colour chart and version used should be specified in the variety description.

3.4 Test design

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

3.5 Additional tests

In accordance with Article 83(3) of Council Regulation No. 2100/94 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, an additional test may be undertaken providing that a technically acceptable test procedure can be devised.

Additional tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characters listed in the protocol.

3.6 Constitution and maintenance of a variety collection

The process for the constitution and the maintenance of a variety collection can be summarized as follows:

Step 1: Making an inventory of the varieties of common knowledge

Step 2: Establishing a collection ("variety collection") of varieties of common knowledge which are relevant for the examination of distinctness of candidate varieties

Step 3: Selecting the varieties from the variety collection which need to be included in the growing trial or other tests for the examination of distinctness of a particular candidate variety.

3.6.1 Forms of variety collection

The variety collection shall comprise variety descriptions and may comprise living plant material. The variety description shall be produced by the EO unless special cooperation exists between EOs and the CPVO. The descriptive and pictorial information produced by the EO shall be held and maintained in a form of a database.

3.6.2 Living Plant Material

The EO shall obtain living plant material of reference varieties as and when those varieties need to be included in growing trials or other tests.

3.6.3 Making an inventory of varieties of common knowledge for inclusion in the variety collection

The inventory shall include varieties protected under National and Community PBR, and varieties in trade or in commercial registers. In addition to the above, the inventory shall be extended to the appropriate to

- any commercial document in which varieties are marketed as propagating or harvested material, especially when there is no official registration system;
- any list including varieties which are publicly available within plant collections (varieties included in genetic resource collections, collection of old varieties, etc.);
- information provided by relevant plant experts;
- relevant example varieties referred to in the technical protocols for the examination of distinctness.

4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY

The prescribed procedure is to assess distinctness, uniformity and stability in a growing trial.

4.1 Distinctness

4.1.1 General recommendations

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 9 'Examining Distinctness' (http://www.upov.int/export/sites/upov/en/publications/tgp/documents/tgp_9_1.pdf) prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in this Technical Protocol.

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 Technical Protocols are familiar with the recommendations contained in the UPOV-General Introduction to DUS 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.

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 third 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 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. colour 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

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 10 ‘Examining Uniformity’ (http://www.upov.int/export/sites/upov/en/publications/tgp/documents/tgp_10_1.pdf) prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in this Technical Protocol:

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-types is allowed.

4.3 Stability

4.3.1 It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 11 ‘Examining Stability’ (http://www.upov.int/export/sites/upov/en/publications/tgp/documents/tgp_11_1.pdf)

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: height/width ratio (characteristic 3)
- b) Plant: basal shoots (characteristic 4)
- c) Leaf blade: width (characteristic 16)
- d) Leaf: main colour (characteristic 19) with the following groups:
 - Gr. 1: white
 - Gr. 2: yellow
 - Gr. 3: green
 - Gr. 4: red
 - Gr. 5: purple
 - Gr. 6: brown
 - Gr. 7: blackish
- e) Leaf: secondary colour (characteristic 20) with the following groups:
 - Gr. 1: white
 - Gr. 2: yellow
 - Gr. 3: green
 - Gr. 4: red
 - Gr. 5: purple
 - Gr. 6: brown
 - Gr. 7: blackish

5.4 If other characteristics than those from the TP are used for the selection of varieties to be included into the growing trial, the EO shall inform the CPVO and seek the prior consent of the CPVO before using these characteristics.

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 Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in the table of characteristics. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted or by specific legislation on plant health. In the latter case, the CPVO should be informed.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N°874/2009, to insert additional characteristics and their expressions in respect of a variety.

States of expression and corresponding notes

In the case of qualitative and pseudo-qualitative characteristics, 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 Example Varieties

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

6.3 Legend

For the CPVO N° column:

G	Grouping characteristic	- see Chapter 5
QL	Qualitative characteristic	
QN	Quantitative characteristic	
PQ	Pseudo-qualitative characteristic	
(+)	Explanations for individual characteristics	- see Chapter 8.2

For the UPOV N° column:

The numbering of the characteristics is provided as a reference to the ad hoc UPOV guideline.

(*)	UPOV Asterisked characteristic	- Characteristics that are important for the international harmonization of variety descriptions.
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For column 'Stage, method':

MG, MS, VG, VS	- see Chapter 4.1.5
(a)-(e)	Explanations covering several Characteristics - see Chapter 8.1

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1. (+) QN	1.	VG	Plant: height		
			short	Tana	3
			medium	Red Fountain	5
			tall	Jel01	7
2. QN	2.	VG	Plant: width		
			narrow	Pink Champagne	3
			medium	Red Star	5
			broad	Can Can	7
very broad	Red Fountain	9			
3. (+) QN	3. (*)	MG/VG	Plant: height/width ratio		
			low	Red Fountain	1
			medium	Tana	3
G		high	Southern Splendour	5	
4. (+) QL	4. (*)	VG	Plant: basal shoots		
			absent	Southern Splendour	1
G			present	Tana	9
5. (+) QN	5.	VG	Plant: number of basal shoots		
			few	Green Goddess	1
			medium	Tana	2
			many	Red Fountain	3
6. PQ	6. (*)	VG	Young leaf: main colour		
			(b), (c) (e)	RHS Colour Chart (indicate reference number)	

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
7.	7.	VG	Young leaf: secondary colour		
PQ		(b), (c) (e)	RHS Colour Chart (indicate reference number)		
8.	8.	VG	Young leaf: tertiary colour		
PQ		(b), (c) (e)	RHS Colour Chart (indicate reference number)		
9.	9. (*)	VG	Petiole: main colour of upper side		
PQ		(a) (e)	RHS Colour Chart (indicate reference number)		
10. (+)	10. (*)	VG/MS	Petiole: length		
QN		(a)	very short	Cardinal	1
			short	Tana	3
			medium	Jel01	5
			long	Purple Sensation	7
			very long	Red Fountain	9
11. (+)	11.	VG/MG	Petiole: width at narrowest part		
QN		(a)	narrow	Red Fountain	1
			medium	Cardinal	2
			broad	Red Star	3
12. (+)	12. (*)	VG	Petiole: profile in cross section		
QN		(a)	flat or slightly concave	Cardinal	1
			moderately concave	Purple Sensation	2
			strongly concave	Red Fountain	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note		
13. (+)	13. (*)	VG	Leaf: curvature				
			QN	(d)	absent or very weak	Pink Champagne	1
					weak	Green Goddess	3
					medium	Albertii	5
					strong	Can Can	7
14. (+)	14.	VG	Leaf: attitude of basal third				
			QN	(d)	upwards	Pink Champagne	1
					upwards and outwards	Albertii	2
					outwards	Red Fountain	3
15. (+)	15. (*)	MG/VG	Leaf blade: length				
			QN	(d)	very short	Karo Kiri	1
					short	Pink Champagne	3
					medium	Tana	5
					long	Purple Sensation	7
					very long	Red Fountain	9
16.	16. (*)	VG/MS	Leaf blade: width				
			QN	(d)	narrow	Pink Champagne	1
					medium	Purple Sensation	3
			G		broad	Green Goddess	5
17. (+)	17.	VG	Leaf: venation				
			QL	(d)	parallel	Albertii, Red Fountain	1
					pinnate	Tana	2
18.	18.	VG	Leaf: glossiness				
			QN	(c), (d)	absent or weak	Green Goddess	1
					medium	Albertii	2
					strong	Red Fountain, Tana	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
19.	19. (*)	VG	Leaf: main colour		
PQ G		(c), (d) (e)	RHS Colour Chart (indicate reference number)		
20.	20. (*)	VG	Leaf: secondary colour		
PQ G		(c), (d) (e)	RHS Colour Chart (indicate reference number)		
21.	21.	VG	Leaf: distribution of secondary colour		
PQ		(c), (d)	mostly middle part	Purple Sensation	1
		(e)	margin and middle parts	Pink Champagne, Red Star	2
			mostly margin	Southern Splendour	3
22.	22.	VG	Leaf: tertiary colour		
PQ		(c), (d) (e)	RHS Colour Chart (indicate reference number)		
23.	23. (*)	VG	Leaf: main colour of lower side		
PQ		(d), (e)	RHS Colour Chart (indicate reference number)		

8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

8.1 Explanations covering several characteristics

Characteristics containing the following key in the third 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 upper 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.
- e) The main colour is the colour with largest surface area. The secondary colour is the colour with the second largest surface area and the colour with the third largest surface is the tertiary colour. In cases where the area of the main and secondary colour are too similar to reliably decide which colour has the largest surface area on the blade, the darker colour is considered to be the main colour.

8.2 Explanations for individual characteristics

Ad. 1: Plant: growth habit

Plant height is observed towards the end of the growing cycle.

Ad. 3: Plant: height/width ratio



1
low



3
medium



5
high

Ad. 4: Plant: basal shoots

Ad. 5: Plant: number of basal shoots

Observations should be made towards the end of the growing cycle.



1
absent

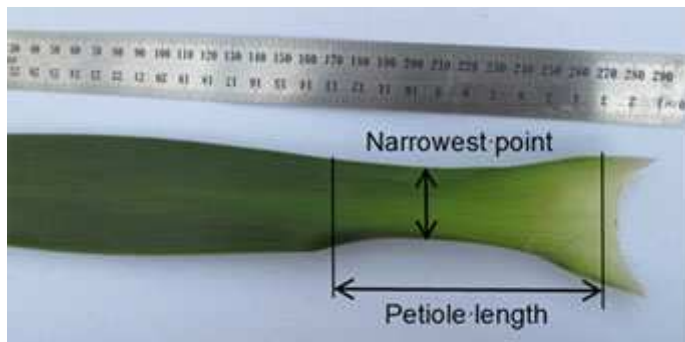


9
present

Ad. 10: Petiole: length

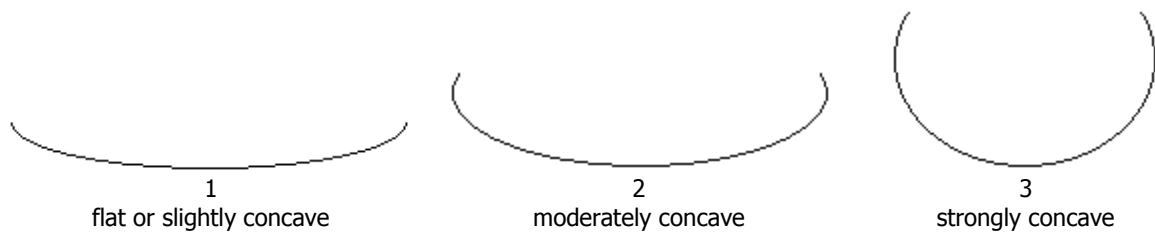
Ad. 11: Petiole: width at narrowest part

The petiole begins at the point of attachment to the stem and ends at the beginning of the blade, the point where the leaf width begins to increase.



Ad. 12: Petiole: profile in cross section

Observations should be made in the middle third of the petiole.



Ad. 13: Leaf: curvature



Ad. 14: Leaf: attitude of basal third



1
upwards



2
upwards and outwards



3
outwards

Ad. 15: Leaf blade: length



The blade length is determined from the apex to the petiole. The blade base and the start of the petiole can be identified by the change in width and profile in cross section of the leaf.

Ad. 17: Leaf: venation



1
parallel



2
pinnate

9. LITERATURE

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10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO-TQ/317/1.