



**European Union
Community Plant Variety Office**

PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

***Chrysanthemum* ×*morifolium* Ramat.
(*Chrysanthemum* ×*grandiflorum* Ramat.),
Chrysanthemum pacificum Nakai
(*Ajania pacifica* Bremer and Humphries)
and hybrids between them**

CHRYSANTHEMUM

**UPOV Species Code: CHRYS_MOR ; CHRYS_PAC
and relevant linked codes**

Adopted on 13th March 2008

I - SUBJECT OF THE PROTOCOL

The protocol describes the technical procedures to be followed in order to meet the requirement of Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on general UPOV Document TG/1/3 and UPOV Guideline TG/26/5 dated 5th April 2006. This protocol applies to all varieties of *Chrysanthemum ×morifolium* Ramat. (*Chrysanthemum ×grandiflorum* Ramat.), *Chrysanthemum pacificum* Nakai (*Ajania pacifica* Bremer and Humphries) of the family *Asteraceae*, and hybrids between them.

II - SUBMISSION OF PLANT MATERIAL

1. The Community Plant Variety Office (CPVO) is responsible for informing the applicant of:

- the closing date for the receipt of plant material;
- the minimum amount and quality of plant material required;
- the examination office to which material is to be sent.

The applicant is responsible for ensuring compliance with any customs and plant health requirements.

2. Final dates for receipt of documentation and material by the Examination Office:

The final dates for receipt of requests, technical questionnaires and the final date or submission period for plant material will be decided by the CPVO and each Examination Office chosen.

The Examination Office is responsible for immediately acknowledging the receipt of requests for testing, and technical questionnaires. If no or unsatisfactory plant material is submitted the CPVO should be informed as soon as possible.

3. Plant material requirements:

Information with respect to closing dates and submission requirements of plant material for the technical examination of varieties can be found on the CPVO website (www.cpvo.europa.eu) and in the special Issue S2 of the Official Gazette of the Office published yearly in the month of September.

Quality: The plant material supplied should be visibly healthy, not lacking in vigour or affected by any important pest or disease, especially virus, as laid down in Council Directive 2000/29/EC and its amendments, or organisms impairing quality as indicated in Council Directive 98/56/EEC and Commission Directive 93/49/EEC and their amendments.

The plant material must not have undergone any treatment unless the CPVO and the examination office allow or request such treatment. If it has been treated, full details of the treatment must be given

Labelling of sample: - Species
- File number of the application allocated by the CPVO
- Breeder's reference
- Examination reference (if known)
- Name of applicant
- The phrase "On request of the CPVO".

III - CONDUCT OF TESTS

1. Variety collection:

A variety collection will be maintained for the purpose of establishing distinctness of the candidate varieties in test. A variety collection may contain both living material and descriptive information. A variety will be included in a reference collection only if plant material is available to make a technical examination.

Pursuant to Article 7 of Council Regulation No. 2100/94, the basis for a collection should be the following:

- varieties listed or protected at the EU level or at least in one of the EEA Member States;
- varieties protected in other UPOV Member States;
- any other variety in common knowledge.

It is the responsibility of Examination Office to keep the variety collection up to date.

2. Material to be examined:

Candidate varieties will be directly compared with other candidates for Community plant variety rights tested at the same Examination Office, and with appropriate varieties in the variety collection. When necessary an Examination Office may also include other candidates and varieties.

3. Characteristics to be used:

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in Annex 1. 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. In the later case, the CPVO should be informed. In addition the existence of some other regulation e.g. plant health, may make the observation of the characteristic impossible.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N° 1239/95, to insert additional characteristics and their expressions in respect of a variety.

4. Grouping of varieties:

The varieties and candidates to be compared will be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety and which in their various states of expression are fairly evenly distributed throughout the collection. In the case of continuous grouping characteristics overlapping states of expression between adjacent groups is required to reduce the risks of incorrect allocation of candidates to groups. The characters used for grouping are the following ones:

- (a) Plant: type (characteristic 2)
- (b) Flower head: type (characteristic 30)
- (c) Excluding double and daisy-eyed double varieties: Disc: type (characteristic 31)
- (d) Ray floret: number of colours of inner side (characteristic 62)
- (e) Ray floret: main colour of inner side (characteristic 63) with the following groups:
 - Gr. 1: white
 - Gr. 2: off-white
 - Gr. 3: yellow
 - Gr. 4: bronze
 - Gr. 5: orange
 - Gr. 6: orange pink
 - Gr. 7: pink
 - Gr. 8: red
 - Gr. 9: red purple
 - Gr. 10: purple
 - Gr. 11: green

(f) Ray floret: second colour of inner side (characteristic 64) with the following groups:

- Gr. 1: white
- Gr. 2: off-white
- Gr. 3: yellow
- Gr. 4: bronze
- Gr. 5: orange
- Gr. 6: orange pink
- Gr. 7: pink
- Gr. 8: red
- Gr. 9: red purple
- Gr. 10: purple
- Gr. 11: green

5. Trial designs and growing conditions:

The minimum duration of tests will normally be one growing cycle if the results on distinctness and uniformity are conclusive. Tests will be carried out under conditions ensuring normal growth. In particular, growth regulators should not be used. The size of the plots will be such that plants or parts of plants may be removed for measuring and counting without prejudice to the observations which must be made up to the end of the growing period.

The test design is as follows:

As a minimum, each test should include a total of 20 plants for vegetatively propagated varieties and 40 plants for seed propagated varieties. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions.

Varieties should be disbudded if bred for such use, but where necessary, in the case of dual purpose varieties, distinctness should also be checked on non-disbudded plants.

For vegetatively propagated varieties, all observations on single plants determined by measurement or counting 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.

For seed propagated varieties all observations on single plants determined by measurement or counting should be made on 20 plants or parts taken from each of 20 plants and any other observations made on all plants in the test.

The test should normally be conducted at one place.

The test should be carried out in the open for natural season types (with plants being

moved into the glasshouse for the final stages of flowering if frost is likely), and in the greenhouse for all other types, under conditions ensuring normal growth.

6. Special 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, 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 characters listed in the protocol.

7. Standards for decisions:

a) Distinctness

A candidate variety will be considered to be distinct if it meets the requirements of Article 7 of Council Regulation No. 2100/94.

b) Uniformity

For the assessment of uniformity of vegetatively propagated varieties and seed-propagated varieties which are self-pollinated, a population standard of 1% with an acceptance probability of at least 95% should be applied.

For a sample size between 6 and 35 plants for vegetatively propagated varieties, only 1 off-type is allowed.

For a sample size between 36 and 82 plants for vegetatively propagated varieties and seed propagated varieties which are self-pollinated, only 2 off-types are allowed.

For the assessment of uniformity of seed propagated open pollinated and hybrid varieties, relative uniformity standards should be applied.

c) Stability

A candidate will be considered to be sufficiently stable when there is no evidence to indicate that it lacks uniformity.

IV - REPORTING OF RESULTS

After each growing cycle the results will be summarised and reported to the CPVO in the form of a UPOV model interim report in which any problems will be indicated under the headings distinctness, uniformity and stability. Candidates may meet the DUS standards after one growing cycle but in some cases two or more growing cycles may be required. When tests are completed the results will be sent by the Examination Office to the CPVO in the form of a UPOV model final report.

If it is considered that the candidate complies with the DUS standards, the final report will be accompanied by a variety description in the format recommended by UPOV. If not the reasons for failure and a summary of the test results will be included with the final report.

The CPVO must receive interim reports and final reports by the date agreed between the CPVO and the examination office.

Interim reports and final examination reports shall be signed by the responsible member of the staff of the Examination Office and shall expressly acknowledge the exclusive rights of disposal of CPVO.

V - LIAISON WITH THE APPLICANT

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 agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

The interim report and final report shall be sent by the Examination Office to the CPVO.

ANNEXES TO FOLLOW

ANNEX I	<u>PAGE</u>
List of characteristics to be observed	9
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<u>Legend:</u>	
QL Qualitative characteristic	
QN Quantitative characteristic	
PQ Pseudo-qualitative characteristic	
(a) - (h) See explanations on the Table of characteristics	
(+) See explanations on the Table of characteristics	
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ANNEX II

Technical Questionnaire

ANNEX 1 TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Characteristics	Examples	Note
1.	1.	Plant: height		
	QN	(a) short	Machismo Time	3
		medium	Dekyen	5
		tall	Figrand	7
2.	2. (+)	Plant: type		
	QL	(a) non bushy	Anastasia, Boulou, Casmo, Reagan	1
		bushy	Elda White, Golden Mariyo, Guitpolin, Tripoli	2
3.	3. (+)	<u>Only bushy varieties:</u> Plant: growth habit		
	PQ	(a) upright	Golden Mariyo	1
		semi upright	Veria Dark	2
		hemispherical	Elda White	3
		spreading		4
		trailing	Fancy That	5
4.	4.	<u>Only bushy varieties:</u> Plant: density of branching		
	QN	(a) sparse	Golden Mariyo	3
		medium	Veria Dark	5
		dense	Elda White	7
5.	5.	Stem: colour		
	PQ	(a) green	Yoko Ono	1
		(b) green tinged with purple or brown	Fancy That	2
		brown		3
		purple	Vymini	4

CPVO N°	UPOV N°	Characteristics	Examples	Note
6.	6.	Stipule: size		
	QN	(a) absent or very small	Zeemimosa	1
		(b) small	Vymini	3
		medium	Yoko Ono	5
		large	Orinocco	7
7.	7. (+)	Petiole: attitude		
	QN	(a) very strongly upwards	Rex	1
		(c) moderately upwards	Dekyen	3
		horizontal	Boris Becker	5
		moderately downwards	Breeze	7
		drooping		9
8.	8.	Petiole: length relative to leaf length		
	QN	(a) short	Vymini	3
		(c) medium	Figrand	5
		long		7
9.	9.	Leaf: length including petiole		
	QN	(a) short	Molfetta Pink	3
		(c) medium	Figrand	5
		long	Yellow Wonder	7
10.	10.	Leaf: width		
	QN	(a) narrow	Molfetta Pink	3
		(c) medium	Figrand	5
		broad	Buttermere Anne	7

CPVO N°	UPOV N°	Characteristics	Examples	Note
11.	11.	Leaf: ratio length/width		
	QN	(a) low	Buttermere Anne	3
		(c) medium	Figrand	5
		high	Dekyen	7
12.	12. (+)	Leaf: length of terminal lobe relative to leaf length		
	QN	(a) short	Le Mans	3
		(c) medium	Figrand	5
		long	Vymini	7
13.	13. (+)	Leaf: depth of lowest lateral sinus		
	QN	(a) shallow	Bea	3
		(c) medium	Scott	5
		deep	Figrand	7
14.	14.	Leaf: margins of lowest lateral sinus		
	PQ	(a) diverging	Zeemimosa	1
		(c) parallel	Alma-Ata	2
		converging	Arusha Dark Pink	3
		touching	Vymini	4
		overlapping	Figrand	5
15.	15. (+)	Leaf: predominant shape of base		
	PQ	(a) acute	Zeemimosa	1
		(c) obtuse	Machismo Time	2
		rounded	Repulse	3
		truncate	Alma-Ata	4
		cordate	Scott	5
		asymmetric	6	

CPVO N°	UPOV N°	Characteristics	Examples	Note
16.	16.	Leaf: glossiness of upper side		
	QN	(a) absent or very weak	Veria Dark	1
		(c) weak	Breeze	2
		strong	Repulse	3
17.	17.	Leaf: green colour of <u>upper</u> side		
	QN	(a) light		3
		(c) medium	Ruby Red Reagan	5
		dark	Dekyen	7
18.	18. (+)	<u>Excluding varieties of <i>Chrysanthemum</i></u> <u><i>×morifolium</i>: Leaf: upper side:</u> prominence of pale margin		
	QN	(a) absent or very weak	Branjania Lotta	1
		(c) weak		3
		medium	Mont Blanc	5
		strong	Zeemimosa	7
19.	19. (+)	<u>Excluding varieties of <i>Chrysanthemum</i></u> <u><i>×morifolium</i>: Leaf: pubescence of</u> lower side		
	QN	(a) weak		3
		(c) medium	Benny	5
		strong	Zeemimosa	7
20.	20. (+)	<u>Excluding varieties of <i>Chrysanthemum</i></u> <u><i>×morifolium</i>: Leaf: colour of lower side</u>		
	PQ	(a) RHS Colour Chart (indicate reference number)		
		(c)		

CPVO N°	UPOV N°	Characteristics	Examples	Note
21.	21. (+)	Leaf margin: number of indentations		
	QN	(a) few	Bea	3
		(c) medium	Le Mans	5
		many	Vymini	7
22.	22. (+)	Leaf margin: depth of indentations		
	QN	(a) shallow	Anastasia	3
		(c) medium	Le Mans	5
		deep	Machismo Time	7
23.	23. (+)	<u>Only non-bushy varieties</u> (see char. 2): Inflorescence: form		
	PQ	(d) conical	Breeze	1
		deeply domed	Yoko Ono	2
		cylindrical	Premium Time	3
		corymbiform	Machismo Time	4
		flat-corymbiform		5
24.	24.	<u>Only non-bushy varieties</u> (see char. 2): Inflorescence: width at widest point		
	QN	(d) narrow	Premium Time	3
		medium	Figrand	5
		broad		7
25.	25. (+)	<u>Only non-bushy varieties</u> (see char. 2): Inflorescence: angle between primary lateral shoot and stem		
	QN	(d) small	Delianne	3
		medium	Dekyen	5
		large	Repulse	7

CPVO N°	UPOV N°	Characteristics	Examples	Note
26.	26. (+)	<u>Only non-bushy varieties</u> (see char. 2): Inflorescence: attitude of lateral flower heads		
		QN (d) upright	Scott	1
		semi upright	Ruby Red Reagan	3
		horizontal	Premium Time	5
		moderately downwards		7
27.	27. (+)	<u>Only non-bushy varieties: (see char. 2):</u> Total number of flower heads per stem		
		QN (d) few	Delianne	3
		medium	Vymini	5
		many	Breeze	7
28.	28. (+)	<u>Only bushy varieties (see char. 2):</u> Total number of flower heads per plant		
		QN few	Golden Mariyo	3
		medium	Balios	5
		many	Elda White	7
29.	29.	Flower bud: colour of outer side just before opening		
		PQ (a) RHS Colour Chart (indicate reference number) (e)		
30.	30. (+)	Flower head: type		
		PQ (e) without ray florets	Zeemimosa	1
		single	Repulse	2
		semi double	Figrand	3
		daisy-eyed double	Veria Dark	4
		double	Delianne	5

CPVO N°	UPOV N°	Characteristics	Examples	Note
31.	31. (+)	<u>Excluding double and daisy-eyed double varieties: Disc: type</u>		
	QL	(e) daisy	Figrand	1
		anemone	Le Mans	2
32.	32.	Flower head: diameter (non-disbudded plants)		
	QN	(d) small	Yoko Ono	3
		(e) medium	Ruby Red Reagan	5
		large	Delianne	7
33.	33.	Flower head: diameter (disbudded plants)		
	QN	(d) small	Boris Becker	3
		(e) medium		5
		large	Anastasia	7
34.	34.	Flower head: height (non-disbudded plants)		
	QN	(d) low	Dekyen	3
		(e) medium	Figrand	5
		high		7
35.	35.	Flower head: height (disbudded plants)		
	QN	(d) low	Anastasia	3
		(e) medium	Anlymp	5
		high		7
36.	36.	Flower head: length of peduncle		
	QN	(e) short	Vymini	3
		medium	Delianne	5
		long	Ruby Red Reagan	7

CPVO N°	UPOV N°	Characteristics	Examples	Note
37.	37.	<u>Only semi double and daisy-eyed double varieties (see char. 30):</u> Flower head: number of rows of ray florets		
	QN	(e) few	Vymini	3
		medium	Fancy That	5
		many	Veria Dark	7
38.	38.	<u>Only single and semi double varieties (see char. 30):</u> Flower head: number of ray florets		
	QN	(e) few	Repulse	3
		medium	Figrand	5
		many	Vymini	7
39.	39.	<u>Only daisy-eyed double and double varieties (see char. 30):</u> Flower head: density of ray florets		
	QN	(e) sparse	Balios	3
		medium	Delianne	5
		dense	Anlymp	7
40.	40. (+)	Flower head: number of types of ray florets		
	PQ	(e) one	Figrand	1
		two	Banjax	2
		more than two	Arusha Dark Pink	3
41.	41. (+)	Flower head: predominant type of ray floret		
	PQ	(e) ligulate	Figrand	1
		incurved	Anlymp, Boulou	2
		spatulate	Banjax	3
		quilled	Anastasia	4
		funnel shaped	Repulse	5

CPVO N°	UPOV N°	Characteristics	Examples	Note
42.	42. (+) PQ	Flower head: secondary type of ray floret		
		(e) ligulate		1
		incurved		2
		spatulate	Arusha Dark Pink	3
		quilled	Banjax	4
		funnel shaped		5
43.	43. (+) PQ	Flower head: tertiary type of ray floret		
		(e) ligulate		1
		incurved		2
		spatulate		3
		quilled	Arusha Dark Pink	4
		funnel shaped		5
44.	44. (+) QN	<u>Only single and semi double varieties (see char. 30): Ray floret: attitude of basal part</u>		
		(e) moderately ascending	Dekyen	3
		(f) horizontal	Vymini	5
		moderately descending	Tango	7
45.	45. (+) PQ	Ray floret: upper surface		
		(e) smooth	Elda White	1
		(f) ribbed	Ruby Red Reagan	2
		keeled	Vymini	3

CPVO N°	UPOV N°	Characteristics	Examples	Note
46.	46. (+) PQ	Ray floret: number of keels		
		(e) one		1
		(f) two	Vymini	2
		more than two		3
47.	47. QN	Ray floret: length of corolla tube		
		(e) short	Yoko Ono	3
		(f) medium		5
		long	Repulse	7
48.	48. (+) QN	Ray floret: profile in cross section at widest point (non-quilled florets)		
		(e) strongly concave with margins overlapping		1
		(f) strongly concave with margins touching		2
		strongly concave	Anlymp	3
		moderately concave	Yoko Ono	4
		weakly concave	Golden Mariyo	5
		flat		6
		weakly convex	Le Mans	7
		moderately convex	Machismo Time	8
		strongly convex		9
		strongly convex with margins touching		10
		strongly convex with margins overlapping		11

CPVO N°	UPOV N°	Characteristics	Examples	Note
49.	49. (+) QN	Ray floret: rolling of margin (non-quilled florets)		
		(e) strongly involute		1
		(f) moderately involute	Boris Becker	2
		weakly involute		3
		flat (not rolled)	Figrand	4
		weakly revolute	Tango	5
		moderately revolute	Machismo Time	6
		strongly revolute		7
50.	50. PQ	Ray floret: position of part with rolled margin (non-quilled florets)		
		(e) basal quarter		1
		(f) basal half	Boris Becker	2
		basal three quarters		3
		middle half		4
		distal three quarters		5
		distal half	Machismo Time	6
		distal quarter		7
throughout		8		
51.	51. PQ	Ray floret: profile of tube (funnel-shaped, spatulate and quilled florets)		
		(e) circular	Repulse	1
		(f) oblate		2
		flattened	Anastasia	3
		triangular	Chatora	4

CPVO N°	UPOV N°	Characteristics	Examples	Note
52.	52. (+)	Ray floret: longitudinal axis		
	PQ	(e) incurving	Anlymp	1
		(f) straight	Alma-Ata	2
		reflexing	Ruby Red Reagan	3
		sinusoidal		4
		twisted	Lunar Time	5
		broken	Edokihachijo	6
53.	53.	Ray floret: longitudinal axis: part not straight (non-straight florets)		
	QN	(e) distal quarter	Ruby Red Reagan	3
		(f) distal half	Anlymp	5
		distal three quarters		7
54.	54. (+)	Ray floret: longitudinal axis: strength of curvature (non-straight florets)		
	QN	(e) weak	Ruby Red Reagan	3
		(f) medium	Anlymp	5
		strong		7
55.	55. (+)	<u>Only semi double, daisy-eyed double and double varieties:</u> Ray floret: longitudinal axis of inner row(s) (if different from outer row)		
	PQ	(e) incurving		1
		(f) straight		2
		reflexing		3
		sinusoidal		4
		twisted		5
		broken		6

CPVO N°	UPOV N°	Characteristics	Examples	Note
56.	56.	<u>Only semi double, daisy-eyed double and double varieties:</u> Ray floret: longitudinal axis of inner row(s) (if different from outer row): part not straight (non-straight florets)		
	QN	(e) distal quarter		3
		(f) distal half		5
		distal three quarters		7
57.	57. (+)	<u>Only semi double, daisy-eyed double and double varieties:</u> Ray floret: longitudinal axis of inner row(s) (if different from outer row): strength of curvature (non-straight florets)		
	QN	(e) weak		3
		(f) medium		5
		strong		7
58.	58.	Ray floret: length		
	QN	(e) short	Dekyen	3
		(f) medium	Figrand	5
		long	Delianne	7
59.	59.	Ray floret: width		
	QN	(e) narrow	Dekyen	3
		(f) medium	Figrand	5
		broad	Boulou	7
60.	60.	Ray floret: ratio length/width		
	QN	(e) low	Vymini	3
		(f) medium	Figrand	5
		high	Delianne	7

CPVO N°	UPOV N°	Characteristics	Examples	Note
61.	61. (+) PQ	Ray floret: shape of tip		
		(e) pointed	Figrand	1
		(f) rounded	Machismo Time	2
		truncate		3
		emarginate		4
		dentate	Dekyen	5
		mamillate	North Bay	6
		fringed	Molfetta	7
		lacinate		8
62.	62. PQ	Ray floret: number of colours of inner side		
		(e) one	Figrand	1
		(f) two	Machismo Time	2
		more than two	3	
63.	63. PQ	Ray floret: <u>main</u> colour of inner side		
		(e) RHS Colour Chart (indicate reference number)		
		(f) (g)		
64.	64. PQ	Ray floret: <u>second</u> colour of inner side		
		(e) RHS Colour Chart (indicate reference number)		
		(f) (g)		

CPVO N°	UPOV N°	Characteristics	Examples	Note	
65.	65. (+)	Ray floret: distribution of <u>second</u> colour of inner side			
		PQ	(e) at tip		1
			(f) distal quarter		2
			(g) distal half		3
			distal three quarters	Breeze	4
			basal three quarters	Machismo Time	5
			basal half	Culata	6
			basal quarter	Lunar Time	7
			at base		8
			on margin		9
			on marginal zone		10
			central bar	North Bay	11
			transverse zone [band]		12
throughout	Ceartist Pink		13		
66.	66. (+)	Ray floret: pattern of <u>second</u> colour of inner side			
		PQ	(e) solid or nearly solid	Machismo Time	1
			(f) flushed	Culata	2
			(g) diffuse stripes		3
				clearly defined stripes	
			flecked		5
			flecked and striped	Ceartist Pink	6
			mottled		7

CPVO N°	UPOV N°	Characteristics	Examples	Note
67.	67.	Ray floret: <u>third</u> colour of inner side		
	PQ	(e) RHS Colour Chart (indicate reference number) (f) (g)		
68.	68. (+)	Ray floret: distribution of <u>third</u> colour of inner side		
	PQ	(e) at tip		1
		(f) distal quarter		2
		(g) distal half		3
		distal three quarters		4
		basal three quarters		5
		basal half		6
		basal quarter		7
		at base		8
		on margin		9
		on marginal zone		10
		central bar		11
		transverse zone [band]		12
		throughout		13
69.	69. (+)	Ray floret: pattern of <u>third</u> colour of inner side		
	PQ	(e) solid or nearly solid		1
		(f) flushed		2
		(g) diffuse stripes		3
		clearly defined stripes		4
		flecked		5
		flecked and striped		6
		mottled		7

CPVO N°	UPOV N°	Characteristics	Examples	Note
70.	70.	Ray floret: colour of outer side compared to inner side (including tube for funnel-shaped, quilled and spatulate florets)		
	QL	(e) similar	Figrand	1
		(f) markedly different	Repulse	2
71.	71.	Ray floret: colour of the <u>outer</u> side, where markedly different to inner side		
	PQ	(e) RHS Colour Chart (indicate reference number)		
		(f)		
72.	72.	<u>Only semi double, daisy-eyed double and double varieties (see char. 30):</u> Ray floret: colour of <u>inner</u> side of <u>inner</u> row(s) (if different from outer row)		
	PQ	(e) RHS Colour Chart (indicate reference number)		
		(f)		
73.	73.	<u>Only semi double, daisy-eyed double and double varieties (see char. 30):</u> Ray floret: colour of <u>outer</u> side of <u>inner</u> row(s) (if different from outer row)		
	PQ	(e) RHS Colour Chart (indicate reference number)		
		(f)		
74.	74.	<u>Only single and semi double varieties (see char. 30) which are daisy type (see char. 31):</u> Disc: diameter		
	QN	(e) small	Breeze	3
		medium	Machismo Time	5
		large	Figrand	7
75.	75.	<u>Only single and semi double varieties (see char. 30) which are anemone type (see char. 31):</u> Disc: diameter		
	QN	(e) small	Billion Pink	3
		medium	Le Mans	5
		large	Banjax	7

CPVO N°	UPOV N°	Characteristics	Examples	Note	
76.	76. (+)	<u>Only single and semi double varieties (see char. 30): Disc: diameter relative to head diameter</u>			
	QN	(e) small	Scott	3	
		medium	Figrand	5	
		large	Vymini	7	
77.	77. (+)	<u>Only daisy type varieties (see char. 31): Disc: profile in cross section</u>			
	PQ	(e) indented		1	
		flat	Dekyen	2	
		slightly domed	Vymini	3	
		slightly conical		4	
		strongly domed	Tango	5	
		strongly conical	Figrand	6	
78.	78.	<u>Only daisy type varieties (see char. 31): Disc: colour group before anther dehiscence</u>			
	PQ	(e) whitish		1	
		(h)	green	Figrand	2
			yellowish green	Machismo Time	3
			light yellow		4
			medium yellow		5
			yellow orange		6
			orange		7
			reddish brown		8
			brown	Vymini	9
			brownish black	Acapulco	10
purplish black		11			

CPVO N°	UPOV N°	Characteristics	Examples	Note
79.	79.	<u>Only daisy type varieties (see char. 31):</u> Disc: presence of dark spot at centre before anther dehiscence		
	QL	(e) absent	Reagan	1
		(h) present	High Way	9
80.	80.	<u>Only daisy type varieties (see char. 31):</u> Disc: size of dark spot at centre before anther dehiscence, relative to disc size		
	QN	(e) small	Retaco	3
		(h) medium	High Way	5
		large	Vyking Orange	7
81.	81.	<u>Only daisy type varieties (see char. 31):</u> Disc: colour of dark central spot before anther dehiscence		
	PQ	(e) RHS Colour Chart (indicate reference number) (h)		
82.	82.	<u>Only anemone type varieties (see char. 31):</u> Disc: colour before anther dehiscence		
	PQ	(e) RHS Colour Chart (indicate reference number) (h)		
83.	83.	<u>Only daisy type varieties (see char. 31):</u> Disc: colour group at anther dehiscence		
	PQ	(e) whitish		1
		green		2
		yellowish green	Figrand	3
		light yellow		4
		medium yellow		5
		yellow orange	Machismo Time	6
		orange		7
		reddish brown	Vymini	8
		brown		9
		brownish black		10
	purplish black		11	

CPVO N°	UPOV N°	Characteristics	Examples	Note
84.	84.	<u>Only anemone type varieties (see char. 31): Disc: colour at anther dehiscence</u>		
	PQ	(e) RHS Colour Chart (indicate reference number)		
85.	85. (+)	<u>Only anemone type varieties (see char. 31): Disc floret: type</u>		
	PQ	(e) needle shaped	Billion Pink	1
		quilled	Banjax	2
		funnel shaped		3
		enlarged tubular	Yovisalia	4
		petaloid	Yogranceland	5
86.	86.	<u>Only anemone type varieties (see char. 31): Disc floret: length</u>		
	QN	(e) short	Yovisalia	3
		medium		5
		long	Banjax	7
87.	87.	<u>Only anemone type varieties (see char. 31): Disc floret: colour</u>		
	PQ	(e) RHS Colour Chart (indicate reference number)		

CPVO N°	UPOV N°	Characteristics	Examples	Note	
88.	88. (+)	Response group (grown with precise daylength control)			
		PQ	less than 6 weeks	1	
			6 weeks	Dekyen	2
			6.5 weeks		3
			7 weeks	Figrand	4
			7.5 weeks		5
			8 weeks	Scott	6
			8.5 weeks		7
			9 weeks	Zeemimosa	8
			10 weeks		9
			11 weeks		10
			12 weeks		11
			more than 12 weeks		12
89.	89. (+)	<u>Only where grown without precise daylength control: Natural flowering period</u>			
		QN	early	3	
			medium	5	
			late	7	

EXPLANATIONS AND METHODS

Explanations covering several characteristics

Unless otherwise indicated below, all characteristics should be recorded at the time of full flowering. In single and semi double varieties this is when the outer two to three rows of disc florets in the terminal flower head have dehisced; in double flowered varieties it is when the terminal flower head is fully open but before it starts to look tired.

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

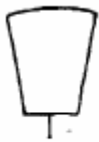
- (a) Plant, stem, stipule, petiole, leaf and bud characteristics should be observed when the terminal buds are showing full colour, just before they begin to open.
- (b) Stem and stipule characteristics should be observed on the middle third of the stem.
- (c) Leaf characteristics should be observed on typical leaves taken from the middle third of the stem.
- (d) In varieties bred to be grown as spray chrysanthemums, the lateral flower heads or lateral shoots are not removed. In varieties bred to be grown as disbud chrysanthemums, the lateral flower heads or lateral shoots (if existing) are removed at an early stage to leave just the terminal flower head. Some varieties are suitable for both types of culture.
 - Characteristics 23, 24, 25, 26, 27, 32 and 34 should only be observed on varieties which are grown as sprays without disbudding. In the case of dual-purpose varieties, these characteristics should be observed on the non-disbudded part of the trial.
 - Characteristics 33 and 35 should only be observed on varieties which are grown as disbuds. In the case of dual-purpose varieties, these characteristics should be observed on the disbudded part of the trial.
- (e) Flower head characteristics should be recorded on the terminal flower head.
- (f) Ray floret characteristics should be observed on the outermost rows of florets, unless otherwise indicated. If there are no ray florets, these characteristics are not recorded.
- (g) The main colour is the colour with the largest total surface area, the second colour [if present] is the colour with the second largest total surface area, and the third colour [if present] is that with the third largest total surface area.
- (h) These characteristics should be observed after the flower bud has opened, but before the disc florets begin to dehisce

Explanations for individual characteristics

Ad. 2: Plant: type

1. Non bushy: varieties with strong apical dominance which naturally produce a single stem, with or without laterals, unless pinched.
2. Bushy: varieties with weak apical dominance which naturally produce bushy growth with no main single stem.

Ad. 3: Only bushy varieties: Plant: growth habit



1
upright



2
semi-upright



3
hemispherical



4
spreading



5
trailing

Ad. 7: Petiole: attitude



3
moderately upwards

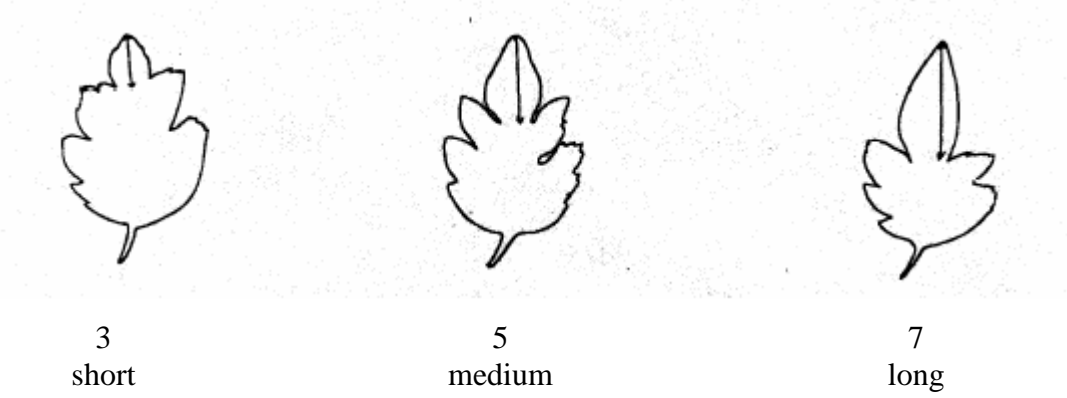


5
horizontal

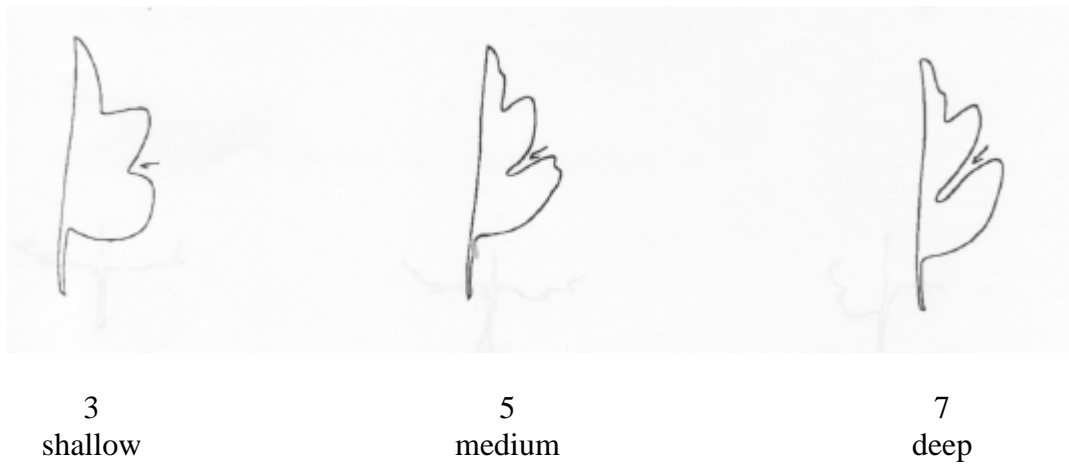


7
moderately downwards

Ad. 12: Leaf: length of terminal lobe relative to leaf length



Ad. 13: Leaf: depth of lowest lateral sinus



Ad. 15: Leaf: predominant shape of base



1
acute



2
obtuse



3
rounded



4
truncate



5
cordate



6
asymmetric

All varieties with asymmetric bases should be observed as state 6 for this characteristic, although the shape of the base of asymmetric varieties may be different from each other.

Ad. 18: Excluding varieties of *Chrysanthemum ×morifolium*: Leaf: upper side: prominence of pale margin



3
weak



5
medium



7
strong

pale margin

Ad. 18: Excluding varieties of *Chrysanthemum* ×*morifolium*: Leaf: upper side: prominence of pale margin

Ad. 19: Excluding varieties of *Chrysanthemum* ×*morifolium*: Leaf: pubescence of lower side

Ad. 20: Excluding varieties of *Chrysanthemum* ×*morifolium*: Leaf: colour of lower side

To be observed for all varieties of *Chrysanthemum pacificum* (*Ajania pacifica*) and all hybrids between *Chrysanthemum pacificum* and *Chrysanthemum* ×*morifolium* Ramat.
(*Chrysanthemum* ×*grandiflorum* Ramat.)

Ad. 21: Leaf margin: number of indentations



3
few



5
medium



7
many

Ad. 22: Leaf margin: depth of indentations



3
shallow



5
medium



7
deep

Ad. 23: Only non-bushy varieties (see char. 2): Inflorescence: form



1
conical



2
deeply domed



3
cylindrical



4
corymbiform



5
flat-corymbiform

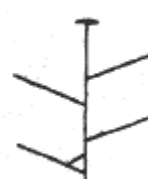
Ad. 25: Only non-bushy varieties (see char. 2): Inflorescence: angle between primary lateral shoot and stem



3
small



5
medium

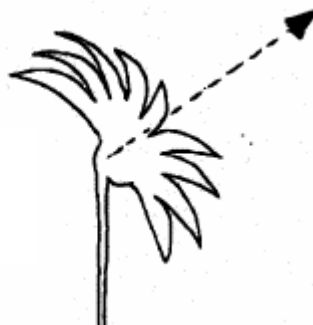


7
large

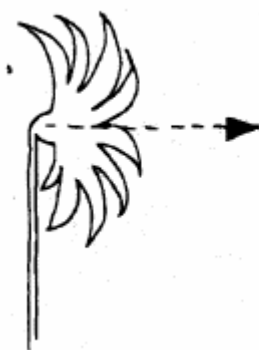
Ad. 26: Only non-bushy varieties (see char. 2): Inflorescence: attitude of lateral flower heads



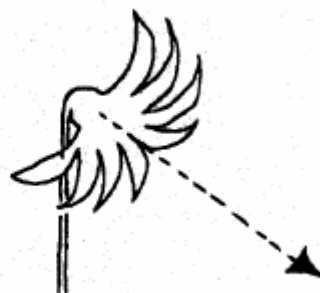
1
upright



3
semi upright



5
horizontal



7
moderally downwards

Ad. 27: Only non-bushy varieties (see char. 2): Total number of flower heads per stem

Ad. 28: Only bushy varieties (see char. 2): Total number of flower heads per plant

The overall floriferousness of the variety is assessed.

Ad. 30: Flower head: type

1. without ray florets: flower heads consist of disc florets only
2. single: flower heads with one row of ray florets, and a clearly defined central disc which is always visible.
3. semi double: flower heads with more than one row of ray florets, and a clearly defined central disc which is always visible.
4. daisy-eyed double: double flower heads where a disc is not visible in the early stages of flowering, but can be seen as the flower head opens fully. The disc is not always clearly defined.
5. double: double flower heads where a disc is not visible at any stage of flowering.

Ad. 31: Excluding double and daisy-eyed double varieties: Disc: type



1
daisy

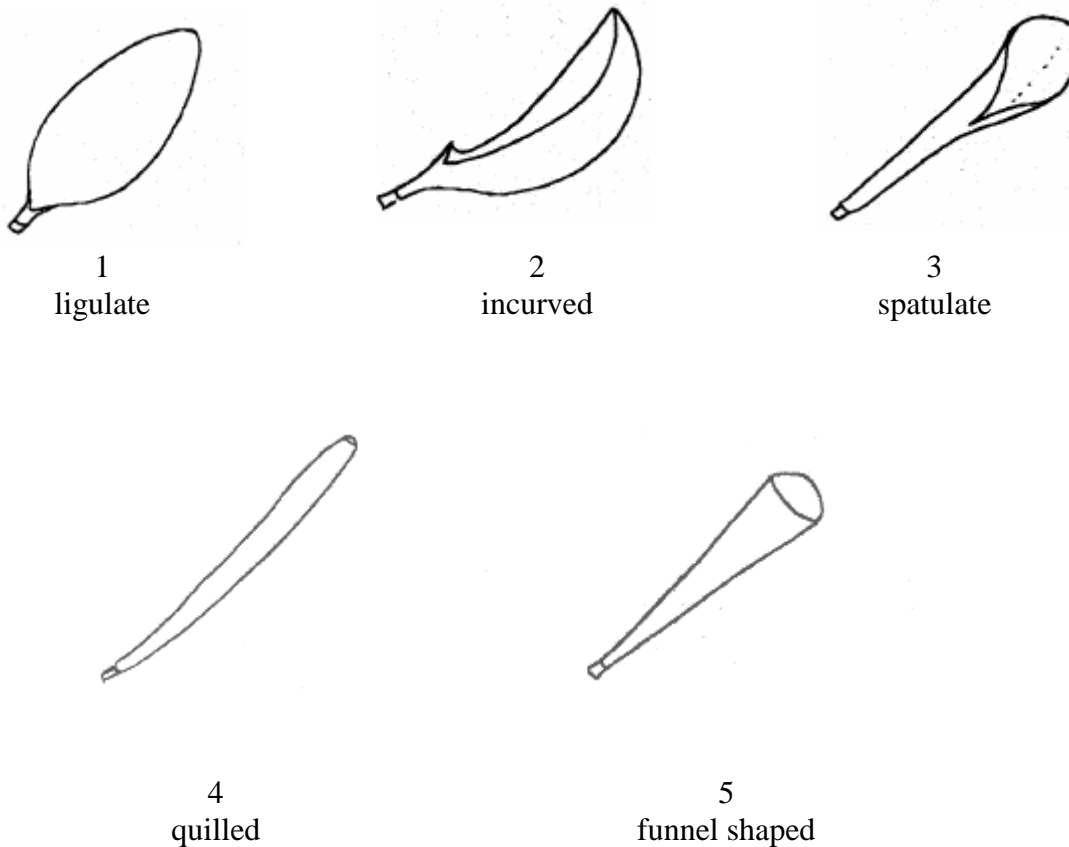


2
anemone

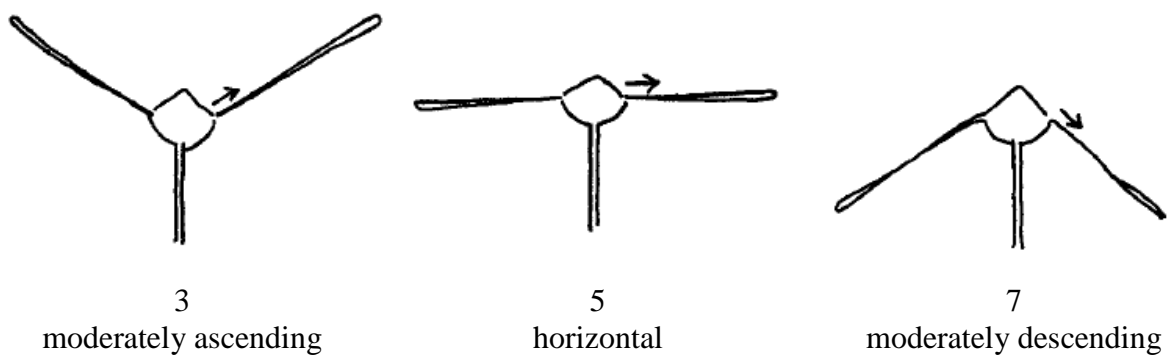
Ad. 40: Flower head: number of types of ray florets

The number of types of ray florets within the flower head is recorded as characteristic 40; the individual types are then described in characteristics 41 to 43.

Ad. 41, 42 and 43: Flower head: predominant type of ray floret (41), secondary type of ray floret (42) and tertiary type of ray floret (43)

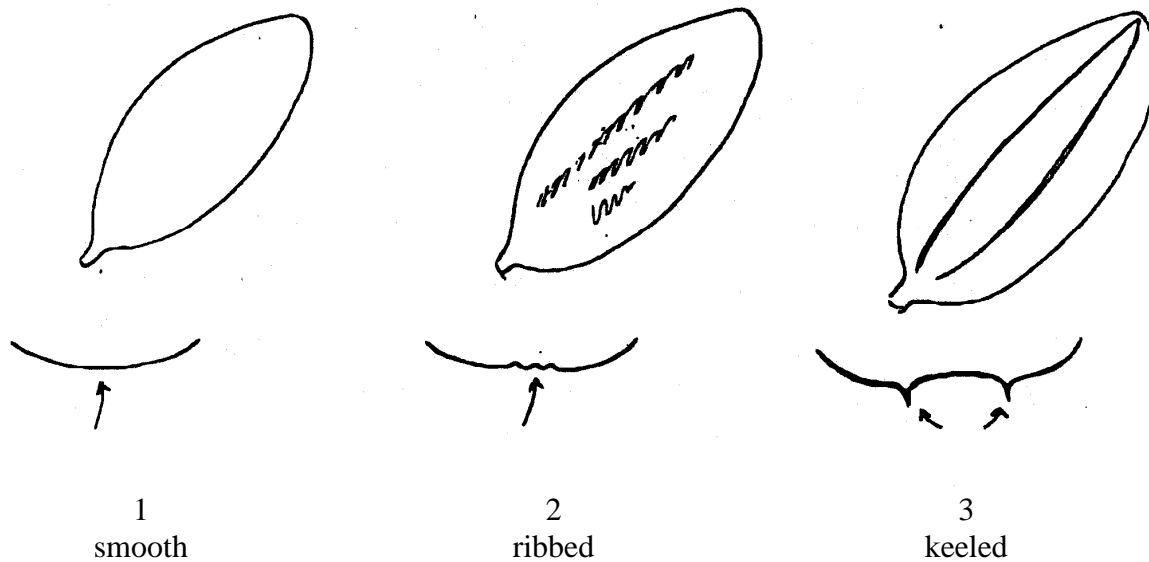


Ad. 44: Only single and semi double varieties (char. 30): Ray floret: attitude of basal part



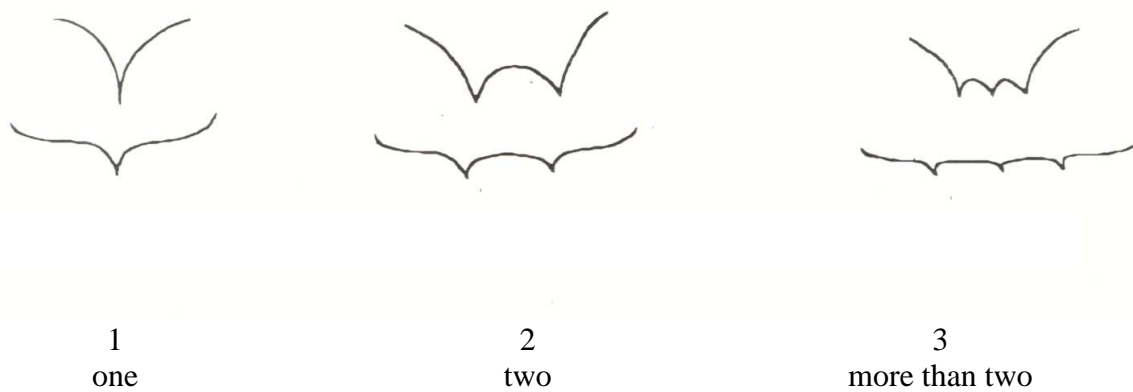
Ad. 45: Ray floret: upper surface

As seen from above (top row) and in profile (bottom row):

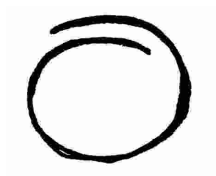


Ad. 46: Ray floret: number of keels

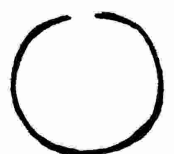
As seen in profile



Ad. 48: Ray floret: profile in cross section at widest point (non-quilled florets)



1
strongly concave
with margins
overlapping



2
strongly concave
with margins
touching



3
strongly concave



4
moderately concave



5
weakly concave



6
flat



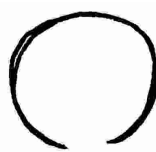
7
weakly convex



8
moderately convex



9
strongly convex

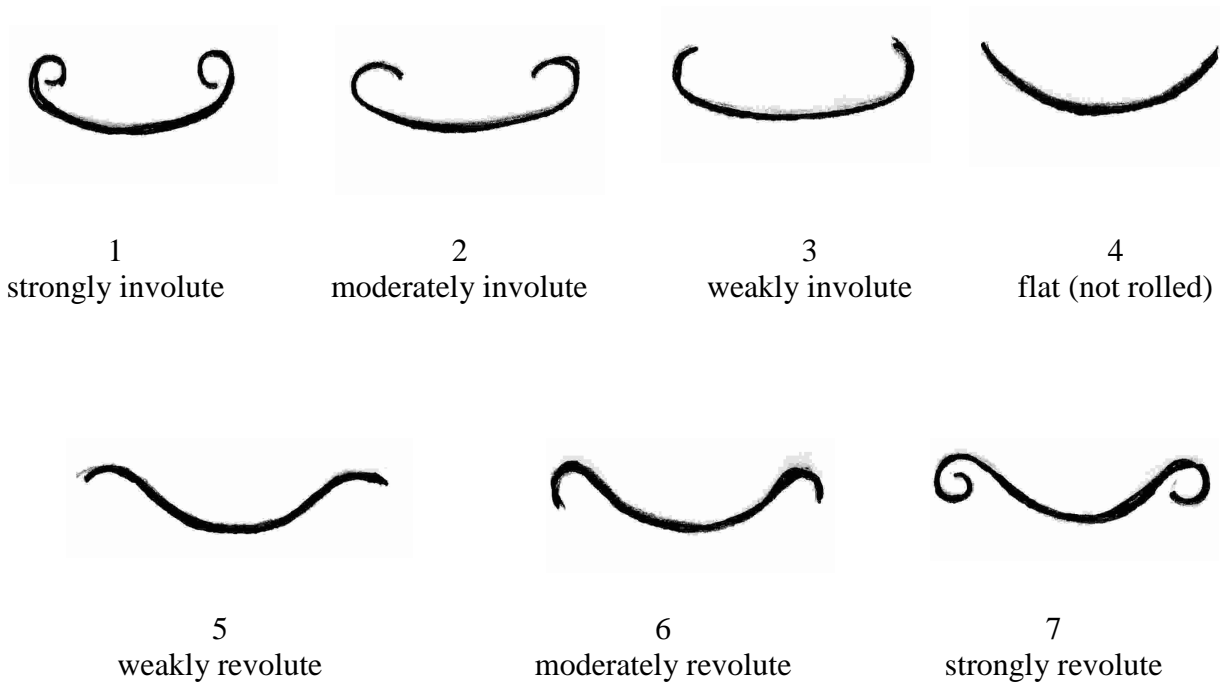


10
strongly convex with
margins touching



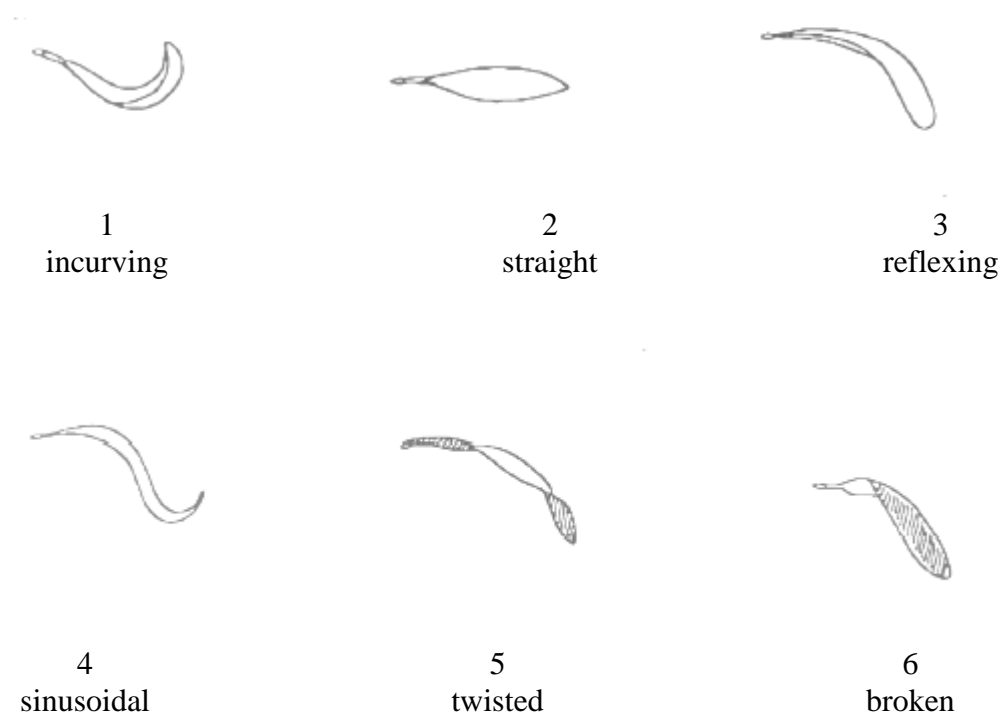
11
strongly convex with
margins overlapping

Ad. 49: Ray floret: rolling of margin (non-quilled florets)



Ad. 52: Ray floret: longitudinal axis

Ad. 55: Only semi double, daisy-eyed double and double varieties: Ray floret: longitudinal axis of inner row(s) (if different from outer row)



Ad. 54: Ray floret: longitudinal axis: strength of curvature (non-straight florets)

Ad. 57: Only semi-double, daisy-eyed double and double varieties: Ray floret: longitudinal axis of inner row(s) (if different from outer row): strength of curvature (non-straight florets)



3
weak



5
medium



7
strong

Ad. 61: Ray floret: shape of tip



1
pointed



2
rounded



3
truncate



4
emarginate



5
dentate



6
mamillate



7
fringed



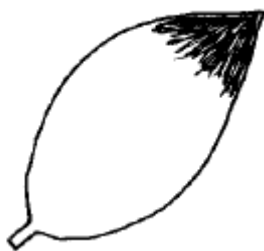
8
laciniate

Ad. 65: Ray floret: distribution of second colour of inner side

Ad. 68: Ray floret: distribution of third colour of inner side



1
at tip



2
distal quarter



3
distal half



4
distal three quarters



5
basal three quarters



6
basal half



7
basal quarter



8
at base



9
on margin



10
on marginal zone



11
central bar



12
transverse zone [band]



13
throughout

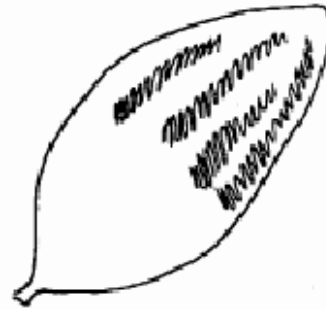
Ad. 66: Ray floret: pattern of second colour of inner side
Ad. 69: Ray floret: pattern of third colour of inner side



1
solid or nearly solid



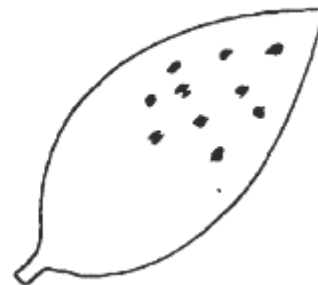
2
flushed



3
diffuse stripes



4
clearly defined stripes



5
flecked

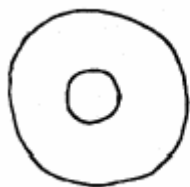


6
flecked and striped

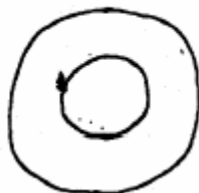


7
mottled

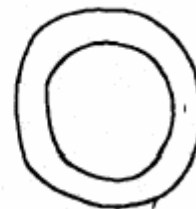
Ad. 76: Only single and semi double varieties (see char. 30): Disc: diameter relative to head diameter



3
small



5
medium



7
large

Ad. 77: Only daisy type varieties (see char. 31): Disc: profile in cross section



1
indented



2
flat



3
slightly domed



4
slightly conical

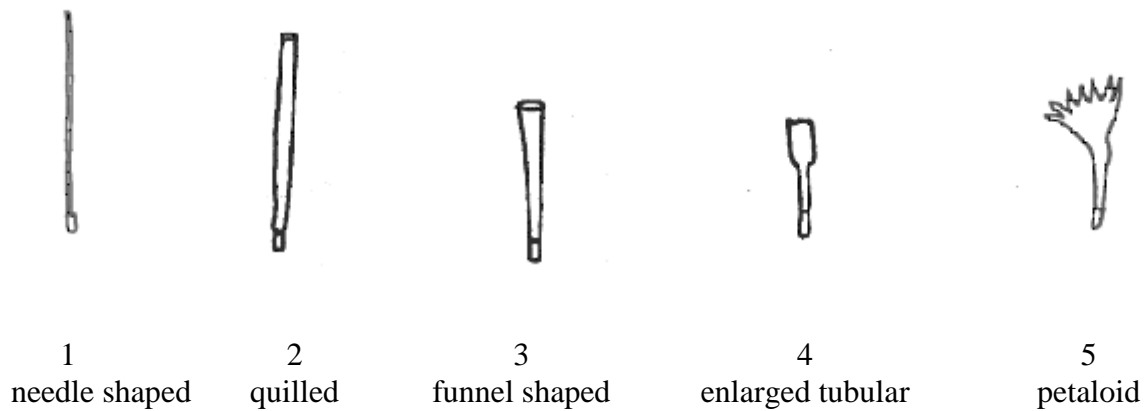


5
strongly domed



6
strongly conical

Ad. 85: Only anemone type varieties (see char. 31): Disc floret: type



Ad. 88: Response group (grown with precise daylength control)

Ad. 89: Only where grown without precise daylength control: Natural flowering period

Chrysanthemums can be grown under a very wide range of cultural regimes depending on climate and region. Varieties may be specifically adapted to one form of culture or another, or they may be multi-purpose, and this should be taken into consideration when designing the trial and selecting comparison varieties.

When varieties are grown and flowered by means of precise artificial daylength control, under an All Year Round (AYR) type system, the Response Group (characteristic 88) can be recorded.

The Response Group is defined as the time from the start of the short day treatment to the production of an inflorescence with at least four fully developed heads in 50% of the plants.

For varieties grown under natural environmental control, the Natural Flowering Period (characteristic 89) should be recorded.

Exact comparisons between varieties for these characteristics are only meaningful when the varieties are grown under the same conditions and at the same location.

LITERATURE

Machin, Barrie, 1996: Cut flower chrysanthemum production, Grower Books, Swanley, Kent, GB

Machin, Barrie, 1997: Pot chrysanthemum production, Grower Books, Swanley, Kent, GB

Royal Horticultural Society, 1992: The New RHS Dictionary of Gardening, Macmillan, London, GB

ANNEX II

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO-TQ/026/2