



PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

Persea americana Mill.

AVOCADO

UPOV Code: PERSE_AME

Adopted on 11/03/2010

Entered into force on 12/03/2010

I SUBJECT OF THE PROTOCOL

The protocol describes the technical procedures to be followed in order to meet the Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on general UPOV Document TG/1/3 and UPOV Guideline TG/97/4 dated 05/04/2006 for the conduct of tests for Distinctness, Uniformity and Stability. This protocol applies to all varieties of *Persea americana* Mill.

II SUBMISSION OF SEED AND OTHER PLANT MATERIAL

1. The Community Plant Variety Office (CPVO) is responsible for informing the applicant of

- the closing date for the receipt of plant material;
- the minimum amount and quality of plant material required;
- the examination office to which material is to be sent.

A sub-sample of the material submitted for test will be held in the variety collection as the definitive sample of the candidate variety.

The applicant is responsible for ensuring compliance with any customs and plant health requirements.

2. Final dates for receipt of documentation and material by the Examination Office

The final dates for receipt of requests, technical questionnaires and the final date or submission period for plant material will be decided by the CPVO and each Examination Office chosen.

The Examination Office is responsible for immediately acknowledging the receipt of requests for testing, and technical questionnaires. Immediately after the closing date for the receipt of plant material the Examination Office should inform the CPVO whether acceptable plant material has been received or not. However if unsatisfactory plant material is submitted the CPVO should be informed as soon as possible.

3. Plant material requirements

The final dates for request of technical examination and sending of Technical Questionnaire by the CPVO as well as submission date, quantity and quality of plant material by the applicant can be found in the CPVO website (www.cpvo.europa.eu).

Quality of plants:Should not be less than the standards laid down in Council Directive 2000/29/EC and its amendments concerning quarantine organisms; please refer to "Eur-Lex" for the full text and in case of any subsequent amendments to the three aforesaid Directives.

Healthy plant material of the candidate variety should be delivered to the test station in accordance with the requirements outlined in the instructions sent by the CPVO for the submission of plant material, and which can also be consulted in the relevant entries for avocado within the S2 Gazette and the CPVO website. In particular with respect to the phytosanitary requirements, the plant material must be accompanied by a valid certificate from a recognised authority attesting to the fact that the plant material sent for the DUS technical examination has shown negative laboratory test results for the list of pests and pathogens outlined in the pertinent entry of the examination office in the S2 Gazette/CPVO website, where the candidate avocado variety is to undergo its DUS technical examination.

Chemical treatment: The plant material must not have undergone any treatment unless the CPVO and the examination office allow or request such treatment. If it has been treated, full details of the treatment must be given.

Labelling of individual - Species
plants in sample: - File number of the application allocated by the CPVO
- Breeder's reference
- Examination office's reference (if known)
- Name of applicant
- The phrase "On request of the CPVO"

III CONDUCT OF TESTS

1. Variety collection

A variety collection will be maintained for the purpose of establishing distinctness of the candidate varieties in test. A variety collection may contain both living material and descriptive information. A variety will be included in a variety collection only if plant material is available to make a technical examination.

Pursuant to Article 7 of Council Regulation (EC) No. 2100/94, the basis for a collection should be the following:

- varieties listed or protected at the EU level or at least in one of the EEA Member States;
- varieties protected in other UPOV Member States;
- any other variety in common knowledge.

The composition of the variety collection in each Examination Office depends on the environmental conditions in which the Examination Office is located.

Variety collections will be held under conditions which ensure the long term maintenance of each accession. It is the responsibility of Examination Offices to replace reference material which has deteriorated or become depleted. Replacement material can only be introduced if appropriate tests confirm conformity with the existing reference material. If any difficulties arise for the replacement of reference material, Examination Offices must inform the CPVO. If authentic plant material of a variety cannot be supplied to an Examination Office the variety will be removed from the variety collection.

2. Material to be examined

Candidate varieties will be directly compared with other candidates for Community plant variety rights tested at the same Examination Office, and with appropriate varieties in the variety collection. When necessary an Examination Office may also include other candidates and varieties. Examination Offices should therefore make efforts to co-ordinate the work with other Offices involved in DUS testing of avocado. There should be at least an exchange of technical questionnaires for each candidate variety, and during the test period, Examination Offices should notify each other and the CPVO of candidate varieties which are likely to present problems in establishing distinctness. In order to solve particular problems Examination Offices may exchange plant material.

3. Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in the Annex 1. 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. In the latter case, the CPVO should be informed. In addition the existence of some other regulation e.g. plant health, may make the observation of the characteristic impossible.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation (EC) No. 1239/95, to insert additional characteristics and their expression in respect of a variety.

4. Grouping of varieties

The varieties and candidates to be compared will be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety and which in their various states of expression are fairly evenly distributed throughout the collection. In the case of continuous grouping characteristics overlapping states of expression between adjacent groups is required to reduce the risks of incorrect allocation of candidates to groups. The characters used for grouping could be the following:

- a) Leaf blade: anise aroma (characteristic 14)
- b) Ripe fruit: colour (characteristic 41)
- c) Ripe fruit: thickness of skin (characteristic 42)
- d) Time of fruit maturity for harvesting (characteristic 54)

5. Trial designs and growing conditions

The minimum duration of tests (independent growing cycles) will normally include at least two satisfactory crops of fruit. Tests will be carried out under conditions ensuring normal growth. The size of the plots will be such that plants or parts of plants may be removed for measuring and counting without prejudice to the observations which must be made up to the end of the growing period.

The test design is as follows

Each test should include 5 plants.

Unless otherwise indicated, all observations should be made on 5 plants or parts taken from each of 5 plants. In the case of parts of plants, the number to be taken from each of the plants should be 2.

6. Special tests

In accordance with Article 83(3) of Council Regulation (EC) 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, 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 characters listed in the protocol.

7. Standards for decisions

a) **Distinctness**

A candidate variety will be considered to be distinct if it meets the requirements of Article 7 of Council Regulation (EC) No. 2100/94.

b) **Uniformity**

A candidate will be considered to be sufficiently uniform if the number of off-types does not exceed the number of plants as indicated in the table below. A population standard of 1% and an acceptance probability of 95% should be applied.

Table of maximum numbers of off-types allowed for uniformity standards.

Number of plants	off-types allowed
≤ 5	0

c) **Stability**

A candidate will be considered to be sufficiently stable when there is no evidence to indicate that it lacks uniformity.

IV REPORTING OF RESULTS

After each recording season the results will be summarised and reported to the CPVO in the form of a UPOV model interim report in which any problems will be indicated under the headings distinctness, uniformity and stability. Candidates may meet the DUS standards after two fruiting periods but in some cases three fruiting periods may be required. When tests are completed the results will be sent by the Examination Office to the CPVO in the form of a UPOV model final report.

If it is considered that the candidate complies with the DUS standards, the final report will be accompanied by a variety description in the format recommended by UPOV. If not the reasons for failure and a summary of the test results will be included with the final report.

The CPVO must receive interim reports and final reports by the date agreed between the CPVO and the examination office.

Interim reports and final examination reports shall be signed by the responsible member of the staff of the Examination Office and shall expressly acknowledge the exclusive rights of disposal of CPVO.

V LIAISON WITH THE APPLICANT

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 agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

The interim report as well as the final report shall be sent by the Examination Office to the CPVO.

VI ENTRY INTO FORCE

The present protocol enters into force on **12/03/2010**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the new TP. Technical examinations of candidate varieties are carried out according to the TP in force at the time the first observations are made on characteristics in an independent growing cycle.

In cases where the CPVO requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process of being carried out at the moment of the 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.

ANNEXES TO FOLLOW

ANNEX I

PAGE

Table of characteristics to be used in DUS-test and preparation of descriptions	7
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Legend:

- (+) See explanations on the Table of characteristics
- (a)-(e) See explanations on the table of characteristics
- G Grouping characteristic

Types of expression of characteristics:

- QL Qualitative characteristic
- QN Quantitative characteristic
- PQ Pseudo-qualitative characteristic

Type of 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

When a method of observation is attributed to a certain characteristic, the first differentiation is made depending if the action taken is a visual observation (V) or a measurement (M).

The second differentiation deals with the number of observations the expert attributes to each variety, thus the attribution of either G or S.

If a single observation of a group consisting of an undefined number of individual plants is appropriate to assess the expression of a variety, we talk about a visual observation or a measurement made on a group of plants, thus we attribute the letter G (either VG or MG). If the expert makes more than one observation on that group of plants, the decisive part is that we have at the end only one data entry per variety which means that we have to deal with G (e.g. measurement of plant length on a plot – MG, visual observation of green colour of leaves on a plot – VG).

If it is necessary to observe a number of individual plants to assess the expression of a variety, we should attribute the letter S (thus either VS or MS). Single plant data entries are kept per variety for further calculations like the variety mean (e.g. measurement of length of ears – MS, visual observation of growth habit of single plants in grasses – VS). The number of individual plants to be observed in such cases is stated in section III.5.

Explanations and methods	17
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Literature.....	25
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ANNEX II

Technical Questionnaire

ANNEX I

TABLE OF CHARACTERISTICS TO BE USED IN DUS-TEST AND PREPARATION OF DESCRIPTIONS

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
1.	1.	VG	Tree: growth habit		
(+)	(*)		upright	Bacon, Zutano	1
PQ	PQ		spreading	Fuerte, Hass	2
			semi drooping	Colín V-33	3
			drooping		4
2.	2.	VG	Young shoot: colour		
	(*)	(a)	yellow green	Collinson	1
PQ	PQ		green	Benedict, G-22, Teague	2
			reddish	Duke 6	3
3.	3.	VG	Young shoot: colour of lenticels		
PQ	PQ	(a)	yellow		1
			green	Collinson, G-22	2
			red	Benedict, Duke 6	3
			purple		4
4.	5.	VG	Shoot: length of internode		
(+)	(+)		short	San Martín	1
QN	QN		intermediate	Fuerte, Hass	2
			long		3
5.	6.	VG	Leaf: attitude relative to shoot		
QN	QN	(c)	upwards	G-6	1
			outwards	Hass	2
			downwards		3

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
6.	7.	MG/VG	Leaf blade: length		
QN	QN	(c)	very short	San Martín	1
			short	Fuchsia, Puebla, Topa Topa	3
			medium	Choquette, Colín V-33, Fuerte	5
			long	Barker	7
			very long	Encinos	9
7.	8.	MG/VG	Leaf blade: width		
QN	QN	(c)	very narrow	Duke 7, San Martín	1
			narrow	Hass, Thomas	3
			medium	Choquette, Fuerte	5
			broad	Monroe, Pollock	7
			very broad	Encinos, G755c	9
8.	9.	MG/VG	Leaf blade: ratio length/width		
QN	QN	(c)	very small	Santana	1
			small	G755c	3
			medium	Choquette	5
			large	Mike, Pinkerton	7
			very large	Reed	9
9.	10.	VG	Leaf blade: shape		
(+)	(+)	(c)	lanceolate	Collinson	1
PQ	PQ		ovate	Teague	2
			elliptic	Duke	3
			circular	Santana	4
			obovate	Dilly	5
10.	11.	VG	Leaf blade: shape of apex		
(+)	(+)	(c)	acuminate	Fuerte	1
PQ	PQ		acute	Hass	2
			rounded	Santana	3

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
11.	12.	VG	Leaf blade: twisting <u>along whole length</u>		
(+)	(+)	(c)	absent	Fuerte	1
QL	QL		present	Zutano	9
12.	14.	VG	Leaf blade: undulation of margin		
(+)	(+)	(c)	absent or very weak	Duke	1
QN	QN		weak	Frazer	3
			medium	Ettinger	5
			strong	Pinkerton	7
			very strong	Arturo	9
13.	15.	VG	Leaf blade: relief of venation on upper surface		
QN	QN	(c)	sunken	G755c, Topa Topa	1
			level	Duke 7, Fuerte	2
			raised	Edranol, Frazer, Teague	3
14.	18.	VG	Leaf blade: anise aroma		
	(*)	(c)	absent or weak	Hass, Reed	1
QN	QN		medium	Duke 7	2
G			strong	Thomas	3
15.	19.	VG	Petiole: length		
QN	QN	(c)	very short	San Martín	1
			short	Aguilar, Reed	3
			medium	Frazer, G755c, Mike	5
			long	Encinos, Hass	7
			very long	Fuerte	9
16.	20.	VG	Inflorescence: length of axis		
(+)	(+)	(d)	short	Bacon	3
QN	QN		medium	Fuerte	5
			long	Pinkerton	7

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
17.	21.	VG	Inflorescence: colour of lenticels		
QL	QL	(d)	green	Topa Topa	1
			red	Teague	2
18.	22.	VG	Inflorescence: flowering type		
(+)	(+)	(d)	type A	Hass	1
QL	QL		type B	Colín V-33, Fuerte	2
19.	23.	VG	Flower: nectary		
(+)	(+)	(e)	sessile	Ettinger	1
QL	QL		stalked	Fuerte	2
20.	28.	MG/VG	Mature fruit: length		
	(*)	(f)	very short	Mexicola, Northrup	1
QN	QN		short	Dickinson, Edranol, Fuerte	3
			medium	Avis, Hellen	5
			long	Cellon's Hawaii Seedling	7
			very long	Lima Late, Telsen	9
21.	29.	MG/VG	Mature fruit: diameter		
	(*)	(f)	very small	Mexicola, Northrup	1
QN	QN		small	Dickinson, Edranol, Fuerte	3
			medium	Avis, Hellen	5
			large	Cellon's Hawaii Seedling	7
			very large	Lima Late, Telsen	9
22.	30.	MG/VG	Mature fruit: ratio length/diameter		
	(*)	(f)	very small	Trapp	1
QN	QN		small	Monroe	3
			medium	Carlsbad, Lima Late, Topa Topa	5
			large	#86	7
			very large	Telsen	9

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
23. PQ	31. PQ	MG/VG (f)	Mature fruit: shape at stalk end		
			pointed	Dickinson, Frazer	1
			narrowly rounded	Carlsbad, Edranol, Sharwil	2
			broadly rounded	Esther, Hashimoto, Nimlioh	3
			truncate	Lamb Hass, Mayo, Puebla	4
24. QL	32. QL	VG (f)	Mature fruit: presence of neck		
			absent	Hashimoto, Hass, Lamat	1
			present	Akbal, Fuerte, Horshim	9
25. QL	33. QL	VG (f)	Mature fruit: presence of depression at stalk end		
			absent	Jim, Sharwil, Wurtz	1
			present	Maxima, Simmonds, Trapp	9
26. QN	34. QN	VG (f)	Mature fruit: diameter of stalk attachment		
			small	Frazer	3
			medium	Fuerte	5
			large	Encinos	7
27. QN	35. QN	VG (f)	Mature fruit: position of stalk		
			along axis	G-22, Nabal, Simmonds	1
			slightly oblique	Fuerte, Rincon	2
			strongly oblique	Hayes, Whitsell	3
28. PQ	36. PQ	VG (f)	Mature fruit: shape at styler region		
			pointed	Lamat, Mexicola	1
			rounded		2
			flattened	Dade, Stewart, Trapp	3
			slightly depressed	Gordo, Irving, Nimlioh	4
			deeply depressed	Duke	5

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
29.	37.	VG	Mature fruit: conspicuousness of lenticels		
QN	QN	(f)	inconspicuous or weak	Topa Topa	1
			medium	Fuerte	2
			strong	Carlsbad, Stewart	3
30.	38.	VG	Mature fruit: size of lenticels		
QN	QN	(f)	small	Rincon	3
			medium	Fuerte, Stewart	5
			large	Ettinger	7
31.	39.	VG	Mature fruit: colour of lenticels		
PQ	PQ	(f)	cream	Biscayne Seedling	1
			yellow	Fuerte	2
			light green	Akbal	3
			brown	Aycock Red 3, Carlsbad	4
32.	40.	VG	Mature fruit: glossiness		
QN	QN	(f)	absent or weak	Fuerte, Horshim	1
			medium	Ettinger, Zutano	2
			strong	Simmonds, Topa Topa	3
33.	41.	VG	Mature fruit: surface		
	(*)	(f)	very smooth	Duke, Simmonds, Topa Topa	1
QN	QN		smooth	Bacon, Ettinger	3
			medium	Alboyce, Fuerte, Horshim	5
			rough	Hass, Whitsell	7
			very rough	Dickinson	9
34.	42.	VG	Mature fruit: persistence of perianth		
QN	QN	(f)	absent or weak	Hass	1
			medium	Colín V-33, Lypps	2
			strong	Irving, Jim	3

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
35.	43.	VG	Pedicle: thickness compared to peduncle (at junction)		
QL	QL	(g)	same	Ettinger, Simmonds	1
			thicker	Collinson, Dade	2
36.	44.	VG	Pedicle: length		
	(*)	(g)	short	Pollock	3
QN	QN		medium	Fuerte	5
			long	G-22, Hass	7
37.	45.	VG	Pedicle: shape		
	(*)				
(+)	(+)	(g)	cylindrical	Horshim, Iriet, Teague	1
QL	QL		conical	Dunedin, Edranol, Monroe	2
38.	46.	VG	Pedicle: "nailhead"		
	(*)				
(+)	(+)	(g)	absent	Duke, Edranol, Wurtz	1
QL	QL		present	Maxima, Pollock	9
39.	47.	VG	Pedicle: colour		
PQ	PQ	(g)	yellow	Aycock Red 3, Duke	1
			yellow green	Hass, Iriet	2
			green	Alboyce, Lamat	3
			green brown	Horshim	4
			reddish	Wurtz	5
40.	48.	VG	Pedicle: surface		
QL	QL	(g)	smooth	Duke, Ferdyn, Topa Topa	1
			wrinkled	Edranol, Ettinger	2

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
41. PQ G	49. PQ	VG (*) (h)	Ripe fruit: colour		
			yellow green	Melendez	1
			light green	Marsheline, Mayo	2
			medium green	Greengold, Rincon, Zutano	3
			dark green	Ahaheim, Colín V-33, Edranol	4
			reddish	Los Moros	5
			medium purple		6
dark purple or black	Hass, Topa Topa	7			
42. QN G	50. QN	VG (*) (h)	Ripe fruit: thickness of skin		
			very thin	Mexicola, Topa Topa	1
			moderately thin	Colín V-33, Fuerte	3
			medium	Edranol	5
			moderately thick	Hass	7
very thick	Dickinson	9			
43. PQ	51. QL	VG (+) (h)	Ripe fruit: consistency of skin		
			membranous	Ettinger, Teague, Topa Topa	1
			leathery	Edranol, Pollock, Santana	2
corky	G-22, Nabal	3			
44. QN	52. QN	VG (+) (h)	Ripe fruit: adherence of skin to flesh		
			weak	Edranol, Fuerte	1
			intermediate	Sharwil	2
strong	Ettinger, Nabal, Teague	3			
45. PQ	53. PQ	VG (h)	Ripe fruit: main colour of flesh		
			whitish	Hazzard	1
			cream	Bacon, Ettinger, Zutano	2
			yellow	Hayes, Nabal	3
light green	G-6, San Miguel	4			

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
46.	54.	VG	Ripe fruit: colour of layer next to skin		
PQ	PQ	(h)	light green	Santana	1
			medium green	Hass, Sharwil, Sir Prize	2
			yellow green	Duke	3
47.	55.	VG	Ripe fruit: width of layer next to skin		
QN	QN	(h)	narrow	Duke, Santana	3
			medium	Colín V-33, Fuerte, Santana	5
			broad	Edranol, Reed, Whitsell	7
48.	56.	VG	Ripe fruit: conspicuousness of fibres in flesh		
QL	QL	(h)	inconspicuous	Fuerte, Santana	1
			conspicuous	Edranol, Ettinger, Ryan	2
49.	57.	VG	Ripe fruit: consistency of flesh		
PQ	PQ	(h)	watery	Simmonds	1
			buttery	Fuerte, Hass	2
			dry	Fundación II	3
			granular		4
50.	58.	VG	Ripe fruit: anise aroma of flesh		
QL	QL	(h)	absent	Aguilar, Hass, Lamb Hass	1
			present	Mexicola	9
51.	60.	VG	Seed: shape in longitudinal section (lateral view)		
(+)	(+)	(h)	triangular	Simmonds, Telsen, Zutano	1
PQ	PQ		ovate	Anaheim, Colín V-33, Rincon	2
			elliptic	Jan Boyce, Lima Late, Topa Topa	3
			circular	Lamat, Lamb Hass, Mayapan	4
			oblate	Hayes, McDonald, Suardia	5
			depressed oblate	Carlsbad, Nowels	

CPVO N°	UPOV N°	Observation	Characteristics	Examples	Note
52.	62.	VG	Seed coat: adherence to flesh		
QN	QN	(h)	absent or weak	Zutano	1
			medium	Northrup, Topa Topa	2
			strong	Colín V-33, Fuerte, Hass	3
53.	66.	MG	Time of beginning of flowering		
QN	QN		early	Duke	3
			medium	Fuerte	5
			late	Hass	7
54.	67.	MG	Time of maturity for harvesting		
QN	QN	(f)	very early	Topa Topa	1
			early	Ettinger	3
			medium	Fuerte	5
			late	Hass, Ryan	7
G			very late	Reed	9

EXPLANATIONS AND METHODS

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:

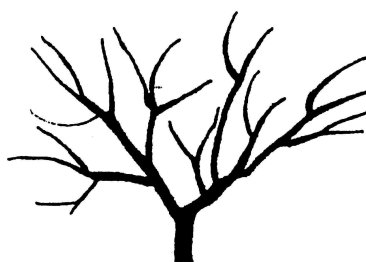
- (a) Young shoot / Young leaf: All observations on the young shoot and young leaf should be made on the current season's growth, during a period of active growth (flush).
- (b) Pubescence: All observations on pubescence should be made with the aid of a magnifying glass.
- (c) Leaf: Unless otherwise indicated, all observations on the leaf should be made on mature leaves from branches which are neither bearing fruit nor showing signs of new flush on the outside of the tree. They should be made in the middle third of the current season's growth.
- (d) Inflorescence: All observations on the inflorescence should be made at the time of full flowering.
- (e) Flower: All observations on the flower should be made during female opening. To determine the flowering type of a variety, the average night and day minimum temperatures should not be below 15°C and 25°C, respectively.
- (f) Mature fruit: The mature fruit is defined as the fruit ready for harvesting.
- (g) Pedicel: All observations on the pedicel should be made on mature fruits.
- (h) Ripe fruit, seed, cotyledon: observations on the ripe fruit, seed and cotyledon which should be made when the fruit is ready for eating.

2 *Explanations for individual characteristics*

Ad. 1: Tree: growth habit



1
upright



2
spreading



3
semi drooping

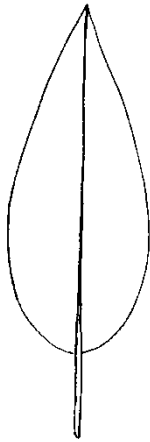


4
drooping

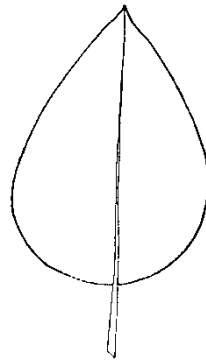
Ad. 4: Shoot: length of internode

To be observed on the middle part of the shoot, after the current season's growth has stopped.

Ad. 9: Leaf blade: shape



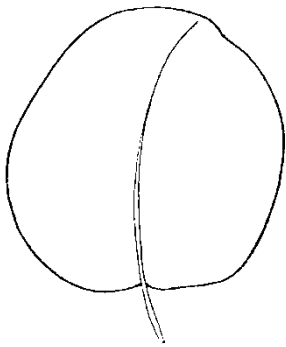
1
lanceolate



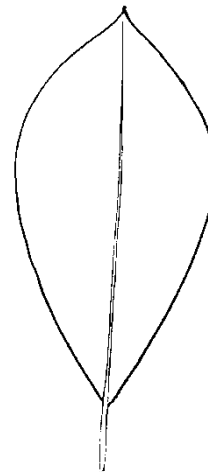
2
ovate



3
elliptic

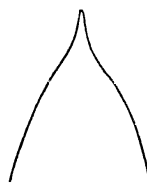


4
circular



5
obovate

Ad 10: Leaf blade: shape of apex



1
acuminate



2
acute



3
rounded

Ad. 11: Leaf blade: twisting along whole length



1
absent



9
present

Ad. 12: Leaf blade: undulation of margin



1
absent or very weak



3
weak



5
medium

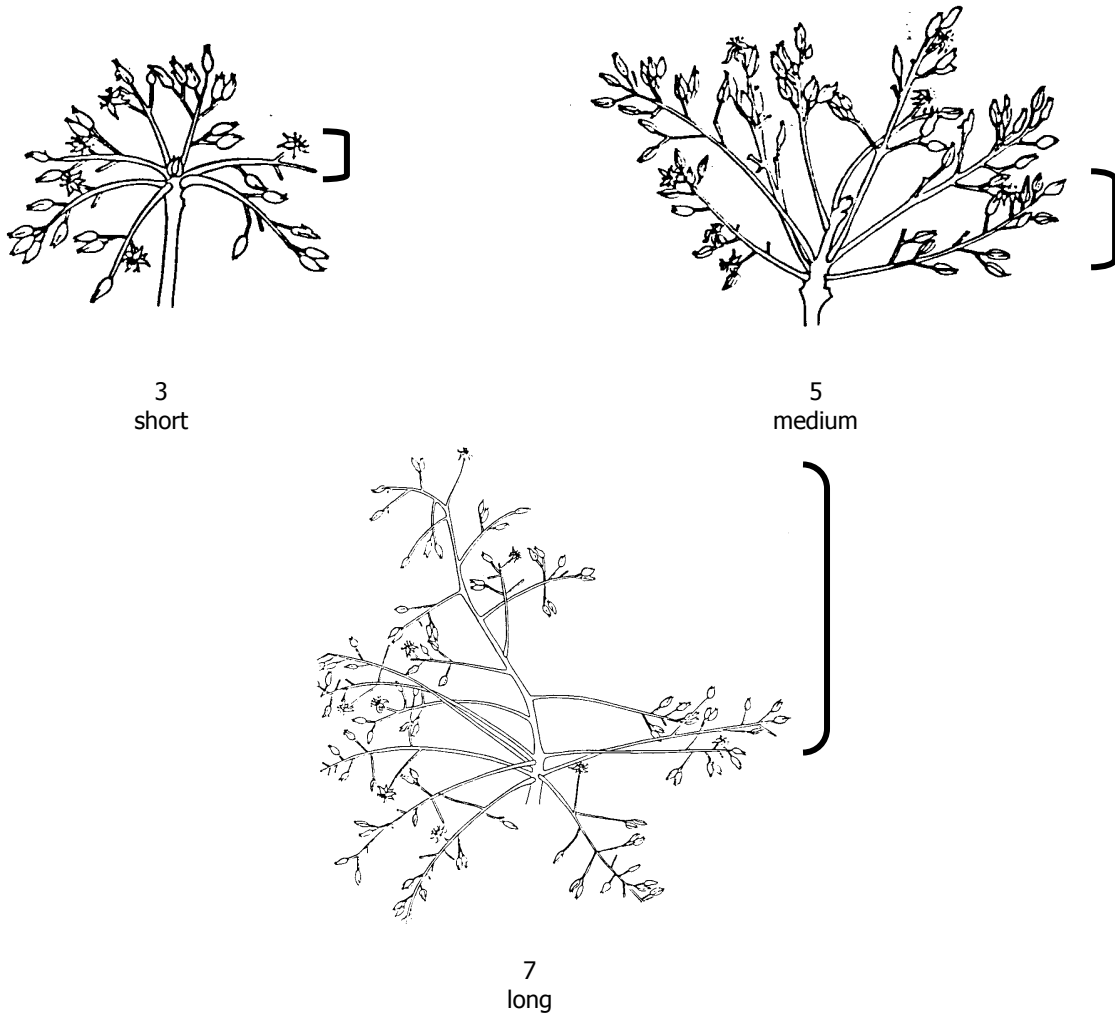


7
strong



9
very strong

Ad. 16: Inflorescence: length of axis



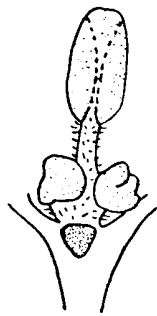
Ad. 18: Inflorescence: flowering type

A flower from inflorescence

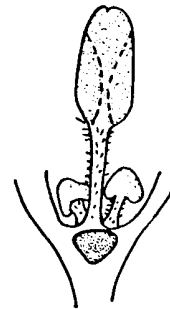
Type	A	B	
Day 1	a.m.	open with female parts functional	closed
	p.m.	closed	open with female parts functional
Day 2	a.m.	closed	open with male parts functional
	p.m.	open with male parts functional	closed

Observations should be carried out according to Ish-Am, G. and D. Eisikowitch. 1991: New insight into avocado flowering in relation to its pollination. California Avocado Society Yearbook 75: 125-137.

Ad. 19: Flower: nectary

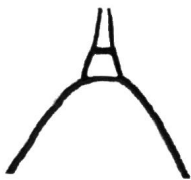


1
sessile



2
stalked

Ad. 23: Mature fruit: shape of stalk end



1
pointed



2
narrowly rounded

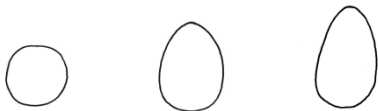


3
broadly rounded



4
truncate

Ad. 24: Mature fruit: presence of neck

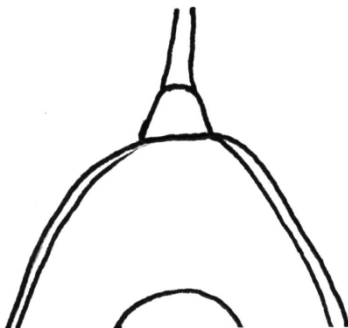


1
absent

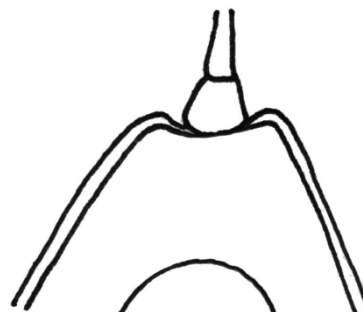


9
present

Ad. 25: Mature fruit: presence of depression at stalk end



1
absent



9
present

Ad. 26: Mature fruit: diameter of stalk attachment



3
small

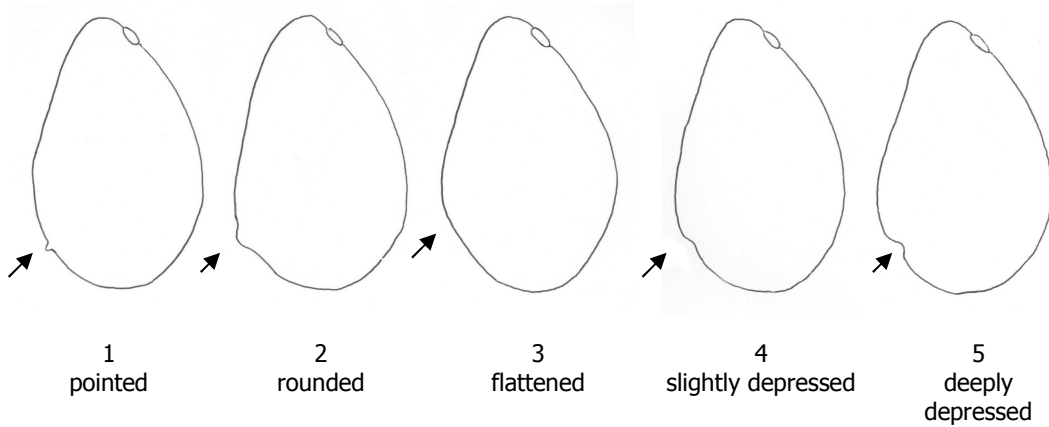


5
medium

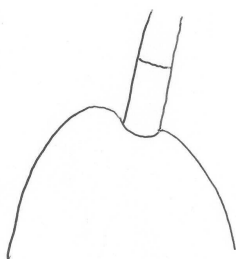


7
large

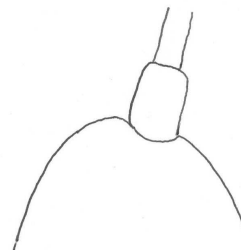
Ad. 28: Mature fruit: shape at styler region



Ad. 35: Pedicel: thickness compared to peduncle (at junction)

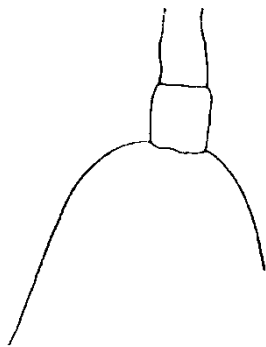


1
same

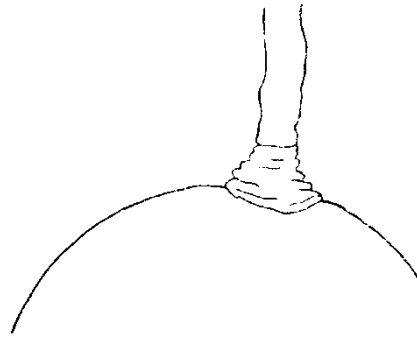


2
thicker

Ad. 37: Pedicel: shape

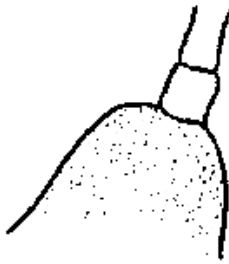


1
cylindrical

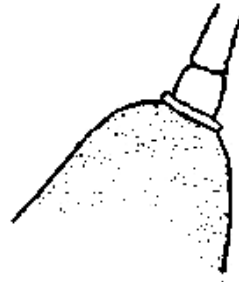


2
conical

Ad. 38: Pedicel: "nailhead"



1
absent



9
present

Ad. 43: Ripe fruit: consistency of skin

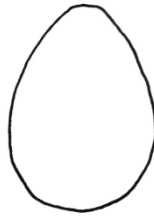
Ad. 44: Ripe fruit: adherence of skin to flesh

Should be evaluated by peeling the ripe fruit with the aid of the fingers.

Ad. 51: Seed: shape in longitudinal section (lateral view)



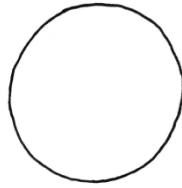
1
triangular



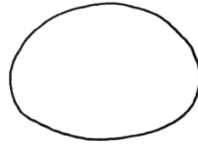
2
ovate



3
elliptic



4
circular



5
oblate



6
depressed oblate

LITERATURE

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IPGRI, 1995: Descriptors for Avocado (*Persea americana* Mill.). International Genetic Resources Institute (IPGRI-FAO). Rome, Italy. 52 p.

Ish-Am, G.; Eisikowitch, D., 1991: New insight into avocado flowering in relation to its pollination. California Avocado Society Yearbook 75: 125-137. (Can be downloaded at www.avocadosource.com)

ANNEX II

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO-TQ/097/1