CPVO · OCVV
Community Plant Variety Office
Office Communautaire des Variétés Végétales

PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

Fragaria L.

STRAWBERRY

UPOV Code: FRAGA

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1. SUBJECT OF THE PROTOCOL AND REPORTING

1.1 Scope of the technical protocol

This Technical Protocol applies to all varieties of ***Fragaria*** **L.**

The protocol describes the technical procedures to be followed in order to meet the requirements of Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on documents agreed by the International Union for the Protection of New Varieties of Plants (UPOV), such as the General Introduction to DUS (UPOV Document TG/1/3 http://www.upov.int/export/sites/upov/resource/en/tg_1_3.pdf), its associated TGP documents (http://www.upov.int/tgp/en/) and the relevant UPOV Test Guideline TG/22/11 dated 31/08/2023 (https://www.upov.int/edocs/tgdocs/en/tg022.pdf) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **01/01/2025**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the Technical Protocol. Technical examinations of candidate varieties are carried out according to the TP in force when the DUS test starts. The starting date of a DUS examination is considered to be the due date for submitting of plant material for the first growing cycle.

In cases where the Office requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process to be carried out at the moment of this request, such report can only be accepted if the technical examination has been carried out according to the CPVO TP which was in force at the moment when the technical examination started.

1.3 Reporting between Examination Office and CPVO and Liaison with Applicant

1.3.1 Reporting between Examination Office and CPVO

The Examination Office shall deliver to the CPVO a preliminary report ("the preliminary report") no later than four weeks after the date of the request for technical examination by the CPVO and in any case preferably before the submission period of the plant material.

The Examination Office shall also deliver to the CPVO a report relating to each growing period ("the interim report") and, when the Examination Office considers the results of the technical examination to be adequate to evaluate the variety or the CPVO so requests, a report relating to the examination ("the final report").

The final report shall state the opinion of the Examination Office on the distinctness, uniformity and stability of the variety. Where it considers those criteria to be satisfied, or where the CPVO so requests, a description of the variety shall be added to the report.

If a report is negative the Examination Office shall set out the detailed reasons for its findings.

The interim and the final reports shall be delivered to the CPVO as soon as possible and no later than on the deadlines as laid down in the designation agreement.

1.3.2 Informing on problems in the DUS test

In cases where the Examination Office identifies issues during the course of the technical examination that may lead to a negative report, the Examination Office shall inform the CPVO and in urgent cases the applicant/holder as soon as such issues become obvious.

1.3.3 Sample keeping in case of problems

As far as feasible the Examination Office shall keep a representative sample of any relevant testing material of the candidate variety and reference variety(ies) if the technical examination has resulted in a negative report. As soon as possible, the CPVO shall inform the Examination Office when the material can be destroyed.

2. MATERIAL REQUIRED

2.1 Plant material requirements

Information with respect to the agreed closing dates and submission requirements of plant material for the technical examination of varieties can be found on https://public.plantvarieties.eu/publication in the special issue S2/S3 of the Official Gazette of the Office. General requirements on submission of samples are also to be found following the same link.

2.2 Informing the applicant of plant material requirements

The CPVO informs the applicant that:

- he is responsible for ensuring compliance with any customs and plant health requirements;
- the plant material supplied should be visibly healthy, not lacking in vigour, nor affected by any important pest or disease;
- 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.

2.3 Informing about problems on the submission of material

The Examination Office shall report to the CPVO immediately in cases where the test material of the candidate variety has not arrived in time or in cases where the material submitted does not fulfil the conditions laid down in the request for submission of plant material issued by the CPVO.

In cases where the examination office encounters difficulties to obtain plant material of reference varieties the CPVO should be informed in writing.

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.

The testing of a variety may be concluded when the entrusted examination office can determine with certainty the outcome of the test.

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

The two independent growing cycles should be in the form of a single or two separate plantings.

3.1.2 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 or observation of the stolons which ever appears later.

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" http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf.

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

3.4.1 Each test should be designed to result in a total of at least 20 plants.

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 Special tests for additional characteristics

In accordance with Article 23 of Implementing Rules N° 874/2009 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

Special tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characteristics listed in the protocol.

3.6 Constitution and maintenance of a variety collection

The process for the constitution and the maintenance of a variety collection can be summarized as follows:

Step 1: Making an inventory of the varieties of common knowledge.

Step 2: Establishing a collection ("variety collection") of varieties of common knowledge which are relevant for the examination of distinctness of candidate varieties.

Step 3: Selecting the varieties from the variety collection which need to be included in the growing trial or other tests for the examination of distinctness of a particular candidate variety.

3.6.1 Forms of variety collection

The variety collection shall comprise variety descriptions and living plant material, thus a living reference collection. The variety description shall be produced by the EO unless special cooperation exists between EOs and the CPVO. The descriptive and pictorial information produced by the EO shall be held and maintained in a form of a database.

In addition, the variety collection shall comprise images (e.g., photographs, illustrations or digitalized images) of representative parts of the plants of each variety, produced by the respective EO.

3.6.2 Living Plant Material

The EO shall collect and maintain living plant material of varieties of the species concerned in the variety collection.

3.6.3 Range of the variety collection

The living variety collection shall cover at least those common knowledge varieties that are suitable to grow in the climatic conditions of a respective EO.

3.6.4 Making an inventory of varieties of common knowledge for inclusion in the variety collection

The inventory shall include varieties protected under National and Community PBR, varieties of National Catalogues (where such catalogues exist) and varieties in trade or in commercial registers.

The inventory shall take into account the list of varieties which are the subject of an on-going application for protection or official registration (candidate varieties).

In addition to the above, the inventory shall be extended to the appropriate to:

- relevant example varieties referred to in the technical protocols,
- any commercial document in which varieties are marketed as propagating or harvested material, especially when there is no official registration system,
- any list including varieties which are publicly available within plant collections (varieties included in genetic resource collections, collection of old varieties, etc.),
- information provided by relevant plant experts.

3.6.5 Maintenance and renewal/update of a living variety collection

(a) Seed propagated varieties

The EO shall maintain seeds in conditions which will ensure germination and viability, periodical checks, and renewal as required.

Living material in variety collections representing varieties for which a DUS test was carried out at that EO shall be renewed after verification in a side-by-side comparison. In case where no living material is available anymore in the collection, such verification could be done with any other test that has proven to give similar results between the material in the collection and the new material.

(b) Vegetatively propagated varieties

The EO shall maintain the variety collection under appropriate growing conditions (e.g., glasshouse, orchard, in vitro), where it shall be ensured that the plants are adequately irrigated, fertilised, pruned and protected from harmful pests and diseases.

Living material in variety collections representing varieties for which a DUS test was carried out at that EO shall be renewed after verification in a side-by-side comparison. In case where no living material is available anymore in the collection, such verification could be done with any other test that has proven to give similar results between the material in the collection and the new material.

4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY

The prescribed procedure is to assess distinctness, uniformity and stability in a growing trial.

4.1 Distinctness

4.1.1 General recommendations

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 9 'Examining Distinctness' (http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf) prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in this Technical Protocol.

Further guidance is provided in documents TGP/9 "Examining Distinctness" and TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability".

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 Technical Protocols are familiar with the recommendations contained in the UPOV-General Introduction to DUS prior to making decisions regarding distinctness.

4.1.4 Number of plants/parts of plants to be examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 8 plants or parts taken from each of 8 plants and any other 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 third column of the Table of Characteristics (see document TGP/9 "Examining Distinctness", Section 4 "Observation of characteristics"):

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

Type of observation: visual (V) or measurement (M)
"Visual" observation (V) is an observation made on the basis of the expert's judgment. For the purposes of this document, "visual" observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g., diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g., colour 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 this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 10 'Examining Uniformity' (http://www.upov.int/edocs/tgpdocs/en/tgp_10.pdf) prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in this Technical Protocol:

4.2.2 This Technical Protocol has been developed for the examination of vegetatively propagated and seed propagated varieties. For varieties with other types of propagation the recommendations in the UPOV-General Introduction to DUS and document TGP/13 "Guidance for new types and species", Section 4.5 "Testing Uniformity" should be followed.

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

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 UPOV-General Introduction to DUS.

For the assessment of uniformity of vegetatively propagated and self pollinated seed 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 It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 11 'Examining Stability' (http://www.upov.int/edocs/tgpdocs/en/tgp_11.pd)

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 ORGANISATION 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 organise the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

a) Plant: growth habit (characteristic 1)

b) Leaf: size (characteristic 7)

c) Petiole: attitude of hairs (characteristic 17)

d) Flower: diameter (characteristic 19)

e) Flower: size of calyx in relation to corolla (characteristic 21)

f) Petal: colour of upper side (characteristic 25)

g) Fruit: length in relation to width (characteristic 26)

h) Fruit: size (characteristic 27)

i) Fruit: shape (characteristic 28)

j) Fruit: colour (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 If characteristics other than those mentioned in the list of grouping characteristics and/or from the table of characteristics and/or from the Technical Questionnaire – sections 5 and 7 are used for the selection of varieties to be included into the growing trial, the EO shall inform the CPVO and seek the prior consent of the CPVO before using these characteristics.

5.5 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the UPOV-General Introduction to DUS and document TGP/9 "Examining Distinctness".

6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS

6.1 Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in the table of characteristics. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted or by specific legislation on plant health. In the latter case, the CPVO should be informed.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N°874/2009, to insert additional characteristics and their expressions in respect of a variety.

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. All relevant states of expression are presented in the characteristic.

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

6.3 Example Varieties

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

6.4 Legend

For column "CPVO N°":

G	Grouping characteristic	-see Chapter 5
QL	Qualitative characteristic	
QN	Quantitative characteristic	
PQ	Pseudo-qualitative characteristic	
(+)	Explanations for individual characteristics	-see Chapter 8.2

For column "UPOV N°":
The numbering of the characteristics is provided as a reference to the UPOV guideline.

(*)	UPOV Asterisked characteristic	- Characteristics that are important for the international harmonization of variety descriptions.

For column "Stage, method":

MG, MS, VG, VS		-see Chapter 4.1.5
(a)-(d)	Explanations covering several Characteristics	-see Chapter 8.1

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1. (+)	**1. (*)**	**VG**	**Plant: growth habit**		
QN		**(a)**	upright	Vibrant	1
			upright to semi-upright	Korona	2
			semi-upright	Senga Sengana	3
			semi-upright to spreading	Weiße Ananas	4
G			spreading	Lucida Perfecta	5
2. (+)	**2.**	**VG**	**Plant: density of foliage**		
QN		**(a)**	very sparse		1
			sparse	Elista, Pantagruella	2
			medium	Everest, Florin, Gorella	3
			dense	Sans Rivale, Yamaska	4
			very dense	Alexandria	5
3. (+)	**3.**	**VG**	**Plant: vigour**		
QN		**(a)**	very weak		1
			very weak to weak		2
			weak	Serenata, Temptation	3
			weak to medium	CIVRI 30, Drisstrawfive	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	Schwarze Hubertus	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
4.	**4. (*)**	**VG**	**Plant: position of inflorescence in relation to foliage**		
QN		**(b)**	strongly below	Lucia	1
			slightly below	Senga Sengana	2
			same level	Korona	3
			slightly above	Daroyal	4
			strongly above	Vibrant	5
5.	**5.**	**VG**	**Plant: number of stolons**		
QN		**(c)**	absent or very few	Alexandria, Rügen	1
			very few to few	Everest, Loran	2
			few	Bolero, Sonata	3
			few to medium	Malling Sunrise, Marionnet 97	4
			medium	Altess, Amandine, NF 633, Vivaldi	5
			medium to many	Ranaissance, Starlette	6
			many	Roseta	7
			many to very many	Mieze Nova	8
			very many	BBB PO 01	9
6. (+)	**6.**	**VG**	**Stolon: intensity of anthocyanin coloration**		
QN		**(c)**	absent or very weak	Weitgasserii l Nivális	1
			weak	Alice, BBB PO 01, Florence, Salsa	2
			medium	Albion, Charlotte, Darselect	3
			strong	Candiss, Wendy	4
			very strong		5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
7. (+)	**7. (*)**	**MG/VG**	**Leaf: size**		
QN		**(a)**	very small		1
			very small to small		2
			small	Fontaine	3
			small to medium	Sans Rivale, Toscana	4
			medium	Gorella, Korona, Senga Sengana	5
			medium to large	Elsanta, Honeoye, Salsa	6
			large	Aprica, Darselect	7
			large to very large	Merkur, Ramir	8
G			very large		9
8.	**8.**	**VG**	**Leaf: colour of upper side**		
PQ		**(a)**	yellow green		1
			light green	Junita	2
			medium green	Dream, Malling Centenary	3
			dark green	Marionnet 99, Mieze Schindler	4
			blue green	Mount Everest	5
9. (+)	**9. (*)**	**VG**	**Leaf: rugosity**		
QN		**(a)**	absent or very weak	Anablanca, Florence, Yamaska	1
			weak	Clery	2
			medium	Cigaline, Everest	3
			strong	Cijosée	4
			very strong	Bogota, Romina, Symphony	5
10. (+)	**10. (*)**	**VG**	**Leaf: glossiness**		
QN		**(a)**	absent or weak	Bogota, White Dream	1
			medium	Irvine, Kamila, Marionnet 86	2
			strong	Aromella, Florence, Sweet Delight, Verity, Vivara	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
11.	**11. (*)**	**MG/VG**	**Terminal leaflet: length in relation to width**		
QN		**(a)**	shorter than broad		1
			as short as broad	Cirano, Everest, Salsa	2
			slightly longer than broad	Elsanta, Korona, Symphony	3
			much longer than broad	Anablanca, Cigaline	4
12. (+)	**12.**	**VG**	**Terminal leaflet: shape of base**		
PQ		**(a)**	acute	Gariguette	1
			obtuse	Cirano, Verity	2
			rounded	NF 421	3
13. (+)	**13.**	**VG**	**Terminal leaflet: margin**		
QN		**(a)**	serrate	Chandler, Elsanta, Gariguette, Yamaska	1
			serrate to crenate	Altess, Amandine, Pandora	2
			crenate	Cambridge Favourite, Everest	3
14. (+)	**14.**	**VG**	**Terminal leaflet: depth of incisions of margin**		
QN		**(a)**	very shallow	Weiße Ananas	1
			shallow	Senga Sengana	2
			medium	Symphony	3
			deep	Polka	4
			very deep	Cigaline	5
15. (+)	**15.**	**VG**	**Leaf: profile in cross-section**		
QN		**(a)**	concave	MA 65, Malwina, Verity	1
			straight	Aromella, Cigaline	2
			convex	Cirano	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
16. (+)	**16.**	**MG/VG**	**Petiole: length**		
QN		**(a)**	very short		1
			very short to short	Fontaine	2
			short	Frel, Tristan	3
			short to medium	Floriante	4
			medium	Everest, Favori	5
			medium to long	GH 75	6
			long	Malwina	7
			long to very long	Faith	8
			very long		9
17. (+)	**17. (*)**	**VG**	**Petiole: attitude of hairs**		
QN		**(a)**	adpressed	Elianny, Vivara	1
			upwards	Darselect, Elsanta	2
			outwards	Albion, Filicia, Malwina	3
G			downwards	Cirano	4
18.	**18.**	**VG**	**Stipule: intensity of anthocyanin coloration**		
QN		**(a)**	absent or very weak	Clery, Hansawhit, Lucida Perfecta, Senga Sengana	1
			weak	Camarosa, Darlisette, Korona, Lambada	2
			medium	Anablanca, Cambridge Favourite, Elsanta, Musica	3
			strong	Darselect, Sonata	4
			very strong	Frugodi	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
19.	**19. (*)**	**MG/VG**	**Flower: diameter**		
QN		**(b)**	very small		1
			very small to small	Fontaine	2
			small	Darestivale, Sans Rivale	3
			small to medium	Majestic, Mara des Bois, Senga Sengana, Yamaska	4
			medium	Bogota, Elsanta, Everest, Korona	5
			medium to large	Camarosa, Chandler, Darselect	6
			large	Cambridge Favourite, Ines	7
			large to very large		8
G			very large	SG 0203	9
20. (+)	**20. (*)**	**VG**	**Flower: arrangement of petals**		
QN		**(b)**	free	Gariguette, Lia	1
			touching	Cijosée, Wendy	2
			overlapping	Gladis, Malling Centenary, Marionnet 86	3
21. (+)	**21. (*)**	**VG**	**Flower: size of calyx in relation to corolla**		
QN		**(b)**	smaller	Jussara, Toscana	1
			same size	Filicia, Gladis	2
G			larger	Camarosa, Candiss, Everest	3
22.	**22. (*)**	**VG**	**Flower: stamen**		
QL		**(b)**	absent	Pandora, Yamaska	1
			present	Gariguette	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
23. (+)	**23.**	**VG**	**Petal: shape**		
PQ		**(b)**	elliptic	Gariguette	1
			circular	Daroyal, Darselect, Weiße Ananas	2
			transverse elliptic	Ines, Portola	3
			ovate	BBB PO 01, Elsanta	4
24.	**24.**	**MG/VG**	**Petal: ratio length/width**		
QN		**(b)**	low	Ines, Verity	1
			medium	CIR 104, Darselect, Honeoye, Majestic, Osiris	2
			high	Anablanca, BBB PO 01, Ciflorette, Gariguette, Gustine	3
25.	**25. (*)**	**VG**	**Petal: colour of upper side**		
PQ		**(b)**	greenish white		1
			white	Gariguette	2
			light pink	Marajox, Pikan	3
			medium pink	Frel	4
			dark pink	Tarpan	5
G			red		6
26.	**26. (*)**	**MG/VG**	**Fruit: length in relation to width**		
QN		**(d)**	very short	Mieze Schindler	1
			short	Lia, Sussette	2
			medium	Gorella, Honeoye	3
			long	Malling Centenary, Osiris	4
G			very long	Pantagruella	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
27. (+)	**27. (*)**	**MG/VG**	**Fruit: size**		
QN		**(d)**	very small	Rosa Perle, Ulrichsburg	1
			very small to small	Fontaine	2
			small	Linne, Summer Breeze Snow	3
			small to medium	Toscana, Weiße Ananas	4
			medium	BBB PO 01, Sans Rivale	5
			medium to large	Finesse, MA 65	6
			large	Altess, Lia	7
			large to very large	Albion, Verity	8
G			very large		9
28. (+)	**28. (*)**	**VG**	**Fruit: shape**		
PQ		**(d)**	reniform	Jumbo	1
			conic	Albion, Clery, Everest, Matis, Murano, Sweet Charlie	2
			cordate	Malling Champion	3
			ovate	Quarantaine de Prin	4
			oblong		5
			rhombic	Lumotar	6
			oblate	BBB PO 01	7
			circular	Florika	8
G			wedged	Konia	9
29. (+)	**29.**	**VG**	**Fruit: position of maximum width**		
QN		**(d)**	strongly towards calyx	Symphony	1
			moderately towards calyx	Senga Sengana	2
			at middle	Florika, Weiße Ananas	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
30. (+)	**30.**	**VG**	**Fruit: shape of apex**		
PQ		**(d)**	acute		1
			rounded	Korona, Weiße Ananas	2
			retuse	Zanta	3
			notched	Camarosa	4
			truncate		5
31. (+)	**31.**	**VG**	**Fruit: shape of calyx end**		
PQ		**(d)**	obtuse	NF 421	1
			rounded	Florence	2
			flattened	Malwina, Symphony	3
			retuse	Elegance	4
32. (+)	**32. (*)**	**VG**	**Fruit: colour**		
PQ		**(d)**	pinkish white	Weiße Ananas	1
			yellowish white	Lucida Perfecta	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
G			blackish red	Arista	10

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
33. (+)	**33.**	**VG**	**Fruit: width of band without achenes**		
QN		**(d)**	absent or very narrow	Drisstrawfive, Fontaine	1
			very narrow to narrow	Altess, Amandine, Verity	2
			narrow	Elsanta, Everest, Murano, Pandora	3
			narrow to medium	CIR 107, Honeoye, Ines	4
			medium	Dream, Lorette, Salsa	5
			medium to broad	Romina, Yamaska	6
			broad	Frugodi, Valotar	7
			broad to very broad		8
			very broad		9
34. (+)	**34. (*)**	**VG**	**Fruit: position of achenes**		
QN		**(d)**	strongly below surface	Mieze Schindler	1
			slightly below surface	Albion, Kimberley	2
			level with surface	Malling Centenary, Osiris	3
G			above surface	Alice, Frugodi, Toscana	4
35. (+)	**35.**	**VG**	**Fruit: colour of achenes**		
PQ		**(d)**	greenish	Lucy	1
			yellow	Candiss	2
			red	Weiße Ananas	3
36. (+)	**36.**	**MG/VG**	**Fruit: density of achenes**		
QN		**(d)**	sparse		1
			medium	Elegance, Evita, Red Glory	2
			dense	Lucy, NF 205	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
37. (+)	**37. (*)**	**VG**	**Fruit: position of calyx attachment**		
QN		**(d)**	inserted	Finesse	1
			level with fruit	Lia, Murano, Senga Sengana, Sweet Charlie	2
G			raised	Ciflorette, Gariguette, NF 421	3
38. (+)	**38. (*)**	**VG**	**Fruit: attitude of sepals**		
QN		**(d)**	upwards	Gariguette	1
			outwards	Altess, Lia, Osiris	2
G			downwards	Pink Extara	3
39. (+)	**39. (*)**	**VG**	**Fruit: diameter of calyx in relation to diameter of fruit**		
QN		**(d)**	much smaller	Momoirohoppe 8 Go	1
			slightly smaller	Lia, Tecla, Vivaldi	2
			same size	Avarosa, Candiss, Cirano, Cupid, Daroyal	3
			slightly larger	Gladis, Murano	4
G			much larger	ASF 2021, FD 1604	5
40. (+)	**40.**	**VG**	**Fruit: colour of flesh**		
PQ		**(d)**	whitish	Anablanca, BBB PO 01, Fontaine	1
			light pink	Jukhyang	2
			orange red	Elegance	3
			light red	Majestic	4
			medium red	Aprica, Malling Sunrise, NF 421	5
			dark red	Cijosée, Daroyal	6

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
41. (+)	**41.**	**VG**	**Fruit: colour of core**		
PQ		**(d)**	white	BBB PO 01, Pink Extara	1
			light red	Elegance, Figaro, Toscana	2
			medium red	Avarosa, Gladis, Murano	3
			dark red	Malwina	4
42. (+)	**42. (*)**	**MG**	**Time of beginning of flowering**		
QN			very early	Lorette	1
			very early to early	Avarosa, Murano, Starlette	2
			early	Anabelle, Camarillo, Charlotte	3
			early to medium	Evie 3, Sweet Eve	4
			medium	Gorella, Hansawhit, Osiris, Velvet	5
			medium to late	Avamaria, Driscoll Jubilee	6
			late	Laetitia, Rina	7
			late to very late	Filicia, Finesse, Florin, Sussette	8
G			very late	Judibell, Malwina	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
43. (+)	**43. (*)**	**MG**	**Time of beginning of fruit ripening**		
QN			very early	Flair, Lorette, Sweet Charlie	1
			very early to early	Avarosa, Honeoye, Julyana, Murano	2
			early	Altess, CIR 104, Deluxe, Drisstrawfive, Floriante, Verity	3
			early to medium	Cirafine, Evita, Gorella, Janiss, Pink Extara, Senga Sengana	4
			medium	Cijosée, Cupid, Gladis, Malling Opal, Velvet	5
			medium to late	Bolero, Faith, Laetitia, Marionnet 100	6
			late	Flamenco, Yamaska	7
			late to very late	Finesse, Seascape, Sophie, Sussette	8
G			very late	GH 75, Judibell, Malwina	9
44.	**44. (*)**	**VG**	**Flowering runners**		
QL			absent	Elsanta	1
G			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 third column of the Table of Characteristics should be examined as indicated below:

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

b) Observations should be made in full flower. 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 should be made for all types of varieties at the end of bearing of the non-remontant varieties.

d) Observations should be made at picking ripeness, excluding the terminal fruits of the inflorescences.

8.2 Explanations for individual characteristics

Ad. 1: Plant: growth habit

1
upright

3
semi-upright

5
spreading

Ad. 2: Plant: density of foliage

1
very sparse

3
medium

5
very dense

Ad. 3: Plant: vigour

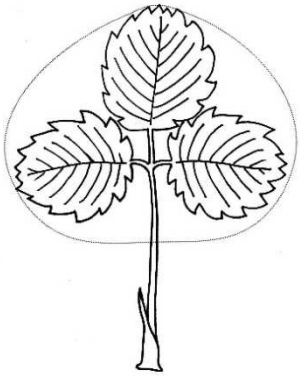
The plant vigour should be considered as the overall abundance of vegetative growth. In particular it is related to height and diameter of the plant.

Ad. 6: Stolon: intensity of anthocyanin coloration

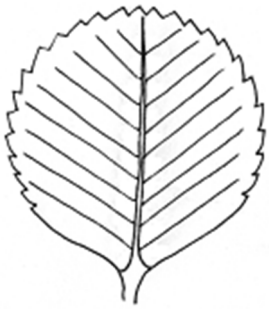
Observations should be made on the middle third of the stolons.

Ad. 7: Leaf: size

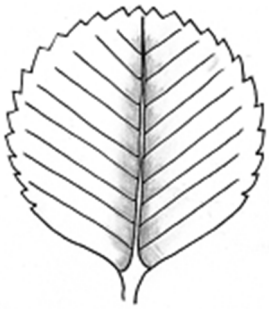
Observations should be made excluding the petiole and stipules.



Ad. 9: Leaf: rugosity



1
absent or very weak



2
weak

3
medium

4
strong

5
very strong

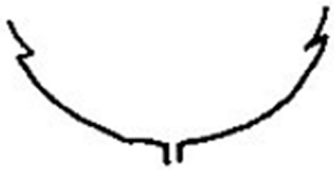
Ad. 10: Leaf: glossiness

Observations should be made on the upper side of the leaf.

Ad. 12: Terminal leaflet: shape of base

1
acute

2
obtuse



3
rounded

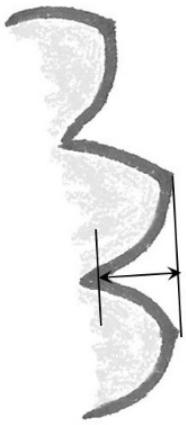
Ad. 13: Terminal leaflet: margin

1
serrate

2
serrate to crenate

3
crenate

Ad. 14: Terminal leaflet: depth of incisions of margin



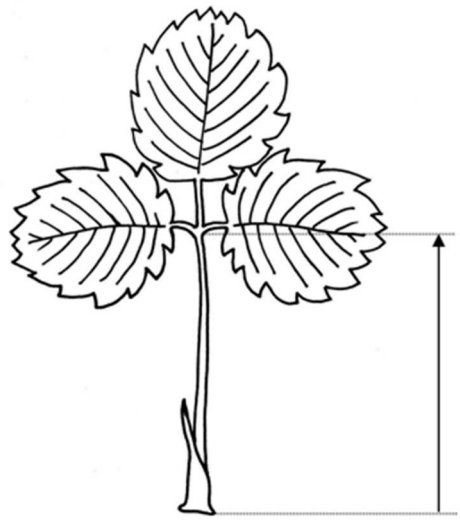
Ad. 15: Terminal leaflet: profile in cross-section

1
concave

2
straight

3
convex

Ad. 16: Petiole: length



Ad. 17: Petiole: attitude of hairs

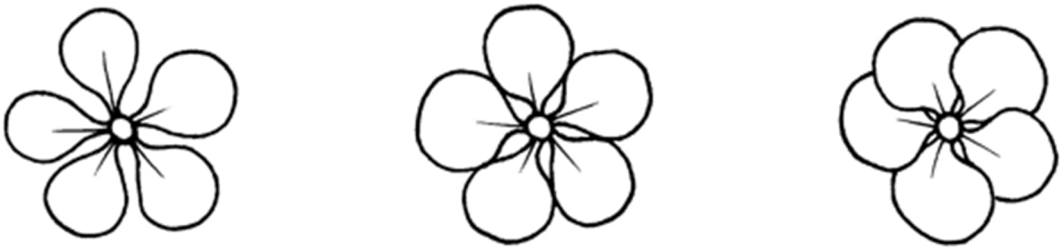
1
adpressed

2
upwards

3
outwards

4
downwards

Ad. 20: Flower: arrangement of petals



1
free

2
touching

3
overlapping

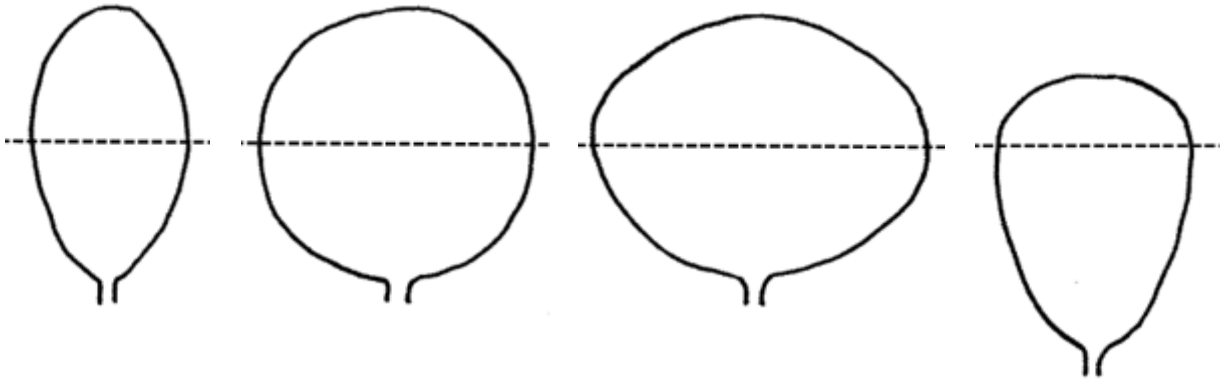
Ad. 21: Flower: size of calyx in relation to corolla

1
smaller

2
same size

3
larger

Ad. 23: Petal: shape



1
elliptic

2
circular

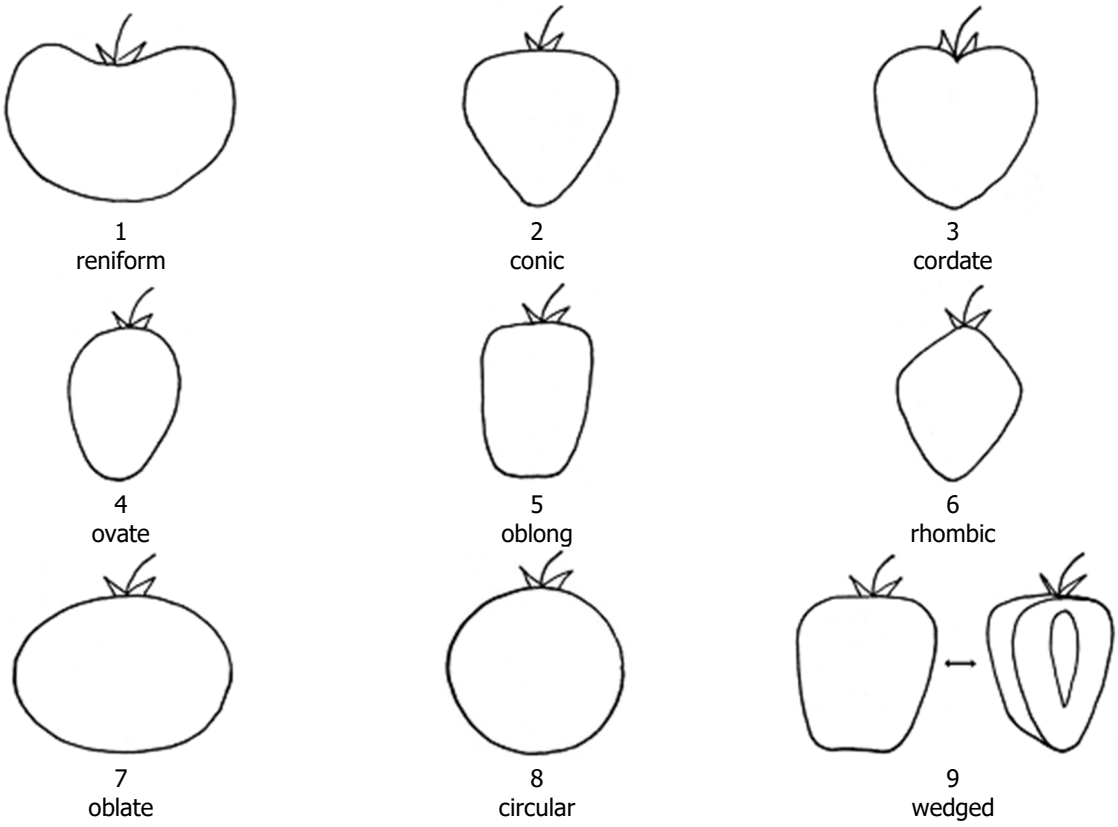
3
transverse elliptic

4
ovate

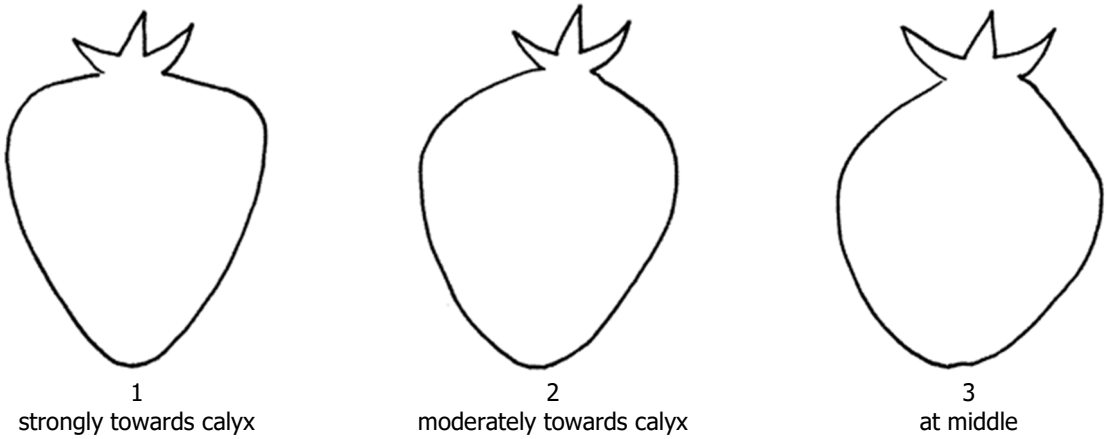
Ad. 27: Fruit: size

Observations should be made visually, or by assessing the fruit weight.

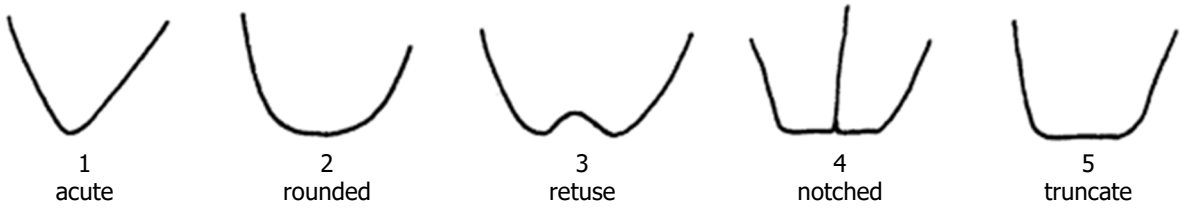
Ad. 28: Fruit: shape



Ad. 29: Fruit: position of maximum width



Ad. 30: Fruit: shape of apex



Ad. 31: Fruit: shape at calyx end

1
obtuse

2
rounded

3
flattened

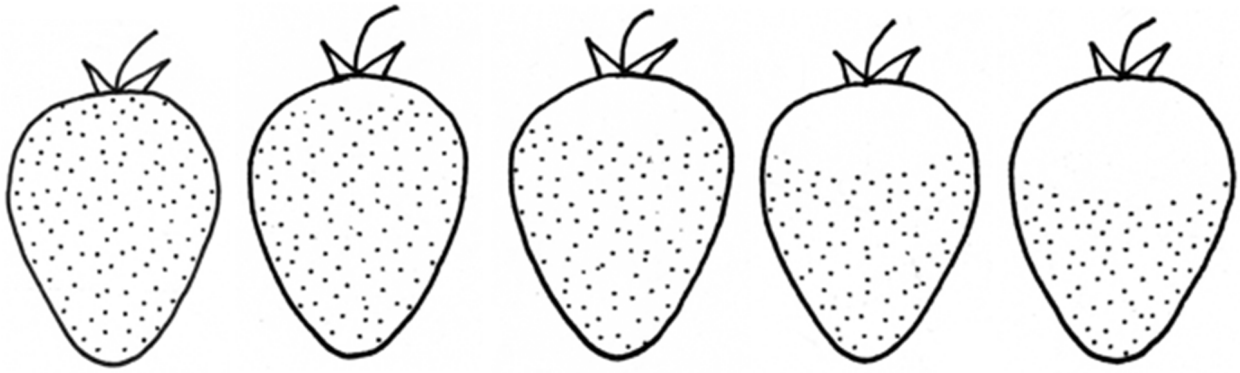
4
retuse

Observations should be made excluding the neck.

Ad. 32: Fruit: colour

Observations should be made on the side of the fruit which is exposed to the sun.

Ad. 33: Fruit: width of band without achenes



1
absent or very narrow

3
narrow

5
medium

7
broad

9
very broad

Ad. 34: Fruit: position of achenes

Observations should be made on the central part of fruit surface.

1
strongly below surface

2
slightly below surface

3
level with surface

4
above surface

Ad. 35: Fruit: colour of achenes

Observations should be made on the side of the fruit which is exposed to the sun.

Ad. 36: Fruit: density of achenes

Observations should be made on the central part of the fruit by counting in a defined area (e.g. a 1 cm square) or by visual assessment.

Ad. 37: Fruit: position of calyx attachment

1
inserted

2
level with fruit

3
raised

Ad. 38: Fruit: attitude of sepals

1
upwards

2
outwards

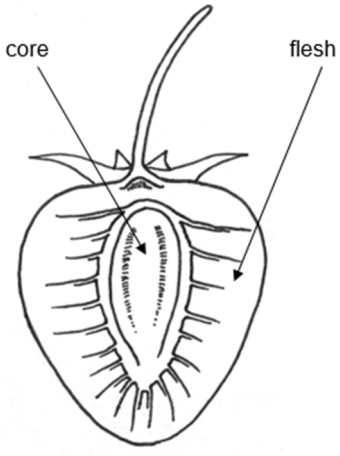
3
downwards

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

Observations should be made with the sepals held flat.

Ad. 40: Fruit: colour of flesh

Observations should be made excluding the core.



Ad. 41: Fruit: colour of core

See the drawing at Ad.40.

Ad. 42: Time of beginning of flowering

The time of beginning of flowering is reached when 50% of plants have at least one open flower.

Ad. 43: Time of beginning of fruit ripening

The time of beginning of fruit ripening is reached when 50% of plants have at least one fully coloured 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 Miniére, FR

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

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO/TQ-022/4 – *Fragaria* L. - strawberry