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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

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ECHINACEA

UPOV Code: ECNCE

Echinacea Moench.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from the United Kingdom

to be considered by the

Technical Working Party for Ornamental Plants and Forest Trees
at its forty-fourth session, to be held in Fukuyama City, Hiroshima Prefecture, Japan,
from November 7 to 11, 2011

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Echinacea Moench.	Echinacea, Cone Flower	Echinacée	Igelkopf	

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 *Echinacea* Moench.

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 young plants, or seed.

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

vegetatively propagated varieties: 10 young plants
seed propagated varieties: a sufficient quantity of seed to produce 40 plants

In the case of seed, the seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority.

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 Observation of color by eye

Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within

the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background. The color chart and version used should be specified in the variety description.

3.4 Test Design

3.4.1 Vegetatively propagated varieties: each test should be designed to result in a total of at least 10 plants.

3.4.2 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 two replicates.

3.4.3 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

4.1.4.1 Unless otherwise indicated, for vegetatively propagated varieties, 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 observations made on all plants in the test, disregarding any off-type plants.

4.1.4.2 Unless otherwise indicated, for seed-propagated varieties, for the purposes of distinctness, all observations on single plants should be made on 15 plants or parts taken from each of 15 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:

(a) Uniformity assessment by off-types

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.

For the assessment of uniformity of seed propagated varieties which are self-pollinated, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 40 plants, 2 off-types are allowed.

(b) Cross-pollinated varieties

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

(c) Hybrid varieties

The assessment of uniformity for seed-propagated hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction.

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 seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

4.3.3 Where appropriate, or in cases of doubt, the stability of a hybrid variety may, in addition to an examination of the hybrid variety itself, also be assessed by examination of the uniformity and stability of its parent lines.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Leaf: variegation (Characteristic 12)
(b) Ray floret: main color of inner side (Characteristic 31) 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

(c) Disc: type (Characteristic 39)
(d) Only varieties with disc type: daisy: Disc: color of paleae (spikes) (Characteristic 47)
(e) Only varieties with disc type: anemone: Disc: color after disc florets open (Characteristic 50) 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

(f) Only varieties with disc type: daisy: Presence of ray florets within the disc (Characteristic 51)

Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

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

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

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

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

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

6.5 Legend

(*) Asterisked characteristic – see Chapter 6.1.2

QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS – see Chapter 4.1.5

(a)-(d) See Explanations on the Table of Characteristics in Chapter 8.1

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

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.	**VG**	**Plant: growth habit**					
QN		upright				Mount Hood	1
		semi upright				Green Jewel, Ida	2
		semi spreading				Mistral	3
		spreading					4
2. **(*)** **(+)**	**VG/ MG**	**Plant: height**					
QN		short				Mistral	3
		medium				Green Jewel	5
		tall				Catharina	7
3. **(+)**	**VG**	**Plant: floriferousness**					
QN		weak				Tiki Torch	3
		medium				Green Jewel	5
		strong				Mistral	7
4. **(+)**	**VG**	**Plant: density**					
QN		sparse				Hot Summer	3
		medium				Mount Hood	5
		dense				Mistral	7
5.	**VG**	**Stem: color**					
PQ	**(a)**	green				Green Jewel	1
		green tinged slightly purple				Catharina	2
		green tinged heavily purple				Merlot	3
		purple				Fatal Attraction	4

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6.	**VG**	**Stem: number of leaves**					
QN		few					3
		medium				Green Jewel	5
		many				Ida, Mistral	7
7. **(*)**	**VG/ MG /MS**	**Leaf: length (including petiole)**					
QN	**(b)**	short				Mistral	3
		medium				Merlot	5
		long				Green Jewel	7
8. **(*)**	**VG/ MG /MS**	**Leaf: width**					
QN	**(b)**	narrow				Purity	3
		medium				Green Jewel	5
		broad				Catharina	7
9. **(*)**	**VG/ MG /MS**	**Leaf : length/width ratio**					
QN	**(b)**	slightly elongated				Merlot	3
		moderately elongated					5
		strongly elongated				Kim’s Mop Head	7
10.	**VG**	**Leaf: position of broadest part**					
QN	**(b)**	at middle or slightly towards base					1
		moderately towards base				Tomato Soup	2
		strongly towards base				Milkshake	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11.	**VG**	**Leaf: intensity of green color**					
QN	**(b)**	light				Tomato Soup	1
		medium				Purity	2
		dark				Fatal Attraction	3
12. (*)	**VG**	**Leaf: variegation**					
QL	**(b)**	absent				Tomato Soup	1
		present				Prairie Frost	9
13. (*)	**VG**	**Leaf: color of variegation**					
PQ	**(b)**	white					1
		yellowish white				Prairie Frost	2
		yellow					3
		yellow green					4
14. (*)	**VG**	**Leaf: distribution of variegation**					
PQ	**(b)**	marginal				Prairie Frost	1
		central					2
		irregular				Sparkler	3
15. (*)	**VG**	**Leaf: rugosity**					
QN	**(b)**	absent or very weak				Hot Papaya	1
		weak				Summer Cocktail	3
		medium				Green Jewel	5
		strong				Catharina	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16.	**VG**	**Leaf: glossiness**					
QN	**(b)**	absent or very weak				Mistral, Lilliput	1
		weak				After Midnight	2
		medium					3
		strong					4
17. (*) (+)	**VG**	**Leaf: indentations of margin**					
QN	**(b)**	absent or very few				Hot Papaya	1
		few				Catharina	2
		medium				Green Jewel	3
		many				Avalanche	4
18. (*)	**VG**	**Peduncle: color**					
PQ		green				Green Jewel	1
		green tinged slightly purple				Tomato Soup	2
		green tinged heavily purple				Catharina	3
		purple				After Midnight	4
19. (*)	**VG**	**Peduncle: pubesence**					
QN		absent or very sparse					1
		sparse				Hot Papaya	2
		medium				Tomato Soup	3
		dense				Green Jewel	4
		very dense				Mistral	5

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
20.	**VG/**	**Flower head:**					
(*)	**MG**	**diameter**					
(+)	**/MS**						
QN	**(c)**	small				Kim's Mop Head	3
		medium				Green Jewel	5
		large				Merlot	7
21.	**VG/**	**Flower head: height**					
(*)	**MG**						
(+)	**/MS**						
QN	**(c)**	low					3
		medium				Mistral	5
		high				Hot Papaya	7
22.	**VG/**	**Flower head:**					
(*)	**MG**	**number of ray**					
(+)	**/MS**	**florets**					
QN	**(c)**	few				Tiki Torch	3
		medium				Mistral	5
		many				Fatal Attraction	7
23.	**VG**	**Flower head:**					
(*)		**attitude of ray**					
(+)		**florets at origin**					
QN	**(c)**	erect					1
		semi-erect				Lilliput	3
		horizontal				Merlot	5
		semi-drooping				Mount Hood	7
		drooping				Hot Papaya	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
24. (*) (+)	**VG**	**Flower head: relative number of ligulate ray florets**					
QN	**(c)**	none				All that Jazz	1
		few					2
		medium					3
		many				Sundown	4
		all or almost all				Merlot	5
25. (*) (+)	**VG**	**Flower head: relative number of spatulate ray florets**					
QN	**(c)**	none					1
		few				All that Jazz	2
		medium				Sundown	3
		many					4
		all or almost all					5
26. (*) (+)	**VG**	**Flower head: relative number of quilled ray florets**					
QN	**(c)**	none					1
		few				Sundown	2
		medium					3
		many				All that Jazz	4
		all or almost all					5
27. (*)	**VG/ MG /MS**	**Ray floret: length**					
QN	**(c)**	short				Fatal Attraction	3
	(d)	medium				Merlot	5
		long				Tomato Soup	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
28. (*)	**VG/ MG /MS**	**Ray floret: width**					
QN	**(c)**	narrow				Fatal Attraction	3
	(d)	medium				Summer Cocktail	5
		broad				Milkshake	7
29. (*)	**VG/ MG /MS**	**Ray floret: length/width ratio**					
QN	**(c)**	low				Meditation	3
	(d)	medium				Razzmatazz	5
		high				Mount Hood	7
30. (*)	**VG**	**<u>Only varieties with spatulate or quilled ray florets:</u> Ray floret: color of outer side**					
PQ	**(c)**	RHS Colour Chart (indicate reference number)					
	(d)						
31. (*)	**VG**	**Ray floret: main color of inner side**					
PQ	**(c)**	RHS Colour Chart (indicate reference number)					
	(d)						
32. (*)	**VG**	**Ray floret: secondary color of inner side**					
PQ	**(c)**	RHS Colour Chart (indicate reference number)					
	(d)						

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
33. (*) (+)	**VG**	**Ray floret: distribution of secondary color of inner side**					
	(c)	at the base					1
	(d)	in the basal quarter				Green Envy	2
		in the basal half				Summer Cocktail	3
34. (+)	**VG**	**Ray floret: curvature**					
PQ	**(c)**	strongly incurving					1
	(d)	weakly incurving				Green Jewel	2
		straight				Mount Hood	3
		weakly reflexing				Lilliput	4
		strongly reflexing				Hot Papaya	5
35. (*)	**VG**	**Ray floret: twisting**					
PQ	**(c)**	absent or very weak				Merlot	1
	(d)	weak				Hot Papaya	2
		moderate					3
		strong					4
		very strong					5
36. (+)	**VG**	**Ray floret: shape in cross section**					
QN	**(c)**	strongly concave				Vintage Wine	1
	(d)	moderately concave				Green Jewel	2
		weakly concave				Merlot	3
		flat				Tomato Soup	4
		weakly convex					5
		moderately convex					6
		strongly convex					7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
37. (*) (+)	**VG**	**Ray floret: shape of apex**					
PQ	**(c)**	pointed				Purity	1
	(d)	rounded				Tiki Torch	2
		truncate				Green Jewel	3
38. (*) (+)	**VG**	**Ray floret: indentations of tip**					
QN	**(c)**	absent or very shallow					1
	(d)	shallow				Hot Summer	2
		medium				Green Jewel	3
		deep					4
39. (*) (+)	**VG**	**Disc: type**					
QL	**(c)**	daisy				Merlot	1
		anemone				Hot Papaya	2
40. (*) (+)	**VG/ MG /MS**	**Only varieties with disc type: daisy: Disc: diameter**					
QN	**(c)**	small				Tomato Soup	3
		medium				Summer Cocktail	5
		large				Merlot	7
41. (*)	**VG/ MG /MS**	**Only varieties with disc type: anemone: Disc: diameter**					
QN	**(c)**	small				Pink Double Delight	3
		medium				Razzmatazz	5
		large				Hot Papaya	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
42. **(*)** **(+)**	**VG/ MG /MS**	**Only varieties with disc type: daisy: Disc: height**					
QN	**(c)**	low				Fatal Attraction	3
		medium				Purity	5
		high				After Midnight	7
43. **(*)**	**VG/ MG /MS**	**Only varieties with disc type: anemone: Disc: height**					
QN	**(c)**	low				Meringue	3
		medium					5
		high				Catharina	7
44. **(*)** **(+)**	**VG/ MG /MS**	**Only varieties with disc type: daisy: Disc: height/diameter ratio**					
QN	**(c)**	low				Green Jewel	3
		medium				Purity	5
		high				Tiki Torch	7
45. **(*)**	**VG/ MG /MS**	**Only varieties with disc type: anemone Disc: height/diameter ratio**					
QN	**(c)**	low				Meringue	3
		medium					5
		high				Hot Papaya	7
46. **(*)** **(+)**	**VG**	**Disc: diameter in relation to flower head**					
QN	**(c)**	small				Tomato Soup	3
		medium				Green Jewel	5
		large				Milkshake	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
47. (*) (+)	**VG**	**<u>Only varieties with disc type: daisy:</u> Disc: color of paleae (spikes)**					
PQ	**(c)**	green					1
		yellowish green				Green Jewel	2
		yellow					3
		orange				Purity, Mount Hood	4
		red orange					5
		red brown				Merlot, Hot Summer	6
		purple brown				Fatal Attraction	7
48. (*) (+)	**VG**	**<u>Only varieties with disc type: daisy:</u> Disc: second color of paleae (spikes)**					
PQ	**(c)**	green				Purity, Green Jewel	1
		yellow				Hot Summer	2
		orange				Mount Hood	3
		red orange				Merlot, Fatal Attraction	4
		red brown					5
49. (*)	**VG**	**<u>Only varieties with disc type: anemone:</u> Disc: color <u>before</u> disc florets open**					
PQ		RHS Colour Chart (indicate reference number)					
50. (*)	**VG**	**<u>Only varieties with disc type: anemone:</u> Disc: color <u>after</u> disc florets open**					
PQ		RHS Colour Chart (indicate reference number)					

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
51. (*) (+)	**VG**	**Only varieties with disc type: daisy: Presence of ray florets within the disc**					
QL	**(c)**	absent				Merlot	1
		present				Mount Hood	9
52. (*) (+)	**VG**	**Only varieties with disc type: daisy: with ray florets within the disc: Number of ray florets within the disc**					
QN	**(c)**	few				Mount Hood	3
		medium				Double Decker	5
		many				Pink Poodle	7
53. (*)	**VG/ MG /MS**	**Only varieties with disc type: anemone: Disc floret: length**					
QN	**(c)**	short				Milkshake	3
		medium					5
		long				Hot Papaya	7
54.	**VG/ MG /MS**	**Only varieties with disc type: anemone: Disc floret: width**					
QN	**(c)**	very narrow				Milkshake	1
		narrow					2
		medium				Pink Sorbet	3
		broad				Hot Papaya	4
		very broad					5

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
55. **(+)**	**VG**	**Only varieties with disc type: anemone: Disc floret: curvature**					
QN	**(c)**	straight				Milkshake	1
		weakly reflexed				Pink Sorbet	2
		strongly reflexed				Hot Papaya	3
56. **(*)** **(+)**	**VG**	**Only varieties with disc type: anemone: Disc floret: length of tube**					
QN	**(c)**	short				Hot Papaya	3
		medium					5
		long				Milkshake	7
57. **(*)**	**VG**	**Only varieties with disc type: anemone: Disc floret: depth of indentations of tip**					
QN	**(c)**	absent or very shallow					1
		shallow					2
		medium				Pink Sorbet	3
		deep				Hot Papaya	4

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

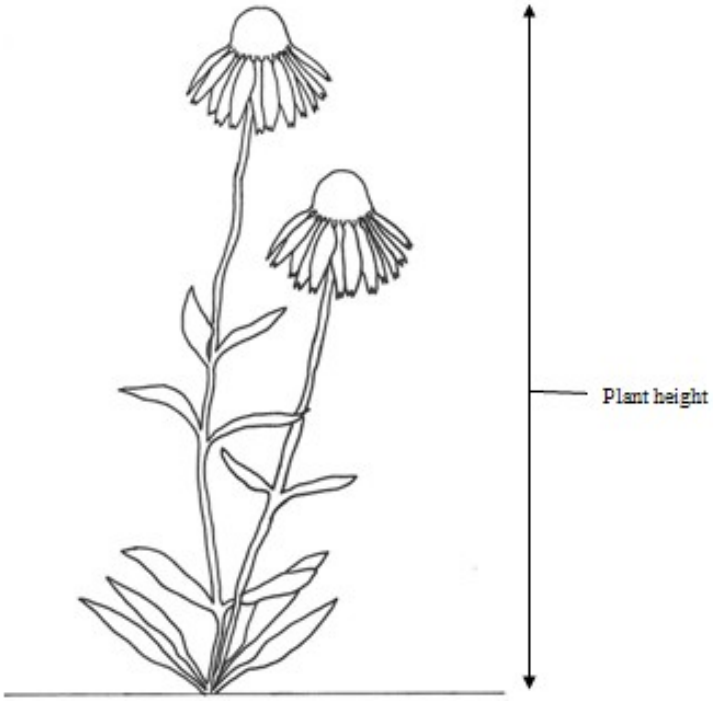
Unless otherwise indicated, all characteristics should be examined at the time of full flowering.

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

(a) Stem characteristics are recorded on the middle third of the stem, excluding the peduncle
(b) Leaf characteristics are recorded on typical stem leaves taken from the middle third of the flowering stem, and are recorded looking at the upper surface unless otherwise indicated.
(c) Unless otherwise indicated, all flower head, ray floret and disc characters to be recorded when half the disc florets in the head have dehisced/opened.
(d) All ray floret characteristics should be observed on the most typical ray florets of the predominant type.

8.2 Explanations for individual characteristics

Ad. 2: Plant: height



Ad. 3: Plant: floriferousness

The number of flowers should be observed as the number of flowers open at the same time on the plant, at the time of full flowering

3	5	7
weak	medium	strong

Ad. 4: Plant: density

The plant density is observed as the overall impression, based on stems, leaves and flowers

3
sparse

5
medium

7
dense

Ad. 17: Leaf: indentations of margin

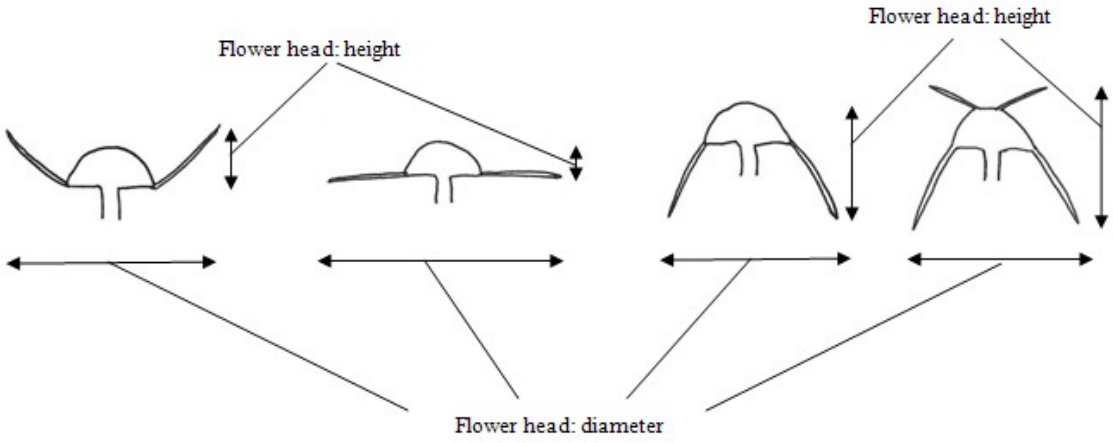
1
absent or very few

2
few

3
medium

4
many

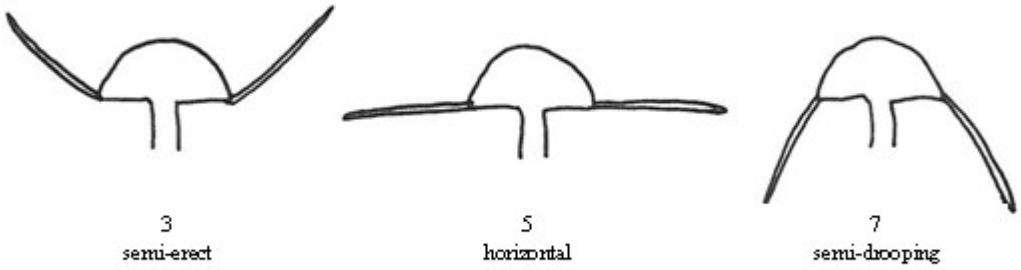
Ad. 20: Flower head: diameter
Ad. 21: Flower head: height



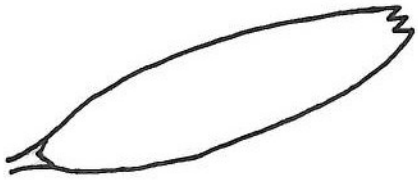
Ad. 22: Flower head: number of ray florets

This excludes any ray florets within the disc (see characteristic 51)

Ad. 23: Flower head: attitude of ray florets at origin

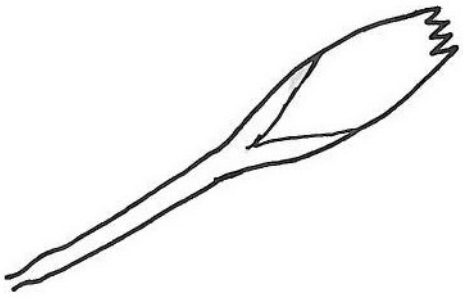


Ad. 24: Flower head: relative number of ligulate ray florets



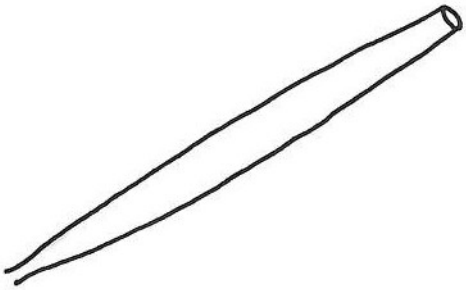
Ligulate florets are flat

Ad. 25: Flower head: relative number of spatulate ray florets



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

Ad. 26: Flower head: relative number of quilled ray florets



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

Ad.30: Only varieties with spatulate or quilled ray florets: Ray floret: color of outer side

To be record on the quilled part of the floret, on the area facing upwards

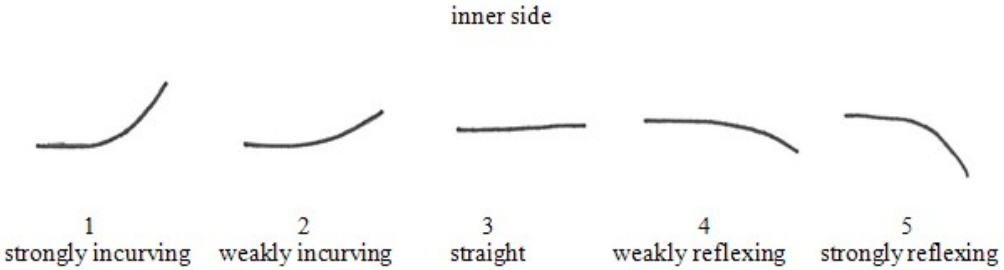
Ad. 33: Ray floret: distribution of secondary color of inner side

1
at the base

2
in the basal quarter

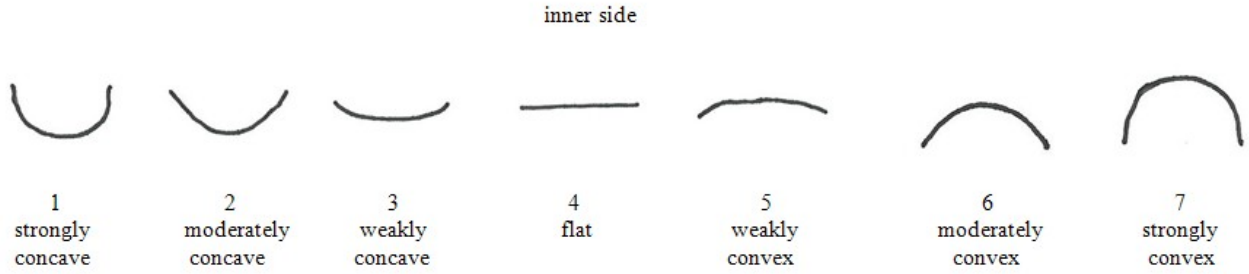
3
in the basal half

Ad. 34: Ray floret: curvature

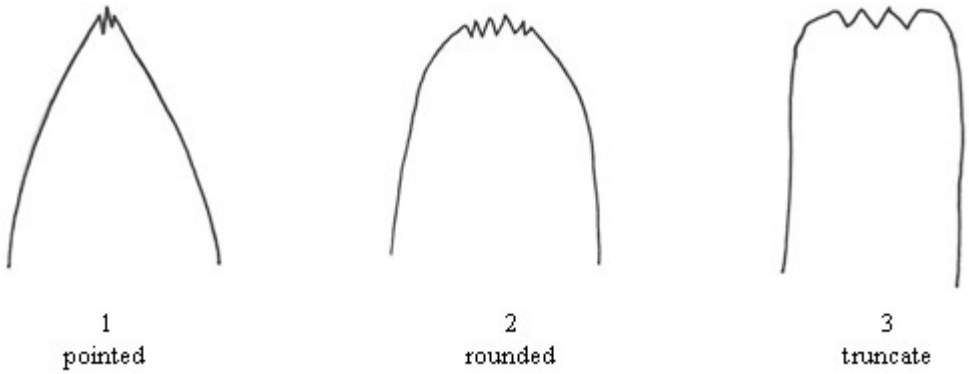


Ad. 36: Ray floret: shape in cross section

To be observed at the midpoint of the floret



Ad. 37: Ray floret: shape of apex



Ad. 38: Ray floret: indentations of tip

2
shallow

3
medium

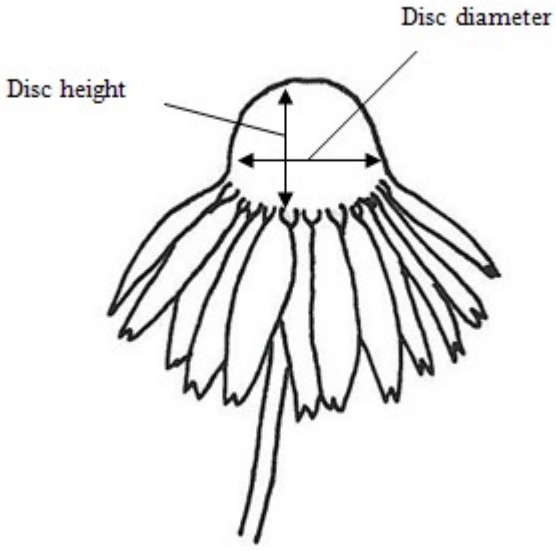
4
deep

Ad. 39: Disc: type

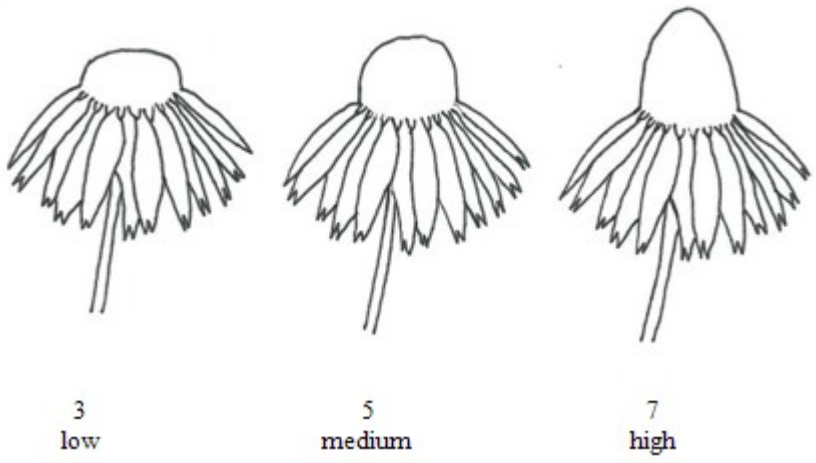
1
daisy

2
anemone

Ad. 40: Only varieties with disc type: daisy: disc: diameter
Ad. 42: Only varieties with disc type: daisy: disc: height



Ad.44 Only varieties with disc type: daisy: Disc: height/diameter ratio



3
low

5
medium

7
high

Ad. 46: Disc: diameter in relation to flower head

3
small

5
medium

7
large

Ad. 47: Only varieties with disc type: daisy: Disc: color of paleae (spikes)
Ad. 48: Only varieties with disc type: daisy: Disc: second color of paleae (spikes)

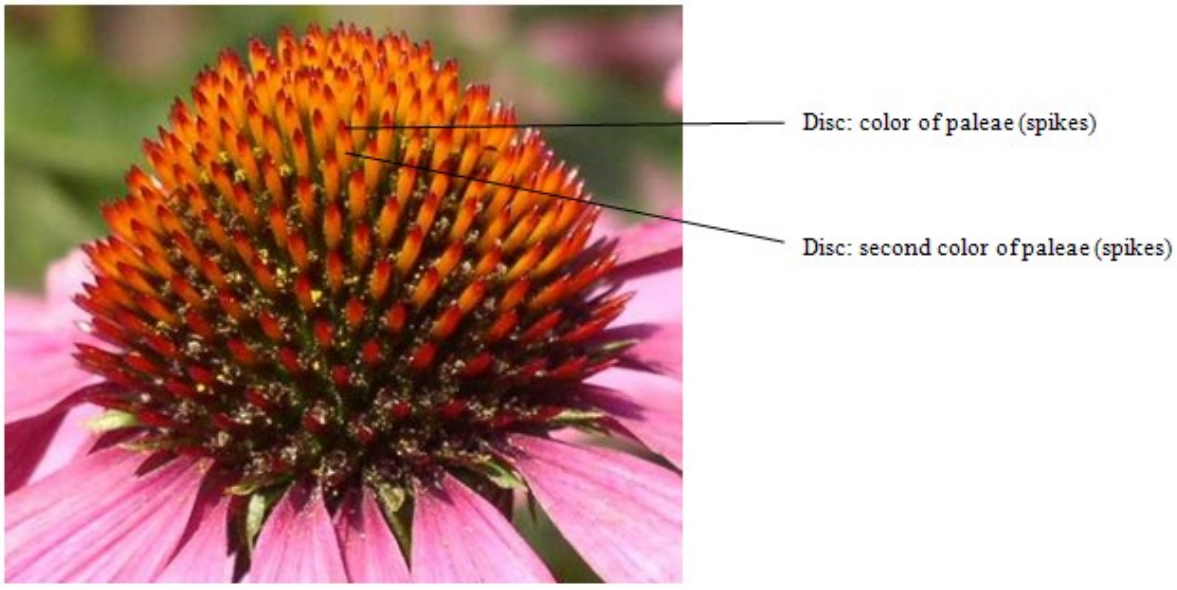
To be recorded on paleae half way between the base and the top of the disc, but just before the disc florets associated with the paleae have dehisced/opened – (see diagram below)

Correct stage and position in head to record palease colour

Ad. 47: Only varieties with disc type: daisy: Disc: color of paleae (spikes)

To be recorded as the color at the tip of the paleae (spikes) – (see diagram below)

Ad. 48: Only varieties with disc type: daisy: Disc: second color of paleae (spikes)



Ad. 51: Only varieties with disc type: daisy: Presence of ray florets within the disc

1
absent

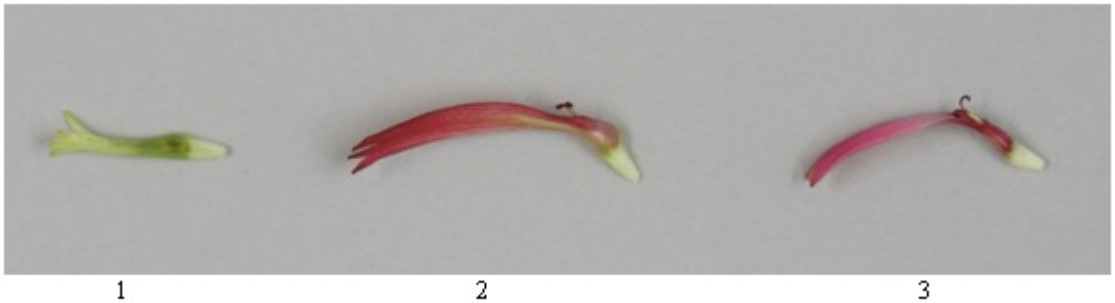
9
present

Ad. 52: Only varieties with disc type: daisy: with ray florets within the disc: Number of ray florets within the disc

3
few

7
many

Ad. 55: Only varieties with disc type: anemone: Disc floret: curvature



1
straight

2
weakly reflexed

3
strongly reflexed

Ad. 56: Only varieties with disc type: anemone: Disc floret: length of tube

3	5	7
short	medium	long

9. Literature

Rice, G. (ed)., 2006: Royal Horticultural Society Encyclopedia of Perennials. Dorling Kinsdersley Ltd.. London, GB.

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	*Echinacea* Moench.
1.1.2 Common name	Echinacea, Cone Flower
1.2 Species (please indicate)	

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

(……..……..…) x (……..……..…)
female parent male parent

(b) partially known cross [ ]
(please state known parent variety(ies))

(……..……..…) x (……..……..…)
female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.4 Other [ ]
(please provide details)

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]

(b) Cross-pollination

(i) population [ ]

(ii) synthetic variety [ ]

(c) Hybrid [ ]

(please provide details)

(d) Other [ ]

(please provide details)

4.2.2 Vegetatively propagated varieties

(a) cuttings [ ]

(b) *in vitro* propagation [ ]

(c) other (state method) [ ]

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

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 (12)	**Leaf: variegation**		
	absent	Merlot	1 [ ]
	present	Prairie Frost	9 [ ]
5.2 (31)	**Ray floret: main color of inner side**		
	green	Green Jewel	1 [ ]
	white	Purity	2 [ ]
	yellow	Harvest Moon	3 [ ]
	orange	Tiki Torch	4 [ ]
	red	Tomato Soup	5 [ ]
	pink	Meditation	6 [ ]
	purple	Magnus, Catharina	7 [ ]
5.3 (32)	**Ray floret: secondary color of inner side**		
	green		1 [ ]
	white		2 [ ]
	yellow		3 [ ]
	orange		4 [ ]
	red		5 [ ]
	pink	Green Envy	6 [ ]
	purple		7 [ ]
5.4 (39)	**Disc: type**		
	daisy	Merlot	1 [ ]
	anemone	Hot Papaya	2 [ ]

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

	Characteristics	Example Varieties	Note
5.5 (47)	**<u>Only varieties with disc type: daisy:</u> Disc: color of paleae (spikes)**		
	green		1 [ ]
	yellowish green	Green Jewel	2 [ ]
	yellow		3 [ ]
	orange	Purity, Mount Hood	4 [ ]
	red orange		5 [ ]
	red brown	Merlot, Hot Summer	6 [ ]
	purple brown	Fatal Attraction	7 [ ]
5.6 (51)	**<u>Only varieties with disc type: daisy:</u> Presence of ray florets within the disc**		
	absent	Merlot	1 [ ]
	present	Mount Hood	9 [ ]

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
Example	*Ray floret color*	*pink*	*purple*

Comments:

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

[#]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)

7.3.1 Other information

Main use of the variety

(a) garden plant [ ]
(b) cut flower [ ]
(c) herbal/pharmaceutical [ ]
(d) other [ ]
(please provide details)

.....

7.3.2 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.

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

9. Information on plant material to be examined or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details for where you have indicated “yes”.

……

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

[End of document]