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DRAFT

DIANTHUS

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Dianthus L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from the Netherlands

to be considered by the

*Technical Working Party for Ornamental Plants and Forest Trees
at its forty-seventh session, to be held in Naivasha, Kenya, from May 19 to 23, 2014*

Alternative Names:^{*}

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Dianthus L.</i>	Carnation, Clove Pink, Pink, Sweet William	Oeillet	Nelke	Clavel

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

^{*} These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Dianthus* 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 rooted cuttings.

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

20 rooted cuttings.

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 In particular, it may be necessary for separate growing trials to be established for cut flower types, garden types and pot types in order to ensure the satisfactory growth of varieties of those types (see Chapter 8.3). These Test Guidelines provide information to cover such a situation.

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 20 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 *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 10 plants or parts taken from each of 10 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 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 20 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:

Only for pot and garden types:

- (a) Plant: height (characteristic 2)
- (b) Flowers: position compared to foliage (characteristic 4)

For all types (including pot and garden types):

- (c) Flower: type (characteristic 37)
- (d) Petal: main color (characteristic 50), with the following groups:
 - Gr. 1: white or near white
 - Gr. 2: green
 - Gr. 3: yellow
 - Gr. 4: orange
 - Gr. 5: pink
 - Gr. 6: pink purple
 - Gr. 7: red
 - Gr. 8: dark red
 - Gr. 9: violet
 - Gr. 10: violet red
 - Gr. 11: purple
 - Gr. 12: purple violet
 - Gr. 13: brownish

(e) Petal: secondary color (characteristic 51), with the following groups:

- Gr. 1: none
- Gr. 2: white or near white
- Gr. 3: green
- Gr. 4: yellow
- Gr. 5: orange
- Gr. 6: pink
- Gr. 7: pink purple
- Gr. 8: red
- Gr. 9: dark red
- Gr. 10: violet
- Gr. 11: violet red
- Gr. 12: purple violet
- Gr. 13: purple
- Gr. 14: brownish

(f) Petal: color pattern of secondary color, if present, with the following groups:

- 1: marginated
- 2: striped
- 3: speckled
- 4: flushed
- 5: maculated

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".

5.5 Where separate growing trials are used for cut flower types (C), garden types (G) and pot types (P) (see Section 3.3.2), varieties should be included in the appropriate growing trial(s) in order to ensure an effective examination of distinctness. In particular, it may be appropriate to include a variety in both the garden type trial and the pot type trial.

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. The type is indicated in brackets after the name of the example variety as follows:

- (C) cut flower type:
 - (Co): one flower per stem
 - (Cs): spray
 - (Cu): umbrella (Sweet William)
- (G) garden type
- (P) pot type

6.5 *Legend*

(*) Asterisk 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)-(f) See Explanations on the Table of Characteristics in Chapter 8.1.

(+) See Explanations on the Table of Characteristics in Chapter 8.2.

- [C] to be examined in cut flower types
- [Cs] to be examined in cut flower 'spray' types
- [G] to be examined in garden types
- [P] to be examined in pot types

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
1.	[C]	Plant: length of stem				
(*)	VG/					
(+)	MS					
QN	short				Barmalyn (Cs), Hilbrequen (Cu)	3
	medium				Fire Queen (Cs), Hilbacer (Cs)	5
	long				Fransesco (Co), White Giant (Co)	7
2.	[G]	Plant: height				
(*)	[P]					
(+)	VG/					
	MS					
QN	short				Hiljoli (P), Shooting Star (G)	3
	medium				Houndspool Cheryl (G), WP08 IAN04 (G)	5
	tall				Devon Wizard (G)	7
3.	[G]	Plant: density				
(*)	[P]					
(+)	VG					
QN	sparse				Devon Wizard (G), Fontaine Darkred (P)	1
	medium				Koviol (P), Waterloo Sunset (G)	2
	dense				Coral Reef (G), Hiljoli (P)	3
4.	[G]	Flowers: position compared to foliage				
(*)	[P]					
(+)	VG					
QN	same level or slightly above				Coral Reef (G), Hiljoli (P)	1
	moderately above				Houndspool Cheryl (G), Koviol (P)	2
	far above				Waterloo Sunset (G)	3
5.	[Cs]	Plant: laterals without flower buds or flowers				
(+)	VG					
QL	absent				Hilboska (Cs)	1
	present				Martina (Cs)	9

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6. (*) (+)	[Cs] VG/ MS	Stem: number of internodes				
QN	four				KLEDM06005 (Cs)	1
	five				Hilboska (Cs), Martina (Cs)	2
	six				Barocior (Cs), Hilqueen (Cs)	3
	more than six				Hilbacer (Cs)	4
7. (*) (+)	[Cs] VG	Plant: laterals with flower buds or flowers of second order				
QN	absent or very few				Barnita (Cs)	1
	few				KLEDM10631 (Cs)	3
	medium				Barocior (Cs), Weslupe (Cs)	5
	many				KLEDM10629 (Cs)	7
8. (*) (+)	[Cs] VG	Plant: clustering on lateral branches				
QN	none				Barnita (Cs), Lekprewi (Cs)	1
	some				Beam Cherry (Cs), Martina (Cs)	2
	all				Westcherry (Cs)	3
9. (+)	[Cs] VG	Inflorescence: form				
PQ	flat					1
	moderately domed				Martina (Cs)	2
	strongly domed				Hilopta (Cs)	3
10. (*)	VG/ MS	Stem: length of internode				
QN	(a) short				Devon Wizard (G)	3
	medium				Komari (Co), Lonaveiro (Cs)	5
	long				KLEDS06013 (Co)	7

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11. (*)	VG/MS	Stem: thickness of internode				
QN	(a)	very thin			Hiljoli (P)	1
		thin			Devon Glow (G)	3
		medium			Komari (Co), Lekprewi (Cs)	5
		thick			Hilbrequeen (Cu), Tico Tico (Co)	7
		very thick			Westcrystal (Cs)	9
12. (*)(+)	VG	Stem: shape in cross section				
PQ	(a)	circular			Hilbreking (Cu)	1
		intermediate			KLEDP07089 (P)	2
		edged			Komari (Co), Martina (Cs), SUNRRB126 (P)	3
13. (*)	VG	Stem: hollowness				
QL	(a)	absent			Komari (Co), Martina (Cs), SUNRRB126 (P)	1
		present			Hilbreking (Cu)	9
14. (*)(+)	VG	Leaf: shape				
PQ	(b)	ovate			Tico Tico (Co)	1
		linear				2
		elliptic			Komari (Co), Martina (Cs)	3
		obovate			Shooting Star (G)	4
15. (*)	VG/MS	Leaf: length				
QN	(b)	short			Shooting Star (G)	3
		medium			Hilbrebar (Cu), Martina (Cs)	5
		long			KLEDS06542 (Co), Komari (Co)	7
16. (*)	VG/MS	Leaf: width				
QN	(b)	narrow			Lonaveiro (Cs), SUNRWB135 (P)	3
		medium			Hyslam (Co), Komari (Co)	5
		broad			Hilbreking (Cu)	7

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17.	VG	Leaf: curvature of longitudinal axis				
(*)						
(+)						
QN	(b)	absent or very weakly recurved			Devon Wizard (G), Komari (Co), SUNRWB135 (P)	1
		weakly recurved			Shooting Star (G)	2
		moderately recurved			Hilbrebar (Cu), Martina (Cs)	3
		strongly recurved			Prado Pino (Co)	4
		very strongly recurved			Raspberry Ripple (G)	5
18.	VG	Leaf: cross section				
(*)						
(+)						
QN	(b)	flat or very weakly concave			Beam Cherry (Cs), KLEDP09102 (P)	1
		weakly concave			Leila (Co), Martina (Cs), Tico Tico (Co)	2
		moderately concave			Hilbreking (Cu), Lonkiro (Co), SUNRRB126 (P)	3
		strongly concave			Barabril (Cs), Wesroman (Cs)	4
19.	VG	Leaf: color				
(*)						
PQ	(b)	medium green			Leila (Co), Hilbreking (Cu), SUNRRB126 (P)	1
		dark green			Hillose (Co), KLET04064 (P), Starburst (G)	2
		grey green			Barcoquette (Cs), Devon Winnie (G), White Liberty (Co)	3
20.	VG	Leaf: glaucosity				
(*)						
QN	(b)	weak			Hilbreking (Cu), SUNRRB126 (P)	1
		medium			Hyslam (Co), Tico Tico (Co)	2
		strong			Komari (Co), Lekprewi (Cs)	3
21.	VG	Leaf: spiny ciliation of margin				
(*)						
(+)						
QL	(b)	absent			Komari (Co), Martina (Cs)	1
		present			Hilbreking (Cu), Whatfield Can Can (G)	9

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
22.	VG					
(*)	Bud: shape					
(+)						
PQ	ovate				KLEDCS05045 (Co)	1
	oblong				Lonkiro (Co)	2
	elliptic				Fontaine Darkred (P), Hiltespret (Cs)	3
	circular				Baryetar (Co)	4
	obovate				Komari (Co), Leila (Co), Martina (Cs)	5
23.	VG					
(*)	Bud: extrusion of styles					
(+)						
QL	absent				Komari (Co), Leila (Co), Martina (Cs)	1
	present				Hilvulca (P), KLEDS07504 (Co)	9
24.	VG					
(+)	Epicalyx: position of outer lobes in relation to calyx					
QN	adpressed				Komari (Co), Martina (Cs), Tico Tico (Co)	1
	intermediate					2
	free				KLEDC05008 (Cs), Leila (Co)	3
25.	VG					
(+)	Epicalyx: apex of outer lobes					
QN	acute				Komari (Co), Martina (Cs), Tico Tico (Co)	1
	acute to acuminate					2
	acuminate				Lonkiro (Co)	3
26.	VG					
(+)	Epicalyx: length of apex of outer lobes					
QN	absent or very short					1
	short				Komari (Co), Martina (Cs), Tico Tico (Co)	2
	medium				Devon Glow (G), Leila (Co)	3
	long				SUNRRB126 (P), Westcrystal (Cs)	4

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
27.	VG	Epicalyx: apex of inner lobes				
(+)						
QN	acute				Komari (Co), Martina (Cs), Tico Tico (Co)	1
	acute to acuminate					2
	acuminate				Lonkiro (Co)	3
28.	VG	Epicalyx: length of apex of inner lobes				
(+)						
QN	absent or very short					1
	short				Komari (Co), Martina (Cs)	2
	medium				SUNRRB126 (P)	3
	long				Westcrystal (Cs)	4
29.	VG/ (*) MS	Calyx: length				
QN	short				Hilbreking (Cu), Whatfield Can Can (G)	3
	medium				Komari (Co), Leila (Co), Martina (Cs)	5
	long				KLEDS10624 (Co), Princess (P)	7
30.	VG/ (*) MS	Calyx: width				
QN	narrow				SUNRRB126 (P)	3
	medium				Komari (Co)	5
	broad				KLEDS10624 (Co)	7
31.	VG (*) (+)	Calyx: shape				
PQ	funnel-shaped				Lonkiro (Co), Tico Tico (Co)	1
	cylindrical				Hilbreking (Cu), Martina (Cs), SUNRRB126 (P)	2
	campanulate				Gaudina (Co), Komari (Co), Leila (Co)	3

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
32.	VG					
(*)						
(+)						
PQ	straight				SUNRRB126 (P), Whatfield Can Can (G)	1
	concave				Martina (Cs), Tico Tico (Co)	2
	angled				Hilopta (Cs)	3
	convex				Gaudina (Co), Komari (Co), Leila (Co)	4
33.	VG					
(*)						
PQ	none				Komari (Co), Leila (Co), Martina (Cs)	1
	margin of lobe				Lonaveiro (Cs), SUNRRB126 (P)	2
	whole lobe				Hilbrebar (Cu), Houndspool Cheryl (G)	3
	whole calyx				Calypso Star (G)	4
34.	VG					
(*)						
QN	weak				Lonaveiro (Cs)	1
	medium				Shooting Star (G)	2
	strong				Simba (P), SUNRE130 (P)	3
35.	VG					
(+)						
PQ	acute				Komari (Co), Lonaveiro (Cs), Lonkiro (Co), SUNRRB126 (P)	1
	intermediate					2
	acuminate				Barfenix (Co)	3
36.	VG					
(*)						
QN	short				Komari (Co), Lonkiro (Co), Tico Tico (Co)	3
	medium				Leila (Co), Lonaveiro (Cs)	5
	long				Hilbreking (Cu)	7

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
37.	VG					
(*)	Flower: type					
(+)						
QL	single				Calypso Star (G), Hilbreking (Cu)	1
	double				Sam's Pride (Cs), William Sim (Co)	2
38.	VG/					
(*)	MS					
	Flower: diameter					
QN	small				Hilbrebar (Cu), Shooting Star (G), SUNRWB135 (P)	3
	medium				Devon Wizard (G)	5
	large				Farida (Co), Komari (Co), Leila (Co)	7
39.	VG/					
(*)	MS					
	<u>Varieties with double</u>					
	<u>flowers only:</u> Flower:					
	number of petals					
QN	few				Lekclaudia (Cs), SUNRRB126 (P)	3
	medium				Komari (Co), Martina (Cs)	5
	many				Hyslam (Co), Tico Tico (Co)	7
40.	VG/					
(*)	MS					
	Corolla: height					
QN	low				SUNRWB135 (P), Whatfield Can Can (G)	3
	medium				Farida (Co)	5
	high				KLEDS13A01 (Co)	7
41.	VG					
(*)	Corolla: profile of upper					
(+)	part in lateral view					
PQ	concave				Night Star (G)	1
	flat				Hilbrequeen (Cu), Shooting Star (G)	2
	flat convex				Komari (Co), Lonkiro (Co), SUNRRB126 (P)	3
	convex				Leila (Co), Martina (Cs), Tico Tico (Co)	4

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
42.	VG					
(*)						
(+)						
	Corolla: profile of lower part in lateral view					
PQ	concave				Komari (Co), Martina (Cs), SUNRRB126 (P)	1
	flat				Hilbrequeen (Cu), Whatfield Can Can (G)	2
	flat convex				Leila (Co), Night Star (G)	3
	convex				Coral Reef (G), Waterloo Sunset (G)	4
43.	VG					
(*)						
(+)						
	Petal: predominant shape					
PQ	(c) type 1				Martina (Cs), Tico Tico (Co)	1
	type 2				Baltico (Co)	2
	type 3				Hilbreking (Cu), SUNRWB135 (P)	3
	type 4				Nobroc (Co), SUNRRB126 (P)	4
	type 5				Barlgraa (Co), WP08 IAN04 (G)	5
	type 6				Gaudina (Co)	6
	type 7				Hilstertes (Cs), Minitira Pink (Cs)	7
44.	VG					
(*)						
(+)						
	Petal: undulation					
QN	(c) absent or weak				Hilbrequeen (Cu), Hilstertes (Cs)	1
	medium				Calypso Star (G), Komari (Co)	2
	strong					3
45.	VG					
(*)						
(+)						
	Petal: number of incisions of margin					
QN	(c) absent or few				Barmalyn (Cs), Koyevi (Co)	1
	medium				Barlitar (Co)	2
	many				Komari (Co), Martina (Cs), Wesroman (Cs)	3

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
46.	VG	Petal: type of incisions of margin				
(+)						
PQ	(c)	sinuate			Farida (Co)	1
		crenate			Hyslam (Co)	2
		dentate			Leila (Co)	3
		denticulate			Hilbrebar (Cu), SUNRWB135 (P)	4
		crenate-denticulate			Komari (Co), Martina (Cs)	5
47.	VG	Petal: depth of incisions of margin				
(*)						
(+)						
QN	(c)	very shallow			Fleurette (Cs), Leila (Co)	1
		shallow			Intermezzo (Cs)	3
		medium			Hilbrebar (Cu)	5
		deep			Pop Star (G)	7
		very deep			CFPC Unforgettable (P)	9
48.	VG/	Petal: length				
(*)	MS					
QN	(c)	short			Whatfield Can Can (G)	3
		medium			Barcandela (Cs)	5
		long			Gaudina (Co), Komari (Co)	7
49.	VG/	Petal: width				
(*)	MS					
QN	(c)	narrow			Hilbrebar (Cu), Whatfield Can Can (G)	3
		medium			Leila (Co), Lonkiro (Co), Tico Tico (Co)	5
		broad			Bartorbel (Co), KLEDS10625 (Co)	7
50.	VG	Petal: main color				
(*)						
PQ	(c)	RHS Colour Chart				
	(d)	(indicate reference number)				
51.	VG	Petal: secondary color				
(*)						
PQ	(c)	RHS Colour Chart				
	(d)	(indicate reference number)				
	(e)					

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
57. (*)	VG	Petal: tertiary color					
PQ	(d)	RHS Colour Chart					
	(f)	(indicate reference number)					
58. (*) (+)	VG	Petal: color pattern of tertiary color					
PQ	(d)	marginated				Margarita (P), SUNRWB135 (P)	1
	(f)	striped					2
		speckled				DICZ0001 (G)	3
		flushed				Starlette (G)	4
		maculated				Rodin (P)	5
59. (*) (+)	VG	Ovary: shape					
PQ		ovate				Lekprewi (Cs)	1
		oblong				Shooting Star (G)	2
		elliptic				Hilbreking (Cu)	3
		rhombic				Martina (Cs)	4
		obovate				Komari (Co), Leila (Co), SUNRWB135 (P)	5
60. (+)	VG	Ovary: color of base					
PQ		whitish				Komari (Co), Lekprewi (Cs)	1
		yellowish				KLEDG10119 (G), Koviol (P)	2
		green				Leila (Co), Shooting Star (G)	3
61. (*)	VG	Ovary: surface					
QN		smooth				Leila (Co), Lekclaudia (Cs)	1
		slightly ribbed				SUNRRB126 (P)	2
		strongly ribbed				Komari (Co), Martina (Cs)	3

	English	Français	Deutsch	Español	Example varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
62. VG (*)	Style: number					
PQ	only two				Hilbreking (Cu), SUNRWB135 (P), Tico Tico (Co)	1
	two and three				Komari (Co), Lonaveiro (Cs)	2
	only three				Barjine (Co), Wesroman (Cs)	3
	three and four				KLEDS07504 (Co)	4
	only four				Baruqedu (Co), KLEDS10624 (Co)	5
	two, three, four and five				Gaudina (Co)	6
63. VG/MS (*)	Style: length					
QN	short				Hilbreking (Cu), Shooting Star (G)	1
	medium				Lonaveiro (Cs), SUNRWB135 (P), Tico Tico (Co)	2
	long				Liberty (Co)	3
64. VG (*) (+)	Style: shoulder					
QL	absent				Martina (Cs), SUNRWB135 (P)	1
	present				Komari (Co), Lonaveiro (Cs), Tico Tico (Co)	9
65. VG (*)	Stigma: color					
PQ	white				Komari (Co), Martina (Cs), Tico Tico (Co)	1
	yellow				Leila (Co)	2
	pink				Barhugo (Co)	3
	white with red flush				Lonaveiro (Cs)	4
	white with purple flush				Shooting Star (G)	5
	red				Hilbrebar (Cu), Hyslam (Co)	6
	purple				Burnob (Co), SUNRRB126 (P)	7

8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

Unless otherwise indicated below, all characteristics should be recorded at the time of full flowering.

Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

- (a) The main stem can be found by following the most direct line from top-flower to base. In varieties bred to be grown as cut flowers, the fifth internode directly below flower should be observed. In varieties bred to be grown as pot and garden carnations, the third internode directly below flower should be observed. Except for length, observations should be made half way between nodes.
- (b) In varieties bred to be grown as cut flowers, to be observed on leaves of the fifth node directly below flower. In varieties bred to be grown as pot and garden carnations, to be observed on leaves of the third node directly below flower.
- (c) For double flowers the observations should be made on a petal of the 3rd outer whorl.
- (d) The main color is the color with the largest surface area. In cases where the areas of the main and secondary color are too similar to reliably decide which color has the largest area, the darkest color is considered to be the main color. In cases where the areas of the secondary and tertiary color are approximately the same, the darkest color will be the secondary color.
- (e) Only to be observed if secondary color is present. The secondary color pattern may cover more than one pattern type
- (f) Only to be observed if tertiary color is present.

8.2 Explanations for individual characteristics

Ad. 1: Plant: length of stem

Length of stem should be measured from soil level to the end of the plant, excluding the flowers.

Ad. 2: Plant: height

Plant height should be measured from soil level to the end of the plant, including the flowers.

Ad. 4: Flowers: position compared to foliage



1
same level or slightly above



2
moderately above



3
far above

Ad. 5: Plant: laterals without flower buds or flowers

Ad. 6: Stem: number of internodes

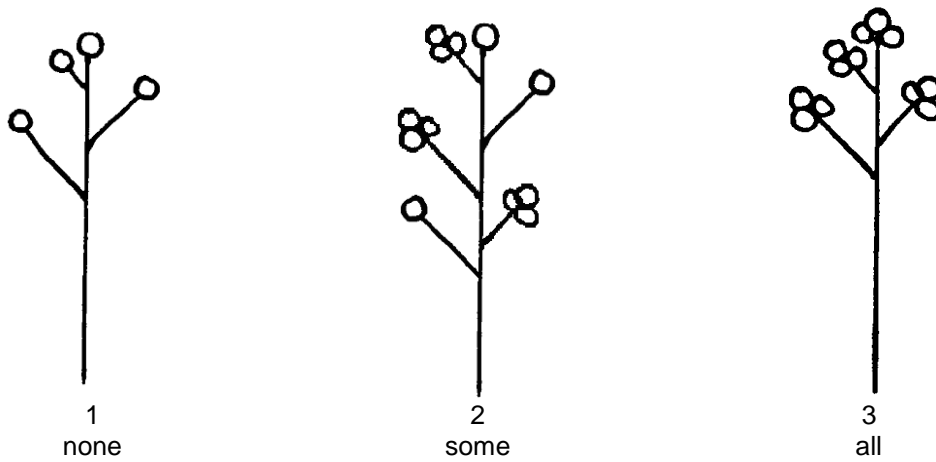
The number of internodes should be observed between epicalyx and lowest node with laterals with flower buds or flowers.



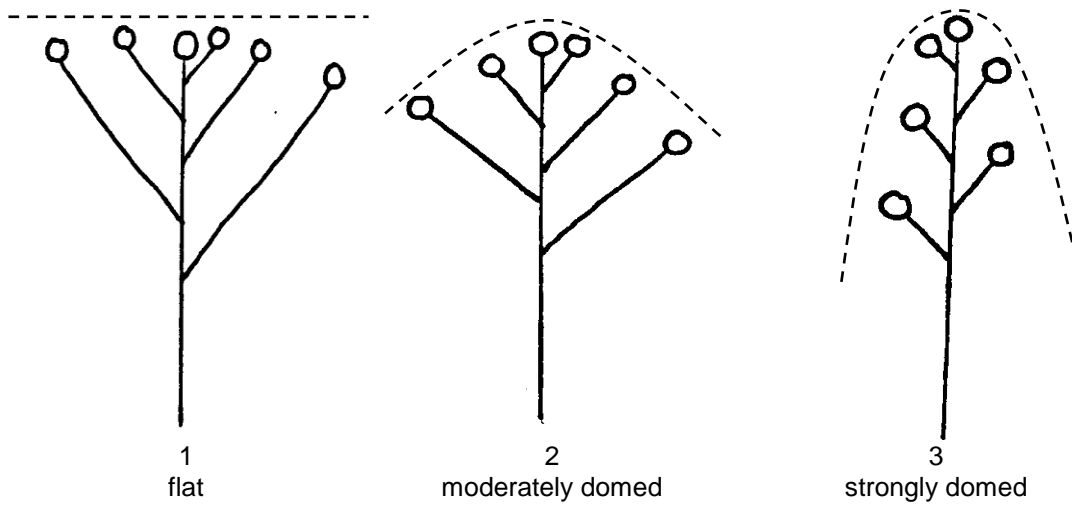
Ad. 7: Plant: laterals with flower buds or flowers of second order



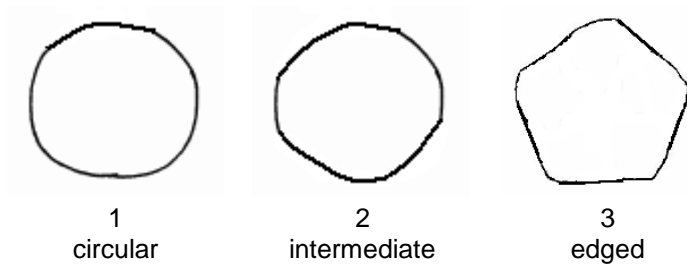
Ad. 8: Plant: clustering on lateral branches







Ad. 9: Inflorescence: form



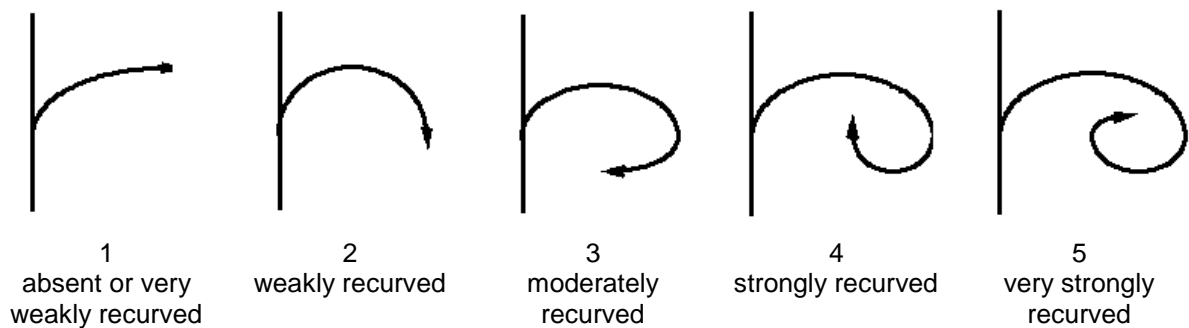
Ad. 12: Stem: shape in cross section



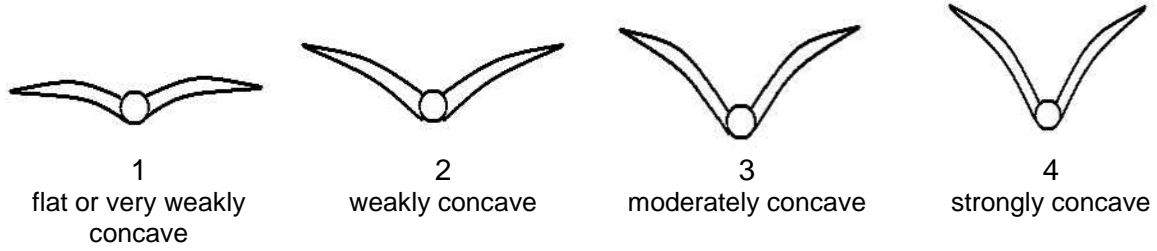
Ad. 14: Leaf: shape

		← broadest part →		
		below middle	at middle	above middle
broad (low) ← width (ratio length/width) → narrow (high)			 2 linear	
		 1 ovate	 3 elliptic	 4 obovate

Ad. 17: Leaf: curvature of longitudinal axis



Ad. 18: Leaf: cross section



Ad. 21: Leaf: spiny ciliation of margin

To be observed by gently rubbing to and fro with finger along the margin of the leaf.








1
absent



9
present

Ad. 22: Bud: shape

To be observed immediately before color appears.

		← broadest part →		
		below middle	at middle	above middle
width (ratio length/width)	↑ narrow (high)		 2 oblong	
	←	 1 ovate	 3 elliptic	 5 obovate
	↓ broad (low)		 4 circular	

Ad. 23: Bud: extrusion of styles

To be observed immediately before color appears.

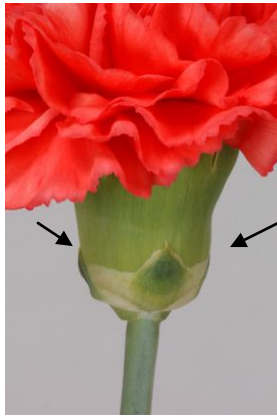


1
absent

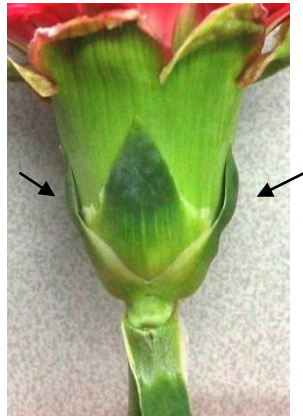


9
present

Ad. 24: Epicalyx: position of outer lobes in relation to calyx



1
addressed



2
intermediate
(lobes are addressed and free)



3
free

Ad. 25: Epicalyx: apex of outer lobes

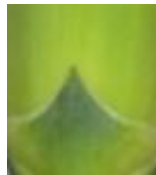
Ad. 27: Epicalyx: apex of inner lobes



1
acute



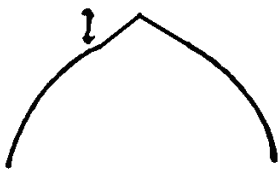
2
acute to
acuminate



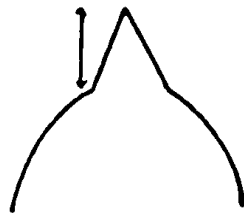
3
acuminate

Ad. 26: Epicalyx: length of apex of outer lobes

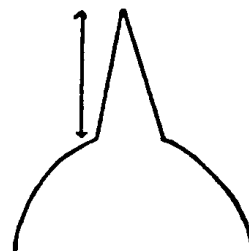
Ad. 28: Epicalyx: length of apex of inner lobes



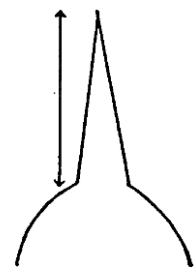
1
absent or very short



2
short

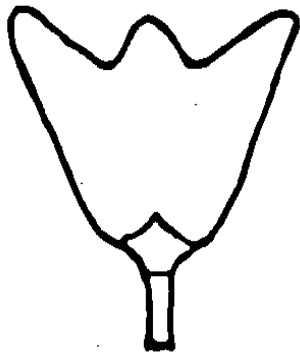


3
medium

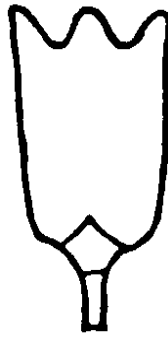


4
long

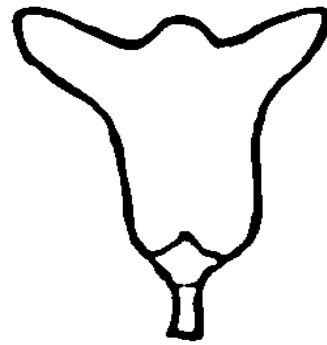
Ad. 31: Calyx: shape



1
funnel-shaped



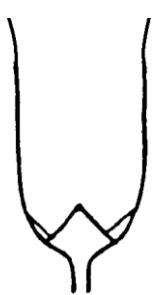
2
cylindrical



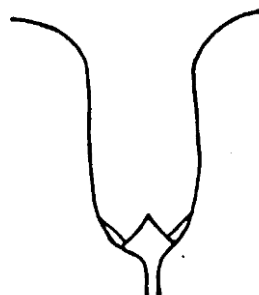
3
campanulate

Ad. 32: Calyx: longitudinal axis of lobes

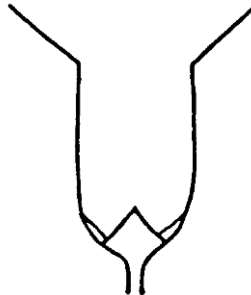
When making this observation, the tip of the lobes should be excluded.



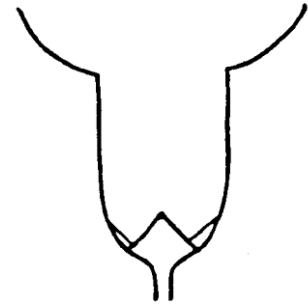
1
straight



2
concave



3
angled



4
convex

Ad. 35: Calyx: shape of apex of lobe



1
acute



2
intermediate



3
acuminate

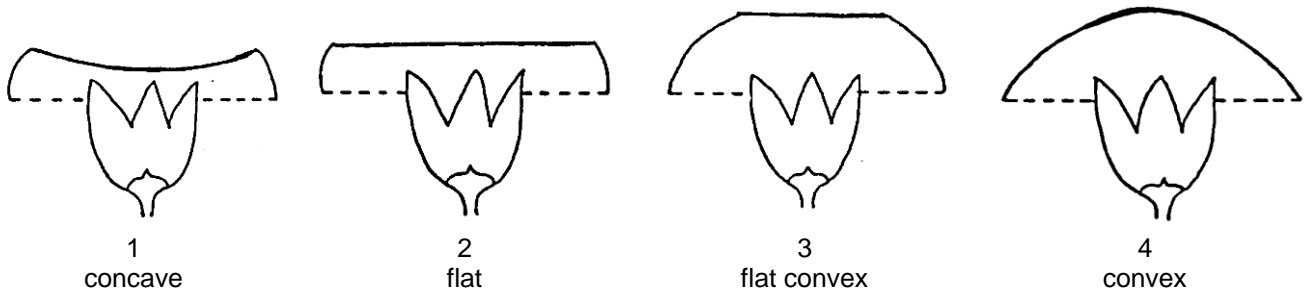
Ad. 37: Flower type

If a flower has more than 5 petals, it can be classified as a double flower type.

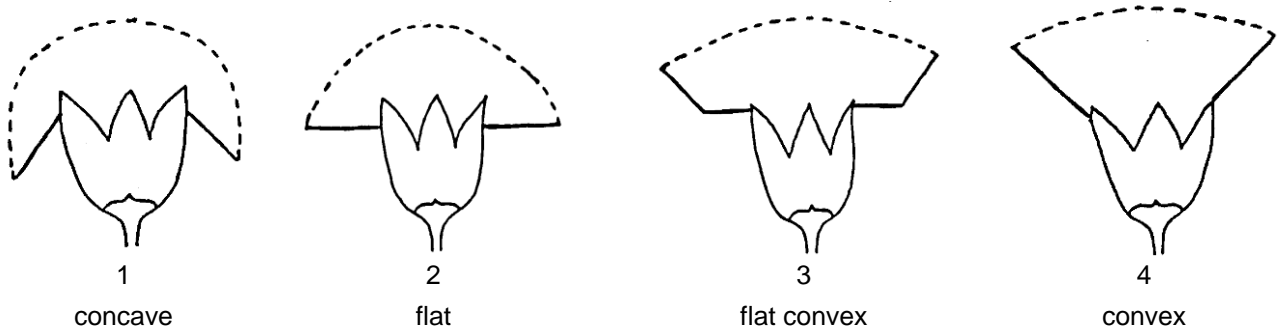
Ad. 40: Corolla: height



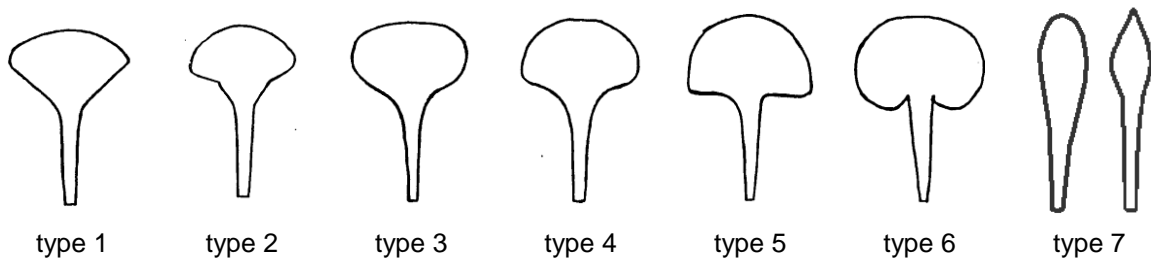
Ad. 41: Corolla: profile of upper part in lateral view



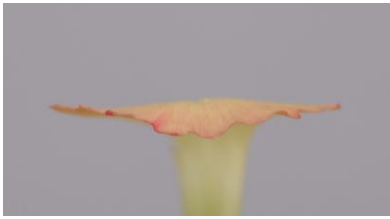
Ad. 42: Corolla: profile of lower part in lateral view



Ad. 43: Petal: predominant shape



Ad. 44: Petal: undulation



1
absent or weak



2
medium



3
strong

Ad. 45: Petal: number of incisions of margin



1
absent or few








2
medium



3
many

Ad. 46: Petal: type of incisions of margin

1	sinuate	
2	crenate	
3	dentate	
4	denticulate	
5	crenate-denticulate	

Ad. 47: Petal: depth of incisions of margin



1
very shallow



3
shallow



5
medium



7
deep



9
very deep

Ad. 52: Petal: width of margin



1
absent



2
narrow



3
medium



4
broad

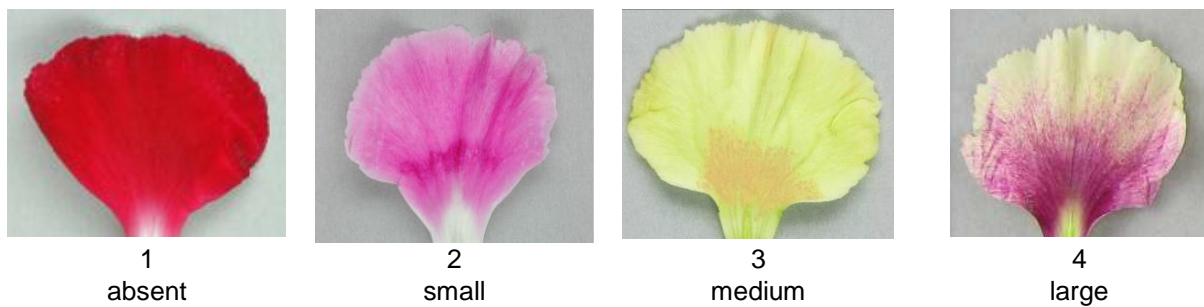
Ad. 53: Petal: number of stripes



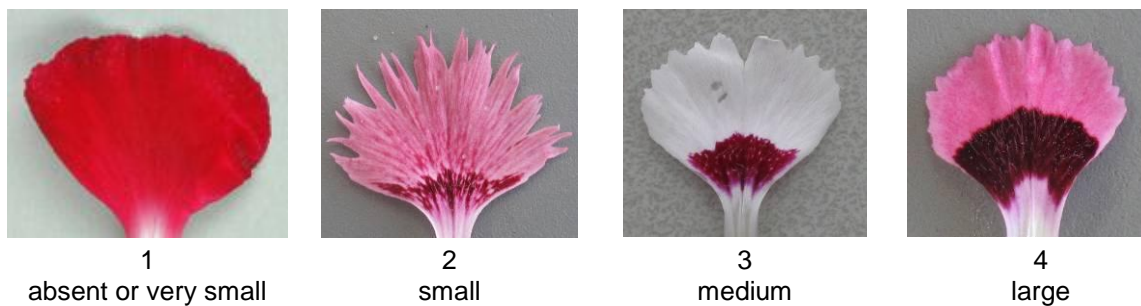
Ad. 54: Petal: number of speckles



Ad. 55: Petal: area of flush



Ad. 56: Petal: size of macule



Ad. 58: Petal: color pattern of tertiary color



1
marginated



2
striped







4
flushed

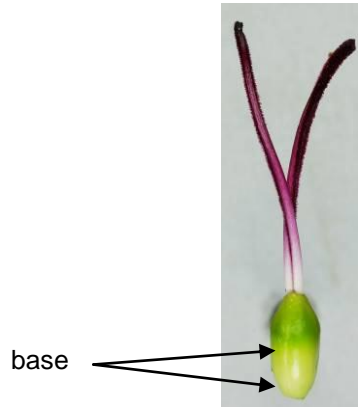


5
maculated

Ad. 59: Ovary: shape

		← broadest part →		
		below middle	at middle	above middle
↑ narrow (high)	width (ratio length/width)	 1 ovate	 2 oblong	 5 obovate
	← broad (low)		 4 rhombic	

Ad. 60: Ovary: color of base



Ad. 64: Style: shoulder



1
absent



9
present

shoulder

8.3 Growing types

As explained in Chapter 3.3.2, it may be necessary for separate growing trials to be established for cut flower types, garden types and pot types in order to ensure the satisfactory growth of varieties of those types. The following information is provided with regard to growing conditions for different types of varieties and information which may help in deciding on the type of trial(s) which may be appropriate for a variety:

Cut flower types (C)

In general varieties bred as cut flower have the following features:

- not very tolerant to low temperatures: heated greenhouses required for good crop development in temperate zones;
- to grow the varieties properly, sufficient support (horizontal nets) need to be provided

spray (Cs) and one flower per stem (Co)

- Breeding is done in a limited gene pool. In general, such types of variety belong to *D. caryophyllus*
- in varieties bred to be grown as one flower per stem carnation, the lateral flower heads or lateral shoots (if existing) are removed at an early stage to leave just the terminal flower head
- most varieties have double flowers

umbrella (Sweet William) (Cu)

- All types of varieties belong to *D. barbatus*
- produce clusters of flowers
- most varieties have single flowers

Garden types (G)

Breeding is done in a rather large gene pool, in most cases much broader and different from other types. Varieties mainly come from *D. plumarius*, *D. x allwoodii* and related species. In general, such types of variety have the following features:

- tolerant to lower temperatures in general;
- plants with limited plant height;
- all flower types (single and double) can be seen in garden types;

Pot types (P)

Breeding is mainly done in a gene pool which is different from garden types. In general, such types of variety belong to *D. caryophyllus* and have the following features:

- not very tolerant to low temperatures: heated greenhouses required for good crop development in temperate zones;
- concern only types produced in greenhouses or other sheltered conditions;
- plants with limited plant height;
- nearly always have double flowers.

9. Literature

Galbally, J. & Galbally, E., 1997: Carnations and Pinks. Timber Press Inc., Portland, Oregon, ISBN 0-88192-382-6

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 Genus		
1.1.1 Botanical name	<input type="text" value="Dianthus L."/>	
1.1.2 Common name	<input type="text" value="Carnation"/>	
1.2 Species		
1.2.1 Botanical name	<input type="text"/>	
1.2.2 Common name	<input type="text"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

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

.....

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

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 Other []
(please provide details)

[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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 Plant: height (only for pot and garden types) (2)		
very short		1 []
very short to short		2 []
short	Hiljoli (P), Shooting Star (G)	3 []
short to medium		4 []
medium	Houndspool Cheryl (G), WP08 IAN04 (G)	5 []
medium to tall		6 []
tall	Devon Wizard (G)	7 []
tall to very tall		8 []
very tall		9 []
5.2 Flowers: position compared to foliage (only for pot and garden types) (4)		
same level or slightly above	Coral Reef (G), Hiljoli (P)	1 []
moderately above	Houndspool Cheryl (G), Koviol (P)	2 []
far above	Waterloo Sunset (G)	3 []
5.3 Flower: type (37)		
single	Calypso Star (G), Hilbreking (Cu)	1 []
double	Sam's Pride (Cs), William Sim (Co)	2 []
5.4 Petal: number of incisions of margin (45)		
absent or few	Barmalyn (Cs), Koyevi (Co)	1 []
medium	Barlitar (Co)	2 []
many	Komari (Co), Martina (Cs), Wesroman (Cs)	3 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.5i (50) Petal: main color RHS Colour Chart (indicate reference number)		
5.5ii (50) Petal: main color		
white or near white		1 []
green		2 []
yellow		3 []
orange		4 []
pink		5 []
pink purple		6 []
red		7 []
dark red		8 []
violet		9 []
violet red		10 []
purple violet		11 []
purple		12 []
brownish		13 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.6i Petal: secondary color (51)		
RHS Colour Chart (indicate reference number)		
5.6ii Petal: secondary color (51)		
none		1 []
white or near white		2 []
green		3 []
yellow		4 []
orange		5 []
pink		6 []
pink purple		7 []
red		8 []
dark red		9 []
violet		10 []
violet red		11 []
purple violet		12 []
purple		13 []
brownish		14 []
5.7 Petal: color pattern of secondary color (if present)		
marginated	Hilbreking (Cu), Komari (Co)	1 []
striped	Komonte (Co)	2 []
speckled	Barlitar (Co), CFPC Aztec (P)	3 []
flushed	Antigua (Co), Hilnotre (Co)	4 []
maculated	Hilmetal (P)	5 []

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
<i>Example</i>	<i>Flower: color</i>	<i>orange</i>	<i>orange red</i>

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#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 Main use

- (a) garden plant []
- (b) pot plant []
- (c) cut flower
 - spray []
 - umbrella (Sweet William) []
 - one flower per stem []
- (d) other []
(please provide details)

7.4. A representative color image 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.

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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]