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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 expert from Japan**to be considered by the**Technical Working Party for Fruit Crops at its thirty-seventh session, to be held in Salvador, Bahia State, Brazil, from August 21 to 25, 2006*

Alternative Names: *

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Fragaria L.</i>	Strawberry	Fraisier	Erdbeere	Fresa

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 seeds.

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

- (a) vegetatively propagated varieties: 20 young plants
- (b) seed propagated varieties: 1,000 seeds (or 300mg seeds) or 50 young 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 plants produce a satisfactory crop of fruit in each of the two growing cycles.

3.3.1 *Stage of development for the assessment*

The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described at the end of Chapter 8.

3.3.2 Type of observation

The recommended method of observing the characteristic is indicated by the following key in the second column of the Table of Characteristics:

MG: single measurement of a group of plants or parts of plants

VG: visual assessment by a single observation of a group of plants or parts of plants

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 20 plants for both greenhouse and outdoor varieties.

3.4.2 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.

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 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) Flower: color on the upper side of petal (characteristic 21)
- (b) Fruit: color (characteristic 32)
- (c) Type of bearing (characteristic 46)

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. VG Plant: habit (+)						
PQ (a)	globose				Akihime, Benton, Darselect, Gorella	1
	flat globose				Cirafine, Senga Sengana, Tochiotome	2
	flat				Darsidor, Patagruella, Pentagruella	3
2. VG Plant: density (+)						
QN (a)	open				Ciflorette, Elista	3
	medium				Cirafine, Gorella	5
	dense				Cirano, Talisman	7
3. VG Plant: vigor						
QN (a)	weak				Senga Precosa	3
	medium				Gorella	5
	strong				Elsanta, Grande	7
4. VG Leaf: color of upper side						
PQ (a)	yellow green				Trister	1
	light green				Aliso, Cigaline, Georg Soltwedel	2
	medium green				Darselect, Gorella	3
	dark green				Akihime, Cirano, Direktor Paul Wallbaum, Macherauchs Frühernte, Tochiotome	4
	blue green				Mark	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5. VG	Leaf: size					
QN	(a) small				Everest	3
	medium				Camarosa	5
	large				Darselect	7
6. VG	Leaf: shape in cross section					
(+)						
PQ	(a) concave				Senga Precosana, Hapil, Ostara	1
	flat				Akihime, Georg Soltwedel, Mara des Bois, Tochiotome	2
	convex				Cambridge Favourite, Domanil, Madame Moutot	3
7. VG	Leaf: blistering					
(*)						
(+)						
PQ	(a) absent or weak				Anabelle, Bemanil, Marmion	1
	medium				Akihime, Cigaline, Precosa, Tochiotome	2
	strong				Cijosée, Marie France, Jamil	3
8. VG	Leaf: glossiness					
(*)						
QN	(a) weak				Aptos, Bogota, Madame Moutot, Mrak, Tochiotome	3
	medium				Akihime, Darestivale, Irvine, Gariguette	5
	strong				Mara des Bois, Sweet Delight, Tioga	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
9. VG	Leaf: variegation (only for ornamental varieties)					
QL	(a) absent				Akihime, Tochiotome	1
	present					9
10. VG	Terminal leaflet: (* ratio of length/width					
QN	(a) broader than long				Siabelle	1
	as long as broad				Chandler , Crusader, Tochiotome	2
	longer than broad				Akihime, Darselect, Montrose, Red Gauntlet	3
	much longer than broad				Gariguette, Macherauchs Frühernte	4
11. VG	Terminal leaflet: (* shape of base (+)					
PQ	(a) acute				Akihime, Gariguette, Gorella, Regina, Tochiotome	1
	obtuse				Darselect, Senga Sengana	2
	rounded				Crusader, Florika, Marie France	3
12. VG	Terminal leaflet: (+ shape of incisions of margin					
PQ	(a) serrate				Garriguette , Nyohou, Tenira	1
	crenate				Cambridge Favourite, Gentonova, Irvine	2

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13. VG	Petiole: attitude of hairs					
QN	(a) upwards				Elsanta, Georg Soltwedel	1
	slightly outwards				Darselect, Elsanta	2
	strong outwards				Cambridge Favourite, Direktor Paul Wallbaum, Mara des Bois	3
14. VG	Petiole: length					
QN	(a) short				Pantagruella	3
	medium				Polka	5
15. VG	Stipule: anthocyanin coloration					
QL	(b) absent or very weak				Elista	1
	weak				Crusader	3
	medium				Akihime, Gorella, Tochiotome	5
	strong				Talisman	7
	very strong				Royal Sovereign	9
16. MG	Stolons: number					
(*)						
QN	(b) few				Marala, Sans Rivale	3
	medium				Anabelle, Gorella	5
	many				Akihime, Cambridge Favourite, Gariguette, Macherauchs Frühernte, Tochiotome	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. VG	Stolon: anthocyanin coloration					
QN (b)	absent or very weak				Tioga	1
	weak				Akihime, Cijosée, Tenira, Tochiotome	3
	medium				Darselect, Gorella	5
	strong				Cigaline, Royal Sovereign	7
	very strong				Arking, Frel	9
18. VG	Stolon: pubescence					
QN (b)	weak				Chandler, Elista, Vigerla	3
	medium				Cambridge Favourite, Gariguette	5
	strong				Grande, Siabelle	7
19. VG (*)	Inflorescence: position relative to foliage					
PQ (c)	beneath				Crusader	1
	same level				Akihime, Astino, Cambridge Favourite	2
	above				Direktor Paul Wallbaum, Tochiotome	3
20. VG (+)	Flower: size (diameter)					
QN (c)	small				Redgauntlet, Rapella	3
	medium				Gorella, Mara des Bois, Tochiotome	5
	large				Akihime, Darselect, Domanil	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21. VG	Flower: color on the upper side of petal					
PQ	(c) white				Akihime, Gariguette, Tochiotome	1
	greenish white					2
	pink				Frel, Marajox, Pikan	3
	red					4
22. VG	Flower: size of calyx relative to corolla					
(*) (+)						
QN	(c) smaller				Bogota, Grande, Nordika	1
	same size				Darselect, Korona	2
	larger				Akihime, Cigoulette, Regina, Tochiotome	3
23. VG	Flower: flower number /flower cluster					
QN	(c) few					3
	medium				Lambada	5
	many				Elsanta	7
24. VG	Flower: relative position of petals (observe only on flower with 5 or 6 petals)					
(*) (+)						
PQ	(c) free				Akihime, Cirafine, Talisman	1
	touching				Darsidor, Regina	2
	overlapping				Florika, Senga Gigana, Tochiotome	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25. VG	Petal: ratio of length/width					
PQ	(c)				Florika, Senga Gigana	1
					Gento Nova, Tioga	2
					Darselect, Red Gauntlet	3
					Ciflorette, Gorella	4
					Talisman	5
26. VG	Fruit: size					
(*)						
QN	(d)				Astino, Frel	1
					Senga Precosa	3
					Mara des Bois, Senga Tigaiga	5
					Akihime, Darselect, Domaniil, Tochiotome	7
					Maxim	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27. VG	Fruit: predominant shape					
(*)						
(+)						
PQ	(d)					
	reniform				Early Dawn, Favette	1
	oblate				Elista	2
	round				Grande, Madame Moutot	3
	conical				Akihime, Gorella, Matis, Tochiotome	4
	bi-conical				Gariguette, Pentagruella	5
	ovate				Florika , Macherouchs Frühernte	6
	almost cylindrical				Chandler, Marie France	7
	wedged				Georg Soltwedel	8
	cordiform				Direktor Paul, wallbaum	9
28. VG	Fruit: ratio of length/width					
(*)						
(+)						
QN	(d)					
	much broader than long				Early Dawn	1
	slightly broader than long				Elista, Madame Moutot	2
	as long as broad				Gento Nova, Gorella, Merton Dawn	3
	slightly longer than broad				Talisman, Tochiotome, Gariguette	4
	much longer than broad				Akihime, Ciflorette, Marie France	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29.	VG	Fruit: difference in shapes between primary and secondary fruits				
QN	(d)	none or very slight			Cambridge Favourite, Vigerla	1
		slight			Akihime, Gariguette, Sengana	3
		moderate			Darselect, Gorella, Tochiotome, Talisman	5
		marked			Bogota, Georg Soltwedel, Talisman	7
		very marked			Maxim	9
30.	VG	Fruit: band without achenes				
(+)						
QN	(d)	absent or very narrow			Akihime, Senga Sengana, Tochiotome	1
		narrow			Mara des Bois, Pandora	3
		medium			Darselect, Garriguette	5
		broad			Gariguette, Pentagruella	7
		very broad			Belrubi, Earliglo	9
31.	VG	Fruit: unevenness of surface				
(+)						
QN	(d)	absent or weak			Akihime, Tochiotome, Vareta	1
		medium			Precosana	2
		strong			Red Gauntlet	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
32. VG	Fruit: color					
(*)						
PQ	(d) whitish yellow				Weisse Ananas	1
	light orange				Madame Moutot, Merton Dawn	2
	orange				Cambridge Favourite	3
	orange red				Akihime, Ciflorette, Gorella	4
	red				Royal Sovereign, chiotome,	5
	dark red				Seascape, Senga Sengana	6
	red black				Honey Oya, Rubina	7
33. VG	Fruit: evenness of color					
QN	(d) uneven				Marie France	1
	slightly uneven				Tamella	2
	even				Valeta	3
34. VG	Fruit: glossiness					
QN	(d) weak				Bemanil, Madame Moutot	3
	medium				Darselect, Macherauchs Frühernte	5
	strong				Akihime, Mara des Bois, Red Gauntlet, Tochiotome	7
35. VG	Fruit: insertion of achenes					
(*)						
PQ	(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
36.	VG	Fruit: insertion of calyx				
(+)						
PQ	(d)	in a basin			Aliso, Favette	1
		with fruit level			Akihime, Cambridge Favourite, Darselect, Talisman, Tochiotome	2
		above fruit			Gariguette, Regina	3
37.	VG	Fruit: attitude of the calyx segments				
(+)						
PQ	(d)	clasping			Ciflorette, Elvira	1
		spreading			Angéline , Framura, Tochiotome	2
		reflexed			Akihime, Bounty, Gariguette	3
38.	VG	Fruit: size of calyx in relation to fruit diameter				
QN	(d)	much smaller			Favette, Lumina	1
		slightly smaller			Ostara, Senga Sengana	2
		same size			Akihime, Cirafine, Tenira	3
		slightly larger			Darselect , Senga Precosa, Tochiotome	4
		much larger			Angéline, Cambridge Favourite	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
39. VG (+)	Fruit: adherence of calyx					
QN (d)	very weak				Confitura, Primek	1
	weak				Precosa, Siabelle	3
	medium				Akihime, Mara des Bois, Sengana, Tochiotome	5
	strong				Darselect, Redgauntlet	7
	very strong				Rainier	9
40. VG	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
41. VG (+)	Fruit: color of flesh (except for core)					
PQ (d)	whitish				Madame Moutot, Regina	1
	pale pink				Direktor Paul Wallbaum, Precosa	2
	orange red				Talisman	3
	light red				Akihime, Cambridge Favourite, Ciflorette, Tochiotome	4
	medium red				Gariguette, Elista	5
	dark red				Senga Tigaiga	6

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
42. VG	Fruit: color of core in longitudinal section					
(+)						
PQ	(d) white				Akihime	1
	pale red					2
	red				Tochiotome	3
43. VG	Fruit: hollow center					
QN	(d) absent or weak				Akihime, Gerida, Onebor, Tochiotome	1
	moderate				Agana, Douglas	2
	strong				Cortina, Fiesta	3
44. MG	Time of flowering					
(*)						
QN	very early				Karina, Sweet Charlie	1
	early				Akihime, Gariguette, Pentagruella	3
	medium				Cambridge Favourite , Elsanta , Tochiotome	5
	late				Daisy, Tago	7
	very late				Marzheyw, Pandora	9
45. MG	Time of ripening					
QN	very early				Favette, Karina	1
	early				Akihime, Gariguette , Pentagruella, Tochiotome	3
	medium				Cambridge Favourite, Elsanta	5
	late				Daisy, Tago	7
	very late				Marzheyw, Pandora	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
46. VG	Type of bearing					
	(*)					
PQ	not remontant				Cambridge Favourite, Gariguette, Tochiotome	1
	partially remontant				Akihime, Red Gauntlet, 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.
- (b) All observations on the stipule and the stolon should be made on one year-old plants towards the end of the growing season.
- (c) Unless otherwise indicated, all observations of the inflorescence (including the flower) should be made on one year old plants when they are in full flower. Unless otherwise indicated, observations on the flower should exclude the primary flower.
- (d) Unless otherwise indicated, all observations on the fruit should be made on secondary fruits of one year old plants at harvest maturity.

8.2 Explanations for individual characteristics

Ad.1: Plant: habit



1
globose



2
flat globose



3
flat

Ad.2: Plant: density



7
open



8
medium

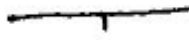


9
dense

Ad.6: Leaf: shape in cross section



1
concave



2
flat



3
convex

Ad. 7: Leaf: blistering



1
absent or weak

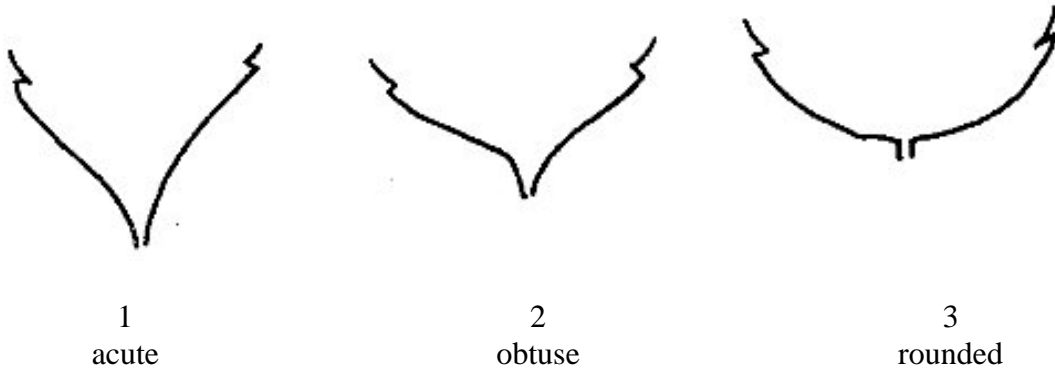


2
medium



3
strong

Ad. 11: Terminal leaflet: shape of base

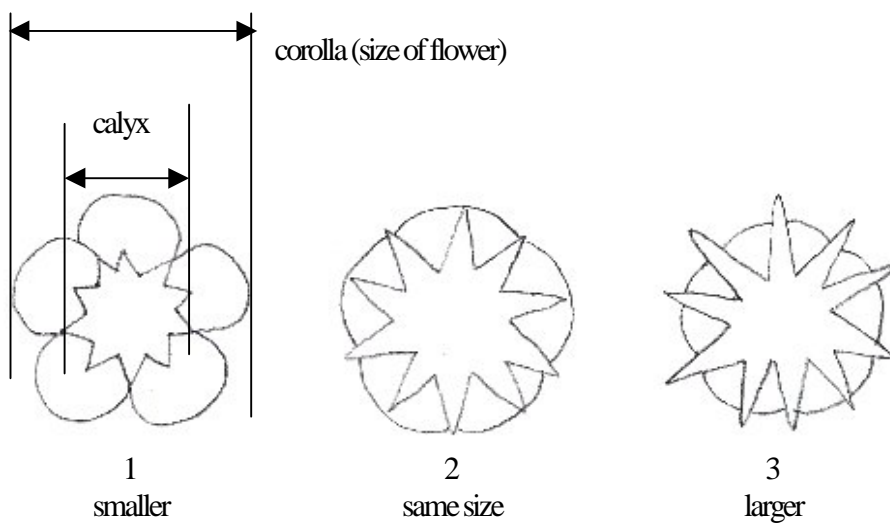


Ad. 12: Terminal leaflet: shape of incisions or margin

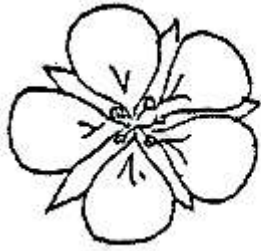


Ad. 20: Flower: size (diameter):

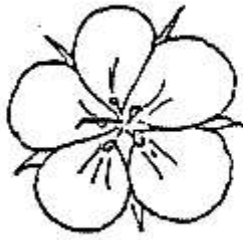
Ad. 22: Flower: size of calyx relative to corolla



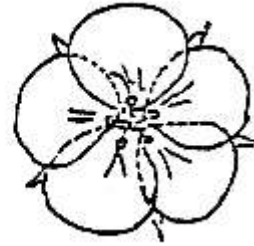
Ad. 24: Flower: relative position of petals (observe only on flower with 5 or 6 petals)



1
free

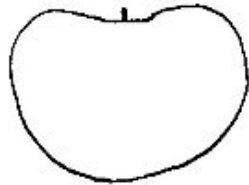


2
touching

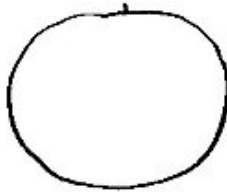


3
overlapping

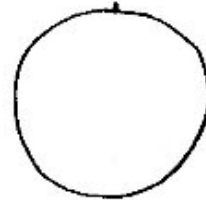
Ad. 27: Fruit: predominant shape



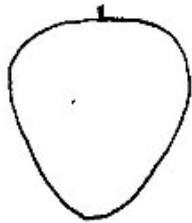
1
reniform



2
oblate



3
round



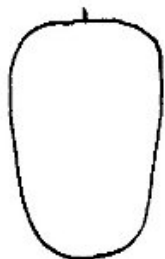
4
conical



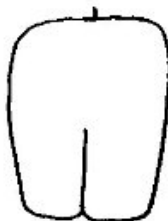
5
bi-conical



6
ovate



7
almost cylindrical

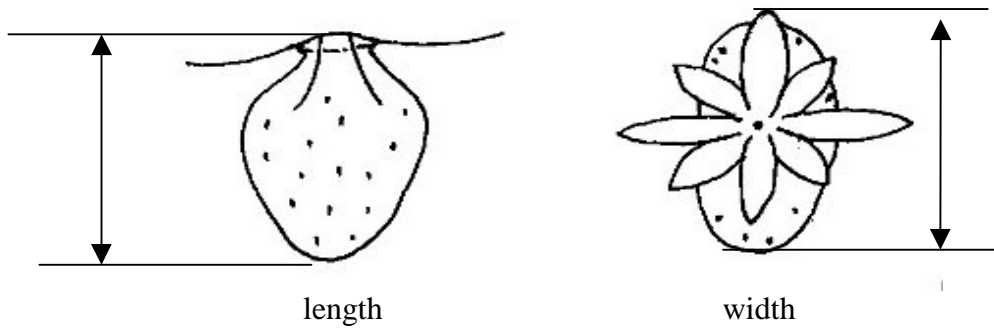


8
wedged

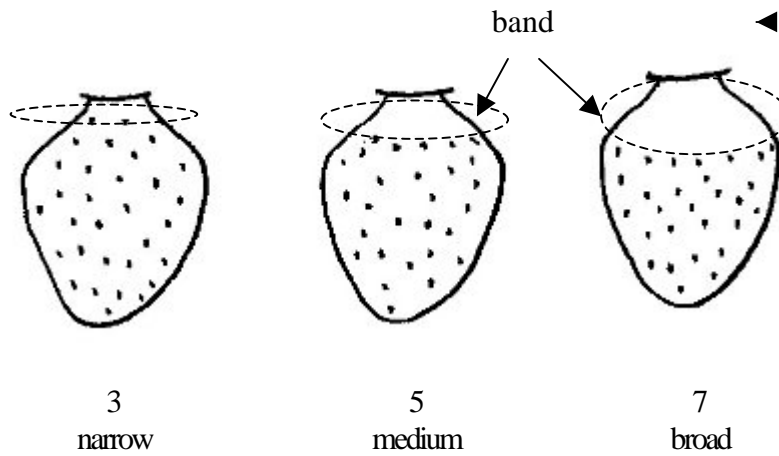


9
cordiform

Ad. 28: Fruit: ratio of length/width



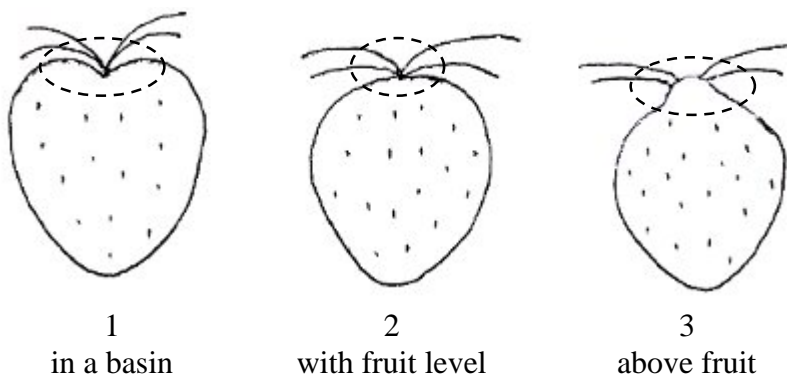
Ad. 30: Fruit: band without achenes



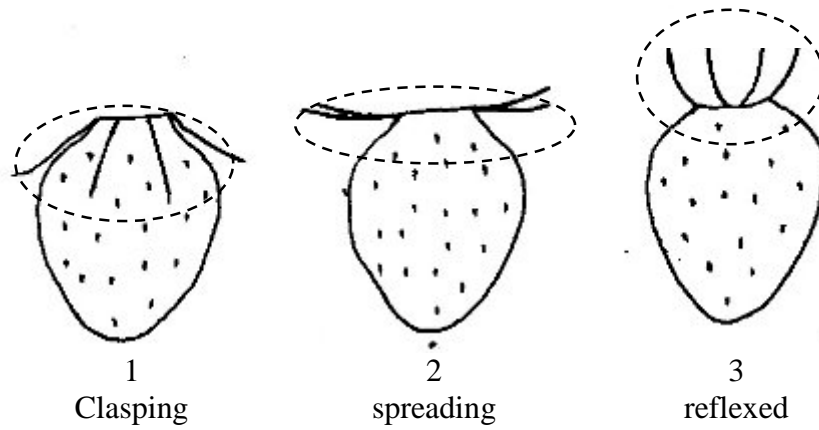
Ad. 31 Fruit: unevenness of surface

Suggest drawings or explanations.

Ad.36: Fruit: insertion of calyx



Ad. 37: Fruit: attitude of the calyx segment

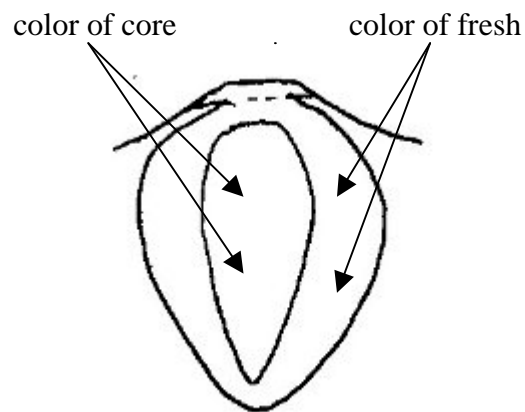


Ad. 39: Fruit: adherence of calyx

Suggest drawings or explanations.

Ad. 41: Fruit: color of fresh

Ad. 42: Fruit: color of core in longitudinal section



9. Literature

Baldini, E., Branzanti, E.G., 1964: "Monografia delle principali cultivar di fragola nonrifiorenti," Ist. Coltiv. Arboree, Università, Bologna, IT, 240 pp.

Bazzocchi, R., Branzanti, E.G., Cristoferi, G., Rosati, P., 1972: "Monografia delle principali cultivar di fragola non rifiorenti," (2). C.H.R., Bologna, IT, 226 pp.

Brossier, J.-O., 1962: "Varieties de fraisiers non remontantes inscrites au catalogue des especes et varieties, leur determination et leur description," Institut national de la recherche agronomique (INRA), Paris, FR

Fischer, M., 1995: "Farbatlas Obstsorten," Eugen Ulmer Verlag, Stuttgart, DE

Gotz, G., Silbereisen, R., 1989: "Obstsorten-Atlas Kernobst, Steinobst, Beerenobst, Schalenobst," Eugen Ulmer GmbH & Co.

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.

Millier, Bissmann, Poenicke, Rosenthal, Schindler: Bd. 7, "Deutschlands Obstsorten," Fachhandel für Gartenbau, Klotzschbroda-Dresden, Winzerstr. 55, DE Sorge, P., 1984: "Beerenobstsorten," Neumann Verlag, Leipzig-Radebeul, DE, 259 pp.

1968 - Le Fraisier a gros fruits - Lemaitre et Linden - les presses agronomiques de Gembloux
- 234 pages - Editions Duculot Gembloux

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"/>	
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:
<p>#4. Information on the breeding scheme and propagation of the variety</p> <p>4.1 Breeding scheme</p> <p>Variety resulting from:</p> <p>4.1.1 Crossing</p> <p>(a) controlled cross [] (please state parent varieties)</p> <p>(b) partially known cross [] (please state known parent variety(ies))</p> <p>(c) unknown cross []</p> <p>4.1.2 Mutation [] (please state parent variety)</p> <p>4.1.3 Discovery and development [] (please state where and when discovered and how developed)</p> <p>4.1.4 Other [] (please provide details)</p> <p>4.2 Method of propagating the variety</p> <p>4.2.1 Vegetative propagation</p> <p>(a) cuttings []</p> <p>(b) <i>in vitro</i> propagation []</p> <p>(c) other (state method) []</p> <p>4.2.3 Other [] (please provide details)</p>		

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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In the case of hybrid varieties the production scheme for the hybrid should be provided on a separate sheet. This should provide details of all the parent lines required for propagating the hybrid e.g.

Single Hybrid

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

Three-Way Hybrid

“(... female line ...) x (... male line ...)

=> single hybrid used as female parent x (... male parent ...)

and should identify in particular:

- (a) any male sterile lines
- (b) maintenance system of male sterile lines.

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).

5.2 Flower: color on the upper side of petal

- | | | |
|------|----------------|------|
| (21) | white | 1[] |
| | greenish white | 2[] |
| | pink | 3[] |
| | red | 4[] |

5.3 Fruit: size

- | | | |
|------|------------|------|
| (26) | very small | 1[] |
| | small | 3[] |
| | medium | 5[] |
| | large | 7[] |
| | very large | 9[] |

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
5.4 Fruit: predominant shape		
(27)	reniform	1[]
	oblate	2[]
	round	3[]
	conical	4[]
	bi-conical	5[]
	ovate	6[]
	almost cylindrical	7[]
	wedged	8[]
	cordiform	9[]
5.5 Fruit: color		
(32)	whitish yellow	1[]
	light orange	2[]
	orange	3[]
	orange red	4[]
	red	5[]
	dark red	6[]
	red black	7[]
5.6 Type of bearing		
(46)	not remontant	1[]
	partially remontant	2[]
	fully remontant	3[]
	day neutral	4[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
<p>6. Similar varieties and differences from these varieties</p> <p><i>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.</i></p>			
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>Flower color</i>	<i>orange</i>	<i>orange red</i>
<p>Comments:</p>			

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>#7. Additional information which may help in the examination of the variety</p> <p>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?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.2 Are there any special conditions for growing the variety or conducting the examination?</p> <p>Yes [] No []</p> <p>(If yes, please provide details)</p> <p>7.3 Other information</p> <p>A representative color photograph of the variety should accompany the Technical Questionnaire.</p>		
<p>8. Authorization for release</p> <p>(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?</p> <p>Yes [] No []</p> <p>(b) Has such authorization been obtained?</p> <p>Yes [] No []</p> <p>If the answer to (b) is yes, please attach a copy of the authorization.</p>		

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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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	<input type="text"/>		
Signature	<input type="text"/>	Date	<input type="text"/>

[End of document]