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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

STRAWBERRY

UPOV Code(s):

FRAGA

Fragaria L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Germany
to be considered by the
Technical Working Party for Fruit Crops
at its fiftieth session, to be held in Budapest, Hungary,
from 2019-06-24 to 2019-06-28

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Fragaria L.	Strawberry	Fraisier	Erdbeere	Fresa, Frutilla

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 *Fragaria* L..

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of young plants or seed.

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

Vegetatively propagated varieties: 20 young plants
Seed propagated varieties: sufficient seed to produce 20 plants, or 20 young 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

3.1.1 The minimum duration of tests should normally be two independent growing cycles.

3.1.2 The two independent growing cycles should be in the form of two separate plantings.

3.1.3 In particular, it is essential that the plants produce a satisfactory crop of fruit in each of the two growing cycles.

3.1.4 The growing cycle is considered to be the duration of a single growing season, beginning with bud burst (flowering and/or vegetative), flowering and fruit harvest and concluding when the following dormant period ends with the swelling of new season buds.

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 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 In the case of vegetatively propagated varieties, each test should be designed to result in a total of at least 20 plants.

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 or 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 8 plants or parts taken from each of 8 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 2.

In the case of seed-propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 8 plants or parts taken from each of 8 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 2.

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 Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

"Visual" observation (V) is an observation made on the basis of the expert's judgment. For the purposes of this document, "visual" observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, "G" provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 These Test Guidelines have been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

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

4.2.4 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 20 plants, 1 off-type is allowed.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be further examined by testing a new 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 Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

(a) Plant : growth habit (characteristic 1)
(b) Leaf: size (characteristic 7)
(c) Petiole: attitude of hairs (characteristic 17)
(d) Flower: diameter (characteristic 22)
(e) Flower: size of calyx in relation to corolla (characteristic 24)
(f) Petal: color of upper side (characteristic 28)
(g) Fruit: length in relation to width (characteristic 29)
(h) Fruit: size (characteristic 30)
(i) Fruit: shape (characteristic 31)
(j) (New states; to revise example varieties) Fruit: color (characteristic 35)
(k) (New state) Fruit: position of achenes (characteristic 39)
(l) Fruit: position of calyx attachment (characteristic 42)
(m) Fruit: attitude of sepals (characteristic 43)
(n) Fruit: diameter of calyx in relation to diameter of fruit (characteristic 44)
(o) Time of beginning of flowering (characteristic 48)
(p) Time of beginning of fruit ripening (characteristic 49)
(q) Remonting ability (characteristic 50)
(r) Flowering runners (characteristic 51)

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

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 2	**3 4**	**5 6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

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

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

7 Not applicable

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. **(*)**	**QN** **VG**	**(+)** **(a)**				
	Plant : growth habit					
	upright				Darselect, Gorella	1
	upright to semi-upright					2
	semi-upright				Cirafine, Senga Sengana	3
	semi-upright to spreading					4
	spreading					5
2.	**QN** **VG**	**(+)** **(a)**				
	Plant: density of foliage					
	very sparse					1
	very sparse to sparse					2
	sparse				Elista	3
	sparse to medium				Clery, Sweet Eve	4
	medium				Everest, Florin, Gorella	5
	medium to dense				Gariguette, MA 65	6
	dense				F 62, Yamaska	7
	dense to very dense				Malwina, Pink Extara	8
	very dense				Weitgasserii I Nivális	9
3.	**QN** **VG**	**(+)** **(a)**				
	Plant: vigor					
	very weak					1
	very weak to weak					2
	weak				Serenata, Temptation	3
	weak to medium				CIVRI 30	4
	medium				Clery, Everest, Pandora	5
	medium to strong				Korona, Salsa	6
	strong				Florence, Yamaska	7
	strong to very strong				BBB PO 01, Pink Extara	8
	very strong					9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
4. (*) QN VG		**(b)**				
	Plant: position of inflorescence in relation to foliage					
	beneath				Crusader	1
	beneath to same level					2
	same level				Astino, Cambridge Favourite	3
	same level to above					4
	above				Direktor Paul Wallbaum	5
5. (*) QN VG		**(c)**				
	Plant: number of stolons					
	absent or very few				Rügen, Weitgasserii I Nivális	1
	very few				Gladis, Jive	2
	few				CIVRI 30, Sonata	3
	few to medium				Polka, Symphony	4
	medium				Anabelle, Gorella, Korona, Rubis des Jardins	5
	medium to many				Starlette, Suzana	6
	many				CT 1, Roseta	7
	many to very many				Mietze Nova	8
	very many				BBB PO 01, Pink Extara	9
6. QN VG		**(+)**	**(c)**			
	Stolon: anthocyanin coloration					
	absent or very weak				Suvetar	1
	very weak				Arosa, Faith	2
	weak				Avarosa, Cijosée, Weiße Ananas	3
	weak to medium				Daroyal, Rubis des Jardins	4
	medium				Darselect, Dream, Gorella	5
	medium to large				Matis	6
	large				Sans Rivale, Wendy	7
	large to very large				Arking, Frel, Pink Extara	8
	very large					9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7. (*)	**QN MG/MS/VG**	**(+) (a)**				
	Leaf: size					
	very small					1
	very small to small					2
	small				Frel	3
	small to medium				Sans Rivale, Toscana	4
	medium				Gorella, Korona, Senga Sengana	5
	medium to large				CIR 129, Honeoye	6
	large				Aprica, Darselect	7
	large to very large				Jukhyang	8
	very large					9
8.	**PQ VG**	**(a)**				
	Leaf color of upper side					
	yellow green					1
	light green					2
	light to medium green					3
	medium green				Darselect, Gorella	4
	medium to dark green					5
	dark green					6
	blue green					7
9. (*)	**QN VG**	**(+) (a)**				
	Leaf: blistering					
	absent or very weak				Anabelle, Bemanil, Marmion	1
	weak					2
	medium				Cigaline, Senga Precosa	3
	strong				Cijosée, Jamil, Marie France	4
	very strong					5
10. (*)	**QN VG**	**(a)**				
	Leaf: glossiness					
	absent or weak				Aptos, Bogota, Mrak, Ventana	1
	medium				Darestivale, Irvine	2
	strong				Florence, Malwina, Mara des Bois, Sweet Delight, Tioga	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11.	**(*) QN MG/MS/VG**	**(a)**				
	Terminal leaflet: length in relation to width					
	shorter				Siabelle	1
	equal				Chandler, Crusader	2
	moderately longer				Elsanta, Monstrose, Redgauntlet	3
	much longer				Macherauchs Frühernte	4
12.	**PQ VG**	**(+)** **(a)**				
	Terminal leaflet: shape of base					
	acute				Gorella, Regina	1
	obtuse				Darselect, Senga Sengana	2
	rounded				Crusader, Florika, Marie France	3
13.	**PQ VG**	**(+)** **(a)**				
	Terminal leaflet: margin					
	serrate					1
	serrate to crenate					2
	crenate					3
14.	**QN VG**	**(a)**				
	(New) Terminal leaflet: depth of incision of margin					
	very narrow					1
	narrow					2
	medium					3
	deep					4
	very deep					5
15.	**QN VG**	**(+)** **(a)**				
	Terminal leaflet: shape in cross section					
	concave				Hapil, Ostara, Senga Sengana	1
	straight				Georg Soltwedel, Mara des Bois	2
	convex				Cambridge Favourite, Domanil, Madame Moutot	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16.	**QN MG/MS/VG**	**(+) (a)**				
	Petiole: length					
	very short					1
	very short to short				Fontaine, Tarpan	2
	short				Frel, Tristan	3
	short to medium				Charlotte, Floriante	4
	medium				Clery, Jana, Sweet Eve	5
	medium to long				Dream, GH 75	6
	long				Sussette, Verity	7
	long to very long				Faith	8
	very long					9
17. **(*)**	**QN VG**	**(+) (a)**				
	Petiole: attitude of hairs					
	upwards				Elista, Georg Soltwedel	1
	slightly outwards				Darselect, Elsanta	2
	horizontal				Cambridge Favourite, Direktor Paul Wallbaum, Mara des Bois	3
	downwards					4
18.	**QN VG**	**(+) (c)**				
	(New) Petiole: stalk leaflets					
	none or short				Portola, Seascape	1
	medium				Camarosa, Diamante, Selva	2
	long				Albion, Endurance, Premier, Valor	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19.	**QN VG**	**(c)**				
	Stipule: anthocyanin coloration					
	absent or very weak				Clery, Senga Sengana	1
	very weak to weak				Verity	2
	weak				Darlisette, Sans Rivale, Vivara	3
	weak to medum				Sussette	4
	medium				Musica	5
	medium to srong				Asia, Malwina, Pink Extara	6
	strong				Darselect, Sonata	7
	strong to very strong				Aramella, Frugodi	8
	very strong					9
20.	**QN VG**	**(b)**				
	Inflorescence: number of flowers					
	very few				Camarillo, Drisstrawfive	1
	few				Charlotte, Murano	2
	medium				Gorella, Senga Sengana	3
	many				Daisy, Laroma, Sussette	4
	very many					5
21.	**QN VG**	**(+)** **(b)**				
	Pedicel: attitude of hairs					
	upwards				Cigaline	1
	slightly outwards				Darselect	2
	horizontal				Parker	3
	downwards					4

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22.	**(*)**	**QN**	**MG/VG**		**(b)**				
		Flower: diameter							
		very small							1
		very small to small							2
		small						Rapella, Redgauntlet	3
		small to medium							4
		medium						Gorella, Mara des Bois	5
		medium to large							6
		large						Darselect, Domanil	7
		large to very large							8
		very large							9
23.	**(*)**	**QN**	**VG**	**(+)**	**(b)**				
		Flower: arrangement of petals							
		free						Gariguette, Lia	1
		touching						Cijosée, Wendy	2
		overlapping						Faith, Sussette	3
24.	**(*)**	**QN**	**VG**	**(+)**	**(b)**				
		Flower: size of calyx in relation to corolla							
		smaller						Arking, Jussara	1
		same size						Filicia, Gladis	2
		larger						Janiss, Murano	3
25.	**(*)**	**QL**	**VG**		**(b)**				
		Flower: stamen							
		absent						Pandora, Yamaska	1
		present						Gariguette	9
26.		**PQ**	**VG**	**(+)**	**(b)**				
		(New) Petal: shape							
		elliptial							1
		circular							2
		ovate							3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27.		**QN MG/VG**	**(b)**				
		Petal: length in relation to width					
		shorter				Ines, Velvet, Verity	1
		equal				CIR 104, Darselect, Honeoye, Majestic, Osiris	2
		longer				Anablanca, BBB PO 01, Ciflorette, Gariguette, Gustine	3
28.	**(*)**	**PQ VG**	**(b)**				
		Petal: color of upper side					
		greenish white					1
		white				Gariguette	2
		light pink				Marajox, Pikan	3
		medium pink				Frel	4
		dark pink				Tarpan	5
		red					6
29.	**(*)**	**QN MG/VG**	**(d)**				
		Fruit: length in relation to width					
		much shorter					1
		shorter				Lia, Sussette	2
		equal				Gorella, Honeoye	3
		longer				Malling Centenary, Osiris	4
		much longer				Brilla, Starlette	5
30.	**(*)**	**QN MG/VG**	**(+)** **(d)**				
		Fruit: size					
		very small				Hansafont	1
		very small to small				Frel, Pink Extara	2
		small				CT 1	3
		small to medium				Julyana, Tarpan	4
		medium				BBB PO 01, Sans Rivale	5
		medium to large				F 62, Finesse, MA 65	6
		large				Altess, Lia	7
		large to very large				NF 633, SG 134	8
		very large				Asia	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31. (*)	**PQ VG**	**(+) (d)**				
	Fruit: shape					
	reniform				Early Dawn, Favette	1
	conical				Gorella, Matis	2
	cordate				Direktor Paul Wallbaum	3
	ovoid				Florika, Macherauchs Frühernte	4
	cylindrical				Chandler, Marie France	5
	rhomboid				Gariguette, Pantagruella	6
	obloid				Elista	7
	globose				Grande, Madame Moutot	8
	wedged				Georg Soltwedel	9
32.	**QN VG**	**(+)**				
	(New) Fruit: position of maximum diameter					
	strongly towards the calyx					1
	moderately towards the calyx					2
	at middle					3
33.	**PQ VG**	**(+) (d)**				
	(New) Fruit: shape of apex					
	truncate					1
	truncate with groove					2
	retuse					3
	rounded					4
	acute					5
34.	**PQ VG**	**(+) (d)**				
	(New) Fruit: shape at calyx end (excluding neck)					
	obtuse					1
	rounded					2
	flattened					3
	cordate (retuse?)					4

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35. (*)	**PQ VG**	**(+) (d)**				
	(New states; to revise example varieties) **Fruit: color**					
	whitish				Weiße Ananas	1
	light orange				Madame Moutot, Merton Dawn	2
	medium orange				Cambridge Favourite	3
	orange red				Gorella	4
	light red					5
	medium red				Elsanta, Royal Sovereign	6
	dark red				Seascape, Senga Sengana	7
	blackish red				Honeoye, Rubina	8
36.	**QN VG**	**(+) (d)**				
	Fruit: evenness of color					
	even or very slightly uneven				Malling Centenary, Saga	1
	slightly uneven				Gorella, Vivaldi	2
	strongly uneven				Florika	3
37.	**QN VG**	**(+) (d)**				
	Fruit: evenness of surface					
	even or very sligtly uneven				Valeta	1
	slightly uneven				Senga Precosana	2
	strongly uneven				Redgauntlet	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
38.	**QN VG**	**(+) (d)**				
	Fruit: width of band without achenes					
	absent or very narrow				CT 1, Drisstrawfive	1
	very narrow to narrow				Altess, Amandine	2
	narrow				Elsanta, Murano, Pandora, Premy	3
	narrow to medium				CIR 107, Honeoye	4
	medium				Dream, Lorette	5
	medium to broad				Lambada, Romina	6
	broad					7
	broad to very broad				Frugodi, Valotar	8
	very broad					9
39. **(*)**	**QN VG**	**(+) (d)**				
	(New state) Fruit: position of achenes					
	strongly below surface				Albion, Mieze Schindler	1
	slightly below surface					2
	level with surface				Malling Centenary, Osiris	3
	above surface				Alice, Frugodi, Toscana, Weitgasserii I Nivális	4
40.	**PQ VG**					
	(New) Fruit: color of achenes on sunny side					
	greenish					1
	yellow					2
	red					3
41.	**QN VG**	**(+) (d)**				
	(New) Fruit: density of achenes					
	few					1
	medium					2
	many					3

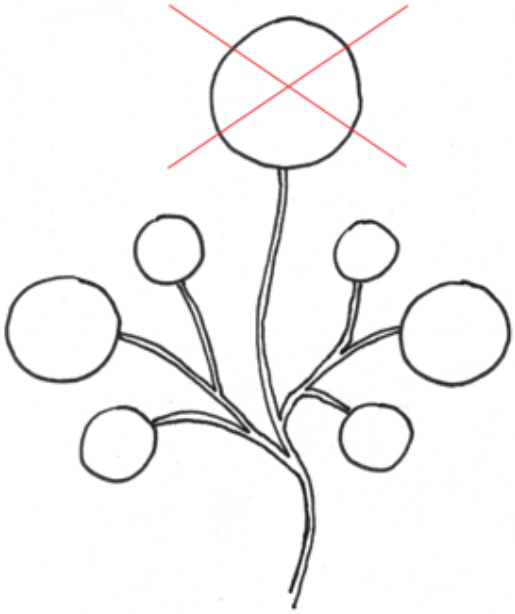
	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
42. **(*)**	**QN** **VG**	**(+)** **(d)**				
	Fruit: position of calyx attachment					
	inserted				Finesse	1
	level with fruit				Lia, Senga Sengana	2
	raised				Asia, Ciflorette, Gariguette	3
43. **(*)**	**QN** **VG**	**(+)** **(d)**				
	Fruit: attitude of sepals					
	upwards				Asia, Gariguette	1
	outwards				Altess, Lia, Osiris	2
	downwards				Pink Extara, Senga Sengana	3
44. **(*)**	**QN** **VG**	**(+)** **(d)**				
	Fruit: diameter of calyx in relation to diameter of fruit					
	much smaller					1
	slightly smaller				Brilla, Lia, Tecla, Vivaldi	2
	same size				Gorella, Laetitia, Senga Sengana, Tenira	3
	slightly larger				Ciflorette, Darselect, Deluxe, Gladis, Linosa	4
	much larger				Rubinociv	5
45.	**PQ** **VG**	**(+)** **(d)**				
	Fruit: color of flesh					
	whitish				Madame Moutot, Regina	1
	light pink				Direktor Paul Wallbaum, Senga Precosa	2
	orange red				Elsanta, Talisman	3
	light red				Cambridge Favourite, Ciflorette	4
	medium red				Elista, Gariguette	5
	dark red				Senga Tigaiga	6

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
46.		**PQ VG**	**(+) (d)**				
		Fruit: color of core					
		white				Orly	1
		light red				Figaro	2
		medium red				Drisstrawnine, Marvel	3
		dark red				Malwina	4
47.		**QN VG**	**(d)**				
		Fruit: cavity					
		absent or small				Gerida, Onebor	1
		medium				Agana, Douglas	2
		large				Commitment, Cortina, Fiesta	3
48.	**(*)**	**QN MG**	**(+)**				
		Time of beginning of flowering					
		very early				Frel, Sans Rivale	1
		very early to early				Avarosa, Murano, Starlette	2
		early				Jussara, MA 65	3
		early to medium				Brilla, Marionnet 97, Verity, Wendy	4
		medium				Gorella, Hansawhite, Osiris	5
		medium to late				Faith, Gladis, Musica	6
		late				F 62, Laetitia	7
		late to very late				Filicia, Sussette	8
		very late				Judibell, Malwina	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
49. (*)	**QN MG**	**(+)**				
	Time of beginning of fruit ripening					
	very early				Flair, Ischia, Sweet Charlie	1
	very early to early				Avarosa, Honeoye, Murano	2
	early				Altess, CF 4402, Deluxe, Verity	3
	early to medium				CF 6821, Gorella, Pink Extara, Senga Sengana	4
	medium				Cupid, Gladis	5
	medium to late				Faith, Laetitia	6
	late				Isaura, Yamaska	7
	late to very late				Sophie, Sussette	8
	very late				Judibell, Laura, Malwina	9
50.	**QL VG**					
	Remonting ability					
	absent or slightly present				Cambridge Favourite, Gariguette	1
	moderately present					2
	strongly present				Mara des Bois	3
51. (*)	**QL VG**					
	Flowering runners					
	absent				Elsanta	1
	present				Aromas, Cirafine, Florika	9

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics



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

(a) Observations on the plant and leaf should be made on plants shortly before the beginning of fruit ripening. Observations on the leaf should be made on fully-developed leaves.

(b) Observations of the inflorescence (including the flower) should be made on plants when they are in full flower. Unless otherwise indicated, observations on the flower should not be made on the terminal flower. In the case of remontant varieties, the characteristics should be observed on the first flush of flowers.

(c) Observations on the stipule and the stolon which should be made after the end of bearing (excluding day-neutral varieties).

(d) Observations on the fruit should not be made on terminal fruits.

8.2 Explanations for individual characteristics

Ad. 1: Plant : growth habit

1
upright

3
semi-upright

5
spreading

Ad. 2: Plant: density of foliage

1
sparse

3
medium

5
dense

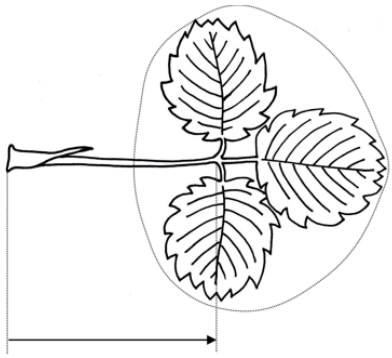
Ad. 3: Plant: vigor

The plant vigor should be considered as the overall abundance of vegetative growth.

Ad. 6: Stolon: anthocyanin coloration

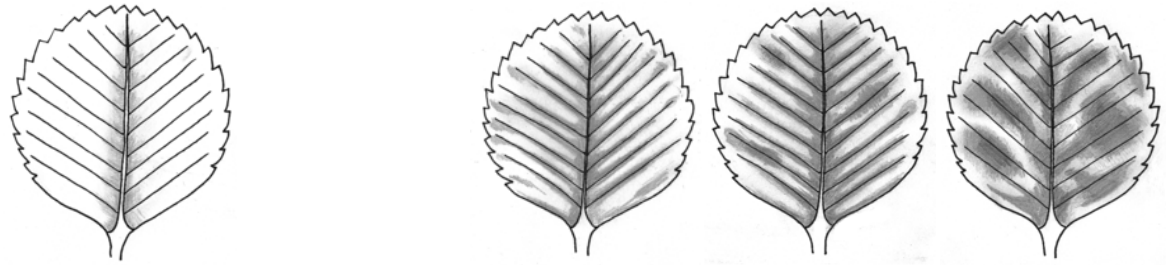
The anthocyanin coloration should be observed on the middle third of the stolon.

Ad. 7: Leaf: size



The size of leaf excludes the petiole an stipules.

Ad. 9: Leaf: blistering



1 absent or very weak | 2 weak | 3 medium | 4 strong | 5 very strong

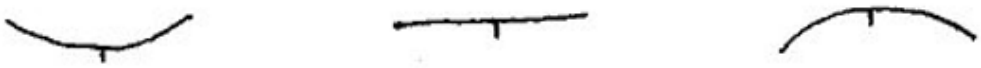
Ad. 12: Terminal leaflet: shape of base

1 acute | 2 obtuse | 3 rounded

Ad. 13: Terminal leaflet: margin

1 serrate | 2 serrate to crenate | 3 crenate

Ad. 15: Terminal leaflet: shape in cross section

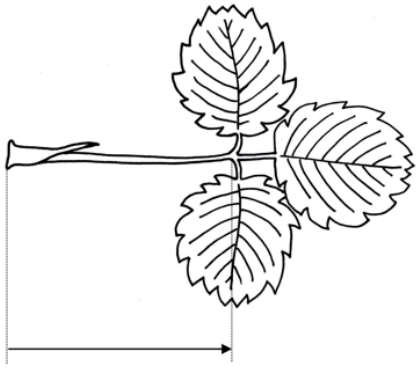


1
concave

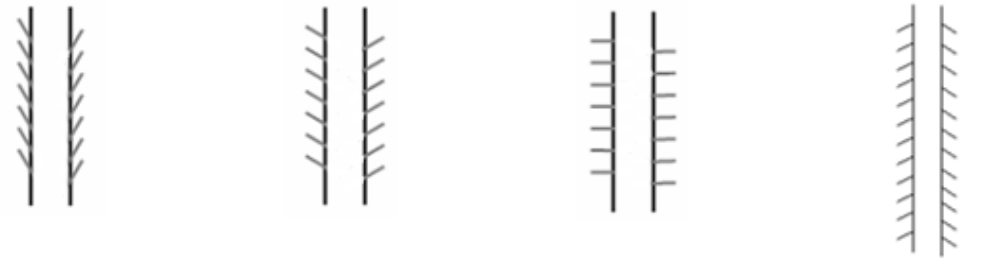
2
straight

3
convex

Ad. 16: Petiole: length



Ad. 17: Petiole: attitude of hairs



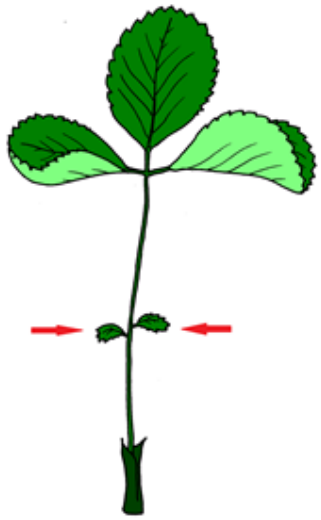
1
upwards

2
slightly outwards

3
horizontal

4
downwards

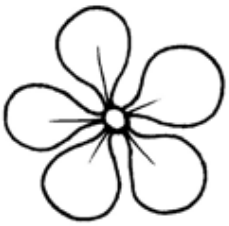
Ad. 18: (New) Petiole: stalk leaflets



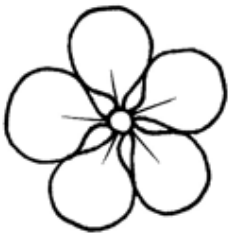
Ad. 21: Pedicel: attitude of hairs

See Ad. 18

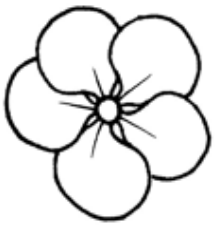
Ad. 23: Flower: arrangement of petals



1
free

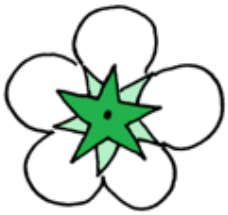


2
touching



3
overlapping

Ad. 24: Flower: size of calyx in relation to corolla

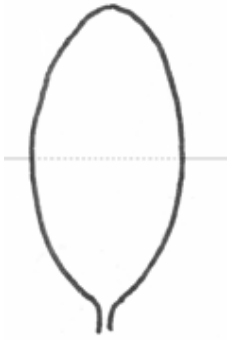


1
smaller

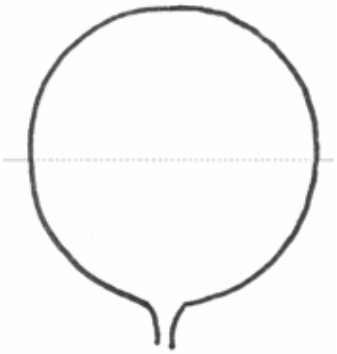
2
same size

3
larger

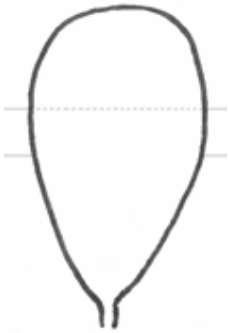
Ad. 26: (New) Petal: shape



1
elliptial



2
circular



3
ovate

Ad. 30: Fruit: size

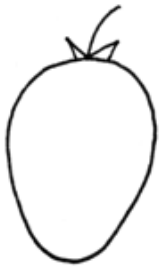
The fruit size is determined ~~by the length, height and thickness~~ visually, or by assessing the fruit weight.

Ad. 31: Fruit: shape

1
reniform

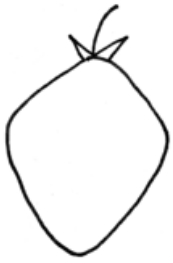
2
conical

3
cordate



4
ovoid

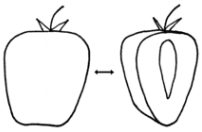
5
cylindrical



6
rhomboid

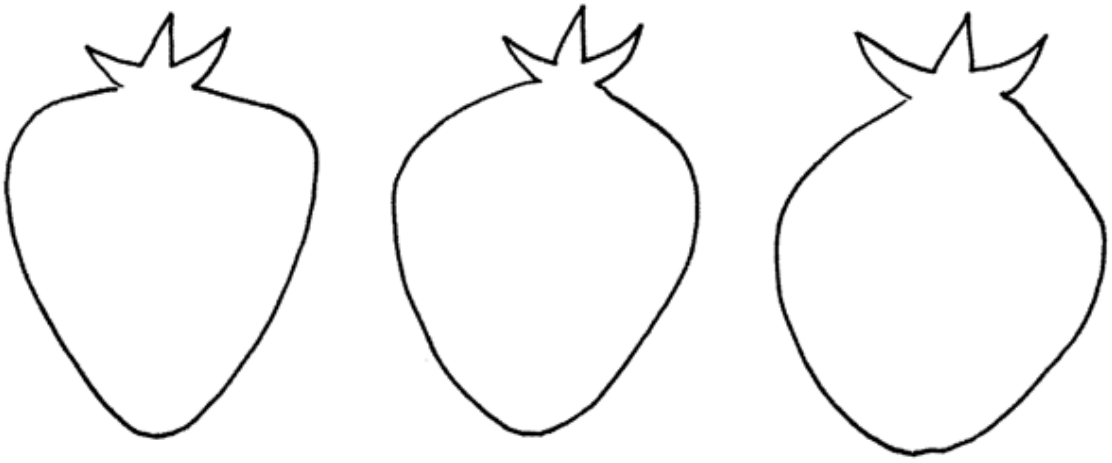
7
obloid

8
globose



9
wedged

Ad. 32: (New) Fruit: position of maximum diameter



1
clearly above middle

2
moderately above middle

3
at middle

Ad. 33: (New) Fruit: shape of apex

1
truncate

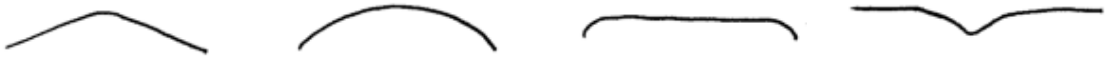
2
truncate with groove

3
indented

4
rounded

5
acute

Ad. 34: (New) Fruit: shape at calyx end (excluding neck)



1
obtuse

2
rounded

3
flat

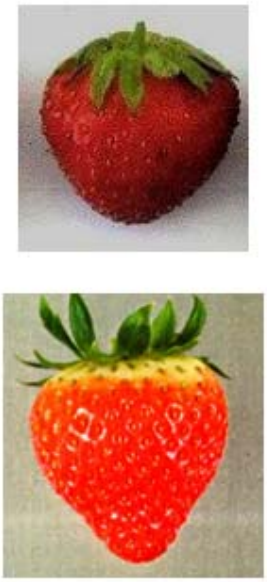
4
indented

Ad. 35: (New states; to revise example varieties) Fruit: color

Should be assessed on the side of the fruit which is exposed to the sun.

Ad. 36: Fruit: evenness of color

Should be assessed on the side of the fruit which is exposed to the sun.

		
1	2	3
even or very slightly uneven	slightly uneven	strongly uneven

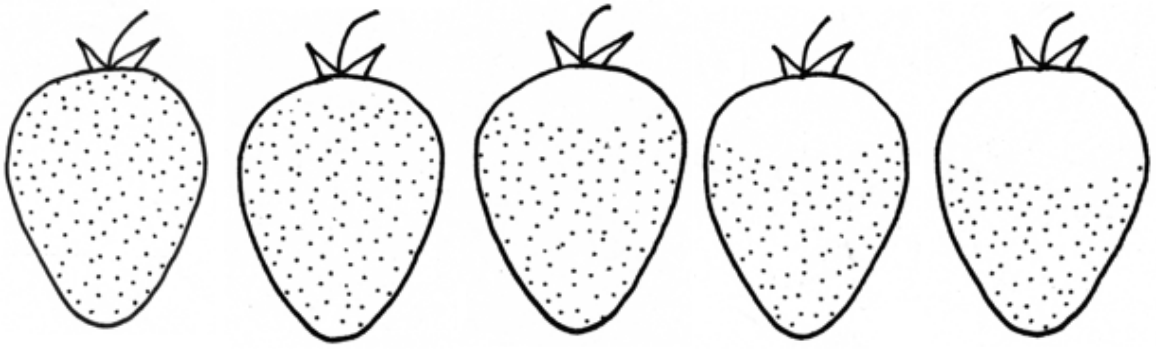
Ad. 37: Fruit: evenness of surface

1
even or very slightly uneven

2
slightly uneven

3
strongly uneven

Ad. 38: Fruit: width of band without achenes



1	3	5	7	9
absent or very narrow	narrow	medium	broad	very broad

Ad. 39: (New state) Fruit: position of achenes

Should be observed at midlength of fruit surface.

1	2	3	4
strongly below surface	slightly below surface	level with surface	above surface

Ad. 42: Fruit: position of calyx attachment

1	2	3
inserted	level with fruit	raised

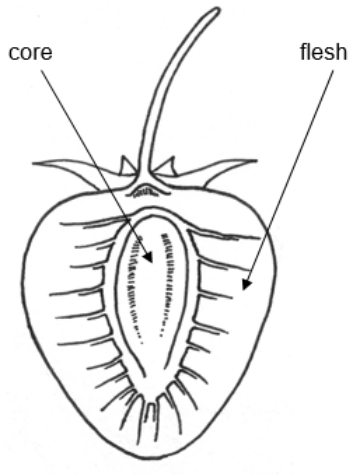
Ad. 43: Fruit: attitude of sepals

1	2	3
upwards	outwards	downwards

Ad. 44: Fruit: diameter of calyx in relation to diameter of fruit

The diameter of calyx is assessed with the sepals held flat.

Ad. 45: Fruit: color of flesh



Ad. 46: Fruit: color of core

See Ad. 46

Ad. 48: Time of beginning of flowering

The time of beginning of flowering is when 50% of plants show at least 1 open flower.

Ad. 49: Time of beginning of fruit ripening

The time of beginning of fruit ripening is when 50 % of plants provide of at least one fully colored fruit.

9. Literature

(to be updated:)

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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 Botanical name	*Fragaria* L.
1.2 Common name	Strawberry

2. Applicant

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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))

(please state known parent varieties)
(……..……..…) 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 Other [ ]

(Please provide details)

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 (1)	**Plant : growth habit**		
	upright	Darselect, Gorella	1 [ ]
	upright to semi-upright		2 [ ]
	semi-upright	Cirafine, Senga Sengana	3 [ ]
	semi-upright to spreading		4 [ ]
	spreading		5 [ ]
5.2 (7)	**Leaf: size**		
	very small		1 [ ]
	very small to small		2 [ ]
	small	Frel	3 [ ]
	small to medium	Sans Rivale, Toscana	4 [ ]
	medium	Gorella, Korona, Senga Sengana	5 [ ]
	medium to large	CIR 129, Honeoye	6 [ ]
	large	Aprica, Darselect	7 [ ]
	large to very large	Jukhyang	8 [ ]
	very large		9 [ ]
5.3 (17)	**Petiole: attitude of hairs**		
	upwards	Elista, Georg Soltwedel	1 [ ]
	slightly outwards	Darselect, Elsanta	2 [ ]
	horizontal	Cambridge Favourite, Direktor Paul Wallbaum, Mara des Bois	3 [ ]
	downwards		4 [ ]

	Characteristics	Example Varieties	Note
5.4 (22)	**Flower: diameter**		
	very small		1 [ ]
	very small to small		2 [ ]
	small	Rapella, Redgauntlet	3 [ ]
	small to medium		4 [ ]
	medium	Gorella, Mara des Bois	5 [ ]
	medium to large		6 [ ]
	large	Darselect, Domanil	7 [ ]
	large to very large		8 [ ]
	very large		9 [ ]
5.5 (24)	**Flower: size of calyx in relation to corolla**		
	smaller	Arking, Jussara	1 [ ]
	same size	Filicia, Gladis	2 [ ]
	larger	Janiss, Murano	3 [ ]
5.6 (28)	**Petal: color of upper side**		
	greenish white		1 [ ]
	white	Gariguette	2 [ ]
	light pink	Marajox, Pikan	3 [ ]
	medium pink	Frel	4 [ ]
	dark pink	Tarpan	5 [ ]
	red		6 [ ]
5.7 (29)	**Fruit: length in relation to width**		
	much shorter		1 [ ]
	shorter	Lia, Sussette	2 [ ]
	equal	Gorella, Honeoye	3 [ ]
	longer	Malling Centenary, Osiris	4 [ ]
	much longer	Brilla, Starlette	5 [ ]

	Characteristics	Example Varieties	Note
5.8 (30)	**Fruit: size**		
	very small	Hansafont	1 [ ]
	very small to small	Frel, Pink Extara	2 [ ]
	small	CT 1	3 [ ]
	small to medium	Julyana, Tarpan	4 [ ]
	medium	BBB PO 01, Sans Rivale	5 [ ]
	medium to large	F 62, Finesse, MA 65	6 [ ]
	large	Altess, Lia	7 [ ]
	large to very large	NF 633, SG 134	8 [ ]
	very large	Asia	9 [ ]
5.9 (31)	**Fruit: shape**		
	reniform	Early Dawn, Favette	1 [ ]
	conical	Gorella, Matis	2 [ ]
	cordate	Direktor Paul Wallbaum	3 [ ]
	ovoid	Florika, Macherauchs Frühernte	4 [ ]
	cylindrical	Chandler, Marie France	5 [ ]
	rhomboid	Gariguette, Pantagruella	6 [ ]
	obloid	Elista	7 [ ]
	globose	Grande, Madame Moutot	8 [ ]
	wedged	Georg Soltwedel	9 [ ]
5.10 (35)	**(New states; to revise example varieties) Fruit: color**		
	whitish	Weiße Ananas	1 [ ]
	light orange	Madame Moutot, Merton Dawn	2 [ ]
	medium orange	Cambridge Favourite	3 [ ]
	orange red	Gorella	4 [ ]
	light red		5 [ ]
	medium red	Elsanta, Royal Sovereign	6 [ ]
	dark red	Seascape, Senga Sengana	7 [ ]
	blackish red	Honeoye, Rubina	8 [ ]
5.11 (39)	**(New state) Fruit: position of achenes**		
	strongly below surface	Albion, Mieze Schindler	1 [ ]
	slightly below surface		2 [ ]
	level with surface	Malling Centenary, Osiris	3 [ ]
	above surface	Alice, Frugodi, Toscana, Weitgasserii I Nivális	4 [ ]

	Characteristics	Example Varieties	Note
5.12 (42)	**Fruit: position of calyx attachment**		
	inserted	Finesse	1 [ ]
	level with fruit	Lia, Senga Sengana	2 [ ]
	raised	Asia, Ciflorette, Gariguette	3 [ ]
5.13 (43)	**Fruit: attitude of sepals**		
	upwards	Asia, Gariguette	1 [ ]
	outwards	Altess, Lia, Osiris	2 [ ]
	downwards	Pink Extara, Senga Sengana	3 [ ]
5.14 (44)	**Fruit: diameter of calyx in relation to diameter of fruit**		
	much smaller		1 [ ]
	slightly smaller	Brilla, Lia, Tecla, Vivaldi	2 [ ]
	same size	Gorella, Laetitia, Senga Sengana, Tenira	3 [ ]
	slightly larger	Ciflorette, Darselect, Deluxe, Gladis, Linosa	4 [ ]
	much larger	Rubinociv	5 [ ]
5.15 (48)	**Time of beginning of flowering**		
	very early	Frel, Sans Rivale	1 [ ]
	very early to early	Avarosa, Murano, Starlette	2 [ ]
	early	Jussara, MA 65	3 [ ]
	early to medium	Brilla, Marionnet 97, Verity, Wendy	4 [ ]
	medium	Gorella, Hansawhite, Osiris	5 [ ]
	medium to late	Faith, Gladis, Musica	6 [ ]
	late	F 62, Laetitia	7 [ ]
	late to very late	Filicia, Sussette	8 [ ]
	very late	Judibell, Malwina	9 [ ]
5.16 (49)	**Time of beginning of fruit ripening**		
	very early	Flair, Ischia, Sweet Charlie	1 [ ]
	very early to early	Avarosa, Honeoye, Murano	2 [ ]
	early	Altess, CF 4402, Deluxe, Verity	3 [ ]
	early to medium	CF 6821, Gorella, Pink Extara, Senga Sengana	4 [ ]
	medium	Cupid, Gladis	5 [ ]
	medium to late	Faith, Laetitia	6 [ ]
	late	Isaura, Yamaska	7 [ ]
	late to very late	Sophie, Sussette	8 [ ]
	very late	Judibell, Laura, Malwina	9 [ ]

	Characteristics	Example Varieties	Note
5.17 (50)	**Remonting ability**		
	absent or slightly present	Cambridge Favourite, Gariguette	1 [ ]
	moderately present		2 [ ]
	strongly present	Mara des Bois	3 [ ]
5.18 (51)	**Flowering runners**		
	absent	Elsanta	1 [ ]
	present	Aromas, Cirafine, Florika	9 [ ]

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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			

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 Other information

A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)"

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (http://www.upov.int/tgp/en/).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

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

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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.

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

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

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

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

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

.....

9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes [ ]

(please provide details as specified by the Authority)

No [ ]

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

Applicant’s name

Signature Date

[End of document]