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DRAFT

STRAWBERRY

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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 fifty-second session, to be held in Zhengzhou, China,
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Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Fragaria</i> 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 raised from seed.

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 The two independent growing cycles may be observed from a single planting, examined in two separate growing cycles.

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

3.1.5 The growing cycle is considered to be the period ranging from the beginning of active vegetative growth or flowering, continuing through active vegetative growth or flowering and fruit development and concluding with the harvesting of fruit.

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

3.2 *Testing Place*

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 "Examining Distinctness".

3.3 *Conditions for Conducting the Examination*

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.4 *Test Design*

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

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 20 plants or parts of plants taken from each of 20 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 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 and seed-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 The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction.

4.2.5 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) (Proposal to keep 3 states only) Plant : growth habit (characteristic 1)
- (b) Leaf: size (characteristic 7)
- (c) Petiole: attitude of hairs (characteristic 17)
- (d) Flower: diameter (characteristic 19)
- (e) Flower: size of calyx in relation to corolla (characteristic 21)
- (f) Petal: color of upper side (characteristic 25)
- (g) Fruit: length in relation to diameter (characteristic 26)
- (h) (Explanation requested) Fruit: size (characteristic 27)
- (i) Fruit: shape (characteristic 28)
- (j) Fruit: color (characteristic 32)
- (k) Fruit: position of achenes (characteristic 34)
- (l) Fruit: position of calyx attachment (characteristic 37)
- (m) Fruit: attitude of sepals (characteristic 38)
- (n) Fruit: diameter of calyx in relation to diameter of fruit (characteristic 39)
- (o) Time of beginning of flowering (characteristic 42)
- (p) Time of beginning of fruit ripening (characteristic 43)
- (q) Flowering runners (characteristic 44)

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 All relevant states of expression are presented in the characteristic.

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)				
	(Proposal to keep 3 states only) Plant : growth habit							
		upright					Darselect, Gorella	1
		upright to semi-upright						2
		semi-upright					Cirafine, Senga Sengana	3
		semi-upright to spreading						4
		spreading					Irvine, Selva, Splendor	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)				
	(Proposal to reduce to 1-5 scale) 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						
	clearly beneath					Crusader	1
	slightly beneath						2
	same level					Astino, Cambridge Favourite, Gariguette, Sweet Charlie	3
	slightly above						4
	clearly 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: intensity of anthocyanin coloration						
	absent or very weak					Suvenir	1
	weak					Avarosa, Cijosée, Weiße Ananas	2
	medium					Darselect, Dream, Gorella	3
	strong					Sans Rivale, Wendy	4
	very strong						5

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7. (*)	QN	MG/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
	medium green					Camarillo, Darselect, Gorella		3
	dark green							4
	blue green							5
9. (*)	QN	VG	(+)	(a)				
	Leaf: rugosity							
	absent or very weak					Anabelle, Bemanil, Marmion		1
	weak					Clery		2
	medium					Cigaline, Everest, Senga Precosa		3
	strong					Cijosée, Jamil, Marie France		4
	very strong							5
10 (*)	QN	VG		(a)				
	(Explanation requested) 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/VG	(a)				
	Terminal leaflet: length in relation to width					
	shorter than broad				Siabelle	1
	as short as broad				Chandler, Crusader	2
	longer than broad				Elsanta, Monstrose, Redgauntlet	3
	much longer than broad				Macherauchs Frühernte	4
12	PQ VG	(+) (a)				
	Terminal leaflet: shape of base					
	acute				Gariguette, Gorella, Regina	1
	obtuse				Darselect, Senga Sengana	2
	rounded				Crusader, Florika, Marie France	3
13	PQ VG	(+) (a)				
	Terminal leaflet: margin					
	serrate				Gariguette	1
	serrate to crenate					2
	crenate					3
14	QN VG	(+) (a)				
	Terminal leaflet: depth of incision of margin					
	shallow					1
	medium					2
	deep					3
15	QN VG	(+) (a)				
	Terminal leaflet: shape in cross section					
	concave				Camarosa, Hapil, Ostara, Senga Sengana	1
	straight (or: even? or: flat?)				Georg Soltwedel, Mara des Bois	2
	convex				Cambridge Favourite, Domanil, Madame Moutot	3

	English		français		deutsch	español	Example Varieties Exemples Bei ejemplo	Note/
16	QN	MG/MS/VG	(+)	(a)				
	(Consider to reduce scale) 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							
		adpressed					Elista, Georg Soltwedel	1
		upwards					Darselect, Elsanta	2
		horizontal					Cambridge Favourite, Clery, Direktor Paul Wallbaum, Gariguette, Mara des Bois	3
		downwards						4
18	QN	VG		(b)				
	(consider to reduce to 1-5 scale) Stipule: intensity of anthocyanin coloration							
		absent or very weak					Clery, Senga Sengana	1
		weak					Darlisette, Sans Rivale, Vivara	2
		medium					Musica	3
		strong					Darselect, Sonata	4
		very strong						5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19	(*) QN MG/VG		(c)			
	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
20	(*) QN VG		(+)	(c)		
	Flower: arrangement of petals					
	free				Gariguette, Lia	1
	touching				Cijosée, Wendy	2
	overlapping				Faith, Sussette	3
21	(*) QN VG		(+)	(c)		
	Flower: size of calyx in relation to corolla					
	smaller				Arking, Jussara	1
	same size				Filicia, Gladis	2
	larger				Camarosa, Everest, Janiss, Murano	3
22	(*) QL VG		(c)			
	Flower: stamen					
	absent				Pandora, Yamaska	1
	present				Gariguette	9
23	PQ VG		(+)	(c)		
	Petal: shape					
	elliptic					1
	circular					2
	transverse elliptic					3
	ovate					4

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
24	QN MG/VG	(c)				
	Petal: ratio length / width					
	low				Ines, Velvet, Verity	1
	medium				CIR 104, Darselect, Honeoye, Majestic, Osiris	2
	high				Anablanca, BBB PO 01, Ciflorette, Gariguette, Gustine	3
25 (*)	PQ VG	(c)				
	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
26 (*)	QN MG/VG	(d)				
	Fruit: length in relation to diameter					
	very low					1
	low				Lia, Sussette	2
	medium				Gorella, Honeoye	3
	high				Malling Centenary, Osiris	4
	very high				Brilla, Starlette	5
27 (*)	QN MG/VG	(+)	(d)			
	(Explanation requested) 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
28	(*)	PQ	VG	(+)	(d)			
		Fruit: shape						
			reniform				Early Dawn, Favette	1
			conical				Albion, Clery, Everest, Gorella, Matis, Murano, Sweet Charlie	2
			cordate				Direktor Paul Wallbaum	3
			ovate				Florika, Macherauchs Frühernte	4
			oblong				Chandler, Marie France	5
			rhombic				Gariguette, Pantagruella	6
			oblate				Elista	7
			circular				Grande, Madame Moutot	8
			wedged				Camarosa, Georg Soltwedel	9
29		QN	VG	(+)				
			Fruit: position of maximum diameter					
			strongly towards the calyx					1
			moderately towards the calyx					2
			at middle					3
30		PQ	VG	(+)	(d)			
			Fruit: shape of apex					
			truncate					1
			truncate with groove					2
			retuse					3
			rounded					4
			acute					5
31		PQ	VG	(+)	(d)			
			Fruit: shape at calyx end					
			obtuse					1
			rounded					2
			flattened					3
			retuse					4

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
32	(*)	PQ	VG	(+)	(d)			
		Fruit: color						
		pinkish white						1
		yellowish white						2
		light orange					Merton Dawn	3
		medium orange					Cambridge Favourite	4
		orange red					Gorella	5
		pink						6
		light red						7
		medium red					Elsanta, Royal Sovereign, Sweet Charlie	8
		dark red					Honeoye, Seascape, Senga Sengana	9
		blackish red					Rubina	10
33		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, Everest, 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
34	(*)	QN	VG	(+)	(d)			
		Fruit: position of achenes						
		strongly below surface						1
		slightly below surface						2
		level with surface					Malling Centenary, Osiris	3
		above surface					Alice, Frugodi, Toscana, Weitgasserii I Nivális	4

	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35	PQ	VG	(+)				
	Fruit: color of achenes						
	greenish						1
	yellow						2
	red						3
36	QN	MG/VG	(+)	(d)			
	Fruit: density of achenes						
	sparse						1
	medium						2
	dense						3
37 (*)	QN	VG	(+)	(d)			
	Fruit: position of calyx attachment						
	inserted					Finesse	1
	level with fruit					Lia, Murano, Senga Sengana, Sweet Charlie	2
	raised					Asia, Ciflorette, Gariguette	3
38 (*)	QN	VG	(+)	(d)			
	Fruit: attitude of sepals						
	upwards					Asia, Gariguette	1
	outwards					Altes, Lia, Osiris	2
	downwards					Pink Extara, Senga Sengana	3
39 (*)	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

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
40	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, Murano	5
		dark red					Senga Tigaiga	6
41	PQ	VG	(+)	(d)				
	Fruit: color of core							
		white					Orly	1
		light red					Figaro	2
		medium red					Drisstrawnine, Everest, Marvel	3
		dark red					Malwina	4
42	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
43	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
44	(*)	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 should be made after the end of bearing. In case of day-neutral varieties the observations should be carried out at the same time, at the end of bearing of the non-remonting varieties.
- (d) Observations on the fruit should not be made on terminal fruits on one-year-old plants when picking ripe.

8.2 *Explanations for individual characteristics*

Ad. 1: (Proposal to keep 3 states only) Plant : growth habit



1
upright



3
semi-upright



5
spreading

Ad. 2: Plant: density of foliage



3
sparse



5
medium



7
dense

Ad. 3: (Proposal to reduce to 1-5 scale) Plant: vigor

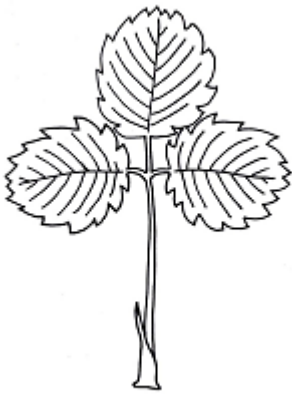
The plant vigor should be considered as the overall abundance of vegetative growth. In particular it is related to height and diameter of the plant.

Ad. 6: Stolon: intensity of anthocyanin coloration

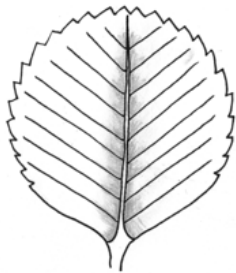
The anthocyanin coloration should be observed on the middle third of the stolon.

Ad. 7: Leaf: size

The size of leaf excludes the petiole and stipules.



Ad. 9: Leaf: rugosity



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. 14: Terminal leaflet: depth of incision of margin



Ad. 15: Terminal leaflet: shape in cross section



1
concave

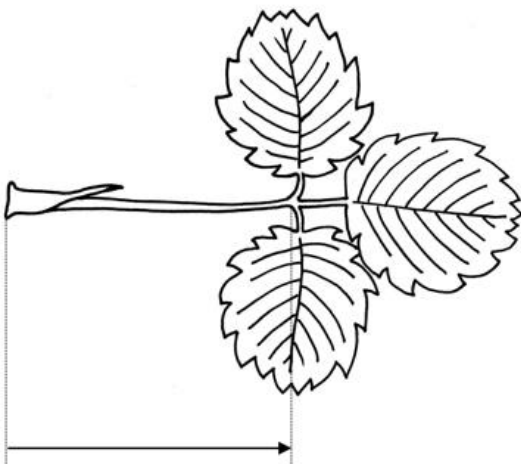


2
straight

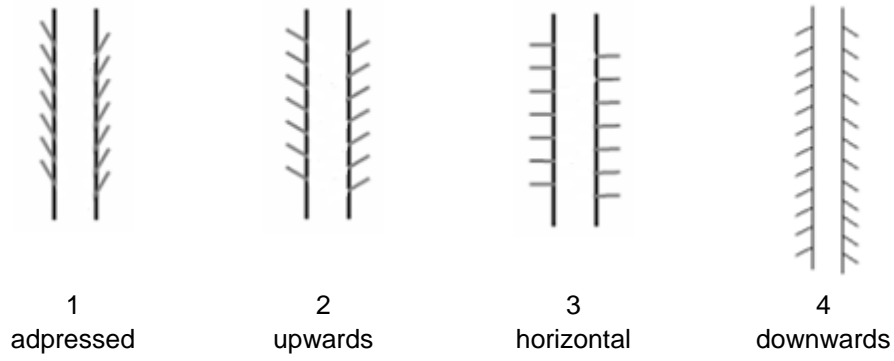


3
convex

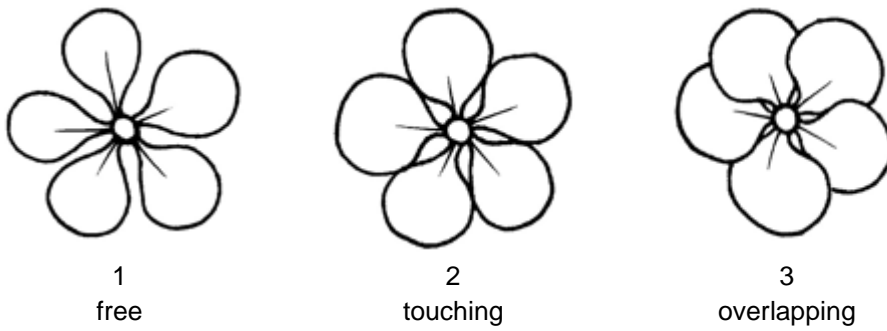
Ad. 16: (Consider to reduce scale) Petiole: length



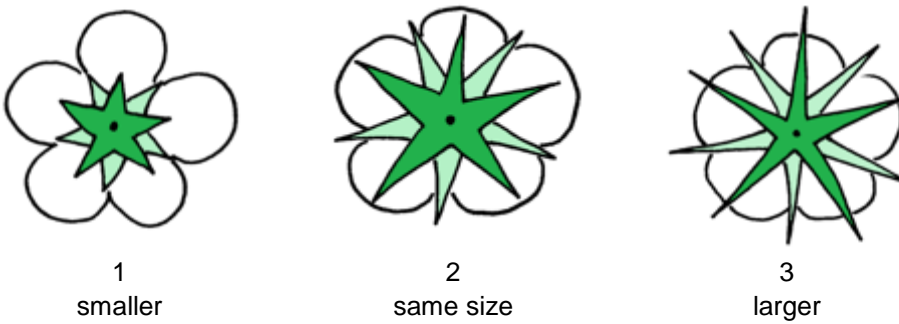
Ad. 17: Petiole: attitude of hairs



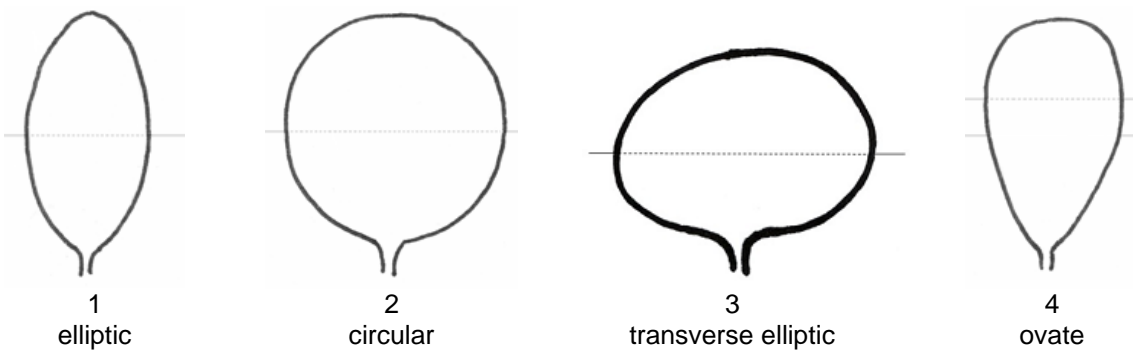
Ad. 20: Flower: arrangement of petals



Ad. 21: Flower: size of calyx in relation to corolla



Ad. 23: Petal: shape



Ad. 27: (Explanation requested) Fruit: size

The fruit size is determined visually, or by assessing the fruit weight.

Ad. 28: Fruit: shape



1
reniform



2
conical



3
cordate



4
ovate



5
oblong



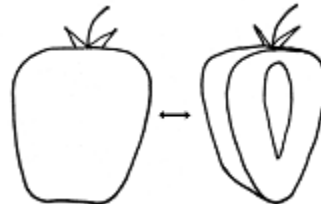
6
rhombic



7
oblate

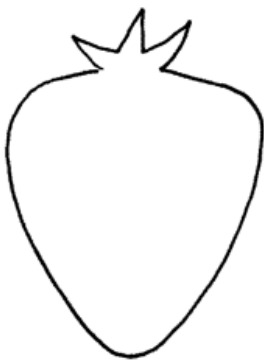


8
circular

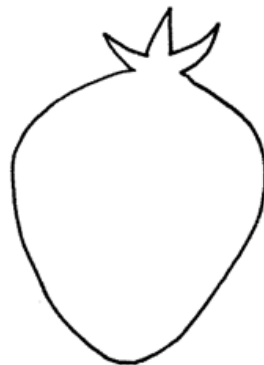


9
wedged

Ad. 29: Fruit: position of maximum diameter



1
strongly towards the calyx

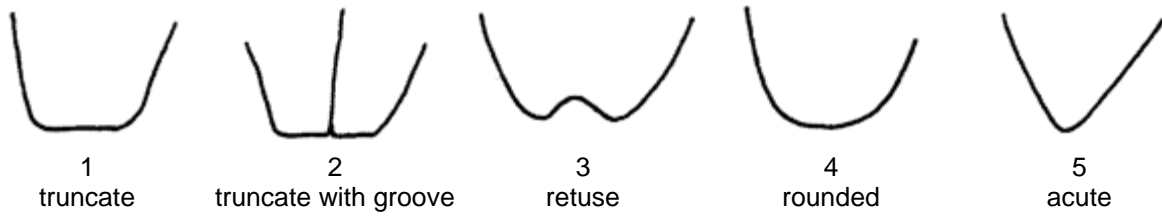


2
moderately towards the calyx

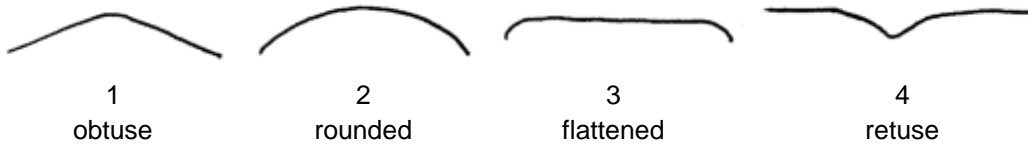


3
at middle

Ad. 30: Fruit: shape of apex



Ad. 31: Fruit: shape at calyx end

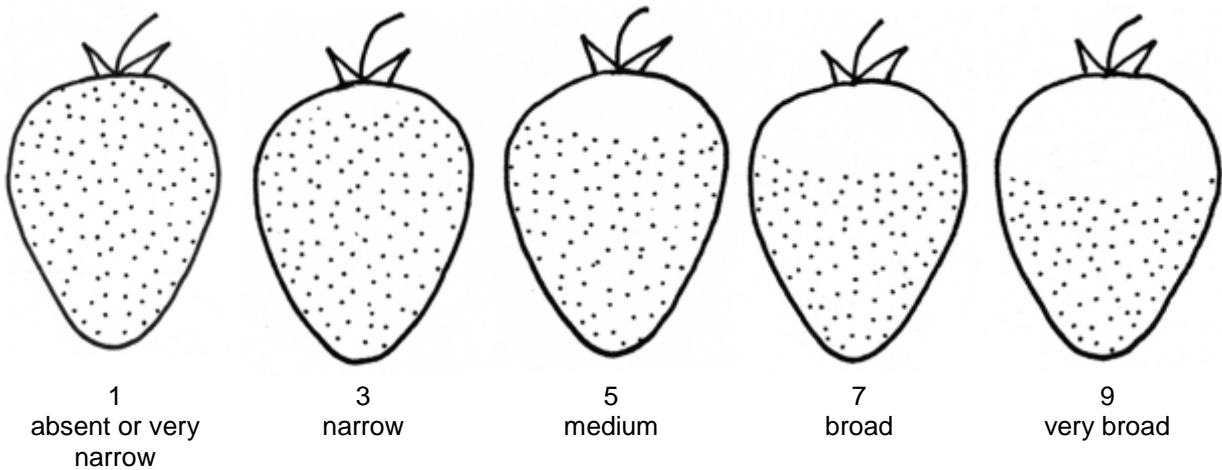


Observations should be made excluding the neck.

Ad. 32: Fruit: color

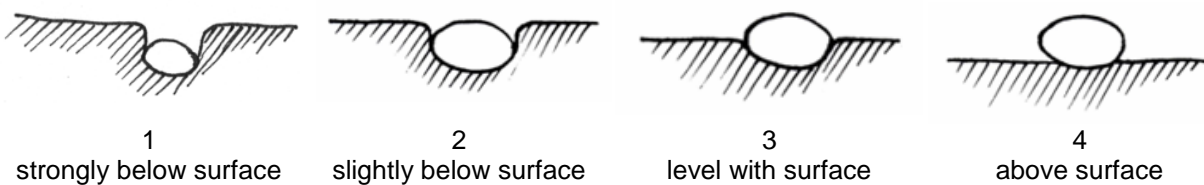
Should be assessed on the side of the fruit which is exposed to the sun.

Ad. 33: Fruit: width of band without achenes



Ad. 34: Fruit: position of achenes

Should be observed at midlength of fruit surface.



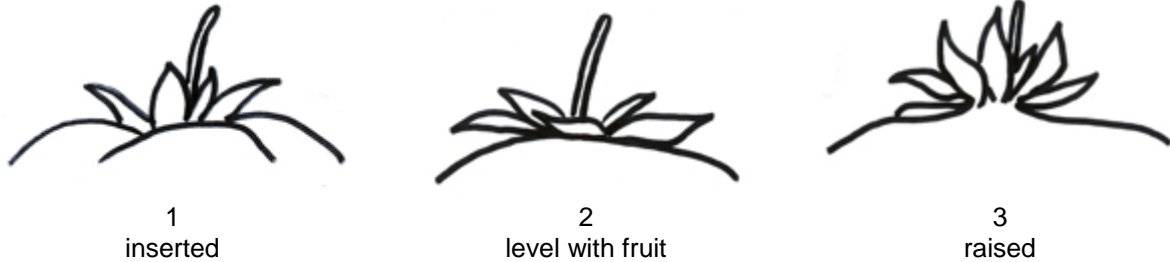
Ad. 35: Fruit: color of achenes

The color of the achenes should be observed at the sunny side of the fruit.

Ad. 36: Fruit: density of achenes

Should be assessed at midlength of fruit, by counting (in a defined area [e.g. a window of 1 cm²] or by visual assessment of the density of achenes on the skin.

Ad. 37: Fruit: position of calyx attachment



Ad. 38: Fruit: attitude of sepals

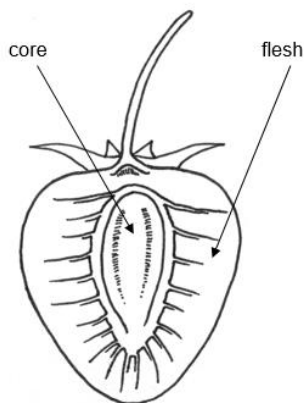


Ad. 39: Fruit: diameter of calyx in relation to diameter of fruit

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

Ad. 40: Fruit: color of flesh

Observations should be made excluding the core.



Ad. 41: Fruit: color of core

See Ad. 40.

Ad. 42: Time of beginning of flowering

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

Ad. 43: 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

Bundessortenamt (ed.), 2015: Beschreibende Sortenliste Erdbeeren. Landbuch Verlag, Hannover, DE, 128 pp.

Centre technique interprofessionnel des fruits et légumes (ed.), 1997: La fraise - Plant et variétés. Paris, FR, 103 pp.

Groupe d'Étude de contrôle des variétés et des Semences (GEVES), 2003: Les Variétés de Fraisier - anciennes, actuelles, nouvelles (CD-ROM). La Minière, FR.

Istituto Sperimentale per la Frutticoltura, 2002: Monografia di cultivar di fragola, Roma, 291 pp.

Japan Seed Trade Association, 1978: The report on the characterization and classification of strawberry varieties, Japan Seed Trade Association, Tokyo (by consignment of the MAFF), JP, 20 pp.

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	<input type="text" value="Fragaria L."/>
1.2	Common name	<input type="text" value="Strawberry"/>
1.3	Indicate species:	<input type="text"/>
2. Applicant		
	Name	<input type="text"/>
	Address	<input type="text"/>
	Telephone No.	<input type="text"/>
	Fax No.	<input type="text"/>
	E-mail address	<input type="text"/>
	Breeder (if different from applicant)	<input type="text"/>
3. Proposed denomination and breeder's reference		
	Proposed denomination (if available)	<input type="text"/>
	Breeder's reference	<input type="text"/>

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross

(please state parent variety)

(.....) 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:
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4.2	Method of propagating the variety	
4.2.1	Vegetative propagation	
(a)	<i>In vitro</i> propagation	[]
(b)	runners	[]
(c)	Other (state method)	[]
	<input type="text"/>	
4.2.2	Other (Please provide details)	[]
	<input type="text"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

Characteristics	Example Varieties	Note
5.1 (1) (Proposal to keep 3 states only) Plant : growth habit		
upright	Darselect, Gorella	1 []
upright to semi-upright		2 []
semi-upright	Cirafine, Senga Sengana	3 []
semi-upright to spreading		4 []
spreading	Irvine, Selva, Splendor	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		
adpressed	Elista, Georg Soltwedel	1 []
upwards	Darselect, Elsanta	2 []
horizontal	Cambridge Favourite, Clery, Direktor Paul Wallbaum, Gariguette, Mara des Bois	3 []
downwards		4 []

Characteristics	Example Varieties	Note
5.4 Flower: diameter (19)		
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 Flower: size of calyx in relation to corolla (21)		
smaller	Arking, Jussara	1 []
same size	Filicia, Gladis	2 []
larger	Camarosa, Everest, Janiss, Murano	3 []
5.6 Petal: color of upper side (25)		
greenish white		1 []
white	Gariguette	2 []
light pink	Marajox, Pikan	3 []
medium pink	Frel	4 []
dark pink	Tarpan	5 []
red		6 []
5.7 Fruit: length in relation to diameter (26)		
very low		1 []
low	Lia, Sussette	2 []
medium	Gorella, Honeoye	3 []
high	Malling Centenary, Osiris	4 []
very high	Brilla, Starlette	5 []

Characteristics	Example Varieties	Note
5.8 (Explanation requested) Fruit: size (27)		
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 Fruit: shape (28)		
reniform	Early Dawn, Favette	1 []
conical	Albion, Clery, Everest, Gorella, Matis, Murano, Sweet Charlie	2 []
cordate	Direktor Paul Wallbaum	3 []
ovate	Florika, Macherauchs Frühernte	4 []
oblong	Chandler, Marie France	5 []
rhombic	Gariguette, Pantagruella	6 []
oblate	Elista	7 []
circular	Grande, Madame Moutot	8 []
wedged	Camarosa, Georg Soltwedel	9 []
5.10 Fruit: color (32)		
pinkish white		1 []
yellowish white		2 []
light orange	Merton Dawn	3 []
medium orange	Cambridge Favourite	4 []
orange red	Gorella	5 []
pink		6 []
light red		7 []
medium red	Elsanta, Royal Sovereign, Sweet Charlie	8 []
dark red	Honeoye, Seascape, Senga Sengana	9 []
blackish red	Rubina	10 []

Characteristics	Example Varieties	Note
5.11 Fruit: position of achenes (34)		
strongly below surface		1 []
slightly below surface		2 []
level with surface	Malling Centenary, Osiris	3 []
above surface	Alice, Frugodi, Toscana, Weitgasserii I Nivális	4 []
5.12 Fruit: position of calyx attachment (37)		
inserted	Finesse	1 []
level with fruit	Lia, Murano, Senga Sengana, Sweet Charlie	2 []
raised	Asia, Ciflorette, Gariguette	3 []
5.13 Fruit: attitude of sepals (38)		
upwards	Asia, Gariguette	1 []
outwards	Altess, Lia, Osiris	2 []
downwards	Pink Extara, Senga Sengana	3 []
5.14 Fruit: diameter of calyx in relation to diameter of fruit (39)		
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 Time of beginning of flowering (42)		
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 []

Characteristics	Example Varieties	Note
5.16 Time of beginning of fruit ripening (43)		
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 []
5.17 Flowering runners (44)		
absent	Elsanta	1 []
present	Aromas, Cirafine, Florika	9 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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
<i>Example</i>	<i>Fruit: color of flesh</i>	<i>orange red</i>	<i>dark red</i>
Comments:			

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes No

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes No

(If yes, please provide details)

7.3 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.]

Additional information on the bearing type.

The variety is

not remontant

partially remontant

fully remontant

day neutral

Additional information on chilliing requirements

The variety is

low chilling

medium chilling

high chilling

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

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]