



PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

***Actinidia* Lindl.**

ACTINIDIA, KIWIFRUIT

UPOV Code: ACTIN

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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 *Actinidia 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/98/7 Rev dated 28.03.2012 + 14.06.2019 (<https://www.upov.int/edocs/tgdocs/en/tg098.pdf>) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on 28.06.2021. Any ongoing DUS examination of candidate varieties for which the first growing cycle for the purpose of observations has started (following the adequate period of establishment) 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 first growing cycle for the purpose of observations following the adequate period of establishment starts.

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 first growing cycle for the purpose of observations following the adequate period of establishment 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.

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

For male varieties the duration of tests should be a single growing cycle for the purpose of observation of characteristics following an adequate number of growing cycles for establishment of plants. For female and hermaphrodite varieties the duration of tests should be two independent growing cycles for the purpose of observation of characteristics following an adequate number of growing cycles for establishment of plants.

At the end of each growing cycle for the purpose of observation of characteristics the competent authority will determine whether or not the following growing cycle is required.

For female and hermaphrodite varieties, 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 may be observed from a single planting, examined in two separate 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.

For female varieties, the examination office should ensure that an appropriate male variety is available for adequate pollination.

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 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.

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 (where such catalogues exist) 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.

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.

Decision standards

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

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 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.

For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 5 plants, no 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.pdf)

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 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:

For male varieties:

- a) Time of beginning of flowering (characteristic 75)

For female and hermaphrodite varieties (fruiting varieties):

- a) Fruit: weight (characteristic 46)
- b) Fruit: shape (characteristic 50)
- c) Fruit: stylar end (characteristic 52)
- d) Fruit: hairiness of skin (characteristic 59)
- e) Fruit: colour of outer pericarp (characteristic 65)
- f) Fruit: colour of locules (characteristic 66)
- g) Time of maturity for harvest (characteristic 76)

5.4 If other characteristics than those from the Technical Protocol 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

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

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. The varieties have particular relevance to *Actinidia arguta*, *A. chinensis*, *A. deliciosa*, *A. melanandra*, *A. kolomikta*, *A. eriantha*, *A. rufa*, *A. polygama* and interspecific hybrids of these species.

Example varieties are separated into two groups:

Group A: all varieties belonging to *A. deliciosa*, *A. chinensis*, *A. kolomikta*, *A. eriantha*, *A. rufa*

Group B: all varieties belonging to *A. arguta*, *A. polygama*, *A. melanandra*, *A. macrosperma*

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)-(h)	Explanations covering several Characteristics	-see Chapter 8.1

(1) The characteristic only applies to varieties in Group A

(2) The characteristic only applies to varieties in Group B

See Chapter 6.3 and explanations on the Table of Characteristics in Chapter 8.1

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note	
1. (+)	1. (*)	VG	Plant: sex			
			QL	female	Hayward (A), Shinzan (B)	1
				male	a-Awaji (B), Matua (A)	2
				hermaphrodite	Jenny (A)	3
2. (+)	2.	VG	Plant: self fruit setting			
			QL	absent		1
			present		9	
3. (+)	3.	VG	Plant: vigour			
			QN	weak		3
				medium	Hayward (A)	5
				strong	Bruce (A)	7
			very strong	Y368 (A)	9	
4.	4. (*)	VG	Young shoot: density of hairs			
			QN	very sparse	HFR18 (A), Hortgem Tahī (B)	1
				sparse	a-Awaji (B), Kuimi (A)	3
				medium	Hayward (A), Shinzan (B)	5
			dense	King (A), Mitsukou (B)	7	
5.	5. (*)	VG	Young shoot: anthocyanin coloration of growing tip			
			QN	absent or very weak	Hort16A (A), Mitsukou (B)	1
				weak	King (A), Shinzan (B)	3
				medium	Kousui (B), Tomua (A)	5
			strong	Houkou (B), Koryoku (A)	7	

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
6. QN	6. (*)	VG (b)	Stem: thickness		
			thin	a-Gassan (B), Sparkler (A)	1
			medium	a-Awaji (B), Hayward (A)	2
			thick	Bruno (A), Shinzan (B)	3
7. PQ	7. (*)	VG (b)	Stem: colour of shoot on sunny side		
			green white		1
			grey brown	King (A), Mitsukou (B)	2
			yellow brown	Sparkler (A), W47 (A)	3
			light brown	a-Hirano (B), Hort16A (A)	4
			red brown	Ranger (A), Soreli (A)	5
			purple brown	Bruno (A), Bruce (A)	6
			dark brown	Kousui (B), S600 (A), Tuscia (A)	7
8. QN	8.	VG (b)	Stem: texture of bark		
			smooth	Shinzan (B), Sparkler (A)	1
			moderately rough	a-Gassan (B), Meteor (A)	2
			very rough	a-Awaji (B), Hayward (A)	3
9. QN	9.	VG (b) (1)	Stem: density of hairs		
			absent or sparse	Meteor (A)	1
			medium	Hayward (A)	2
			dense	Belén (A)	3
10. QN	10. (*)	VG (b)	Stem: size of lenticels		
			very small	Hortgem Toru (B), Kaimai (A)	1
			small	Monty (A), Shinzan (B)	2
			medium	Hayward (A), r-Gassan (B)	3
			large	Hort16A (A)	4

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
11.	11.	VG	Stem: number of lenticels		
QN	(*)	(b)	few	Meteor (A), Shigemidori (B)	3
			medium	Hayward (A), Shinzan (B)	5
			many	Bruno (A), Mitsukou (B)	7
12.	12.	VG	Stem: prominence of bud support		
QN	(+)	(*)	very weak	Sparkler (A)	1
			weak	Hayward (A)	2
			medium	a-Awaji (B), King (A), Soreli (A)	3
			strong	Kaimai (A), Moshan No 4 (A), Shinzan (B), Tuscia (A)	4
			very strong	Kuimi (A)	5
13.	13.	VG	Stem: presence of bud cover		
QL	(+)	(*)	absent	Hort16A (A), Kousui (B)	1
			present	Hayward (A), Mitsukou (B)	9
14.	14.	VG	Stem: size of hole in bud cover		
QN	(+)	(*)	small	Abbott (A), Mitsukou (B)	1
			medium	Hayward (A), r-Awaji (B)	2
			large	Elmwood (A), r-Nagano (B)	3
15.	15.	VG	Stem: leaf scar		
QN	(+)	(*)	flat	Meteor (A), Shinzan (B)	1
			moderately depressed	Hort16A (A), r-Nagano (B)	2
			strongly depressed	Kousui (B), Monty (A)	3
16.	16.	VG	Stem: pith		
PQ	(+)	(*)	absent	Chuhong (A)	1
			lamellate	Hayward (A)	2
			solid	Gracie (A), Hortgem Toru (B)	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note		
17. (+)	17. (*)	VG	Leaf blade: shape				
			PQ	(c), (d)	lanceolate	Hortgem Toru (B), Kaimai (A)	1
					ovate	Hayward (A)	2
					obovate	Bruno (A)	3
18.	18. (*)	MG/VG	Leaf blade: ratio length/width				
			QN	(c), (d)	very low		1
					very low to low		2
					low	Matua (A)	3
					low to medium	Hayward (A)	4
					medium	Bruno (A), Zesy002 (A)	5
					medium to high	Jintao (A), SkeltonA19 (A)	6
					high	Wuzhi5 (A)	7
					high to very high		8
					very high		9
19. (+)	19. (*)	VG			Leaf blade: shape of apex		
			PQ	(c), (d)	caudate	Hortgem Tahī (B)	1
					acuminate	Belén (A), HFR18 (A), Kaimai (A), Yukimusume(B)	2
					acute	Hayward (A)	3
					emarginate with cuspidate	Hort16A (A)	4
					rounded	Satoizumi (B), Soreli (A)	5
					retuse	Shinzan (B), W45 (A)	6
					emarginate	Kuimi (A)	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note		
20. (+)	20. (*)	VG	Leaf blade: basal lobes				
			QN	(c), (d)	none	S600 (A)	1
				(1)	far apart	Kaimai (A)	2
					slightly apart	Matua (A)	3
					touching each other	Hort16A (A)	4
					slightly overlapping	Hayward (A)	5
					strongly overlapping	Summerfaenza (A)	6
21. (+)	21.	VG	Leaf blade: number of ciliate serrations				
			QN	(c), (d)	few	a-Shouwa (B), Hortgem Toru (B)	3
				(2)	medium	a-Gassan (B), Hortgem Rua (B)	5
					many	Jumbo (B), Mitsukou (B)	7
22.	22.	VG	Leaf blade: density of hairs on <u>upper</u> side				
			QN	(c), (d)	absent or very sparse	Hort16A (A), Tuscia (A)	1
				(1)	sparse	Kaimai (A), Renact (A)	3
					medium	Bruno (A)	5
					dense	Meteor (A)	7
23.	23.	VG	Leaf blade: density of hairs on <u>lower</u> side				
			QN	(c), (d)	absent or very sparse	Hortgem Tahī (B), Kousui (B)	1
				(1)	sparse	a-Gassan (B), Kuimi (A), S600 (A)	3
					medium	a-Shouwa (B), Hayward (A)	5
					dense	Belen (A), Ranger (A), Shinzan (B)	7
24.	24. (*)	VG	Leaf blade: intensity of green colour of <u>upper</u> side				
			QN	(c), (d)	light	a- Gassan (B)	3
				medium	Hayward (A), Satoizumi (B)	5	
				dark	Bruno (A), Shinzan (B)	7	

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
25. (+)	25. (*)	VG	Leaf blade: colour of <u>lower side</u>		
PQ		(c), (d)	whitish	Shinzan (B)	1
			light green	a-Awaji (B), Hortgem Tahi (B), Hort16A (A)	2
			medium green	Bruno (A)	3
			yellow green	Hayward (A)	4
			yellow brown		5
26.	26.	VG	Leaf blade: variegation		
QL		(c), (d)	absent	Hayward (A), Jintao (A)	1
			present		9
27.	27.	VG	Leaf blade: colour of variegation (if present)		
PQ		(c), (d)	white only		1
			white and yellow		2
			yellow only		3
28.	28. (*)	VG	Leaf: length of petiole relative to blade		
QN		(c), (d)	very small	Kaimai (A)	1
			small	Gracie (A)	3
			medium	Kousui (B), Meteor (A)	5
			large	Hayward (A), Satoizumi (B)	7
29.	30.	VG	Petiole: anthocyanin coloration of <u>upper side</u>		
QN		(c), (d), (e)	absent or very weak	Chuhong (A), Jumbo (B), Kaimai (A), Mitsukou (B)	1
			weak	Houkou (B), Sparkler (A)	3
			medium	Hayward (A), Shinzan (B)	5
			strong	a-Hirano (B), Tomua (A)	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note		
30. (+) QL	31.	VG	Inflorescence: type				
			solitary	Jinkui, Hayward (A), Hort16A (A)	1		
			dichasium	Jinyan (A), Zuva (A)	2		
			pleiochasium	Moshan No 4 (A)	3		
31. (+) QN	32.	MG/VG	Inflorescence: number of flowers				
			very few	Hayward (A), Hortgem Rua (B)	1		
			few	Matua (A)	2		
			medium	Hort22D (A)	3		
			many	Moshan No 4 (A)	4		
32. (+) QN	33.	VG	Flower bud: position of first spike				
			(2)	low	Hortgem Rua (B)	1	
				medium	a-Shouwa (B)	2	
				high	a-Gassan (B)	3	
33. QN	34.	VG	Flower: number of sepals				
			(f)	few	Skelton (A)	1	
				medium	Hayward (A), Hortgem Tahī (B)	2	
				many	Bruce (A), HORT16A (A)	3	
34. (+) PQ	35. (*)	VG	Flower: main colour of sepals				
			(f)	white	Jumbo (B), Yukimusume (B)	1	
				green	Hort16A (A), Mitsukou (B)	2	
				brown	Shinzan (B), Tomua (A)	3	
				reddish brown	a-Awaji (B), Hortgem Tahī (B)	4	
35. QN	36.	VG	Flower: density of sepal hairs				
			(f)	absent or sparse	Skelton A19 (A), Y356 (A)	1	
				(1)	medium	Earligreen (A), RS1 (A)	2
				dense	Bruce (A), Hayward (A)	3	

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
36.	37. (*)	MG/MS	Flower: diameter		
QN		(f)	small	a-Gassan (B), Sparkler (A)	3
			medium	Matua (A), RS1 (A), Satoizumi (B)	5
			large	Hort51-1785 (A), Koryoku (A), Shinzan (B)	7
			very large	Hayward (A)	9
37. (+)	38. (*)	VG	Flower: arrangement of petals		
QN		(f)	free	Abbott (A), a-Shouwa (B)	1
			touching	Matua (A), Satoizumi (B)	2
			overlapping	Hayward (A), Shinzan (B)	3
38.	39.	VG	Flower: shape in profile		
PQ		(f)	concave	Hayward (A)	1
			flat	Bruno (A)	2
			convex	Gracie (A), Tamara (A)	3
39.	40.	VG	Flower: number of styles		
QN		(f)	few	Yamagatamusume (B), Z487 (A)	1
			medium	Hort16A (A), Satoizumi (B)	2
			many	Hayward (A), Shinzan (B)	3
40. (+)	41. (*)	VG	Flower: attitude of styles		
PQ		(f)	erect	HFR 18 (A)	1
			semi-erect	Houkou (B), Jinyan (A)	2
			horizontal	Bruno (A), Shinzan (B)	3
			irregular	Hayward (A)	4

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note	
41. (+) PQ	42.	VG	Petal: main colour on adaxial side			
			white	Hayward (A), Hort16A (A), Shinzan (B)	1	
			greenish white	Hortgem Tahí (B), Satoizumi (B)	2	
			yellowish white	Bruce (A), Mitsukou (B), Soreli (A)	3	
			yellowish green		4	
			yellow		5	
			light pink		6	
			red pink		7	
			red		8	
42. (+) QN	43.	VG	Petal: shading of main colour			
			(f)	lighter towards base		1
				even	Hort16A (A)	2
			lighter towards apex	Dong Hong (A)	3	
43. (+) PQ	44.	VG	Petal: second colour on adaxial side			
			(f)	none	Hortgem Toru (B)	1
				white		2
				green	Hayward (A)	3
				light pink	King (A)	4
		dark pink	Meteor (A)	5		
44. (+) PQ	45.	VG	Petal: distribution of second colour			
			(f)	marginal only		1
				irregular spotted	Meteor (A)	2
			basal spot only	Hayward (A)	3	

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
45.	46.	VG	Anther: colour		
PQ		(f)	yellow	Hayward (A), Hort16A (A), r-Nagano (B)	1
			yellow orange	Bruce (A)	2
			grey	Jumbo (B)	3
			dark purple	Hortgem Toru (B), Mitsukou (B)	4
			black	a-Shouwa (B), Hortgem Rua (B)	5
46. (+)	47. (*)	MG	Fruit: weight		
QN		(g)	very low	Jumbo (B)	1
			low	Dong Hong (A), Huaguang2 (A)	3
			medium	Hort16A (A), Hortgem Tahi (B), Tomua (A)	5
			high	Hayward (A), Jin Feng (A)	7
G			very high	Jade Moon (A)	9
47. (+)	48. (*)	MS/VG	Fruit: length		
QN		(g)	short	Hortgem Tahi (B), Kuimi (A)	3
			medium	Hayward (A)	5
			long	Bruno (A), Hortgem Toru (B)	7
48. (+)	49. (*)	MS/VG	Fruit: width		
QN		(g)	narrow	Bruno (A)	3
			medium	Hayward (A)	5
			broad	Kuimi (A), Renact (A)	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note		
49. (+)	50. (*)	MG/VG	Fruit: ratio length/width				
			QN	(g)	very low	1	
					very low to low	2	
					low	Hort22D (A), W45 (A)	3
					low to medium	Tsechelidis (A), Wuzhi5 (A)	4
					medium	Hayward (A), Zesy002 (A)	5
					medium to high	Allison (A)	6
					high	Bruno (A)	7
					high to very high		8
		very high		9			
50. (+)	51. (*)	VG	Fruit: shape				
			QN	(g)	ovate	Hort16A (A), Jecy Gold (A), Yamagatamusume (B)	1
					oblong	Hortgem Toru (B), Wilkins Super (A)	2
					elliptic	Hayward (A), Mitsukou (B)	3
					circular	Hort51-1785 (A), Minkigold (A)	4
					oblate	Katiuscia (A), Kuimi (A), Shinzan (B)	5
G			obovate	Monty (A)	6		
51. (+)	52. (*)	VG	Fruit: shape in cross section (at median)				
			PQ	(g)	circular	Bruno (A), Mitsukou (B)	1
					oblate	Hortgem Tahí (B), Kousui (B), Wilkins Super (A)	2
			transverse elliptic	Hayward (A)	3		

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
52. (+)	53. (*)	VG	Fruit: stylar end		
PQ		(g)	strongly depressed	RS1 (A)	1
			weakly depressed	HFR 18 (A), Jade Moon (A)	2
			flat	Hayward (A), Satoizumi (B)	3
			rounded	Kousui (B), Tomua (A)	4
			weakly blunt protruding	Skelton (A)	5
			strongly blunt protruding	Hort16A (A)	6
G			pointed protrusion	Hortgem Toru (B)	7
53. (+)	54.	VG	Fruit: degree of pointed protrusion		
QN		(g)	weak	Hortgem Toru (B)	1
		(2)	medium	Jumbo (B)	2
			strong	Hortgem Wha (B)	3
54. (+)	55.	VG	Fruit: presence of calyx ring		
QN		(g)	absent or weakly expressed	Bruno (A)	1
		(1)	medium expressed	Hayward (A)	2
			strongly expressed	Hort16A (A), Qinmei (A)	3
55. (+)	56. (*)	VG	Fruit: shape of shoulder at stalk end		
PQ		(g)	truncate	Hortgem Tahi (B), Mitsukou (B)	1
			weakly sloping	Hayward (A), Kousui (B)	2
			strongly sloping	Skelton (A)	3
56.	57. (*)	MS/VG	Fruit: length at stalk		
QN		(g)	short	Hortgem Tahi (B), Houmitu (A)	3
			medium	Jintao (A), Sanuki Gold (A), Shinzan (B)	5
			long	Hayward (A)	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
57. (+)	58. (*)	MS/VG	Fruit: length of stalk relative to length of fruit		
QN		(g)	very short	Jumbo (B), Wuzhi3 (A)	1
			short	Bruno (A), Kousui (B)	3
			medium	Allison (A), Shinzan (B), Soreli (A)	5
			long	Hayward (A)	7
			very long	Jade Moon (A)	9
58.	59.	VG	Fruit: conspicuousness of lenticels on skin		
QN		(g)	weak	Hort16A (A), Mitsukou (B)	1
			medium	Hayward (A)	2
			strong	Kousui (B), Soreli (A), Topstar Vantini (A)	3
59.	60. (*)	VG	Fruit: hairiness of skin		
QL		(g)	absent	a-Shouwa (B), Hortgem Toru (B), Shinzan (B)	1
G			present	Hayward (A)	9
60. (+)	61. (*)	VG	Fruit: density of hairs		
QN		(g)	very sparse	Topstar Vantini (A)	1
		(1)	sparse	Hort16A (A)	3
			medium	Hayward (A)	5
			dense	Bruno (A)	7
61.	62.	VG	Fruit: colour of hairs		
PQ		(g)	white		1
		(1)	yellow		2
			yellow brown	Hort16A (A)	3
			reddish brown	Renact (A)	4
			medium brown	Hayward (A)	5
			dark brown	Bruno (A)	6

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
62. (+)	63. (*)	VG	Fruit: adherence of hairs to skin		
QN		(g)	very weak	Tomua (A)	1
		(1)	weak	Hort16A (A)	3
			medium	Abbott (A)	5
			strong	Hayward (A)	7
63. (+)	64. (*)	VG	Fruit: colour of skin		
PQ		(h)	light green	Hortgem Rua (B)	1
			medium green	Hortgem Tahi (B), Mitsukou (B)	2
			reddish green		3
			yellow		4
			greenish brown	Hayward (A), Shinzan (B)	5
			reddish brown	Soreli (A)	6
			light brown	Hort16A (A)	7
			medium brown	Sanuki Gold (A), Tuscia (A)	8
			dark brown	Kousui (B), Tomua (A)	9
			purple red		10
64.	65.	VG	Fruit: adherence of skin to flesh		
QN		(h)	weak	Hortgem Rua (B)	1
		(2)	medium	Hortgem Tahi (B)	2
			strong	Hortgem Toru (B)	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
65. (+)	66. (*)	VG	Fruit: colour of outer pericarp		
PQ		(h)	light green	Shinzan (B), S600 (A)	1
			medium green	Hayward (A)	2
			dark green	Hortgem Toru (B)	3
			greenish yellow	Dong Hong (A), Hort22D (A), Satoizumi (B)	4
			medium yellow	Hort16A (A), Kousui (B)	5
			dark yellow	Hort51-1785 (A), Soreli (A)	6
			yellowish orange		7
			orange		8
			red		9
G			red purple		10
66. (+)	67. (*)	VG	Fruit: colour of locules		
PQ		(h)	light green	Jumbo (B), Shinzan (B)	1
			medium green	Hayward (A), Hortgem Tahiti (B)	2
			dark green	Hortgem Toru (B)	3
			greenish yellow	Jinyan (A), Satoizumi (B)	4
			medium yellow	Hort16A (A), Kousui (B)	5
			dark yellow	Hort51-1785 (A), Soreli (A)	6
			red	Hort22D (A), Hortgem Rua (B)	7
G			red purple	HFR 18 (A)	8
67. (+)	68.	VG	Fruit: spread of reddish colour along locules (if present)		
QN		(h)	very weak	Hortgem Rua (B), Red Princess (A)	1
			weak	Dong Hong (A), Honghua (A)	2
			medium	Chuhong (A)	3
			strong		4
			very strong	HFR 18 (A), Hort22D (A)	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
68.	69.	VG	Fruit: intensity of reddish colour in locules (if present)		
QN		(h)	light	Chuhong (A), Red Princess (A)	3
			medium	HFR 18 (A)	5
			dark	Hort22D (A)	7
69. (+)	70. (*)	MG/VG	Fruit: width of core relative to fruit		
QN		(h)	small	Hort16A (A)	3
			small to medium	S600 (A)	4
			medium	Bruno (A)	5
			medium to large	Tomua (A)	6
			large	Hayward (A)	7
70. (+)	71. (*)	VG	Fruit: general shape of core in cross section		
PQ		(h)	circular	Jintao (A), Yukimusume (B)	1
			oblate	Hort22D (A), Hortgem Tahi (B), Shinzan (B)	2
			transverse elliptic	Hort16A (A), Mitsukou (B)	3
71.	72. (*)	VG	Fruit: colour of core		
PQ		(h)	white	Hort22D (A), Tuscia (A)	1
			greenish white	Hayward (A), Hortgem Tahi (B)	2
			yellow white	Hort16A (A), Shinzan (B)	3
			red purple		4
72. (+)	73.	MG	Fruit: sweetness		
QN		(h)	very low	Jade Moon (A)	1
			low	Hayward (A), Satoizumi (B)	3
			medium	Tomua (A), Yukimusume (B)	5
			high	Hort16A (A), Kousui (B)	7

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
73. (+)	74.	MG	Fruit: acidity		
QN		(h)	low	Hort16A (A), Sanuki Gold (A), Satoizumi (B)	3
			medium	Hayward (A), Yamagatamusume (B)	5
			high	a-Gassan (B), Bruno (A), S600 (A)	7
74.	75. (*)	MG/VG	Time of vegetative bud burst		
QN			very early	Hort16A (A), Hortgem Rua (B)	1
			early	Tomua (A), Yukimusume (B)	3
			medium	Hayward (A), Shinzan (B)	5
			late	Mitsukou (B), Jinyan (A)	7
75. (+)	76. (*)	MG/VG	Time of beginning of flowering		
QN			early	Hort16A (A), Yukimusume (B)	3
			medium	Abbott (A), Kousui (B), Soreli (A)	5
G			late	Hayward (A)	7
76. (+)	77. (*)	MG/VG	Time of maturity for harvest		
QN		(g)	very early	Hortgem Rua (B)	1
			early	Hort22D (A), Hortgem Tahī (B), Yamagatamusume (B), Y368 (A)	3
			medium	HFR 18 (A), Kousui (B), Tomua (A)	5
G			late	Hayward (A), Yukimusume (B)	7

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:

- (1) The characteristic only applies to varieties in Group A: all varieties belonging to *A. deliciosa*, *A. chinensis*, *A. kolomikta*, *A. eriantha*, *A. rufa*
 - (2) The characteristic only applies to varieties in Group B: all varieties belonging to *A. arguta*, *A. polygama*, *A. melanandra*, *A. macrosperma*
- a) All observations on the young shoot should be made during active vegetative growth. Observation of hairs should be made on internodes from the middle third of growing shoots.
 - b) All observations on the stem (including observations on the buds and bud support) should be made in the middle third of the replacement stem after leaf fall.
 - c) The shape, size and hairiness of leaves can vary greatly according to the type and vigour of the shoot on which they are borne. Unless specified, the shoots should be replacement canes, i.e., those that will be tied down and retained for the following season's flowering.
 - d) All observations on the leaf should be made near the middle of the current season's growth on sufficiently mature, but not old leaves. The most basal leaves of a shoot should be excluded since they do not usually attain full size or typical shape.
 - e) All observations on the presence or absence of anthocyanin coloration in vegetative organs refer to the general appearance of the organ, irrespective of whether red pigments are present in hairs or in the underlying surface.
 - f) All observations on the flower should be made on recently fully-opened terminal (king) flowers.
 - g) Observations on fruit characteristics should be made at harvest maturity.
 - h) Observations on fruit characteristics should be made when ripe for eating.

8.2 Explanations for individual characteristics

Ad. 1: Plant: sex

A hermaphrodite variety has flowers with stigmas and anthers with pollen.

Ad. 2: Plant: self fruit setting

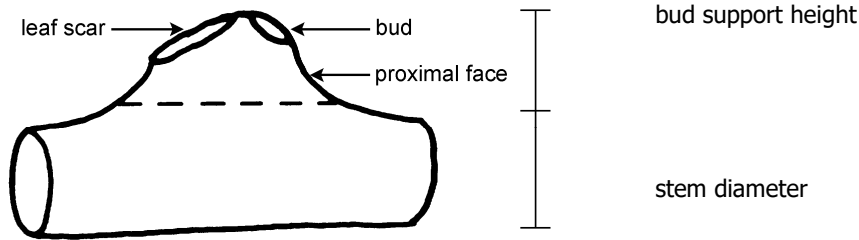
A self fruiting variety will set viable fruit without the presence of polliniser male plants or if flowers are bagged to prevent cross pollination.

Ad. 3: Plant: vigour

Plant vigour is determined by the evaluation of the overall abundance of vegetative growth.

Ad. 12: Stem: prominence of bud support

Ad. 15: Stem: leaf scar



The prominence of the bud support is determined by the bud support height/stem diameter contrast.

Ad. 13: Stem: presence of bud cover



1
absent



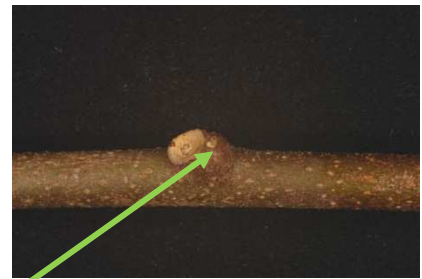
9
present

The absence or presence of the bud cover is indicated by the visibility of the bud. A variety with no bud cover has a strongly protruding bud which is clearly visible. A variety with a bud cover has an almost invisible bud that appears sunk into the stem.

Ad. 14: Stem: size of hole in bud cover



1
small



2
medium

bud cover



3
large

Ad. 16: Stem: pith

The stem is cut in longitudinal section and the inner part is observed from above.

- 1 absent: The inner part is empty or hollow.
- 2 lamellate: The pith consists of layers of thin plates, one against another.
- 3 solid: The pith consists of a dense mass.

Ad. 17: Leaf blade: shape



1
lanceolate

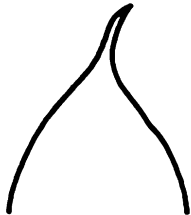
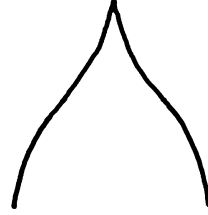
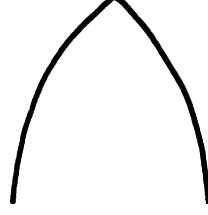

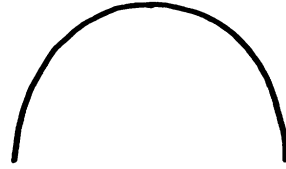




2
ovate

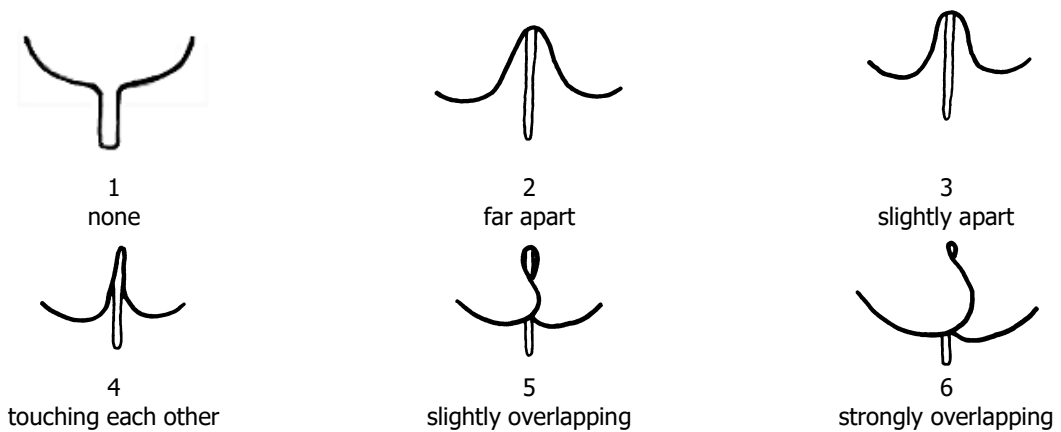


3
obovate

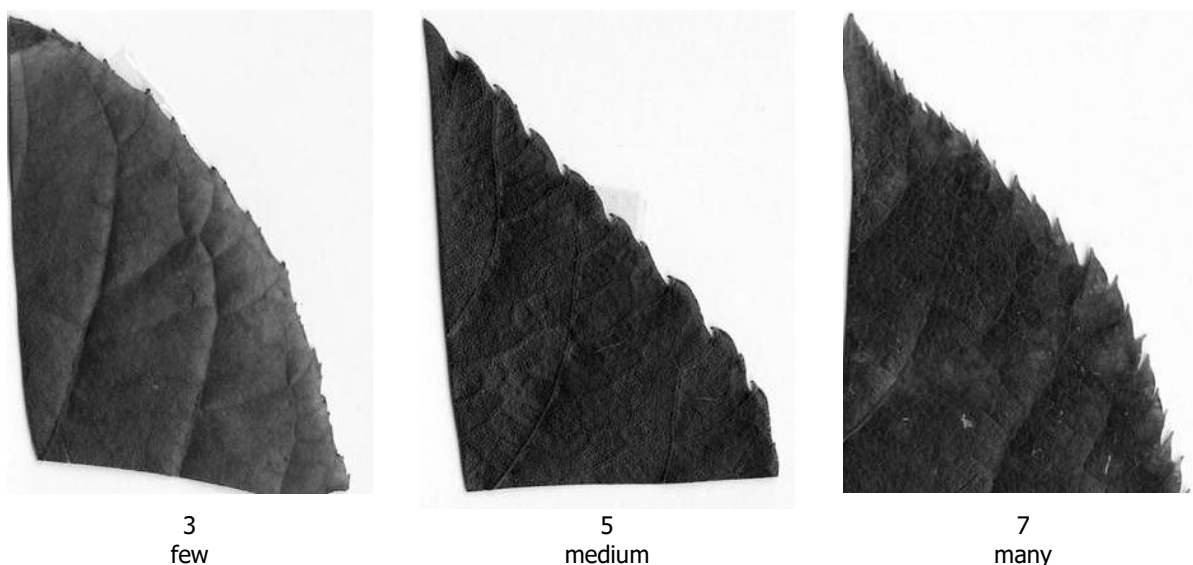
Ad. 19: Leaf blade: shape of apex

pointed				
	1 caudate	2 acuminate	3 acute	4 emarginate with cuspidate
rounded				
	5 rounded			
notched				
	6 retuse	7 emarginate		

Ad. 20: Leaf blade: basal lobes



Ad. 21: Leaf blade: number of ciliate serrations



Ad. 25: Leaf blade: colour of lower side

The observation on the lower side of the leaf is an overall visual impression. The observation includes hairs and leaf surface.

Ad. 30: Inflorescence: type



Ad. 31: Inflorescence: number of flowers

Flowers occur on the first 1-6 nodes on a current season's shoot. The observation should be made immediately before flower opening, when at least 2 nodes have developed. The number of flowers present at each node is recorded. It is recommended that at least two shoots are observed per plant.

Ad. 32: Flower bud: position of first spike

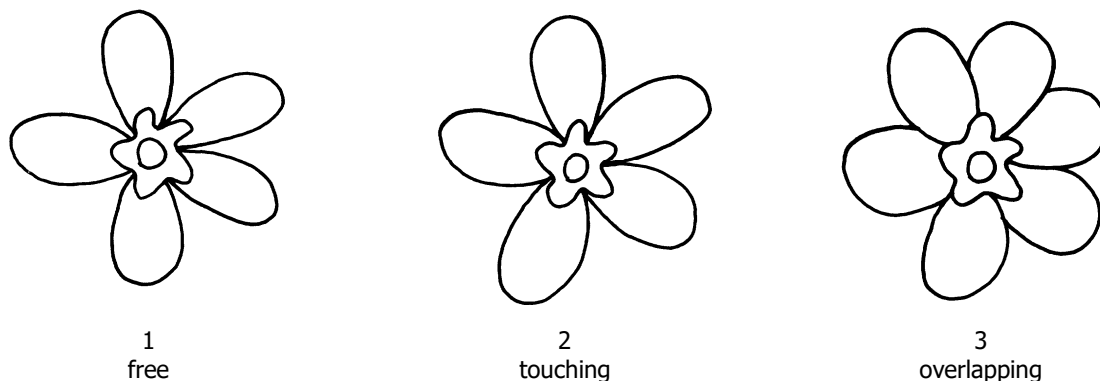
The position of the first spike is determined by node order, of which the first spike is set, from the base. Some varieties set the first spike at the lowest node from the base.

Ad. 34: Flower: main colour of sepals

The sepal may have more than one colour. The main colour is the colour with the largest surface area on the organ.

Ad. 37: Flower: arrangement of petals

Flowers are viewed from beneath as shown in the diagrams.



Ad. 40: Flower: attitude of styles

State 4 irregular: The attitude of the styles is a mixture of erect, semi erect and horizontal in any combination of two of three different attitudes. The general impression of the flowers is one of no consistency of style attitude or a single predominant style attitude.

Ad. 41: Petal: main colour on adaxial side

Ad. 42: Petal: shading of main colour

The main colour is the colour with the largest surface area on the petal. The main colour may be shaded, being darker or lighter from base to apex. This is also referred to as a different intensity of colour or colour gradient on an organ.

The adaxial side is facing the axis of the flower, the upper side. Note that the upper side may be facing downwards when observed on the plant.

Ad. 43: Petal: second colour on adaxial side

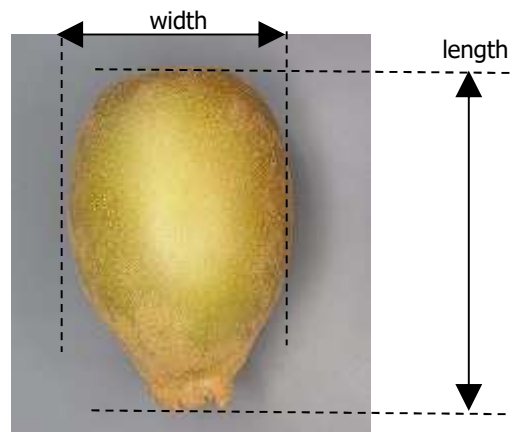
Ad. 44: Petal: distribution of second colour

The secondary colour is identified as the colour with the second largest surface area on the organ. The second colour occurs as a single basal spot, irregular spotting over the entire petal or solid coloration on or near the margin.

Ad. 46: Fruit: weight

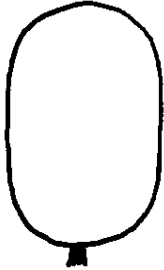
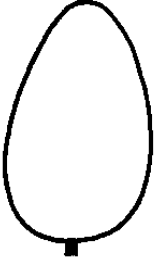
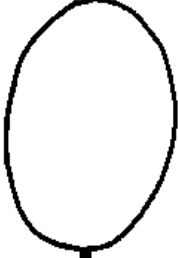

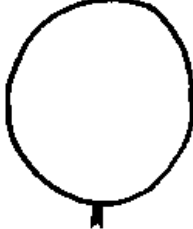
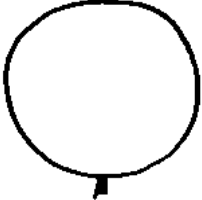
Fruit weight should be determined by a sample size of 25 harvested fruits, 5 each from 5 plants.

Ad. 47: Fruit: length
Ad. 48: Fruit: width

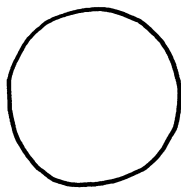


Ad. 49: Fruit: ratio length/width

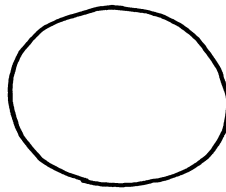
Ad. 50: Fruit: shape

			← broadest part →		
			below the middle	at middle	above middle
high					
				2 oblong	
↑ length/width ratio					
	1 ovate			3 elliptic	6 obovate
↓					
				4 circular	
low					
				5 oblate	

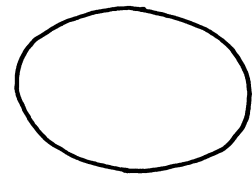
Ad. 51: Fruit: shape in cross section (at median)



1
circular



2
oblate



3
transverse elliptic

Ad. 52: Fruit: stylar end



1
strongly depressed



2
weakly depressed



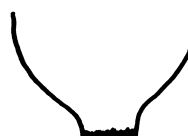
3
flat



4
rounded



5
weakly blunt protruding



6
strongly blunt protruding



7
pointed protrusion

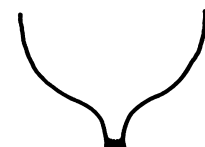
Ad. 53: Fruit: degree of pointed protrusion



1
weak

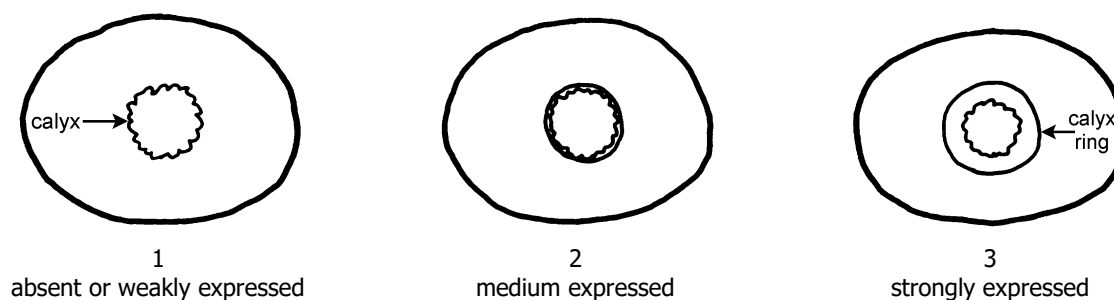


2
medium

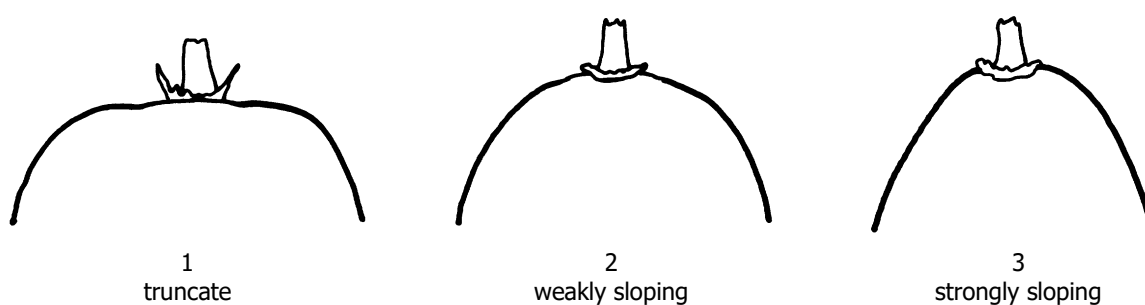


3
strong

Ad. 54: Fruit: presence of calyx ring



Ad. 55: Fruit: shape of shoulder at stalk end



Ad. 57: Fruit: length of stalk relative to length of fruit

The relativity is determined by the size of the difference between the length of the stalk and the length of the fruit.

short means moderately shorter stalk to length of fruit
medium means similar stalk length to fruit length
long means moderately longer stalk to length of fruit

Ad. 58: Fruit: conspicuousness of lenticels on skin

The conspicuousness of lenticels is determined by the size and number on the skin.

Ad. 60: Fruit: density of hairs

The density is determined by the combination of the number of hairs and length of individual hairs.

Ad. 62: Fruit: adherence of hairs to skin

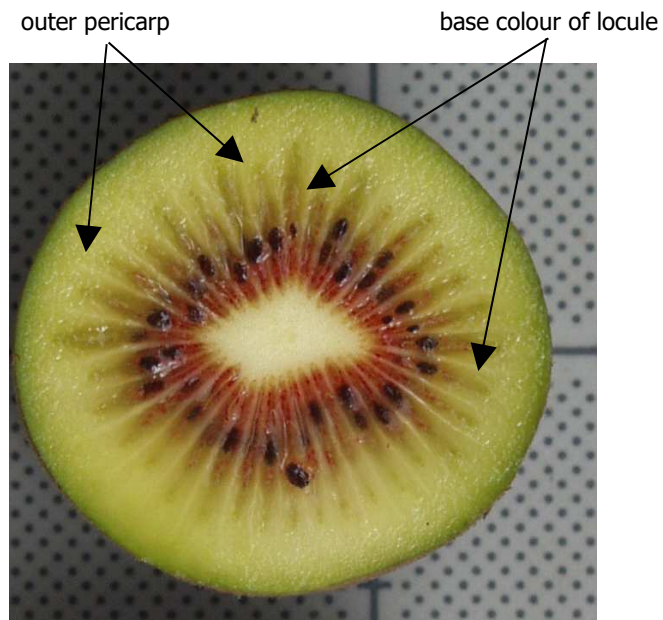
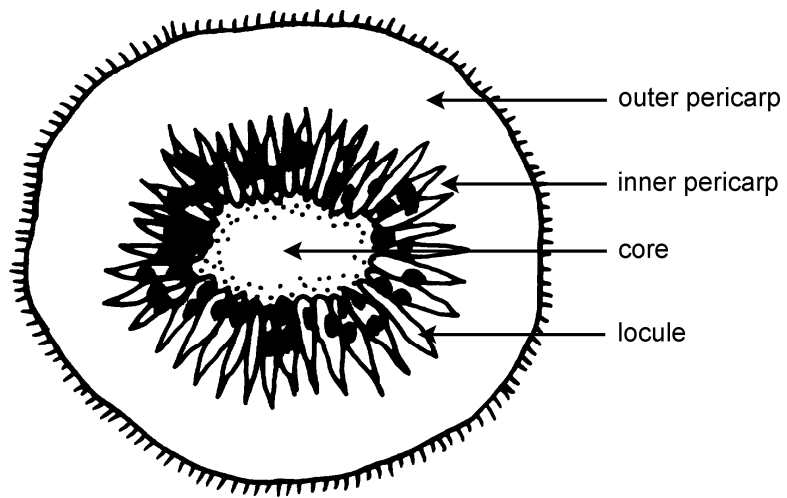
Observation is made by rubbing a finger across the fruit surface and determining the ease or difficulty of hair removal.

Ad. 63: Fruit: colour of skin

The colour of skin is assessed at harvest after removal of as much hair as practical. The colour of the skin does not include coloration from hair.

Ad. 65: Fruit: colour of outer pericarp

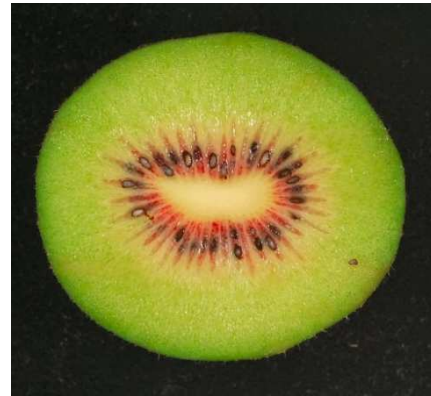
Ad. 66: Fruit: colour of locules



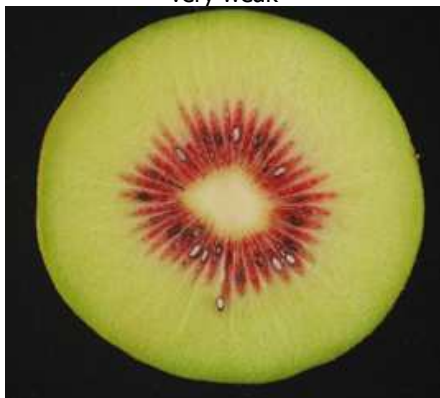
Ad. 67: Fruit: spread of reddish colour along locules (if present)



1
very weak



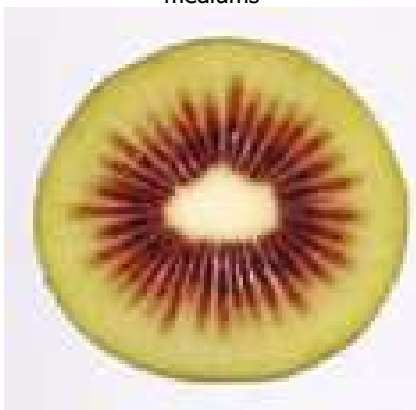
2
weak



3
mediums

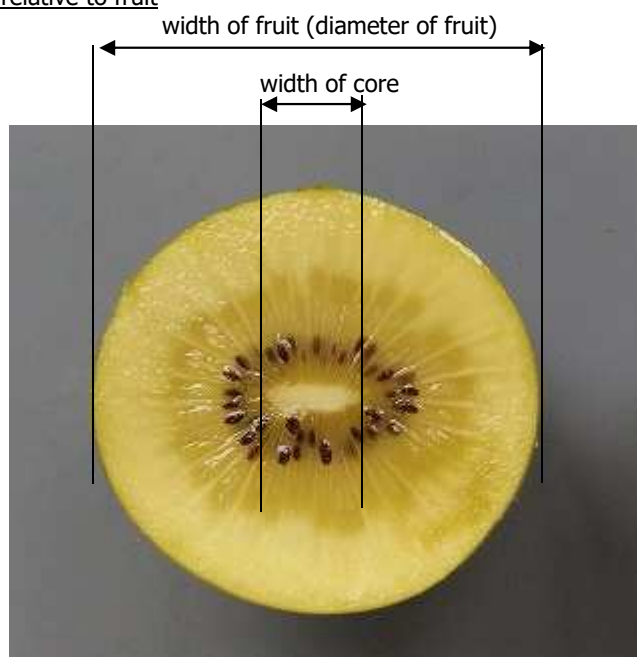


4
strong

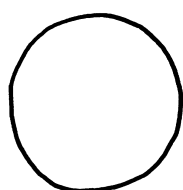


5
very strong

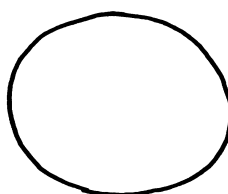
Ad. 69: Fruit: width of core relative to fruit



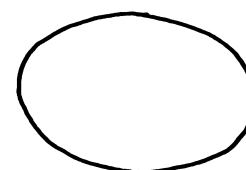
Ad. 70: Fruit: general shape of core in cross section



1
circular



2
oblate



3
transverse elliptic

Ad. 72: Fruit: sweetness

The total soluble solids content is measured by refractometer.

Ad. 73: Fruit: acidity

Acidity is determined by titration of titrateable acids.

Ad. 74: Time of vegetative bud burst

When 10% of buds are showing green shoots.

Ad. 75: Time of beginning of flowering

When 10% of flower buds have fully opened.

Ad. 76: Time of maturity for harvest

It is recommended that harvest occur when the total soluble solids content is at the level determined by national or regional harvest requirements. The total soluble solids can be measured by Brix test.

9. LITERATURE

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10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the [CPVO website](#) under the following reference:
CPVO-TQ/098/3 – *Actinidia* Lindl. - kiwifruit