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TG/PYRUS(proj.1)
ORIGINAL: English
DATE: 2015-07-24

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

Pear, Japanese Pear *

UPOV Code: PYRUS_BRE; PYRUS_COM; PYRUS_LEC; PYRUS_PYR; PYRUS_PYR_CUL; PYRUS_USS

Pyrus communis L.;
Pyrus pyrifolia (Burm. f.) Nakai;
Pyrus pyrifolia (Burm. f.) Nakai var. culta (Mak.) Nakai;
Pyrus ussuriensis Maxim.;
Pyrus xbretschneideri Rehder; Pyrus ×lecontei Rehder

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by (an) expert(s) from New Zealand

to be considered by the

Technical Working Party for Fruit Crops
at its forty-sixth session
to be held in Mpumalanga, South Africa
from 2015-08-24
to 2015-08-28

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Pyrus communis L., Pyrus communis L. var sativa DC.	European Pear, Pear	Poirier	Birne	Peral
Pyrus pyrifolia (Burm. f.) Nakai	Asian pear, Chinese pear, Chinese sand pear, Japanese pear, Nashi, Nashi pear, Oriental pear, Sand pear	poirier japonais	China-Birne, Nashi-Birne, Sandbirnbaum	pera

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Pyrus pyrifolia (Burm. f.) Nakai var. culta (Mak.) Nakai, Chinese Pear, Japanese Pear, Nashi, Sand Pear	poirier japonais	Chinesische Birne, Nashi, Sandbirne	peral japonés	
Pyrus ussuriensis Maxim	Harbin pear, Ussurian pear		Ussuri-Birne	
Pyrus xbretschneideri Rehder, Pyrus pyrifolia x Pyrus bretschneideri	Chinese white pear, Chinese white pear, white pear		weiße Birne	
Pyrus ×lecontei Rehder				

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

Other associated UPOV documents: Pear TG/15/3
Japanese Pear TG/149/2
Pyrus Rootstocks TG/169/1

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of Pyrus xbretschneideri Rehder, Pyrus communis L., Pyrus ×lecontei Rehder, Pyrus pyrifolia (Burm. f.) Nakai, Pyrus pyrifolia (Burm. f.) Nakai var. culta (Mak.) Nakai, Pyrus ussuriensis Maxim..

and hybrids between these species

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of grafted or budded trees on a suitable rootstock prescribed by the competent authority.

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

five trees.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

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

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

3.1.3 The two independent growing cycles may be observed from a single planting, examined in two separate growing cycles.

3.1.4 The growing cycle is considered to be the duration of a single growing season, beginning with bud burst (flowering and/or vegetative), flowering and fruit harvest and concluding when the following dormant period ends with the swelling of new season buds.

3.1.5 The first growing cycle should begin after the trees have produced the first crop of fruit.

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 Conditions for Conducting the Examination

3.3.1 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.

3.3.2 Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, Part I. These

determinations should be made with the plant part placed against a white background. The color chart and version used should be specified in the variety description.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 5 trees.

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

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 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 second 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. color 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 these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 5 plants, 0 off-types are 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) Tree: growth habit (characteristic 3)
(b) Fruit: size (characteristic 45)
(c) Fruit: position of maximum diameter (characteristic 50)
(d) Fruit: profile of sides (characteristic 52)
(e) Fruit: relative area of over color (characteristic 54)
(f) Fruit: hue of over color (characteristic 55)
(g) Fruit: presence of eye in calyx basin (characteristic 69)

(h) Time of harvest maturity (characteristic 83)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

6.2.1 States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), 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

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

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

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

6.5 Legend

(*)	Asterisked characteristic	– see Chapter 6.1.2
QL	Qualitative characteristic	– see Chapter 6.3
QN	Quantitative characteristic	– see Chapter 6.3
PQ	Pseudo-qualitative characteristic	– see Chapter 6.3
MG, MS, VG, VS		– see Chapter 4.1.5

(a)-(a) See Explanations on the Table of Characteristics in Chapter 8.

(+) See Explanations on the Table of Characteristics in Chapter 8.

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. (*) QN VG (+) **Tree: vigor**	**Arbre : vigueur**	**Baum: Wuchsstärke**	**Árbol: vigor**		
weak	faible	gering	débil		3
medium	moyenne	mittel	mediano		5
strong	forte	stark	fuerte		7
2. (*) QN VG (a) **Tree: branching**					
absent or very weak					1
weak					3
medium					5
strong					7
3. (*) PQ VG (+) (a) **Tree: growth habit**					
fastigiate					1
upright					2
semi upright					3
spreading					4
drooping					5
weeping					6
4. QN MS VG (a) **One-year-old shoot: length of internode**	**Rameau d'un an: longueur des entre- nœuds**	**Einjähriger Trieb: Internodienlänge**	**Rama de un año: longitud de los entrenudos**		
very short	très courts	sehr kurz	muy cortos		1
short	courts	kurz	cortos		3
medium	moyens	mittel	medios		5
long	longs	lang	largos		7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5. (*) QN VG (a) **One-year-old shoot: thickness**	**Rameau d'un an : épaisseur**	**Einjähriger Trieb: Dicke**	**Rama de un año: grosor**		
thin	fin	dünn	delgada		1
medium	moyen	mittel	mediana		2
thick	épais	dick	gruesa		3
6. (*) PQ VG (a) **One year old shoot: color on sunnyside**					
grey brown					1
grey green					2
greenish brown					3
medium brown					4
dark brown					5
orange brown					6
brown red					7
brown purple					8
dark purple					9
7. (*) QN VG (a) **One-year-old shoot: number of lenticels**	**Rameau d'un an: nombre de lenticelles**	**Einjähriger Trieb: Anzahl der Lentizellen**	**Rama de un año: número de lenticelas**		
few					1
medium					3
many					5

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
8. (*) QN VG (a) **One year old shoot: size of lenticels**					
small					1
medium					2
large					3
9. (*) PQ VG **One year old shoot: shape of vegetative bud apex**					
acute					1
obtuse					2
rounded					3
10. QL VG **One year old shoot: presence of axillary flower buds**					
absent					1
present					9
11. QN VG **One year old shoot: number of axillary flower buds**					
few					1
medium					2
many					3
12. QN VG **Vegetative bud: position in relation to shoot**					
adpressed					1
slightly held out					2
strongly held out					3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13. (*) QN VG **Mature shoot: number of spurs**					
few					3
medium					5
many					7
14. (*) PQ VG **Young leaf: color of upper side**					
yellow green					1
greenish brown					2
brown					3
red brown					4
15. (*) QN VG **Young shoot: anthocyanin coloration of growing tip**					
absent or weak					1
medium					2
strong					3
16. QN VG (+) **Leaf blade: attitude in relation to shoot**	**Limbe: port par rapport au rameau**	**Blattspreite: Haltung im Verhältnis zum Trieb**	**Limbo: porte en relación con la rama**		
upwards	dressé	aufwärts gerichtet	ascendente		1
outwards	perpendiculaire	abstehend	horizontal		2
downwards	retombant	abwärts gerichtet	descendente		3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. (*) QN MS VG **Leaf blade: length**	**Limbe: longueur**	**Blattspreite: Länge**	**Limbo: longitud**		
short	court	kurz	corta		3
medium	moyen	mittel	media		5
long	long	lang	larga		7
18. (*) QN MS VG **Leaf blade: width**	**Limbe: largeur**	**Blattspreite: Breite**	**Limbo: anchura**		
narrow	étroit	schmal	estrecha		3
medium	moyen	mittel	media		5
broad	large	breit	ancha		7
19. (*) QN MG VG **Leaf blade: ratio length/width**	**Limbe: rapport longueur/largeur**	**Blattspreite: Ver-hältnis Länge/Breite**	**Limbo: relación entre la longitud y la anchura**		
small	faible	klein	pequeña		3
medium	moyen	mittel	media		5
large	élevé	groß	grande		7
20. (*) PQ VG (+) **Leaf blade: shape**	**Limbe: forme**	**Blattspreite: Form**	**Limbo: forma**		
ovate					1
elliptic					2
rounded					3
obovate					4
cordate					5

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21. (*) PQ VG (+) **Leaf blade: shape of apex**	**Limbe: forme du sommet**	**Blattspreite: Form der Spitze**	**Limbo: forma del ápice**		
acuminate	acuminé	zugespitzt	acuminada		1
acute	pointu	spitz	aguda		2
obtuse					3
rounded					4
22. (*) PQ VG (+) **Leaf blade: shape of base**	**Limbe : forme de la base**	**Blattspreite: Form der Basis**	**Limbo: forma de la base**		
acute					1
obtuse					2
truncate					3
cordate					4
23. QN VG **Leaf blade: length of tip**	**Limbe: longueur de la pointe**	**Blattspreite: Länge der aufgesetzten Spitze**	**Limbo: longitud de la punta**		
absent or short					1
medium	moyenne	mittel	media		3
long	longue	lang	larga		5
24. PQ VG (+) **Leaf blade: incisions of margin (upper half)**	**Limbe: incisions du bord (moitié supérieure)**	**Blattspreite: Rand-einschnitte (obere Hälfte)**	**Limbo: incisiones del borde (mitad superior)**		
entire					1
crenate					2
blunt serrate					3
sharp serrate					4
dentate					5

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25. QN VG **Leaf blade: depth of incisions of margin**	**Limbe : profondeur des incisions du bord**	**Blattspreite: Tiefe der Randeinschnitte**	**Limbo: profundidad de las incisiones del borde**		
absent or very shallow					1
shallow					2
medium					3
deep					4
26. QN VG **Petiole: length**	**Pétiole: longueur**	**Blattstiel: Länge**	**Peciolo: longitud**		
short	court	kurz	corta		3
medium	moyen	mittel	media		5
long	long	lang	larga		7
27. QL VG **Petiole: stipules**	**Pétiole : stipules**	**Blattstiel: Nebenblätter**	**Pecíolo: estípulas**		
absent	absentes	fehlend	ausentes		1
present	présentes	vorhanden	presentes		9
28. QN MG VG (+) **Petiole: distance of stipules from basal attachment**					
short					1
medium					2
long					3
29. (*) QN MG VG **Ratio length of petiole/ length of blade**					
small					3
medium					5
large					7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
30. (*) QL VG **Shoot: location of flower buds**					
mainly on spurs					1
mainly on long shoots					2
31. (*) QN VG **Inflorescence: number of flowers**	**Inflorescence: nombre de fleurs**	**Blütenstand: Anzahl Blüten**	**Inflorescencia: número de flores**		
few					3
medium					5
many					7
32. (*) QN VG **Flower bud: size**					
small					3
medium					5
large					7
33. (*) QN MG VG **Flower: number of petals**	**Fleur: nombre de pétales**	**Blüte: Anzahl Blütenblätter**	**Flor: número de pétalos**		
five or less					1
five and six					2
six and seven					3
more than seven					4
34. (*) QN VG **Flower: arrangement of petals**	**Fleur: disposition des pétales**	**Blüte: Anordnung der Blütenblätter**	**Flor: disposición de los pétalos**		
free					1
intermediate					2
overlapping					3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35. (*) QN VG **Flower: number of stamens**	**Fleur : nombre d'étamines**	**Blüte: Anzahl der Staubgefäße**	**Flor: número de estambres**		
few					1
medium					2
many					3
36. (*) QN VG **Flower: position of stigma in relation to anthers**	**Fleur : position du stigmate par rapport aux étamines**	**Blüte: Stellung der Narbe im Vergleich zu den Antheren**	**Flor: posición del estigma en relación con las anteras**		
below					1
same level					2
above					3
37. (*) QL VG **Anthers: pollen**	**Anthères : pollen**	**Antheren: Pollen**	**Anteras: polen**		
absent					1
present					9
38. QL VG **Anthers: intensity of red coloration**					
light					1
medium					2
dark					3
39. QN MS VG **Petal: length**	**Pétale : longueur**	**Blütenblatt: Länge**	**Pétalo: longitud**		
short					1
medium					2
long					3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
40. QL MS VG **Petal: width**	**Pétale : largeur**	**Blütenblatt: Breite**	**Pétalo: anchura**		
narrow					1
medium					2
broad					3
41. PQ VG **Petal: shape**	**Pétale: forme**	**Blütenblatt: Form**	**Pétalo: forma**		
narrow ovate					1
broad ovate					2
elliptic					3
circular					4
42. PQ VG **Petal: shape of base (excluding claw)**					
cuneate					1
rounded					2
truncate					3
cordate					4
43. PQ VG **Petal: color of inner side**	**Pétale : couleur de la face interne**	**Blütenblatt: Farbe der Innenseite**	**Pétalo: color de la cara interna**		
white					1
light pink					2
medium pink					3
dark pink					4

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
44. PQ VG **Petal: color of outer side**					
white					1
light pink					2
medium pink					3
dark pink					4
45. (*) QN VG **Fruit: size**	**Fruit : taille**	**Frucht: Größe**	**Fruto: tamaño**		
very small	très petit	sehr klein	muy pequeño		1
small	petit	klein	pequeño		3
medium	moyen	mittel	mediano		5
large	grand	groß	grande		7
very large	très grand	sehr groß	muy grande		9
46. (*) QN MS VG **Fruit: height**	**Fruit: hauteur**	**Frucht: Höhe**	**Fruto: altura**		
short					3
medium					5
tall					7
47. (*) QN MS VG **Fruit: diameter**	**Fruit: diamètre**	**Frucht: Durchmesser**	**Fruto: diámetro**		
small					3
medium					5
large					7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
48. (*) QN MG VG **Fruit: ratio height/diameter**	**Fruit: rapport hauteur/diamètre**	**Frucht: Verhältnis Höhe/Durchmesser**	**Fruto: relación altura/diámetro**		
very small					1
small					3
medium					5
large					7
very large					9
49. (*) PQ VG (+) **Fruit: shape (in lateral view)**	**Fruit : forme (en vue latérale)**	**Frucht: Form (in Seitenansicht)**	**Fruto: forma (en vista lateral)**		
ovate					1
oblate					2
elliptic					3
circular					4
obovate					5
50. (*) QN VG (+) **Fruit: position of maximum diameter**	**Fruit: localisation du diamètre maximal**	**Frucht: Position des maximalen Durchmessers**	**Fruto: posición del diámetro máximo**		
towards stem end					1
in middle					2
slightly toward calyx end					3
strongly toward calyx end					4
51. QN VG **Fruit: symmetry**	**Fruit : symétrie**	**Frucht: Symmetrie**	**Fruto: simetría**		
symmetric or slightly asymmetric	symétrique ou légèrement dissymétrique	symmetrisch oder leicht asymmetrisch	simétrico o ligeramente asimétrico		1
moderately asymmetric	modérément dissymétrique	mäßig asymmetrisch	moderadamente asimétrico		2
strongly asymmetric	fortement dissymétrique	stark asymmetrisch	muy asimétrico		3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
52. (*) QN VG (+) **Fruit: profile of sides**					
concave					1
straight					2
convex					3
53. (*) PQ VG **Fruit: ground color**	**Fruit: couleur du fond**	**Frucht: Grundfarbe**	**Fruto: color de fondo**		
not visible					1
green					2
yellow green					3
yellow					4
yellow brown					5
red brown					6
54. (*) QN VG **Fruit: relative area of over color**	**Fruit: proportion de lavis**	**Frucht: Anteil der Deckfarben**	**Fruto: zona relativa del color superior**		
absent or very small					1
small					3
medium					5
large					7
very large					9
55. PQ VG **Fruit: hue of over color**	**Fruit: teinte du lavis**	**Frucht: Ton der Deckfarbe**	**Fruto: tono del color superpuesto**		
orange					1
orange red					2
pink red					3
light red					4
dark red					5

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
56. QN VG **Fruit: area of russet around eye basin**	**Fruit: surface de liège autour de la cuvette de l'œil**	**Frucht: Fläche der Berostung im Bereich der Kelchgrube**	**Fruto: zona de russeting de la cavidad del ojo**		
absent or small					1
medium					2
large					3
57. QN VG **Fruit: area of russet on cheeks**	**Fruit: surface de liège sur les joues**	**Frucht: Fläche der Berostung auf den Wangen**	**Fruto: zona de russeting de las caras**		
absent or small					1
medium					2
large					3
58. QL VG **Fruit: area of russet around stalk attachment**	**Fruit: surface de liège autour du pédoncule**	**Frucht: Fläche der Berostung im Bereich des Stielansatzes**	**Fruto: zona de russeting en torno a la base peduncular**		
absent or small					1
medium					2
large					3
59. (*) QN VG **Fruit: density of lenticels on skin**					
absent or very sparse					1
sparse					3
medium					5
dense					7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
60. (*) QN MG VG **Fruit: length of stalk**	**Fruit : longueur du pédoncule**	**Frucht: Länge des Stiels**	**Fruto: longitud del pedúnculo**		
short	court	kurz	corto		3
medium	moyen	mittel	medio		5
long	long	lang	largo		7
61. (*) QL VG **Fruit: thickness of stalk**	**Fruit: grosseur du pédoncule**	**Frucht: Dicke des Stiels**	**Fruto: grosor del pedúnculo**		
thin	fin	dünn	delgado		1
medium	moyen	mittel	medio		3
thick	gros	dick	grueso		5
62. (*) QN VG **Fruit: attitude of stalk to axis of fruit**					
straight					1
oblique					2
right angled					3
63. (*) QL VG **Fruit: swelling of stalk**					
absent					1
present					9
64. QN VG **Fruit: density of lenticels on stalk**					
absent or sparse					1
medium					3
dense					5

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
65. (*) QN VG (+) **Fruit: depth of stalk cavity**	**Fruit : profondeur de la dépression pédonculaire**	**Frucht: Tiefe der Stielhöhle**	**Fruto: profundidad de la cavidad peduncular**		
absent or very shallow					1
shallow					3
medium					5
deep					7
66. QN VG (+) **Fruit: width of stalk cavity**	**Fruit : largeur de la dépression pédonculaire**	**Frucht: Breite der Stielhöhle**	**Fruto: anchura de la cavidad peduncular**		
narrow					3
medium					5
broad					7
67. (*) QN VG (+) **Fruit: persistence of calyx**					
weak					1
mediuum					2
strong					3
68. QN VG (+) **Fruit: attitude of sepals**	**Fruit : port des sépales**	**Frucht: Haltung der Kelchblätter**	**Fruto: porte de los sépalos**		
converging					1
erect					2
spreading					3

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
69. (*) QL VG **Fruit: presence of eye in calyx basin**					
absent					1
present					9
70. (*) QN VG (+) **Fruit: depth of calyx basin**					
shallow					3
medium					5
deep					7
71. (*) QN VG (+) **Fruit: width of calyx basin**					
narrow					3
medium					5
broad					7
72. PQ VG **Fruit: color of flesh**	**Fruit : couleur de la chair**	**Frucht: Farbe des Fleisches**	**Fruto: color de la pulpa**		
white					1
yellowish white					2
whitish yellow					3
pinkish					4
red					5

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
73. QN MG VG					
Fruit: firmness of flesh	**Fruit: fermeté de la chair**	**Frucht: Festigkeit des Fruchtfleisches**	**Fruto: firmeza de la pulpa**		
very soft	très molle	sehr weich	muy blanda		1
soft	molle	weich	blanda		3
medium	moyenne	mittel	media		5
firm	ferme	fest	firme		7
very firm	très ferme	sehr fest	muy firme		9
74. QN VG					
Fruit: texture of flesh	**Fruit: texture de la chair**	**Frucht: Textur des Fleisches**	**Fruto: textura de la pulpa**		
fine	fine	fein	fina		1
medium	intermédiaire	mittel	mediana		2
coarse	grossière	grob	grosera		3
75. QN MG VG					
Fruit: juiciness of flesh	**Fruit: jutosité de la chair**	**Frucht: Saftigkeit des Fleisches**	**Fruto: jugosidad de la pulpa**		
low	faible	gering	baja		3
medium	moyenne	mittel	media		5
high	forte	hoch	alta		7
76. QN MG					
Fruit: total soluble solids	**Fruit: teneur en matières solubles**	**Frucht: Gesamt-gehalt an löslicher Trockensubstanz**	**Fruto: contenido total de sólidos solubles**		
low	faible	gering	bajo		3
medium	moyenne	mittel	medio		5
high	forte	hoch	alto		7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
77. QN MG **Fruit: acidity**	**Fruit: acidité**	**Frucht: Säure**	**Fruto: acidez**		
low	faible	gering	baja		3
medium	moyenne	mittel	media		5
high	forte	stark	alta		7
78. QN MG VG (+) **Fruit: ratio diameter of core/diameter of fruit**					
very small					1
small					3
medium					5
large					7
very large					9
79. QN VG **Fruit: number of locules**					
very few					1
few					3
medium					5
many					7
80. (*) QL VG **Fruit: cracking**					
absent					1
present					9

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
81. (*) QN VG **Time of beginning of vegetative bud burst**	**Époque de début de débourrement**	**Zeitpunkt des Aufbruchs der vegetativen Knospe**	**Época de brotación de las yemas vegetativas**		
early					3
medium					5
late					7
82. (*) QN VG **Time of beginning of flowering**	**Époque de début de floraison**	**Zeitpunkt des Blüh-beginns**	**Época de inicio de la floración**		
very early					1
early					3
medium					5
late					7
very late					9
83. (*) QN MG VG **Time of harvest maturity**	**Époque de maturité de récolte**	**Zeitpunkt der Erntereife**	**Época de madurez para la cosecha**		
very early					1
early					3
medium					5
late					7
very late					9

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

(a) Observations should be made in the dormant season.

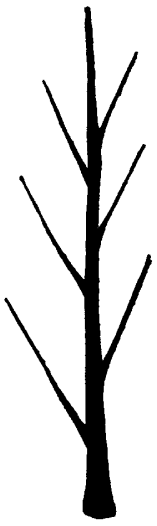
8.2 Explanations for individual characteristics

Ad. 1: Tree: vigor

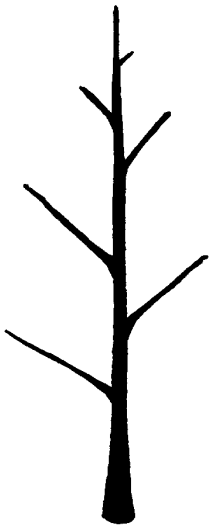
Observations should be made during active vegetative growth. The vigor of the tree should be considered as the overall abundance of vegetative growth.

Ad. 3: Tree: growth habit

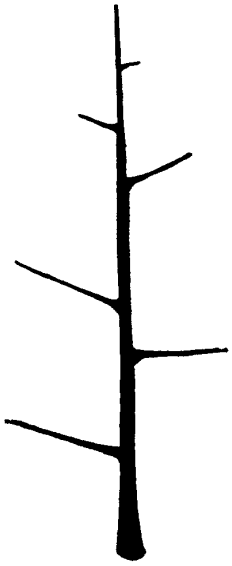
1 - fastigiate



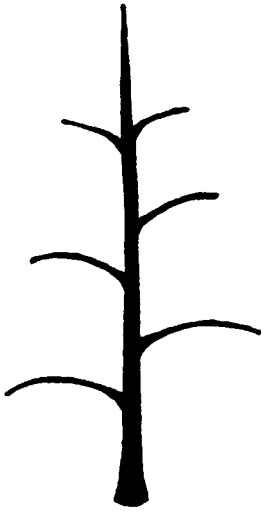
2 - upright



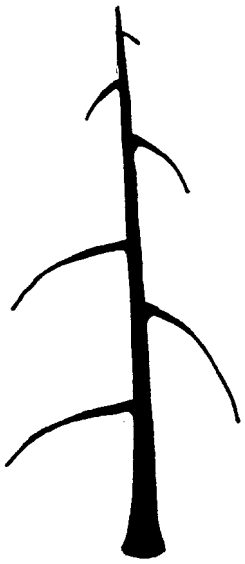
3 - semi upright



4 - spreading

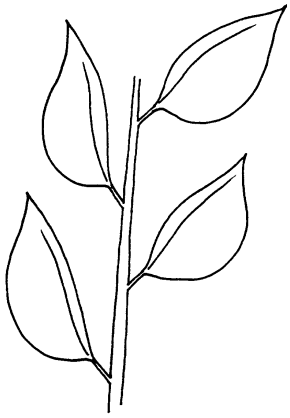


5 - drooping

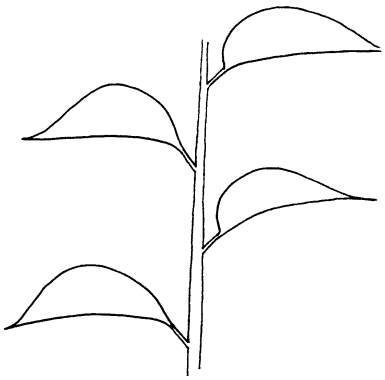


6 - weeping

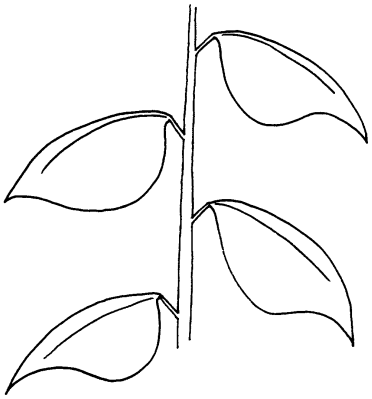
Ad. 16: Leaf blade: attitude in relation to shoot



1 - upwards

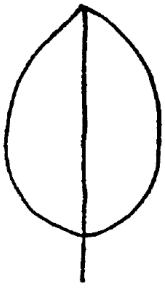


2 - outwards

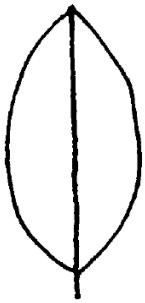


3 - downwards

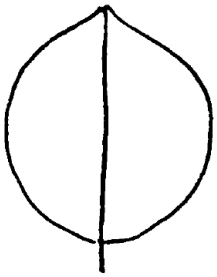
Ad. 20: Leaf blade: shape



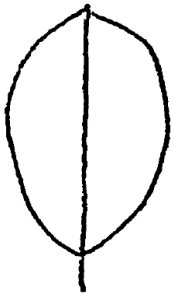
1 - ovate



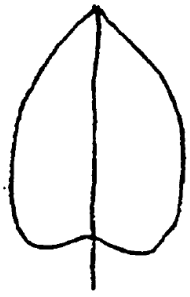
2 - elliptic



3 - rounded

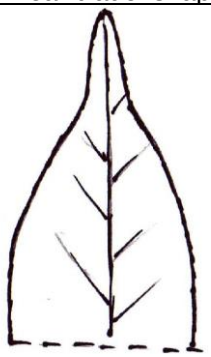


4 - obovate

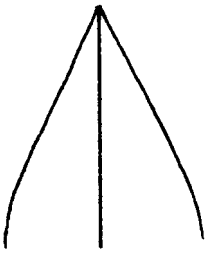


5 - cordate

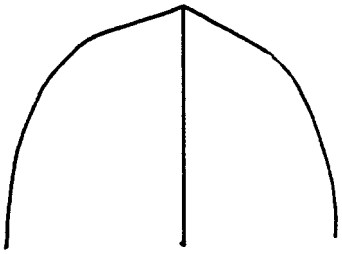
Ad. 21: Leaf blade: shape of apex



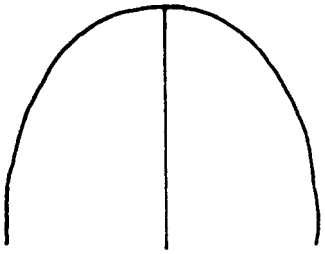
1 - acuminate



2 - acute

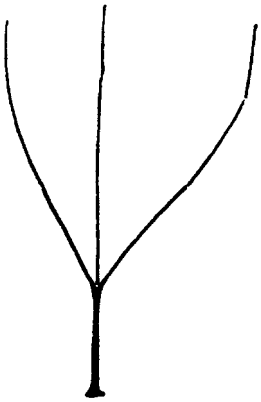


3 - obtuse

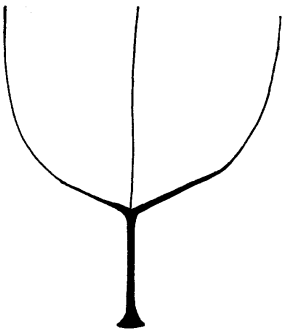


4 - rounded

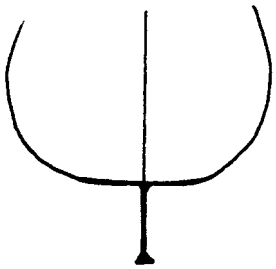
Ad. 22: Leaf blade: shape of base



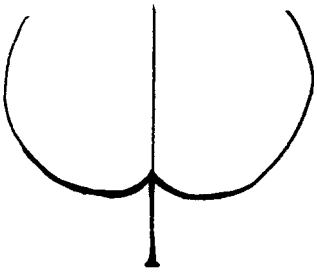
1 - acute



2 - obtuse

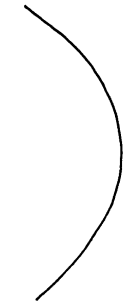


3 - truncate

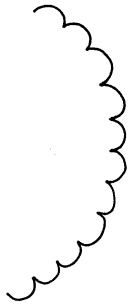


4 - cordate

Ad. 24: Leaf blade: incisions of margin (upper half)



1 - entire



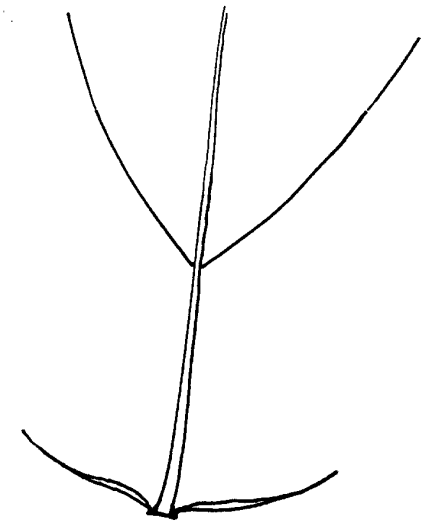
2 - crenate

3 - blunt serrate

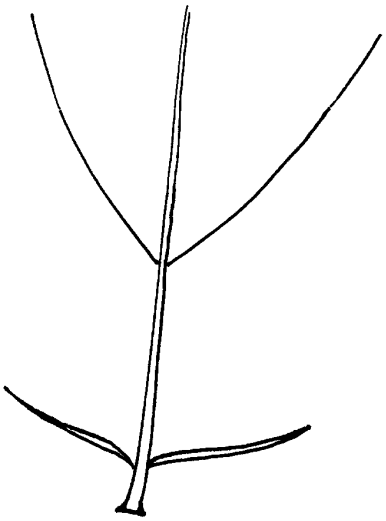
4 - sharp serrate

5 - dentate

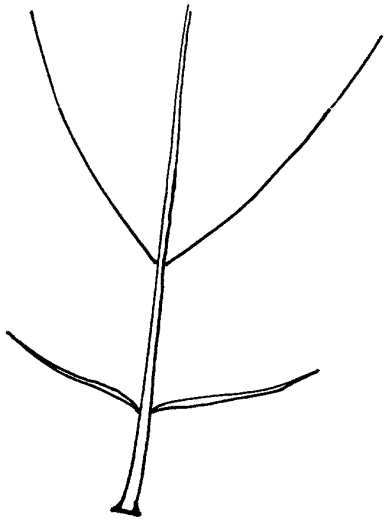
Ad. 28: Petiole: distance of stipules from basal attachment



1 - short

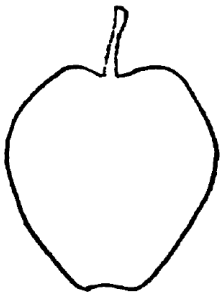


2 - medium

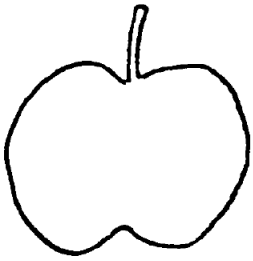


3 - long

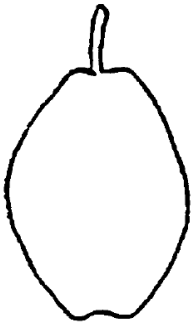
Ad. 49: Fruit: shape (in lateral view)



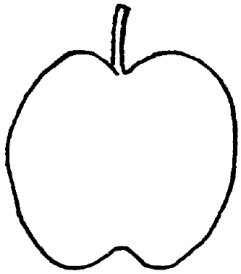
1 - ovate



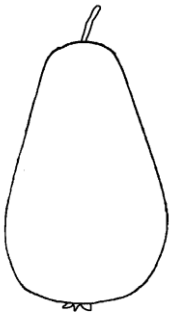
2 - oblate



3 - elliptic

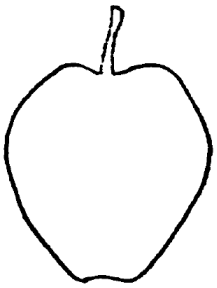


4 - circular

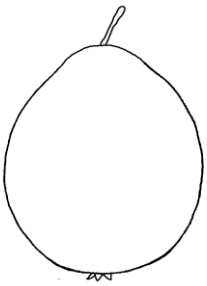


5 - obovate

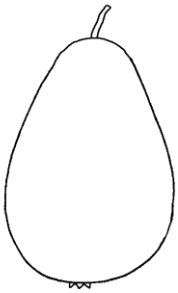
Ad. 50: Fruit: position of maximum diameter



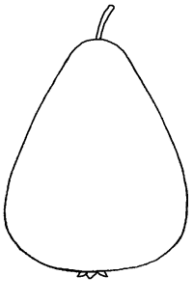
1 - towards stem end



2 - in middle

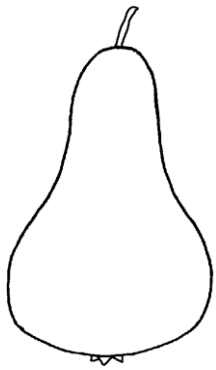


3 - slightly toward calyx end

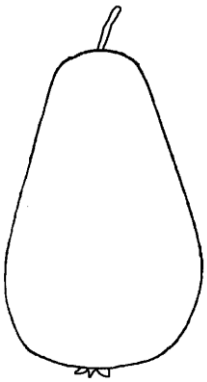


4 - strongly toward calyx end

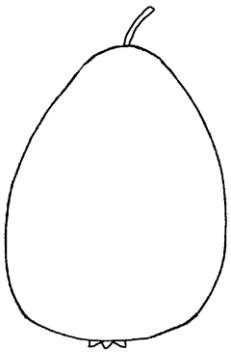
Ad. 52: Fruit: profile of sides



1 - concave

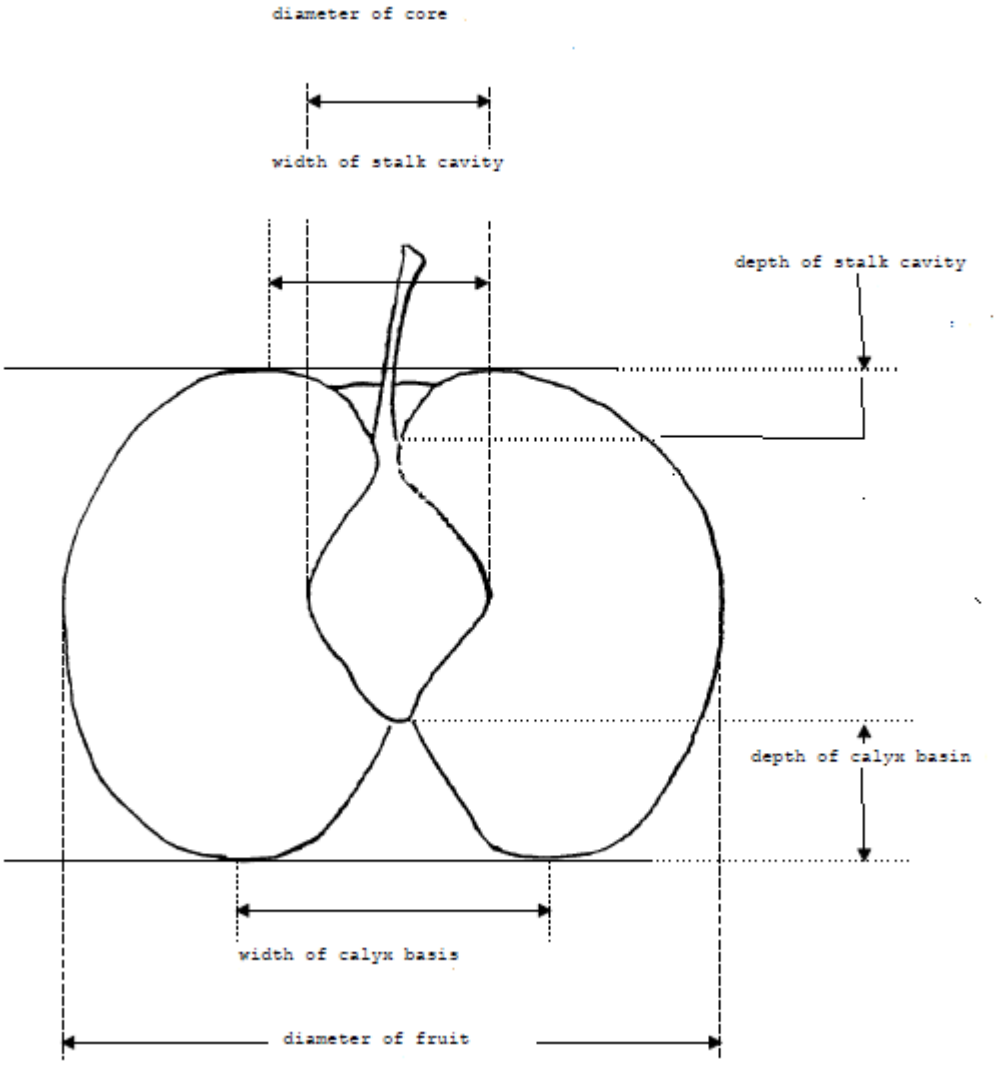


2 - straight



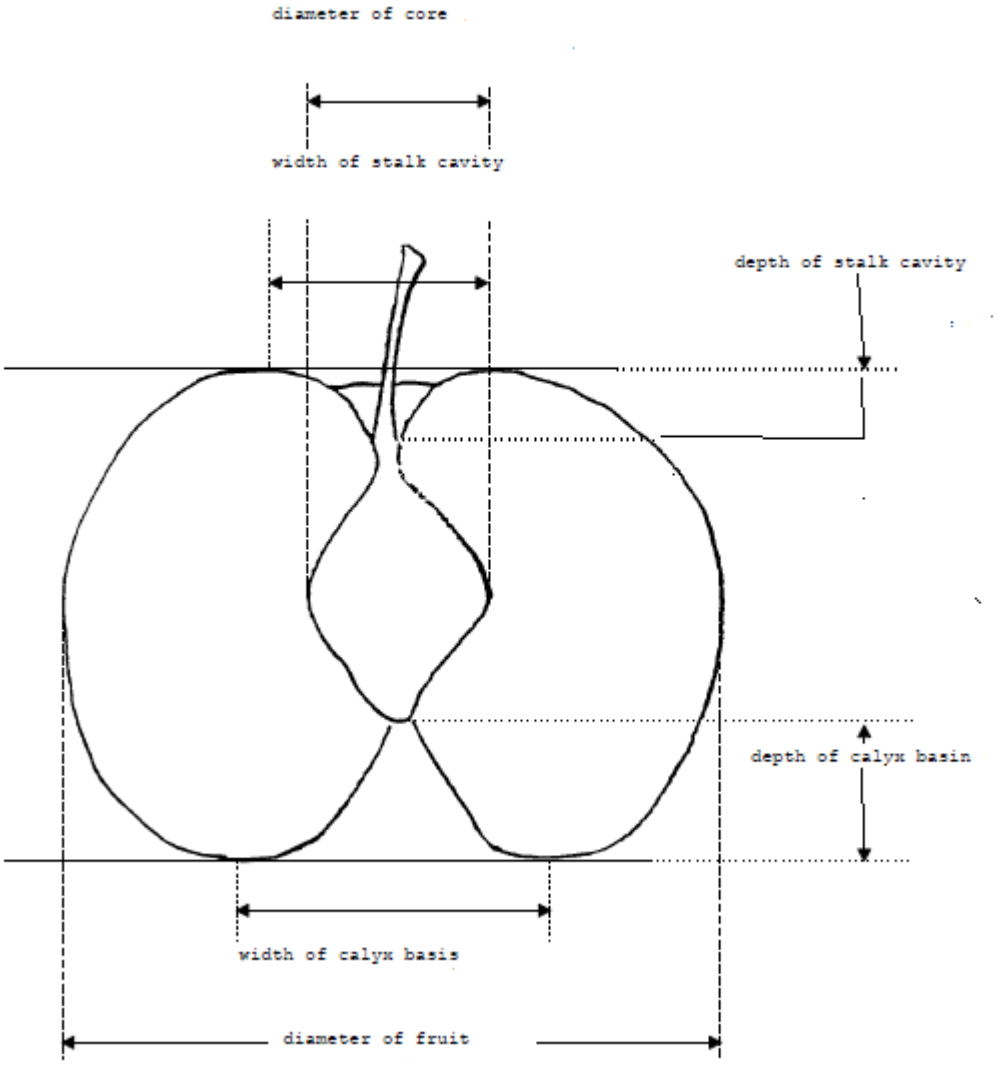
3 - convex

Ad. 65: Fruit: depth of stalk cavity



Fruit: depth of stalk cavity

Ad. 66: Fruit: width of stalk cavity



Fruit: width of stalk cavity

Ad. 67: Fruit: persistence of calyx

The sepals on fruit at harvest can be:

absent or very few remaining = weak persistance

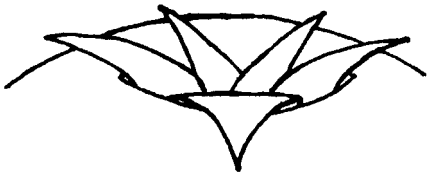
approximately half present = medium persistence

all or almost all present = strong persistence

Ad. 68: Fruit: attitude of sepals

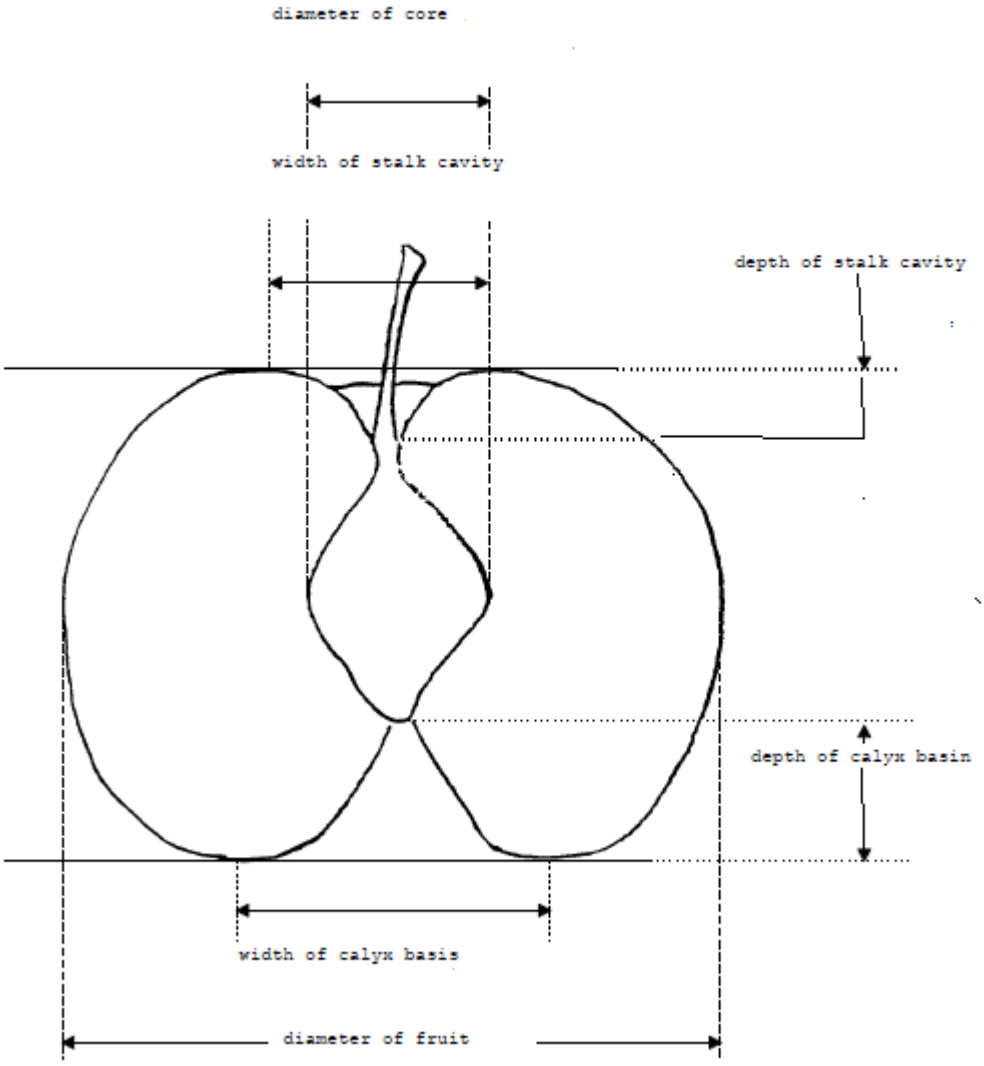
1 - converging

2 - erect



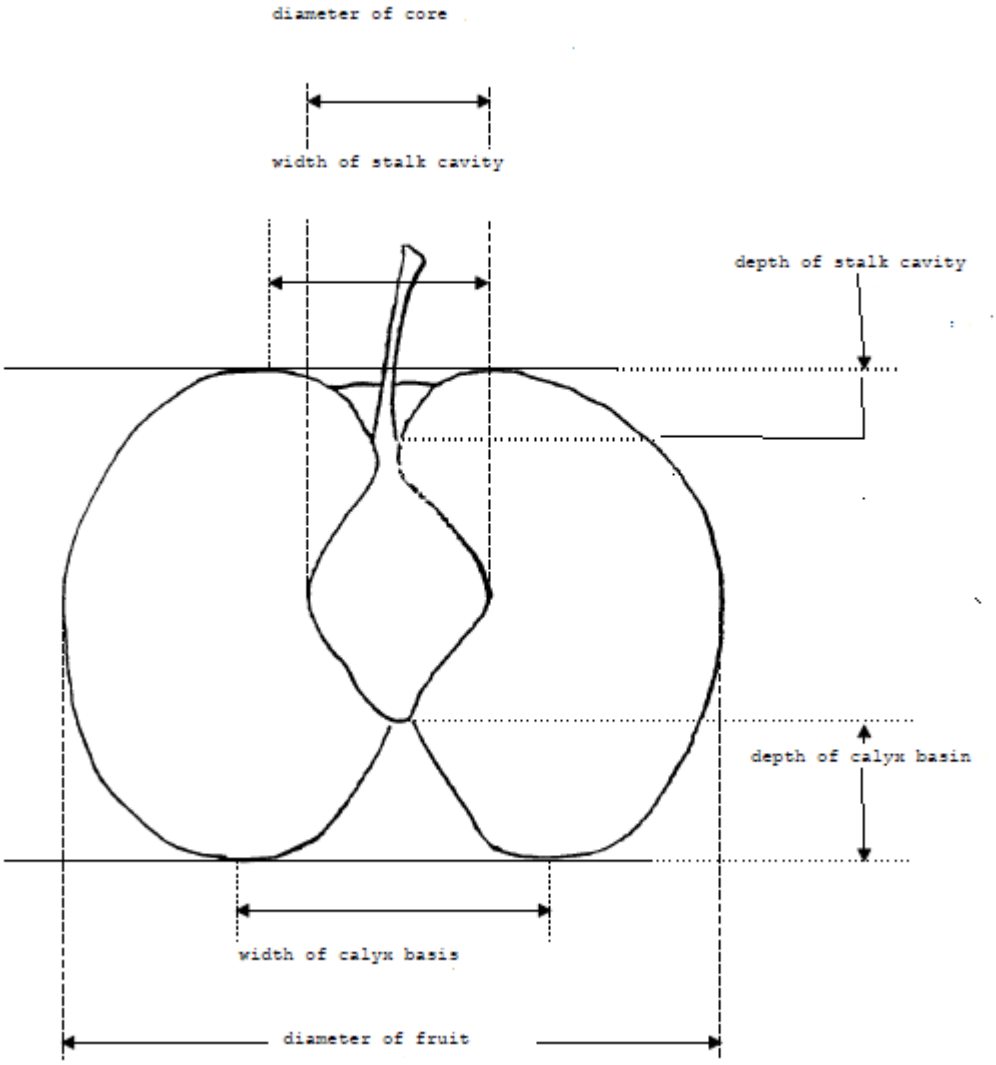
3 - spreading

Ad. 70: Fruit: depth of calyx basin



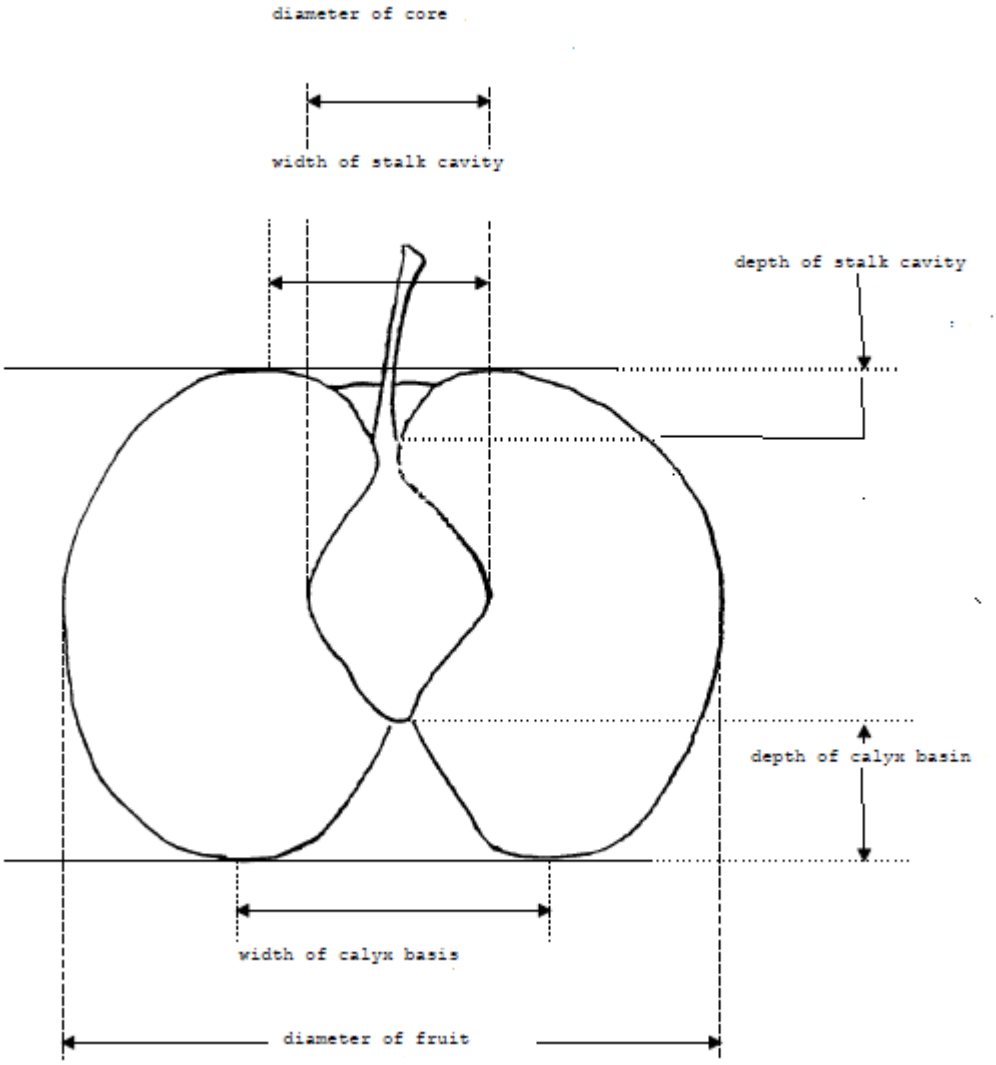
Fruit: depth of calyx basin

Ad. 71: Fruit: width of calyx basin



Fruit: width of calyx basin

Ad. 78: Fruit: ratio diameter of core/diameter of fruit



Fruit: diameter of core and diameter of fruit

9. Literature

Brewer LR, Morgan C, Alspach PA, Volz RK, White AG 2008. Interspecific pear breeding for flavour and texture. Xth International Pear Symposium, 22-26 May 2007, Peniche, Portugal. Acta Horticulturae 800: 461-468.

Brewer LR, Morgan CGT, Alspach, P.A, Volz R.K. X1th International Pear Symposium, 23-26 November 2010, Heritability and Parental Breeding Value Estimates of Abrasion-Induced Skin Discolouration on Pear Fruit

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1.1	Botanical Name	Pyrus xbretschneideri Rehder	[ ]
1.1.2	Common Name	Chinese white pear, Chinese white pear, white pear	
1.2.1	Botanical Name	Pyrus communis L.	[ ]
1.2.2	Common Name	European Pear, Pear	
1.3.1	Botanical Name	Pyrus ×lecontei Rehder	[ ]
1.3.2	Common Name		
1.4.1	Botanical Name	Pyrus pyrifolia (Burm. f.) Nakai	[ ]
1.4.2	Common Name	Asian pear, Chinese pear, Chinese sand pear, Japanese pear, Nashi, Nashi pear, Oriental pear, Sand pear	
1.5.1	Botanical Name	Pyrus pyrifolia (Burm. f.) Nakai var. culta (Mak.) Nakai	[ ]
1.5.2	Common Name	poirier japonais	
1.6.1	Botanical Name	Pyrus ussuriensis Maxim.	[ ]
1.6.2	Common Name	Harbin pear, Ussurian pear	

2. Applicant

Name

Address

Telephone No.

Fax No.

E-mail address

Breeder (if different from applicant)

3. Proposed denomination and breeder's reference

Proposed denomination
(if available)

Breeder's reference

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

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

(b) partially known cross [ ]
(please state known parent variety(ies))

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

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.4 Other [ ]
(please provide details)

4.2 Method of propagating the variety

4.2.1 Vegetative propagation

(a) grafting or budding [ ]
(b) Other (state method) [ ]

.....
: :
: :
:.....:

4.2.2 Other [ ]

(please provide details)

.....
: :
: :
:.....:

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (3)	**Tree: growth habit**		
	fastigiate		1[ ]
	upright		2[ ]
	semi upright		3[ ]
	spreading		4[ ]
	drooping		5[ ]
	weeping		6[ ]
5.2 (45)	**Fruit: size**		
	very small		1[ ]
	small		3[ ]
	medium		5[ ]
	large		7[ ]
	very large		9[ ]
5.3 (50)	**Fruit: position of maximum diameter**		
	towards stem end		1[ ]
	in middle		2[ ]
	slightly toward calyx end		3[ ]
	strongly toward calyx end		4[ ]
5.4 (52)	**Fruit: profile of sides**		
	concave		1[ ]
	straight		2[ ]
	convex		3[ ]
5.5 (54)	**Fruit: relative area of over color**		
	absent or very small		1[ ]
	small		3[ ]
	medium		5[ ]
	large		7[ ]
	very large		9[ ]
5.6 (55)	**Fruit: hue of over color**		
	orange		1[ ]
	orange red		2[ ]
	pink red		3[ ]
	light red		4[ ]
	dark red		5[ ]

5.7 (69)	**Fruit: presence of eye in calyx basin**	
	absent	1[ ]
	present	9[ ]
5.8 (82)	**Time of beginning of flowering**	
	very early	1[ ]
	early	3[ ]
	medium	5[ ]
	late	7[ ]
	very late	9[ ]
5.9 (83)	**Time of harvest maturity**	
	very early	1[ ]
	early	3[ ]
	medium	5[ ]
	late	7[ ]
	very late	9[ ]

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example			

Comments:

7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

7.4 A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (http://www.upov.int/tgp/en/).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

9. Information on plant material to be examined or submitted for examination

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details for where you have indicated “yes”.

.....

9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?
Yes [ ]
(please provide details as specified by the Authority)
No [ ]

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

[End of document]