



PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

***Prunus salicina* Lindl.**

JAPANESE PLUM

UPOV Code: PRUNU_SAL

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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 *Prunus salicina* Lindl..

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/84/4 Corr. 2 dated 05/04/2017 (<http://www.upov.int/edocs/tgdocs/en/tg084.pdf>) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **01.01.2017**. 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 test period.

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 two weeks after the date of the request for technical examination by the CPVO.

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

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior permanent agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

1.3.3 Sample keeping in case of problems

If the technical examination has resulted in a negative report, the CPVO shall inform the Examination Office as soon as possible in case that a representative sample of any relevant testing material shall be kept.

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 <http://cpvo.europa.eu/applications-and-examinations/technical-examinations/submission-of-plant-material-s2-publication> in the special issue S2 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 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.

3. METHOD OF EXAMINATION

3.1 Number of growing cycles

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

In particular, it is essential that the trees produce a satisfactory crop of fruit in each of the two 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" 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 5 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 Additional tests

In accordance with Article 83(3) of Council Regulation No. 2100/94 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, an additional test may be undertaken providing that a technically acceptable test procedure can be devised.

Additional tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characters 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.

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 varieties that are suitable to 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 for fruit species) and varieties in trade or in commercial registers. In addition to the above, the inventory shall be extended to the appropriate to

- 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;
- relevant example varieties referred to in the technical protocols for the examination of distinctness.

3.6.5 Maintenance and renewal/update of a living variety collection

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. For the renewal of existing living material the identity of replacement living plant material shall be verified by conducting side-by-side plot comparisons between the material in the collection and the new material or by checking the identity of the new material against the variety description.

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.

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 5 plants or parts taken from each of 5 plants and any other observations made on all plants in the test, disregarding any off-type plants. In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 2.

4.1.5 Method of observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the 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**

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 5 plants, no off-type is allowed.

4.3 **Stability**

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

4.3.2 Where appropriate, or in cases of doubt, stability may be further examined by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. **GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL**

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

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

5.3 The following have been agreed as useful grouping characteristics.

- a) Fruit: size (characteristic 29)
- b) Fruit: ground colour of skin (characteristic 40)
- c) Fruit: over colour of skin (characteristic 42)
- d) Fruit: colour of flesh (characteristic 46)
- e) Time of beginning of flowering (characteristic 60)
- f) Time of beginning of fruit ripening (characteristic 61)

5.4 If other characteristics than those from the TP 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.

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.

States of expression and corresponding notes

In the case of qualitative and pseudo-qualitative characteristics, all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2 Example Varieties

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

6.3 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 ad hoc UPOV guideline.

(*)	UPOV Asterisked characteristic	- Characteristics that are important for the international harmonization of variety descriptions.
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For column 'Stage, method':

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

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1. PQ	1.	VG	Tree: type of bearing		
			on spurs only	Gaviota	1
			on spurs and long shoots	Angeleno, Shiro	2
			on long shoots only		3
2. (+) QN	2.	VG	Tree: vigour		
			weak	Black Gold, Satsuma	3
			medium	Autumn Giant, Black Diamond	5
			strong	Robusto, Royal Diamond, Taiyou	7
3. PQ	3. (*)	VG	Tree: habit		
			upright	Formosa, Freedom, Taiyou	1
			semi-upright	Laroda	2
			spreading	Ozark Premier, Shiro	3
			drooping	Weeping Santa Rosa	4
4. (+) PQ	4.	VG	One-year-old shoot: colour		
			greyish brown	Taiyou	1
			yellow brown	Sordum	2
			brown	Methley	3
			reddish brown	Comination	4
5. QN	5.	VG	Spur: length		
			short	Laroda, Sordum	3
			medium	Frontier	5
			long	October Purple	7
6. (+) QN	6.	VG (a)	Vegetative bud: size		
			small	Harry Pickstone	1
			medium	Black Gold, Great Yellow	2
			large		3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
7.	7.	VG	Vegetative bud: shape of apex		
(+)		(a)	acute	Eldorado	1
PQ			obtuse	Songold	2
			rounded	Satsuma	3
8.	8.	VG	One-year-old shoot: position of vegetative bud in relation to shoot		
(+)		(a)	adpressed	Queen Ann	1
QN			slightly held out	Satsuma	2
			markedly held out	Songold	3
9.	9.	MS/VG	Leaf blade: length		
	(*)	(a)	short	Honey Rosa	3
QN			medium	Taiyou	5
			long	Ozark Premier, Sordum	7
10.	10.	MS/VG	Leaf blade: width		
	(*)	(a)	narrow	Beauty	3
QN			medium	Black Diamond, Sordum	5
			broad	Combination	7
11.	11.	MS/VG	Leaf blade: length/width ratio		
	(*)	(a)	slightly elongated	Casselman	1
QN			moderately elongated	Pioneer	2
			very elongated	Eclipse	3
12.	12.	VG	Leaf blade: shape		
(+)	(*)	(a)	ovate		1
QN			elliptic	Black Gold, October Purple, Syokou, Taiyou	2
			obovate	Kanro, Kelsey	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
13. PQ	13. (*)	VG (a)	Leaf blade: colour of upper side		
			light green	Flaming Delicious, Taiyou	1
			medium green	Abundance, Laroda	2
			dark green	Gaviota, Shiro	3
			reddish green	Hollywood	4
14. QN	14. (*)	VG (a)	Leaf blade: angle of apex (excluding tip)		
			acute	Ozark Premier, Taiyou	1
			right angled	Satsuma	2
			obtuse	Methley	3
15. QN	15.	VG (a)	Leaf: glossiness of upper side		
			weak	Ozark Premier, Taiyou	1
			medium	Frontier, Shiro	2
			strong	Nubiana	3
16. QN	16.	VG (a)	Leaf blade: density of pubescence of lower side		
			sparse	Angeleno, Redheart, Taiyou	1
			medium	Queen Ann, Shiro	2
			dense	Obilnaja	3
17. PQ	17. (*)	VG (a)	Leaf blade: incisions of margin		
			crenate	Gaviota, Harry Pickstone	1
			bi-crenate	Golden Kiss, Pioneer	2
			serrate	Dapple Dandy	3
			bi-serrate		4
18. QN	18. (*)	MS/VG (a)	Petiole: length		
			short	Kelsey	3
			medium	Frontier	5
			long	Combination	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
19.	19.	VG	Leaf: position of nectaries		
QN		(a)	predominantly on base of leaf blade	Methley	1
			equally on base of leaf blade and on petiole	Nubiana	2
			predominantly on petiole	Queen Ann	3
20.	20.	MS/VG	Pedicle: length		
(+)	(*)	(b)	short	Methley	3
QN			medium	Queen Ann, Shiro	5
			long	Red Ace, Taiyou	7
21.	21.	MS/VG	Flower: diameter		
QN		(b)	small	Black Gold, Nubiana	3
			medium	October Purple, Shiro, Taiyou	5
			large	Kiyou, Methley, Ozark Premier	7
22.	22.	VG	Flowers: arrangement of petals		
(+)		(b)	free	Laroda	1
QN			touching	Harry Pickstone, Shiro	2
			overlapping	Beauty	3
23.	23.	VG	Sepal: shape		
(+)	(*)	(b)	triangular	Mariposa	1
PQ			medium ovate	Harry Pickstone	2
			broad ovate	George Wilson	3
			narrow elliptic	Laroda	4
			medium elliptic	Nubiana	5
24.	24.	MS/VG	Petal: length		
	(*)	(b)	short	Laroda, Shigyoku	3
QN			medium	Santa Rosa	5
			long	Burbank	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
25.	25.	VG	Petal: shape		
(+)	(*)	(b)	elliptic	Red Ace, Taiyou	1
PQ			circular	Shiro, Wickson	2
			oblate	Wright's Early	3
			obovate	Mammoth Cardinal	4
26.	26.	VG	Petal: undulation of margin		
QN		(b)	weak	Redheart, Shiro, Taiyou	1
			medium	Queen Ann	2
			strong	Lady Red, Morettini 355, Showtime	3
27.	27.	VG	Stigma: position in relation to anthers		
	(*)	(b)	below	Mariposa	1
QN			same level	Methley	2
			above	Mammoth Cardinal	3
28.	28.	MS	Fruit: length of stalk		
QN			short	Yonemomo	3
			medium	Sordum	5
			long	Hollywood	7
29.	29.	VG	Fruit: size		
(+)	(*)	(c)	very small	Methley	1
QN			small	Allo, Eldorado	3
			medium	Shiro	5
			large	Angelino, Taiyou	7
G			very large	Songold	9
30.	30.	MS	Fruit: height		
(+)	(*)	(c)	short	Eclipse	3
QN			medium	Harry Pickstone	5
			tall	Valentine	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
31.	31.	MS	Fruit: width		
(+)	(*)	(c)	narrow	Amber Jewel	3
QN			medium	Casselman	5
			broad	Simka	7
32.	32.	VG	Fruit: shape in lateral view		
(+)	(*)	(c)	oblong	Reubennel	1
PQ			elliptic	Ozark Premier, Taiyou	2
			circular	Red Beauty, Shiro	3
			oblate	Friar	4
			cordate	Morettini 355	5
			obovate		6
			obcordate	Santa Rosa	7
33.	33.	VG	Fruit: symmetry		
(+)		(c)	symmetric or slightly asymmetric	Laroda, Shiro	1
QN			moderately asymmetric	Friar, Harry Pickstone	2
			strongly asymmetric	Ozark Premier	3
34.	34.	VG	Fruit: shape of base		
(+)	(*)	(c)	pointed	Morettini 355, Taiyou	1
PQ			truncate	Black Gold, Green Sun	2
			depressed	Calita, Durado, Gabora	3
35.	35.	VG	Fruit: shape of apex		
(+)		(c)	pointed	Golden Plumza	1
PQ			rounded	Shiro	2
			truncate	Angeleno	3
			depressed	Friar, Tereda	4

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
36.	36.	MS/VG (*) (c)	Fruit: depth of stalk cavity		
			shallow	Taiyou	1
			medium	Angeleno, Nubiana	2
QN			deep	Black Gold, Laroda	3
37.	37.	MS/VG (*) (c)	Fruit: width of stalk cavity		
			narrow	Koike Sumomo	1
			medium	Beni Ryozen	2
QN			broad	Finroza	3
38.	38.	VG (*) (c)	Fruit: depth of suture		
			absent or very shallow	Sunrise	1
			shallow	Taiyou	2
			medium	Sordum	3
QN			deep	Akihime	4
39.	39.	VG (*) (c)	Fruit: bloom of skin		
			absent or very weak		1
			weak	Red June	3
			medium	Ooishi Nakate	5
			strong	Sordum	7
QN			very strong		9
40.	40.	VG (*) (c)	Fruit: ground colour of skin		
			not visible	Angeleno	1
			green	Gaviota, Santa Rosa	2
			yellowish green	Songold, Taiyou	3
G			yellow	Shiro	4

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
41.	41.	VG	Fruit: relative area of over colour		
(+)	(*)	(c)	absent or very small	Green Sun, Shiro	1
QN			small	Bragialla	3
			medium	Fortune	5
			large	Taiyou	7
			very large or whole surface	Black Diamond, Friar	9
42.	42.	VG	Fruit: over colour of skin		
(+)	(*)	(c)	none	Golden Japan	1
PQ			orange yellow	Formosa	2
			medium red	Red Beauty	3
			dark red	Starking Delicious, Taiyou	4
			purple	Karari, Morettini 355	5
			dark blue	Laroda	6
G			black	Angeleno	7
43.	43.	VG	Fruit: pattern of over colour		
(+)	(*)	(c)	flecks only	Tiger	1
PQ			mottled	Omega	2
			solid flush only	Friar, Taiyou	3
44.	44.	VG	Fruit: number of lenticels		
	(*)	(c)	few	ARC PR 3	3
QN			medium	Sunrise	5
			many	Polar Eclipse	7
45.	45.	VG	Fruit: size of lenticels		
	(*)	(c)	small	Sunset	1
QN			medium	Extreme	2
			large	Southern Belle	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
46.	46.	VG	Fruit: colour of flesh		
	(*)	(c)	whitish	Taiyou	1
PQ			green	Reina Claudia	2
			yellowish green	Shiro	3
			yellow	Angeleno, Golden Japan, Reubennel	4
			orange	Black Amber, Sun Gold	5
			medium red	Satsuma, Sordum	6
			dark red	Beauty, Hawera, Karari, Stark Delicious	7
G			purplish	Sangue di Drago	8
47.	47.	MS	Fruit: firmness		
(+)		(c)	soft	Shiro	3
QN			medium	Frontier	5
			firm	Laroda, Taiyou	7
48.	48.	MS	Fruit: juiciness		
(+)		(c)	low	Autumn Giant, Laroda	1
QN			medium	Gaviota, Ozark Premier	2
			high	Reubennel, Shiro, Santa Rosa	3
49.	49.	MS	Fruit: acidity		
(+)		(c)	low	Angeleno, Durado	1
QN			medium	Green Sun, Shiro, Taiyou	2
			high	Carmen, Obilnaja	3
50.	50.	MG	Fruit: sweetness		
(+)		(c)	low	Durado, Obilnaja, Shiro	1
QN			medium	Angeleno	2
			high	Black Gold, Laroda, Taiyou	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
51. QN	51. (*)	VG (c)	Fruit: adherence of stone to flesh		
			non-adherent	Fortune	1
			semi-adherent	Nubiana, Taiyou	2
			adherent	Shiro, Songold	3
52. QN	52. (+)	VG	Fruit: amount of fibre		
			low		1
			medium		2
			high		3
53. QN	53. (*)	VG (c)	Stone: size		
			small	Angeleno, Eldorado	3
			medium	Taiyou, Wickson	5
			large	Freedom	7
54. PQ	54. (+) (*)	VG (c)	Stone: shape in lateral view		
			narrow elliptic	Eldorado	1
			medium elliptic	Santa Rosa, Taiyou	2
			circular	Angeleno, Kelsey	3
			broad ovate		4
55. PQ	55. (+) (*)	VG (c)	Stone: shape in ventral view		
			narrow elliptic	Kelsey	1
			medium elliptic	Santa Rosa, Taiyou	2
			broad elliptic	Eldorado	3
56. PQ	56. (*)	VG (c)	Stone: shape in basal view		
			narrow elliptic	Shiro, Songold	1
			medium elliptic	Bragialla	2
			broad elliptic	Black Gold, Frontier	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
57. QN	57. (*)	VG (c)	Stone: symmetry in lateral view		
			symmetric or slightly asymmetric	Angeleno, Frontier	1
			moderately asymmetric	Shiro	2
			strongly asymmetric		3
58. PQ	58.	VG (c)	Stone: texture of lateral surfaces		
			fine grained	Eldorado	1
			granular	Nubiana	2
			rough	Laroda, Songold	3
			hammered	Harry Pickstone	4
59. (+) QN	59.	VG (c)	Stone: width at stalk-end		
			narrow	Frontier	1
			medium	Harry Pickstone	2
			broad	Angeleno, Lady Red	3
60. (+) QN G	60.	MG (c)	Time of beginning of flowering		
			very early	Durado, Karari, Red Beauty	1
			early	Fortune, Mariposa, Taiyou	3
			medium	Green Sun, Nubiana	5
			late	Gaviota, Shiro	7
			very late	Angeleno, Simka	9
61. (+) QN G	61.	MG (c)	Time of beginning of fruit ripening		
			very early	Beauty, Durado, Red Noble	1
			early	Mariposa, Shiro	3
			medium	Black Gold, Gaviota	5
			late	Angeleno, Nubiana, Taiyou	7
			very late	Akihime, Autumn Giant, Golden King	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:

- All observations on the bud, the leaf and the shoot should be made at the central third of the shoot. The observations on the leaf should be made on mature leaves from current season's shoots.
- All observations on the flower should be made at the time of full flowering.
- All observations on the fruit should be made at full maturity for consumption.

8.2 Explanations for individual characteristics

Ad. 2: Tree: vigour

The vigour of the tree is observed as the overall abundance of vegetative growth.

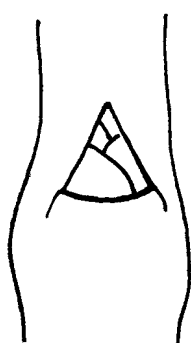
Ad. 4: One-year-old shoot: colour

To be observed on the sunny side after removal of cuticle.

Ad. 6: Vegetative bud: size

To be observed on one-year-old shoots before the opening up of the bud.

Ad. 7: Vegetative bud: shape of apex



1
acute



2
obtuse



3
rounded

Ad. 8: One-year-old shoot: position of vegetative bud in relation to shoot



1
addressed



2
slightly held out



3
markedly held out

Ad. 12: Leaf blade: shape



1
ovate

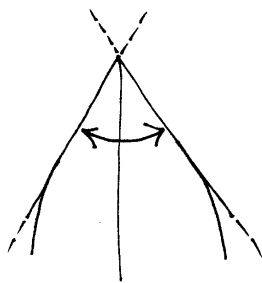


2
elliptic

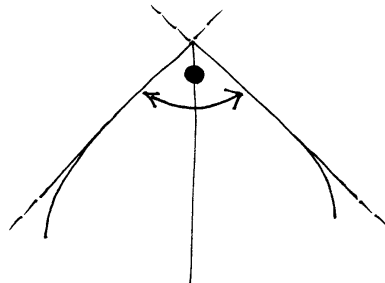


3
obovate

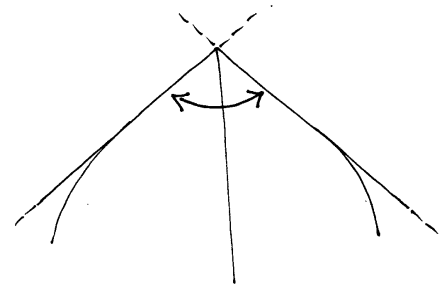
Ad. 14: Leaf blade: angle of apex (excluding tip)



1
acute



2
right angled



3
obtuse

Ad. 17: Leaf blade: incisions of margin



1
crenate



2
bi-crenate



3
serrate



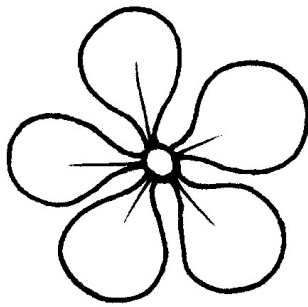
4
bi-serrate

Ad. 20: Pedicel: length

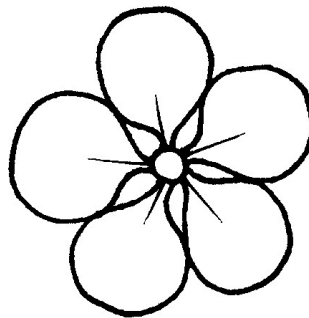


Ad. 22: Flower: arrangement of petals

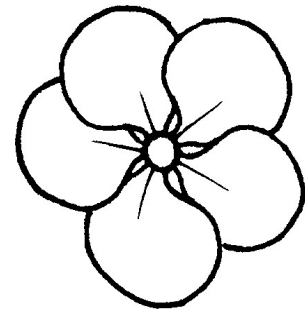
To be observed solely on flowers which have five petals.



1
free

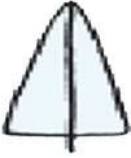
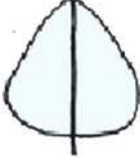

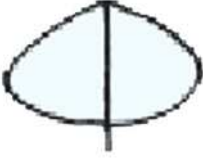
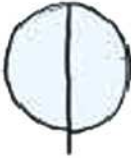


2
touching



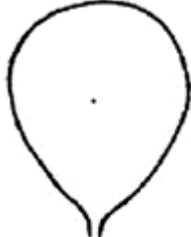



3
overlapping

Ad. 23: Sepal: shape

		← broadest part →		
		(below middle)	at middle	(above middle)
broad (compressed) ← width (ratio length/width) → narrow (elongated)				
	(angular) 1 triangular	(rounded) 2 medium ovate	4 narrow elliptic	
				
	3 broad ovate	5 medium elliptic		

Ad. 25: Petal: shape

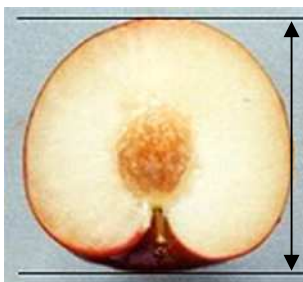
		← broadest part →		
		at middle	(above middle)	
broad (compressed) ← width (ratio length/width) → narrow (elongated)	 1 elliptic			
	 2 circular	 4 obovate		
	 3 oblate			

Ad. 29: Fruit: size

To be observed on the area of the lateral section of the fruit.

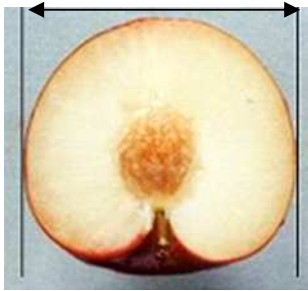
Ad. 30: Fruit: height

Height to be observed from ventral view.



Ad. 31: Fruit: width

Width to be observed from ventral view.



Ad. 32: Fruit: shape in lateral view

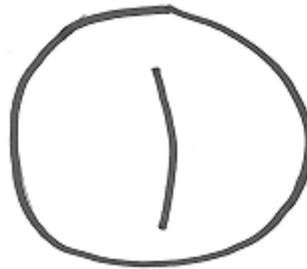
		← broadest part →				
		(below middle)	at middle	(above middle)		
broad (compressed) ← width (ratio length/width) → narrow (elongated)	 5 cordate	 2 elliptic				
		 1 oblong	 3 circular	 7 obcordate	 6 obovate	
	 4 oblate					

Ad. 33: Fruit: symmetry

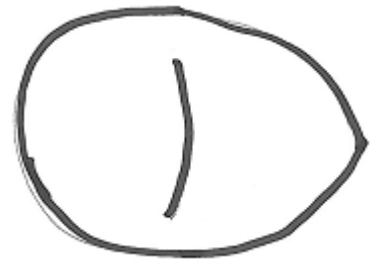
Symmetry to be observed from ventral view, along suture.



1
symmetric or slightly asymmetric



2
moderately asymmetric



3
strongly asymmetric

Ad. 34: Fruit: shape of base



1
pointed



2
truncate



3
depressed

Ad. 35: Fruit: shape of apex



1
pointed



2
rounded



3
truncate



4
depressed

Ad. 37: Fruit: width of stalk cavity



1
narrow



2
medium

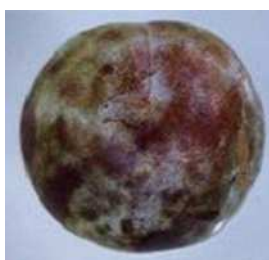


3
broad

Ad. 38: Fruit: depth of suture



2



3



4

Ad. 39: Fruit: bloom of skin

The bloom is the waxy layer that can be removed by rubbing.



3
weak



5
medium



7
strong

Ad. 40: Fruit: ground colour of skin

Ad. 41: Fruit: relative area of over colour

Ad. 42: Fruit: over colour of skin

To be observed without the bloom. The ground colour is the first colour to appear chronologically during the development of the skin and upon which other colours will develop in time in the form of spots, a macule, or a colour flush or blush. It is not always necessarily the largest area of the fruit. The over colour is the second colour developing over time over the ground colour. The coloration does not necessarily cover the smallest area of the fruit and consists of a pattern such as a flush or flecking.

Ad. 43: Fruit: pattern of over colour

The over colour is the second colour developing over time over the ground colour. The coloration does not necessarily cover the smallest area of the fruit and consists of a pattern such as a flush or flecking.

Ad. 47: Fruit: firmness

To be observed at eating ripeness with a penetrometer (see Ad. 61).

Ad. 48: Fruit: juiciness

The characteristic is observed as the juice content expressed as the percentage of total fruit weight obtained by pressing fruit.

Ad. 49: Fruit: acidity

Calculation of total titratable acidity of a juice sample. The equation is the following:

$$Ac (g/l) = (V1 * N * me) / V$$

V = sample volume in ml

V1 = NaOH volume in ml

N = normality of NaOH

me = equivalent weight of malic acid (67)

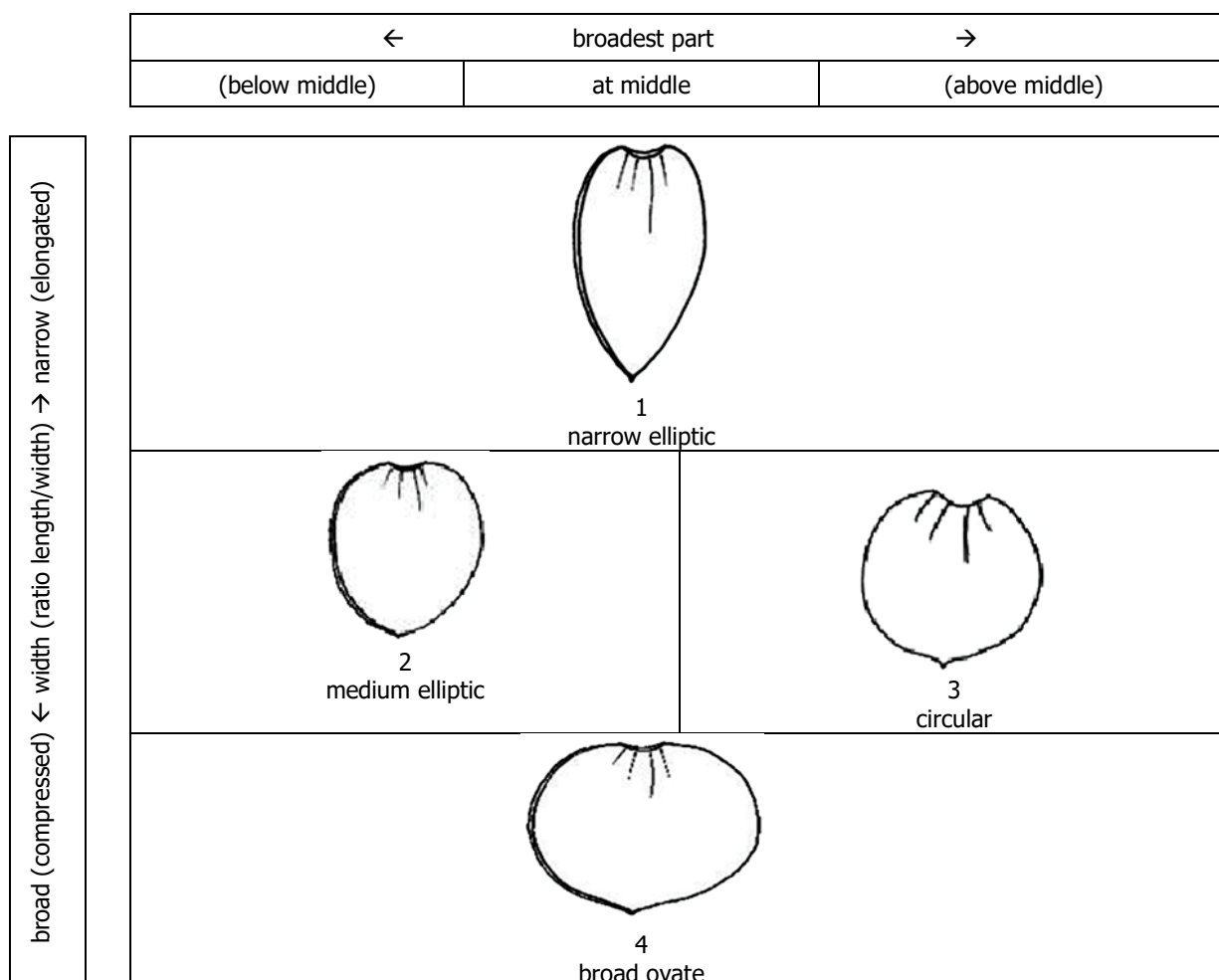
Ad. 50: Fruit: sweetness

Calculation of total soluble solids measured using a refractometer. The measured unit is the degree Brix (° Brix). One degree Brix corresponds to 1 gram of sucrose in 100 grams of solution.

Ad. 52: Fruit: amount of fibre

To be observed at eating ripeness. The fruit should be cut in half longitudinally and a visual observation made to see if there are visible fibres in the flesh. The sliced fruit should then be eaten to assess further the amount of fibre.

Ad. 54: Stone: shape in lateral view



Ad. 55: Stone: shape in ventral view



1
narrow elliptic



2
medium elliptic



3
broad elliptic

Ad. 59: Stone: width of stalk-end



1
narrow



2
medium



3
broad

Ad. 60: Time of beginning of flowering

The time of beginning of flowering is when all trees have 10% open flowers.

Ad. 61: Time of beginning of fruit ripening

The time of fruit ripening should be considered as the time of eating ripeness, when the fruit is most easily removed from the tree.

9. LITERATURE

No specific literature.

10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO-TQ/084/3