



PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

Echinacea Moench.

ECHINACEA

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CPVO-TP/281/2

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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 *Echinacea* Moench.

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/export/sites/upov/resource/en/tg_1_3.pdf), its associated TGP documents (<http://www.upov.int/tgp/en/>) and the relevant UPOV Test Guideline TG/281/2 dated 26/10/2021 (<https://www.upov.int/edocs/tgdocs/en/tg281.pdf>) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **30.12.2022**. 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 4 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 pertinent agreement, on matters of particular urgency, 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 <https://public.plantvarieties.eu/publication> in the special issue S2/S3 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

Single growing cycle for species with establishment period

The duration of tests should be a single growing cycle for the purpose of observation of characteristics following an adequate number of growing cycles for establishment of plants; at the end of each growing cycle for the purpose of observation of characteristics the competent authority will determine whether or not the following growing cycle is required.

The testing of a variety may be concluded if the competent authority can determine with certainty the outcome of the test.

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/edocs/tgpdocs/en/tgp_9.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.

3.4 Test design

- 3.4.1 In the case of vegetatively propagated varieties, each test should be designed to result in a total of at least 10 plants.
- 3.4.2 In the case of seed-propagated varieties, each test should be designed to result in a total of at least 40 plants which should be divided between at least 2 replicates.

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 Special tests for additional characteristics

In accordance with Article 23 of Implementing Rules N° 874/2009 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, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

Special tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characteristics 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 variety collection shall comprise images (e.g. photographs, illustrations or digitalized images) of representative parts of the plants of each variety, produced by the respective EO. 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, 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

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/edocs/tgpdocs/en/tgp_9.pdf) prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in this Technical Protocol.

Further guidance is provided in documents TGP/9 "Examining Distinctness" and TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability".

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

In the case of vegetatively propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 9 plants or parts taken from each of 9 plants and any other observation 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 1.

In the case of seed-propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 30 plants or parts taken from each of 30 plants and any other observation 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 1.

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, 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. 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**

4.2.1 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 10 'Examining Uniformity' (http://www.upov.int/edocs/tgpdocs/en/tgp_10.pdf) prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in this Technical Protocol:

4.2.2 This Technical Protocol has been developed for the examination of vegetatively propagated and cross-pollinated seed propagated] varieties. For varieties with other types of propagation the recommendations in the UPOV-General Introduction to DUS and document TGP/13 "Guidance for new types and species", Section 4.5 "Testing Uniformity" should be followed.

The assessment of uniformity for cross-pollinated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction.

For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 10 plants, 1 off-type is allowed.

4.3 **Stability**

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/edocs/tgpdocs/en/tgp_11.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.

Where appropriate, or in cases of doubt, stability may be further examined by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. GROUPING OF VARIETIES AND ORGANISATION 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 organise the growing trial so that similar varieties are grouped together.
- 5.3** The following have been agreed as useful grouping characteristics:
- a) Plant: height (characteristic 2)
 - b) Leaf: variegation (characteristic 11)
 - c) Ray floret: main colour of inner side (characteristic 28) with the following groups:
 - Gr. 1: green
 - Gr. 2: white
 - Gr. 3: yellow
 - Gr. 4: orange
 - Gr. 5: red
 - Gr. 6: pink
 - Gr. 7: purple
 - d) Disc: type (characteristic 36)
 - e) Disc: colour of tip of paleae (spikes) (characteristic 44)
 - f) Only varieties with disc type: anemone: Disc: colour after disc florets open (characteristic 47) with the following groups:
 - Gr. 1: green
 - Gr. 2: white
 - Gr. 3: yellow
 - Gr. 4: orange
 - Gr. 5: red
 - Gr. 6: pink
 - Gr. 7: purple
- 5.4** If other characteristics than those from the Technical Protocol 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.
- 5.5** Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the UPOV-General Introduction to DUS 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.

6.2. States of expression and corresponding notes

States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description. All relevant states of expression are presented in the characteristic.

Further explanation of the presentation of states of expression and notes is provided in UPOV document TGP/7 "Development of Test Guidelines".

6.3 Example Varieties

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

6.4 Legend

For column 'CPVO N°':

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 column 'UPOV N°':

The numbering of the characteristics is provided as a reference to the 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)-(b)	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: growth habit		
			upright	Mount Hood	1
			semi-upright	Ida, Green Jewel	2
			semi-spreading	Mistral	3
			spreading		4
2. (+) QN	2. (*)	MG/MS /VG	Plant: height		
			very short	SWEET271	1
			very short to short		2
			short	ECHOR273	3
			short to medium		4
			medium	Noectwo	5
			medium to tall		6
			tall	Razzmatazz	7
			tall to very tall		8
G	very tall		9		
3. (+) QN	3.	VG	Plant: floriferousness		
			very weak		1
			weak	Razzmatazz	2
			medium	SWEET271	3
			strong	Hilmoococy	4
	very strong		5		
4. (+) PQ	4.	VG	Stem: colour		
			green	Green Jewel	1
			green tinged weakly purple	Catharina	2
			green tinged strongly purple	Merlot	3
	purple	Fatal Attraction	4		

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
5. QN	5.	VG	Stem: number of leaves		
			very few		1
			few	SWEET271	2
			medium	ECHOR273	3
			many	Hilmooococy	4
			very many		5
6. (+) QN	6. (*)	MS/VG (a)	Leaf: length		
			very short		1
			very short to short		2
			short	Mistral	3
			short to medium		4
			medium	Merlot	5
			medium to long		6
			long	Green Jewel	7
			long to very long		8
very long		9			
7. QN	7. (*)	MS/VG (a)	Leaf: width		
			very narrow		1
			very narrow to narrow		2
			narrow	Purity	3
			narrow to medium		4
			medium	Green Jewel	5
			medium to broad		6
			broad	Catharina	7
			broad to very broad		8
very broad		9			

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
8.	8. (*)	MS/VG	Leaf: length/width ratio		
QN		(a)	very low		1
			very low to low		2
			low	Merlot	3
			low to medium	Hilmoococy	4
			medium		5
			medium to high		6
			high	Secret Glow	7
			high to very high		8
			very high		9
9.	9.	VG	Leaf blade: position of broadest part		
QN		(a)	at middle or slightly towards base		1
			moderately towards base	ECHOR273	2
			strongly towards base	Milkshake	3
10.	10.	VG	Leaf: intensity of green colour		
QN		(a)	light	Tomato Soup	1
			medium	Purity	2
			dark	Fatal Attraction	3
11.	11. (*)	VG	Leaf: variegation		
QL		(a)	absent	ECHOR273	1
G			present	Prairie Frost	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
12.	12.	VG	Leaf: rugosity		
QN	(*)	(a)	absent or very weak	Hot Papaya	1
			very weak to weak		2
			weak	Summer Cocktail	3
			weak to medium		4
			medium	Green Jewel	5
			medium to strong		6
			strong	Catharina	7
			strong to very strong		8
			very strong		9
13.	13.	VG	Leaf: glossiness		
QN		(a)	absent or very weak	Mistral	1
			weak	After Midnight	2
			medium		3
			strong	Pineapple Sundae	4
			very strong		5
14.	14.	VG	Leaf: indentations of margin		
(+)	(*)				
QN		(a)	absent or very few	Hot Papaya	1
			few	Catharina	2
			medium	Green Jewel	3
			many		4
			very many		5
15.	15.	VG	Peduncle: colour		
	(*)				
PQ			green	Green Jewel	1
			green tinged weakly purple	Hilmooocosy	2
			green tinged strongly purple		3
			purple	After Midnight	4

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
16. QN	16.	VG	Peduncle: pubescence		
			absent or sparse	Hot Papaya	1
			medium	Hilmoococy	2
			dense	Green Jewel	3
17. (+) QN	17. (*)	MS/VG (b)	Flower head: diameter		
			very small		1
			very small to small	Hilmoococy	2
			small		3
			small to medium		4
			medium	Green Jewel	5
			medium to large		6
			large	Merlot	7
			large to very large		8
very large		9			
18. (+) QN	18. (*)	MS/VG (b)	Flower head: height		
			very short		1
			very short to short	SWEET271	2
			short	ECHOR273	3
			short to medium		4
			medium	Mistral	5
			medium to tall		6
			tall	Hot Papaya	7
			tall to very tall		8
very tall		9			

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
19. (+)	19. (*)	MS/VG (b)	Flower head: number of ray florets		
			very few		1
			very few to few		2
			few	Tiki Torch	3
			few to medium		4
			medium	Mistral	5
			medium to many		6
			many	Fatal Attraction	7
			many to very many		8
			very many		9
20. (+)	20. (*)	VG (b)	Flower head: attitude of ray florets at origin		
			semi-erect		1
			horizontal	Merlot	2
			semi-drooping	Mount Hood	3
			drooping	Hot Papaya	4
21. (+)	21. (*)	VG	Flower head: relative number of ligulate ray florets		
			none	All that Jazz	1
			few		2
			medium		3
			many	Sundown	4
			all or almost all	Merlot	5
22. (+)	22. (*)	VG (b)	Flower head: relative number of spatulate ray florets		
			none		1
			few	All that Jazz	2
			medium	Sundown	3
			many		4
			all or almost all		5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note		
23. (+)	23. (*)	VG	Flower head: relative number of quilled ray florets				
			QN	(b)	none		1
					few	Sundown	2
					medium		3
					many	All that Jazz	4
					all or almost all		5
24.	24. (*)	MS/VG	Ray floret: length				
			QN	(b), (c)	very short		1
					very short to short		2
					short	Fatal Attraction	3
					short to medium		4
					medium	Merlot	5
					medium to long		6
					long	Tomato Soup	7
					long to very long		8
		very long		9			
25.	25. (*)	MS/VG	Ray floret: width				
			QN	(b), (c)	very narrow		1
					very narrow to narrow		2
					narrow	Fatal Attraction	3
					narrow to medium		4
					medium	Summer Cocktail	5
					medium to broad		6
					broad	Milkshake	7
					broad to very broad		8
		very broad		9			

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
26.	26.	MS/VG	Ray floret: length/width ratio		
QN	(*)	(b), (c)	very low		1
			very low to low		2
			low		3
			low to medium	Hilmoocosy	4
			medium	Razzmatazz	5
			medium to high		6
			high	Mount Hood	7
			high to very high		8
			very high	Secret Glow	9
27.	27.	VG	<u>Only varieties with spatulate or quilled ray florets:</u> Ray floret: colour of outer side		
(+)	(*)				
PQ		(b), (c)	RHS Colour Chart (indicate reference number)		
28.	28.	VG	Ray floret: main colour of inner side		
	(*)				
PQ		(b),	RHS Colour Chart		
G		(c), (d)	(indicate reference number)		
29.	29.	VG	Ray floret: secondary colour of inner side		
	(*)				
PQ		(b),	RHS Colour Chart		
		(c), (d)	(indicate reference number)		
30.	30.	VG	Ray floret: distribution of secondary colour of inner side		
(+)	(*)				
PQ		(d)	none		1
			at base		2
			basal quarter		3
			distal half		4
			distal quarter		5
			at tip		6

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
31. (+) QN	31.	VG (b), (c)	Ray floret: curvature		
			strongly incurving		1
			weakly incurving	Green Jewel	2
			straight	Mount Hood	3
			weakly recurving	ECHOR273	4
			strongly recurving	Hot Papaya	5
32. QN	32.	VG (b), (c)	Ray floret: twisting		
			absent or very weak	Merlot	1
			weak	Hot Papaya	2
			medium	Noectwo	3
			strong		4
			very strong		5
33. (+) QN	33. (*)	VG (b), (c)	Ray floret: profile in cross section		
			strongly concave	Vintage Wine	1
			moderately concave	Green Jewel	2
			weakly concave	Merlot	3
			flat	ECHOR273	4
			weakly convex	Hilmooocosy	5
			moderately convex	Noectwo	6
			strongly convex		7
34. (+) PQ	34. (*)	VG (b), (c)	Ray floret: shape of apex		
			pointed	Purity	1
			rounded	Tiki Torch	2
			truncate	Green Jewel	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note		
35. (+)	35. (*)	VG	Ray floret: indentations of tip				
			QN	(b), (c)	absent or very shallow		1
					shallow	Hot Summer	2
					medium	Green Jewel	3
					deep	ECHOR273	4
					very deep	Secret Glow	5
36. (+)	36. (*)	VG	Disc: type				
			QL	(b)	daisy	Merlot	1
			G		anemone	Hot Papaya	2
37. (+)	37. (*)	MS/VG	Only varieties with disc type: <u>daisy</u>: Disc: diameter				
			QN	(b)	very small		1
					very small to small		2
					small	Tomato Soup	3
					small to medium		4
					medium	Summer Cocktail	5
					medium to large		6
					large	Merlot	7
					large to very large		8
		very large		9			

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
38.	38.	MS/VG	<u>Only varieties with disc type:</u>		
	(*)		<u>anemone: Disc: diameter</u>		
QN		(b)	very small		1
			very small to small	SWEET271	2
			small		3
			small to medium	Secret Glow	4
			medium	Razzmatazz	5
			medium to large		6
			large	Hot Papaya	7
			large to very large		8
			very large		9
39.	39.	MS/VG	<u>Only varieties with disc type:</u>		
(+)	(*)		<u>daisy: Disc: height</u>		
QN		(b)	very short		1
			very short to short		2
			short	Fatal Attraction	3
			short to medium		4
			medium	Purity	5
			medium to tall		6
			tall	After Midnight	7
			tall to very tall		8
			very tall		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
40.	40.	MS/VG	<u>Only varieties with disc type:</u>		
	(*)		<u>anemone:</u> Disc: height		
QN		(b)	very short		1
			very short to short		2
			short	Meringue	3
			short to medium		4
			medium		5
			medium to tall	Secret Glow	6
			tall	Catharina	7
			tall to very tall		8
			very tall	Noectwo	9
41.	41.	MS/VG	<u>Only varieties with disc type:</u>		
(+)	(*)		<u>daisy:</u> Disc: ratio height/diameter		
QN		(b)	very low		1
			very low to low		2
			low	Green Jewel	3
			low to medium		4
			medium	Purity	5
			medium to high		6
			high	Tiki Torch	7
			high to very high		8
			very high		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
42.	42.	MS/VG	<u>Only varieties with disc type:</u>		
	(*)		anemone: Disc: ratio height/diameter		
QN		(b)	very low		1
			very low to low		2
			low	Meringue	3
			low to medium		4
			medium		5
			medium to high		6
			high	Hot Papaya	7
			high to very high		8
			very high		9
43.	43.	VG	Disc: diameter in relation with flower to head		
(+)	(*)				
QN		(b)	very small		1
			very small to small		2
			small	Tomato Soup	3
			small to medium		4
			medium	Green Jewel	5
			medium to large		6
			large	Milkshake	7
			large to very large		8
			very large		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note	
44. (+)	44. (*)	VG	Disc: colour of tip of paleae (spikes)			
		PQ	(b)	none	Meringue	1
				green		2
				yellowish green	Green Jewel	3
				yellow		4
				orange	Purity, Mount Hood	5
				red orange		6
		G		red brown	Merlot, Hot Summer	7
			purple brown	Fatal Attraction	8	
45. (+)	45. (*)	VG	Disc: second colour of paleae (spikes)			
		PQ	(b)	none	Meringue	1
				green	Purity, Green Jewel	2
				yellow	Hot Summer	3
				orange	Mount Hood	4
				red orange	Fatal Attraction, Merlot	5
				red brown		6
46.	46. (*)	VG	<u>Only varieties with disc type:</u> anemone: Disc: colour before disc florets open			
		PQ		RHS Colour Chart (indicate reference number)		
47.	47. (*)	VG	<u>Only varieties with disc type:</u> anemone: Disc: colour after disc florets open			
		PQ G		RHS Colour Chart (indicate reference number)		
48. (+)	48. (*)	VG	<u>Only varieties with disc type:</u> daisy: Disc: presence of ray florets within disc			
		QL	(b)	absent	Merlot	1
			present	Mount Hood	9	

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
49. (+)	49. (*)	MS/VG	<u>Only varieties with disc type:</u> <u>daisy: with ray florets present</u> <u>within disc: Disc: number of ray florets within disc</u>		
QN		(b)	very few		1
			very few to few		2
			few	Mount Hood	3
			few to medium		4
			medium	Double Decker	5
			medium to many		6
			many	Pink Poodle	7
			many to very many		8
			very many		9
50.	50. (*)	MS/VG	<u>Only varieties with disc type:</u> <u>anemone: Disc floret: length</u>		
QN			very short		1
			short	Milkshake	2
			medium		3
			long	Hot Papaya	4
			very long		5
51.	51.	MS/VG	<u>Only varieties with disc type:</u> <u>anemone: Disc floret: width</u>		
QN		(b)	very narrow	Milkshake	1
			narrow	SWEET271	2
			medium		3
			broad	Hot Papaya	4
			very broad		5
52. (+)	52.	VG	<u>Only varieties with disc type:</u> <u>anemone: Disc floret: curvature</u>		
QN		(b)	straight	Milkshake	1
			weakly recurved	Secret Glow	2
			strongly recurved	Hot Papaya	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
53. (+)	53. (*)	VG	<u>Only varieties with disc type:</u> <u>anemone: Disc floret: length of tube</u>		
QN		(b)	very short		1
			short	Hot Papaya	2
			medium		3
			long	Milkshake	4
			very long		5
54.	54. (*)	VG	<u>Only varieties with disc type:</u> <u>anemone: Disc floret: depth of indentations of tip</u>		
QN		(b)	absent or very shallow		1
			shallow		2
			medium	SWEET271	3
			deep	Hot Papaya	4
			very deep	Secret Glow	5

8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

8.1 Explanations covering several characteristics

All characteristics should be observed at the time of full flowering.

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

- a) Observations should be made on leaves taken from the middle third of the flowering stem, and, unless otherwise indicated, on the upper surface.
- b) Observations should be made when half the disc florets in the flower head have dehisced/opened.
- c) Observations should be made on ray florets of the predominant type.
- d) The main colour is the colour of the largest surface area. In cases where the areas of the main and secondary colour are too similar to reliability decide which colour has the largest area, the darker colour is considered to be the main colour.

8.2 Explanations for individual characteristics

Ad 1: Plant: height



Ad 3: Plant: floriferousness

Should be observed as the number of flowers open at the same time on the plant.

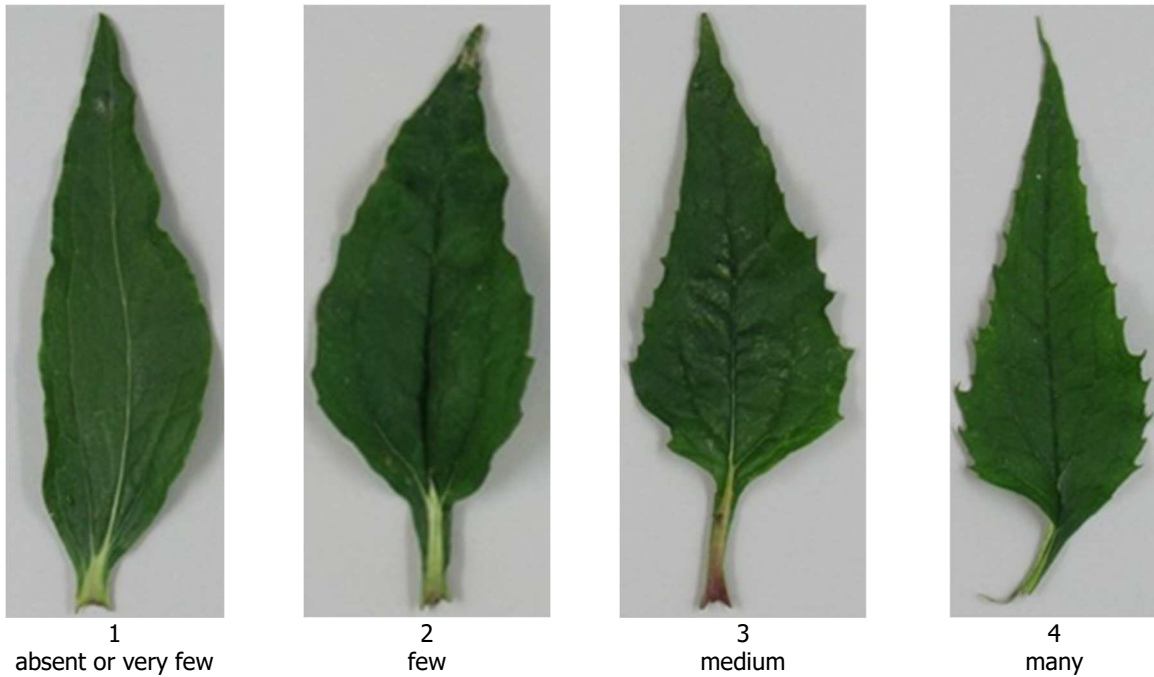
Ad 4: Stem: colour

The colour should be observed on the middle third of the stem, excluding the peduncle.

Ad 6: Leaf: length

Observations should be made including the petiole.

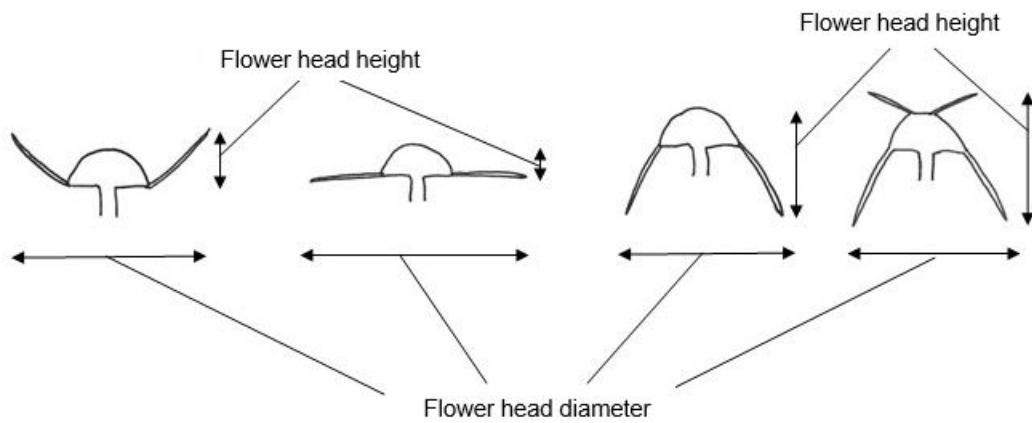
Ad 14: Leaf: indentations of margin



Ad 17: Flower head: diameter

Ad 18: Flower head: height

Observations should be made on the natural flower head diameter and height.

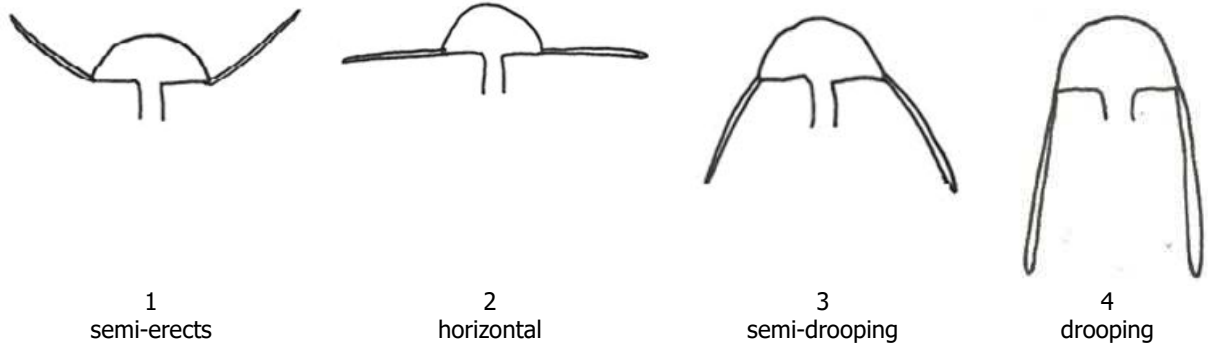


Ad 19: Flower head: number of ray florets

Observations should be made excluding any ray florets within the disc (see characteristic 49).

Ad 20: Flower head: attitude of ray florets at origin

The origin is the base of the ray floret as it emerges from the involucre.



Ad 21: Flower head: relative number of ligulate ray florets

“Relative” means the number of ligulate ray florets as a proportion of the overall number of ray florets. It is this which is observed, not the absolute number of ligulate ray florets.

Ligulate florets are flat.



Ad 22: Flower head: relative number of spatulate ray florets

“Relative” means the number of spatulate ray florets as a proportion of the overall number of ray florets. It is this which is observed, not the absolute number of spatulate ray florets.

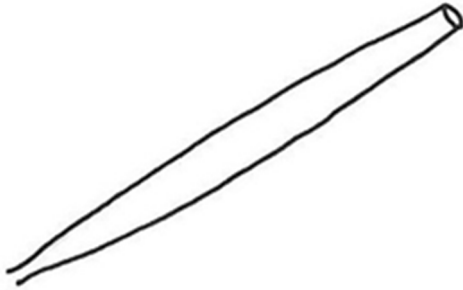
Spatulate florets are where the part of the floret is tubular and part is flat.



Ad 23: Flower head: relative number of quilled ray florets

“Relative” means the number of quilled ray florets as a proportion of the overall number of ray florets. It is this which is observed, not the absolute number of quilled ray florets.

Quilled florets are where the whole length of the floret is tubular.



Ad 27: Only varieties with spatulate or quilled ray florets: Ray floret: colour of outer side

Observations should be made on the quilled part of the floret, on the area facing upwards.



Color to be observed on this part

Ad 30: Ray floret: distribution of secondary colour of inner side



2
at base



3
basal quarter



4
distal half



5
distal quarter



6
at tip

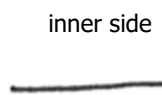
Ad 31: Ray floret: curvature



1
strongly incurving



2
weakly incurving



3
straight



4
weakly recurving

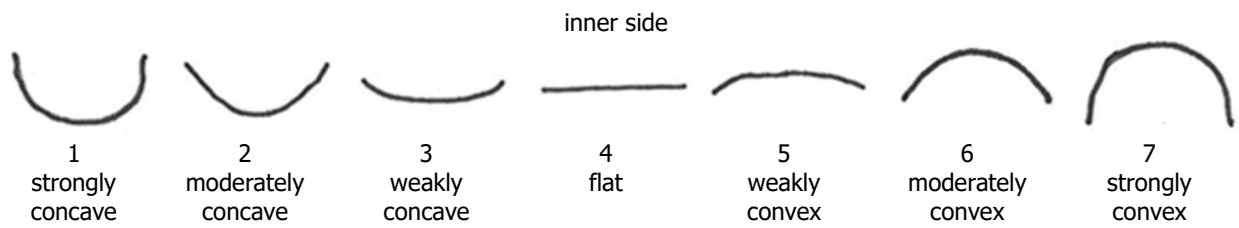


5
strongly recurving

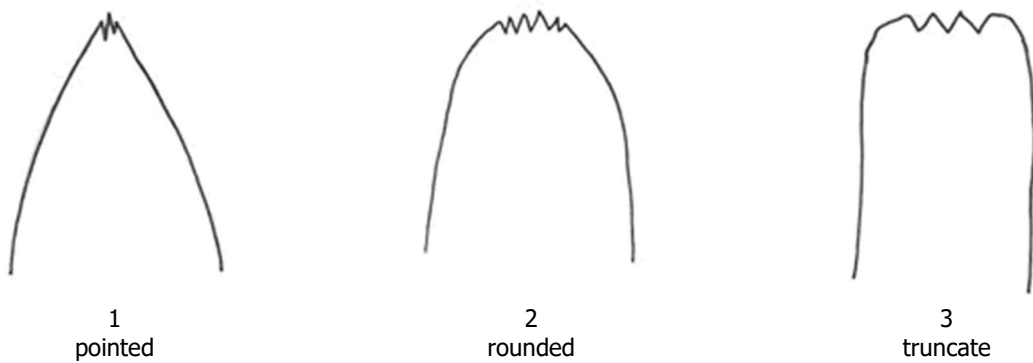
inner side

Ad 33: Ray floret: profile in cross section

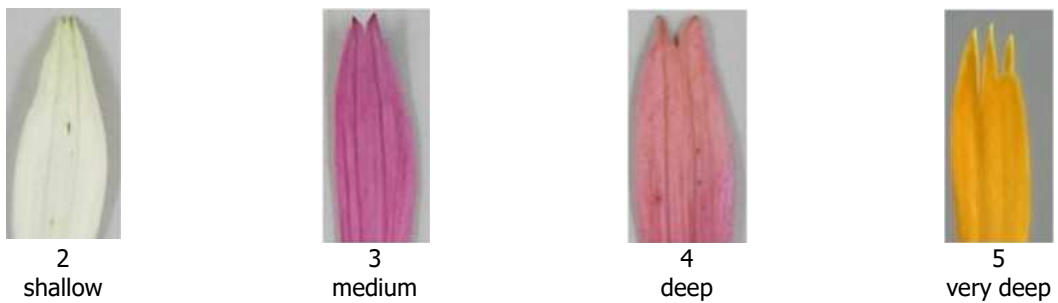
Observations should be made at the midpoint of the floret.



Ad 34: Ray floret: shape of apex



Ad 35: Ray floret: indentations of tip



Ad 36: Disc: type



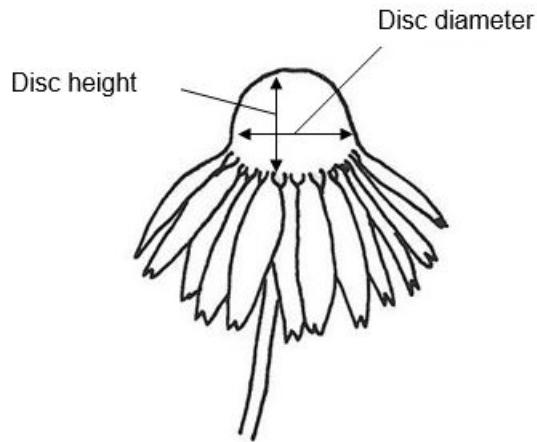
1 daisy



2 anemone

Ad 37: Only varieties with disc type: daisy: Disc: diameter

Ad 39: Only varieties with disc type: daisy: Disc: height



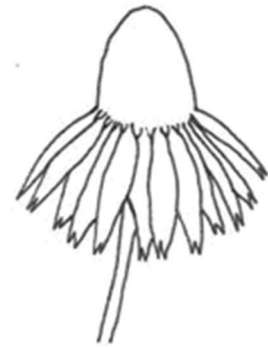
Ad 41: Only varieties with disc type: daisy: Disc: ratio height/diameter



3
low



5
medium



7
high

Ad 43: Disc: diameter in relation to flower head

The disc diameter is observed relative to the natural flower head diameter.



3
small



5
medium

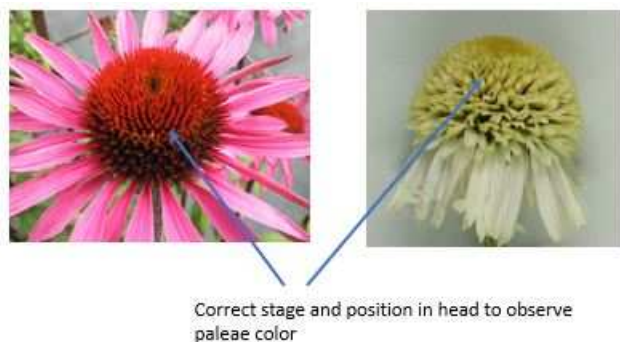


7
large

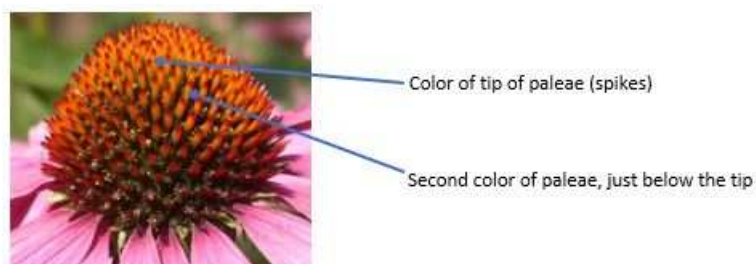
Ad 44: Disc: colour of tip of paleae (spikes)

Ad 45: Disc: second colour of tip of paleae (spikes)

To be observed on paleae half way between the base and the top of the disc, just before the disc florets associated with the paleae have dehisced/opened.



The colour of tip of paleae (spikes) (characteristic 44) is observed irrespective of area covered. The second colour (characteristic 45) is the colour directly below the tip (if different from the tip colour). Any further colours should be ignored.



In some varieties with anemone disc type (characteristic 36) paleae are not visible in the head, in these varieties both characteristic 44 and 45 should be observed as none, note 1.



Example of variety where paleae are observed as 'none'.

Ad 48: Only varieties with disc type: daisy: Disc: presence of ray florets within disc



1
absent



9
present

Ad 49: Only varieties with disc type: daisy: with ray florets present within disc: Disc: number of ray florets within disc



3
few



7
many

Ad 52: Only varieties with disc type: anemone: Disc floret: curvature



1
straight



2
weakly recurved



3
strongly recurved

Ad 53: Only varieties with disc type: anemone: Disc floret: length of tube



2
short



3
medium



4
long

9. LITERATURE

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10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the [CPVO website](#) under the following reference:
CPVO-TQ/281/2 – *Echinacea* Moench – echinacea

Link to the e-TQ:

<https://online.plantvarieties.eu/backOfficeFormQuestions?viewFormId=13953&viewFormType=TQ&viewFormLang=EN&speciesIds=ECHA1&status=1,2&order=formName>