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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

STRAWBERRY

UPOV Code: FRAGA

Fragaria L.

*

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Japan

to be considered by the
Technical Working Party for Fruit Crops,
at its thirty-eighth session, to be held in Jeju, Republic of Korea, from July 9 to 13, 2007

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. of the family *Rosaceae*.

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: 1,000 seeds (or 300mg seed) or 50 young plants
(or how about "sufficient seed to produce 50 plants"?)

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

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

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

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.

3.4.2 In the case of seed-propagated varieties, each test should be designed to result in a total of at least 40 plants.

3.4.3 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, all observations should be made on 20 plants or parts taken from each of 20 plants. In the case of parts of plants, the number to be taken from each of the plants should be 2.

3.6 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.

4.2 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 For the assessment of uniformity, 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. In the case of a sample size of 40 plants, 2 off-types are 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 tested, either by growing a further generation, or by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the previous 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) Petal: color of upper side (characteristic 27)
(b) Fruit: size (characteristic 29)
(c) Fruit: shape (characteristic 30)
(d) Fruit: color (characteristic 32)
(e) Type of bearing (characteristic 48)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

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

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.

6.3 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.

Note: Characteristics of 'Akihime' and 'Tochiotome' were assessed in greenhouse. Other varieties were assessed in open field.

6.5 Legend

(*) Asterisked characteristic – see Chapter 6.1.2

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

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

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

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.		**Plant: growth habit**					
(+)							
QN	**(a)**	upright				Benton, Darselect, Gorella	1
		semi-upright				Cirafine, Senga Sengana, Tochiotome	2
		spreading				Darsidor, Pantagruella	3
2.		**Plant: density of foliage**					
(+)							
QN	**(a)**	sparse				Ciflorette, Elista	3
		medium				Cirafine, Gorella	5
		dense				Cirano, Talisman	7
3.		**Plant: vigor**					
(+)							
QN	**(a)**	weak				Senga Precosa	3
		medium				Gorella	5
		strong				Elsanta, Grande	7
4. **(*)**		**Plant: position of inflorescence in relation to foliage**					
QN	**(c)**	beneath				Crusader	1
		same level				Akihime, Astino, Cambridge Favourite	2
		above				Direktor Paul Wallbaum, Tochiotome	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5. (*)		**Plant: number of stolons**					
QN	**(b)**	few				Marala, Sans Rivale	3
		medium				Anabelle, Gorella	5
		many				Cambridge Favourite, Macherauchs Frühernte, Tochiotome	7
6.		**Stolon: anthocyanin coloration**					
QN	**(b)**	absent or very weak				Tioga	1
		weak				Cijosée, Tenira, Tochiotome	3
		medium				Darselect, Gorella	5
		strong				Cigaline, Royal Sovereign	7
		very strong				Arking, Frel	9
7.		**Stolon: density of pubescence**					
QN	**(b)**	sparse				Chandler, Elista, Vigerla	1
		medium				Cambridge Favourite, Gariguette	2
		dense				Grande, Siabelle	3
8.		**Leaf: size**					
QN	**(a)**	small				Everest	3
		medium				Camarosa	5
		large				Darselect	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9.		**Leaf: color of upper side**					
PQ	**(a)**	yellow green				Tristar	1
		light green				Aliso, Cigaline, Georg Soltwedel	2
		medium green				Elsanta, Darselect, Gorella	3
		dark green				Direktor Paul Wallbaum, Macherauchs Frühernte, Tochiotome	4
		blue green				Mrak	5
10. (*) (+)		**Leaf: blistering**					
QN	**(a)**	absent or weak				Anabelle, Bemanil, Marmion	1
		medium				Cigaline, Senga Precosa, Tochiotome	2
		strong				Cijosée, Marie France, Jamil	3
11. (*)		**Leaf: glossiness**					
QN	**(a)**	absent or weak				Aptos, Bogota, Mrak,	1
		medium				Akihime, Darestivale, Irvine,	2
		strong				Mara des Bois, Sweet Delight, Tioga	3
12.		**Leaf: variegation**					
QL	**(a)**	absent				Akihime, Tochiotome	1
		present					9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13. (*)		**Terminal leaflet: length in relation to width**					
QN	**(a)**	shorter than broad				Siabelle	1
		as long as broad				Chandler , Crusader, Tochiotome	2
		moderately longer than broad				Elsanta, Montrose, Redgauntlet	3
		much longer than broad				Gariguette, Macherauchs Frühernte	4
14. (*) (+)		**Terminal leaflet: shape of base**					
PQ	**(a)**	acute				Gorella, Regina, Tochiotome	1
		obtuse				Darselect, Senga Sengana	2
		rounded				Crusader, Florika, Marie France	3
15. (+)		**Terminal leaflet: incisions**					
PQ	**(a)**	serrate				Garriguette, Tenira	1
		intermediate				Akihime	2
		crenate				Cambridge Favourite, Gentonova, Irvine	3
16. (+)		**Terminal leaflet: shape in cross section**					
QN	**(a)**	concave				Senga Precosana, Hapil, Ostara	1
		straight				Georg Soltwedel,Mara des Bois, Tochiotome	2
		convex				Cambridge Favourite, Domanil, Madame Moutot	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17.		**Petiole: length**					
QN	**(a)**	short				Pantagruella	3
		medium				Polka	5
		long				Akihime, Tochiotome, Darselect	7
18. **(+)**		**Petiole: attitude of hairs**					
QN	**(a)**	upwards				Elista, Georg Soltwedel	1
		slightly outwards				Darselect, Elsanta	2
		strongly outwards				Cambridge Favourite, Direktor Paul Wallbaum, Mara des Bois	3
19.		**Stipule: anthocyanin coloration**					
QN	**(b)**	absent or very weak				Elista	1
		weak				Crusader	3
		medium				Akihime, Gorella, Tochiotome	5
		strong				Talisman	7
		very strong				Royal Sovereign	9
20.		**Inflorescence: number of flowers/ Inflorescence**			(IL) performance char, (NL)How to exanimate the remontant varieties?		
QN	**(c)**	few				Pantagruella	3
		medium				Lambada	5
		many				Elsanta	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21. **(+)**	**VG**	**Pedicel: attitude of hairs**					
QN	**(d)**	upwards				Cigaline	1
		slightly outwards				Darselect	2
		strongly outwards				Parker	3
22.		**Flower: diameter**					
QN	**(c)**	small				Redgauntlet, Rapella	3
		medium				Gorella, Mara des Bois, Tochiotome	5
		large				Akihime, Darselect, Domanil	7
23. **(*)** **(+)**		**Flower: relative position of petals**					
PQ	**(c)**	free				Akihime, Cirafine, Talisman	1
		touching				Darsidor, Regina	2
		overlapping				Florika, Senga Gigana, Tochiotome	3
24. **(*)** **(+)**		**Flower: size of calyx in relation to corolla**					
QN	**(c)**	smaller				Bogota, Grande, Nordika	1
		same size				Darselect, Korona	2
		larger				Cigoulette, Regina, Tochiotome	3
25.		**Flower: stamen**					
QL	**(c)**	absent				Pandora, Yamasaka	1
		present				Gariguette	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
26.		**Petal: length in relation to width**					
QN	**(c)**	much shorter than broad				Florika, Senga Gigana	1
		moderately shorter than broad				Gento Nova, Tioga	2
		as long as broad				Darselect, Redgauntlet	3
		moderately longer than broad				Ciflorette, Elsanta, Gorella	4
		much longer than broad				Talisman	5
27. (*)		**Petal: color of upper side**					
PQ	**(c)**	white				Akihime, Gariguette, Tochiotome	1
		greenish white					2
		pink				Frel, Marajox, Pikan	3
		red				Tarpan	4
28. (*)		**Fruit: length in relation to width**					
QN	**(d)**	much shorter than broad				Early Dawn	1
		moderately shorter than broad				Elista, Madame Moutot	2
		as long as broad				Gento Nova, Gorella, Merton Dawn	3
		moderately longer than broad				Gariguette, Talisman, Tochiotome,	4
		much longer than broad				Akihime, Ciflorette, Marie France	5

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29. (*)		**Fruit: size**					
QN	**(d)**	very small				Astino, Frel	1
		small				Senga Precosa	3
		medium				Mara des Bois, Senga Tigaiga	5
		large				Darselect, Domanil, Tochiotome	7
		very large				Maxim	9
30. (*) (+)		**Fruit: shape**					
PQ	**(d)**	reniform				Early Dawn, Favette	1
		obloid				Elista	2
		globose				Grande, Madame Moutot	3
		conic				Gorella, Matis, Tochiotome	4
		rhomboid				Gariguette, Pantagruella	5
		ovoid				Florika , Macherauchs Frühernte	6
		cylindric				Chandler, Marie France	7
		wedged				Georg Soltwedel	8
		cordiform				Direktor Paul Wallbaum	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
31.		**Fruit: difference in shape of primary and secondary fruits**					
QN	**(d)**	none or very slight				Cambridge Favourite, Vigerla	1
		slight				Akihime, Gariguette, Sengana	3
		moderate				Darselect, Gorella, Tochiotome,	5
		large				Bogota, Talisman, Georg Soltwedel	7
		very large				Maxim	9
32. (*)		**Fruit: color**	**(ND) state 4 to read ,"light red"; state 5 to read "medium red"; state 6 to read "dark red"and state 7 to read "blackish red".**				
PQ	**(d)**	whitish yellow				Weisse Ananas	1
		medium orange				Madame Moutot, Merton Dawn	2
		orange				Cambridge Favourite	3
		orange red				Akihime, Ciflorette, Gorella	4
		red				Royal Sovereign, Tochiotome, Elsanta	5
		dark red				Seascape, Senga Sengana	6
		red black				Honey Oya, Rubina	7
33. (+)		**Fruit: evenness of color**	**(PB) To add (+) with explanation or illustration**				
QN	**(d)**	even or very slightly uneven				Valeta	1
		slightly uneven				Tamella	2
		strongly uneven				Marie France	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
34.		**Fruit: glossiness**					
QN	**(d)**	weak				Bemanil, Madame Moutot	1
		medium				Darselect, Macherauchs Frühernte	2
		strong				Elsanta, Redgauntlet, Tochiotome	3
35. **(+)**		**Fruit: evenness of surface**	**(PB) To add (+) with explanation or illustration/photograph**				
QN	**(d)**	even or very slightly uneven				Akihime, Tochiotome, Valeta	1
		slightly uneven				Senga Precosana	2
		strongly uneven				Redgauntlet	3
36. **(+)**		**Fruit: width of band without achenes**					
QN	**(d)**	absent or very narrow				Akihime, Tochiotome, Senga Sengana,	1
		narrow				Elsanta, Mara des Bois, Pandora	3
		medium				Darselect, Gariguette	5
		broad				Pantagruella	7
		very broad				Belrubi, Earliglo	9
37. **(*)**		**Fruit: position of achenes**					
QN	**(d)**	below surface				Cirafine, Elista, Tochiotome	1
		level with surface				Akihime, Darselect, Regina	2
		above surface				Brighton, Rigensa	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
38. **(+)**		**Fruit: position of calyx**					
QN	**(d)**	inserted				Aliso, Favette	1
		level				Cambridge Favourite, Talisman, Tochiotome	2
		exserted				Gariguette, Regina	3
39. **(+)**		**Fruit: attitude of calyx**					
QN	**(d)**	upwards				Akihime, Bounty, Gariguette	1
		outwards				Angélina , Framura, Tochiotome	2
		downwards				Ciflorette, Elvira	3
40. **(+)**		**Fruit: diameter of calyx in relation to fruit**					
QN	**(d)**	much smaller				Favette, Lumina	1
		slightly smaller				Ostara, Senga Sengana	2
		same size				Akihime, Cirafine, Tenira	3
		slightly larger				Darselect, Tochiotome, Senga Precosa	4
		much larger				Angélina, Cambridge Favourite	5
41.		**Fruit: adherence of calyx**					
QN	**(d)**	very weak				Confitura, Primek	1
		weak				Senga Precosa, Siabelle	3
		medium				Mara des Bois, Sengana, Tochiotome	5
		strong				Darselect, Redgauntlet	7
		very strong				Rainier	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
42.		**Fruit: firmness**					
QN	**(d)**	very soft				Madame Moutot, Marie France	1
		soft				Gento, Grande	3
		medium				Akihime, Gariguette, Gorella	5
		firm				Darselect, Tigaiga	7
		very firm				Holiday, Parker, Tochiotome	9
43. **(+)**		**Fruit: color of flesh (excluding core)**					
PQ	**(d)**	whitish				Madame Moutot, Regina	1
		light pink				Direktor Paul Wallbaum, Senga Precosa	2
		orange red				Elsanta, Talisman	3
		light red				Cambridge Favourite, Ciflorette, Tochiotome	4
		medium red				Gariguette, Elista	5
		dark red				Senga Tigaiga	6
44. **(+)**		**Fruit: color of core**					
PQ	**(d)**	white				Akihime	1
		light red				Figaro	2
		medium red				Tochiotome	3
45.		**Fruit: cavity**	**(IL) performance char**				
QN	**(d)**	absent or small				Gerida, Onebor, Tochiotome	1
		medium				Agana, Douglas	2
		large				Cortina, Fiesta	3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
46. (*)	**Time of beginning of flowering**					
QN	very early				Karina, Sweet Charlie	1
	early				Akihime, Gariguette, Pantagruella	3
	medium				Cambridge Favourit, Elsanta , Tochiotome	5
	late				Daisy, Tago	7
	very late				Marzheyw, Pandora	9
47. (+)	**Time of beginning of ripening**					
QN	very early				Favette, Karina	1
	early				Gariguette,Pantagruella, Tochiotome	3
	medium				Cambridge Favourite, Elsanta	5
	late				Daisy, Tago	7
	very late				Marzheyw, Pandora	9
48. (*) (+)	**Type of bearing**	**(PB) add (+) with explanation of the terms “remontant” and “day-neutral” and the difference between partially or fully remontant**				
PQ	not remontant				Cambridge Favourite, Gariguette, ochiotome	1
	partially remontant				Akihime, Redgauntlet, Sweet Charlie	2
	fully remontant				Brighton, Cirafine, Mara des Bois	3
	day neutral				Florika	4

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) All observations on the plant and leaf should be made on one-year-old plants shortly before the beginning of fruit ripening.
(IL) in Israel planting in September, first flowering in November of the same year! (NL) to delete one-year old.

(b) All observations on the stipule and the stolon should be made on one year-old plants towards the end of the growing season.
(IL) there is no end of the growing season. Better end of the bearing (excluding day-neutral varieties).

(c) Unless otherwise indicated, all observations of the inflorescence (including the flower) should be made on one year old (IL) delete one year old plants when they are in full flower. Unless otherwise indicated, observations on the flower should be made on the secondary flower.

(d) Unless otherwise indicated, all observations on the fruit should be made on secondary fruit of one year old plants.
(IL) delete on one year-old plants at harvest maturity.
(NL) agree with IL.

8.2 Explanations for individual characteristics

Ad.1: Plant: growth habit

1	2	3
upright	semi-upright	spreading

Ad.2: Plant: density of foliage

3
sparse

5
medium

7
dense

Ad.3: Plant: vigor

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

Ad. 10: Leaf: blistering

1
absent

2
medium

3
strong

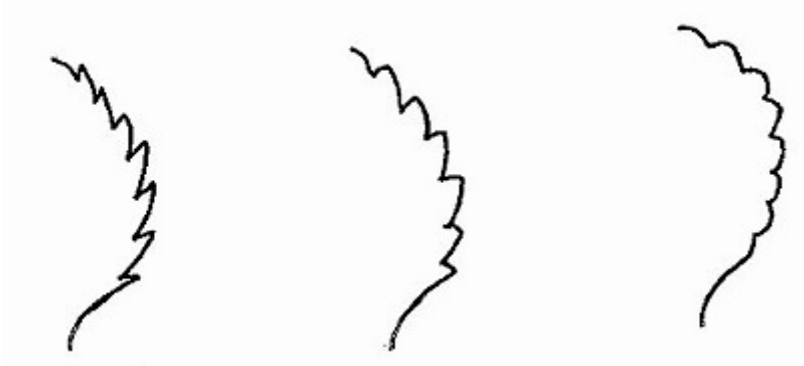
Ad. 14: Terminal leaflet: shape of base

1
acute

2
obtuse

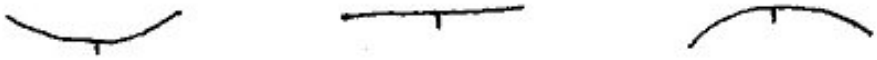
3
rounded

Ad. 15: Terminal leaflet: incisions



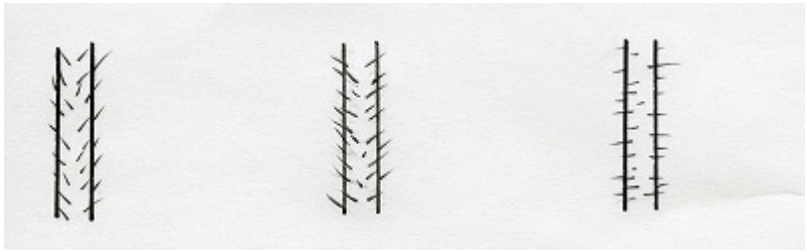
1	2	3
serrate	intermediate	crenate

Ad. 16: Terminal leaflet: shape in cross section



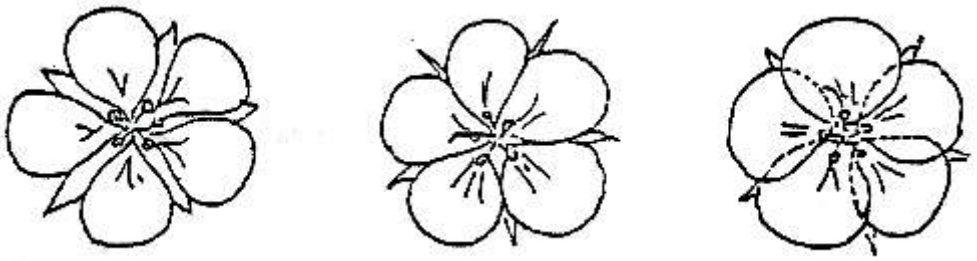
1	2	3
concave	straight	convex

Ad.18: Petiole: attitude of hairs
Ad.21: Pedicel: attitude of hairs



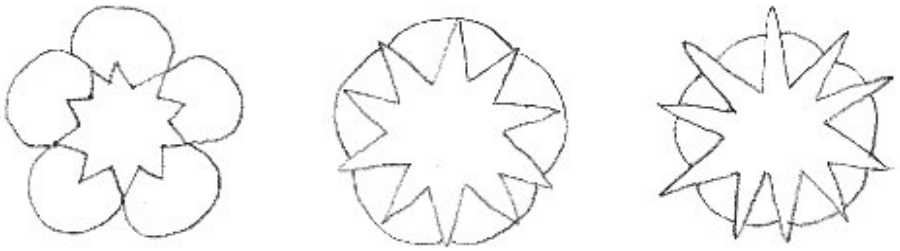
1	2	3
upwards	slightly outwards	strongly outwards

Ad. 23: Flower: relative position of petals



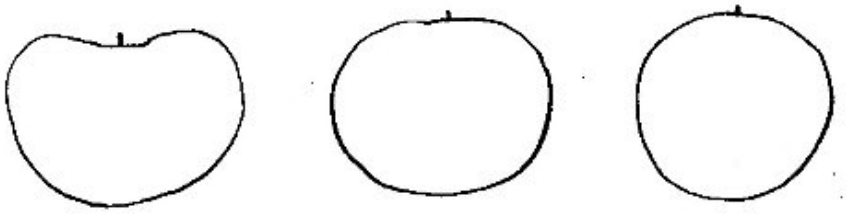
1	2	3
free	touching	overlapping

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

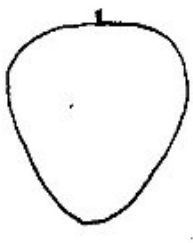


1	2	3
smaller	same size	larger

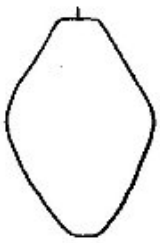
Ad. 30: Fruit: shape



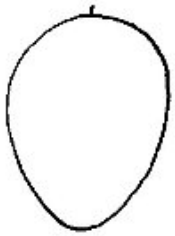
1	2	3
reniform	obloid	globose



4
conic

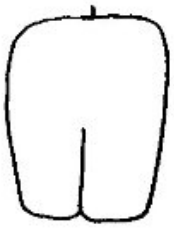


5
rhomboid

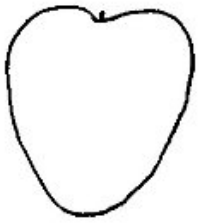


6
ovoid

7
cylindric



8
wedged



9
cordiform

Ad. 33: Fruit: evenness of color

(explanation or illustration)

1	2	3
Even or very slightly uneven	Slightly uneven	Strongly uneven

Ad. 35: Fruit: evenness of surface

(explanation or illustration)

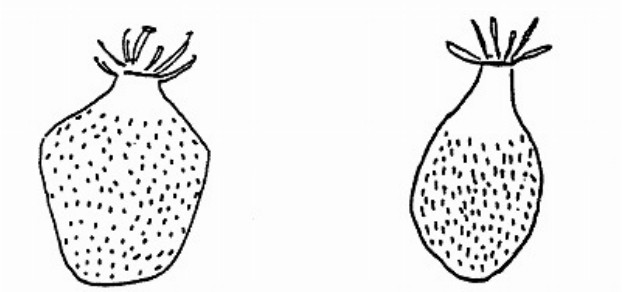
1	2	3
Even or very slightly uneven	Slightly uneven	Strongly uneven

Ad. 36: Fruit: width of band without achenes

1
absent or very narrow

2
narrow

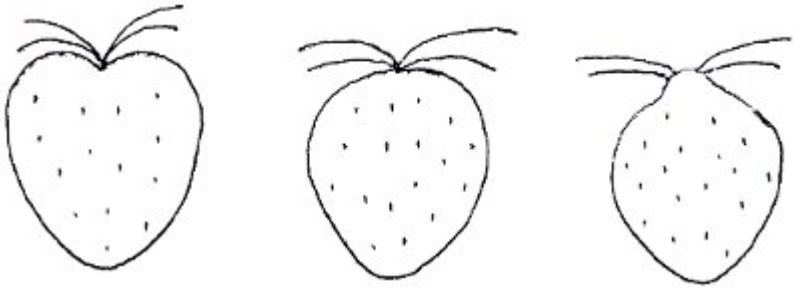
5
medium



7
broad

9
very broad

Ad. 38: Fruit: position of calyx

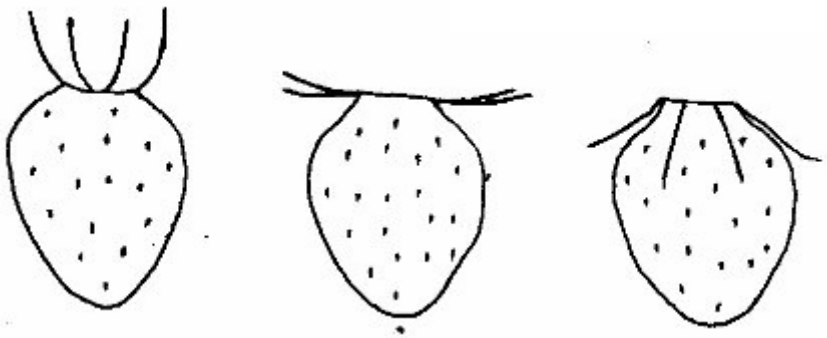


1
inserted

2
level

3
exerted

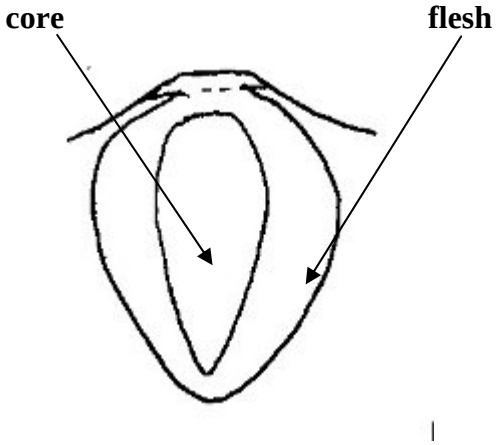
Ad. 39: Fruit: attitude of calyx



1 upwards | 2 downwards | 3 outwards

Ad. 40: Fruit: diameter of calyx in relation to fruit
The diameter of calyx is measured with the calyx held flat.

Ad. 43: Fruit: color of flesh (excluding core)
Ad. 44: Fruit: color of core



Ad. 47: Time of beginning of ripening

The time when the first fruit in the first cluster ripen.

Ad. 48: Type of bearing

Not remontant: The character which blooms in one season in a year.

Partly remontant: It is possible to bloom two times in a year. However it is very easily to be influenced by unstable weather.

Fully remontant: The character which blooms in two seasons in a year, and they can harvest two times in a year.

Day neutral: Time of flowering is almost in a year. Or time of flowering is more than remontant.

9. Literature

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

4.2 Method of propagating the variety

4.2.1 Vegetative propagation

(a) cuttings [ ]

(b) *in vitro* propagation [ ]

(c) other (state method) [ ]

4.2.2 Seed [ ]

4.2.3 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:

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
5.2 (27)	**Petal: color of upper side**		
	white	Akihime, Gariguette, Tochiotome	1[ ]
	greenish white		2[ ]
	pink	Frel, Marajox, Pikan	3[ ]
	red	Tarpan	4[ ]
5.3 (29)	**Fruit: size**		
	very small	Astino, Frel	1[ ]
	small	Senga Precosa	3[ ]
	medium	Mara des Bois, Senga Tigaiga	5[ ]
	large	Darselect, Domanil, Tochiotome	7[ ]
	very large	Maxim	9[ ]
5.4 (30)	**Fruit: shape**		
	reniform	Early Dawn, Favette	1[ ]
	obloid	Elista	2[ ]
	globose	Grande, Madame Moutot	3[ ]
	conic	Gorella, Matis, Tochiotome	4[ ]
	rhomboid	Gariguette, Pantagruella	5[ ]
	ovoid	Florika , Macherauchs Frühernte	6[ ]
	cylindric	Chandler, Marie France	7[ ]
	wedged	Georg Soltwedel	8[ ]
	cordiform	Direktor Paul Wallbaum	9[ ]

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

	Characteristics	Example Varieties	Note
5.5 (32)	**Fruit: color**		
	whitish yellow	Weisse Ananas	1[ ]
	medium orange	Madame Moutot, Merton Dawn	2[ ]
	orange	Cambridge Favourite	3[ ]
	orange red NL: "light red"	Akihime, Ciflorette, Gorella	4[ ]
	red NL: "medium red"	Royal Sovereign, Tochiotome, Elsanta	5[ ]
	dark red	Seascape, Senga Sengana	6[ ]
	red black NL: "blackish red"	Honey Oya, Rubina	7[ ]
5.6 (48)	**Type of bearing**		
	not remontant	Cambridge Favourite, Gariguette, ochiotome	1[ ]
	partially remontant	Akihime, Redgauntlet, Sweet Charlie	2[ ]
	fully remontant	Brighton, Cirafine, Mara des Bois	3[ ]
	day neutral	Florika	4[ ]

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

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Fruit color*	*orange red*	*orange*

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 should accompany the Technical Questionnaire.

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

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

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

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

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

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

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

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

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details for where you have indicated "yes".

……

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]